

Trade and National Security: A Test for Best-Known Hypothesis

Maryam Asghari*¹, Elham Oliagard²

Received: September 29, 2015

Accepted: September 5, 2016

Abstract

National security depends on soft power, the ability of a country to generate and use its economic power and to project its national values. It also depends on long-term factors that contribute to economic growth and increase the total resources base available not only for defense but to provide economic security in the form of income and business opportunities for individuals. The economic issues related to national security are both broad and complex. The economy and economic tools, however, enter into national security considerations in several other ways that include economic sanctions, export controls, economic incentives, expeditionary economics, and economic issues as a cause of conflict. The best-known hypothesis linking trade and conflict among nation-states says, given other things countries that trade more with each other are less likely to go to war. The argument is a simple application of the theory of self-enforcing cooperation in repeated games. This paper focuses on the effect of trade integration between Iran and its important trading partners include Italy, Germany, Greece, Spain, France, Switzerland, Russia, Netherland, Belgium, Sweden, UK, Austria, on Iran's national security over 1980-2015. The results indicate that the trade integration has positive effect on Iran's national security in this period and the best-known hypothesis is valid.

Keywords: Notional Security, Trade, Best-Known Hypothesis, Iran.

JEL Classification: F19, F52, N45.

1. Introduction

Economic activity must be carried out under varying degrees of insecurity. This is true even when the economic activity or transaction is confined to the borders of one country (Dixit, 2009). But insecurity is greater, and has new dimensions, when the activity and transactions

1 . Shahid Ashrafi Esfahani University, Esfahan, Iran (Corresponding Author: Maryam.Asghari@ashrafi.ac.ir).

2. Shahid Ashrafi Esfahani University, Esfahan, Iran (Elham.Oliagard@ashrafi.ac.ir).

cross national borders. The interests of nation-states - geopolitical, domestic political, and economic - influence their trade and investment policies and outcomes; conversely, trade and investment opportunities feedback on interests. Governments may violate the rights of foreigners with less fear of political consequences than they would if the victims were their own citizens, lobbyists, and contributors. Courts may have open or hidden biases favoring their own nationals.

Therefore, traders and investors have greater concerns about the security of their property and contracts when enforcement is in the hands of foreign governments and courts than they would within their own countries. The added insecurity when trading with, or investing in, another country creates a concomitant need for added ex-ante precautionary actions to mitigate some of its effects, as well as attempts to devise new institutions for ex-post remedial or enforcement measures.

Threats to security in both respects may arise not only from foreign private actors, but also from foreign governments, and may be caused by deliberate strategic choices to violate the rights as well as imperfections of governance. Moreover, traders and investors respond to the existence of insecurity by taking ex ante actions, or establishing or joining institutions, to mitigate its effect and also attempt to put in place methods of ex post enforcement, with varying degrees of effectiveness.

An important political argument in favor of free trade agreements is the so called the best-known hypothesis, which states that bilateral trade owns reduce the probability of a bilateral war, a mechanism that has been analyzed theoretically and on which some empirical evidence exists.¹

Martin et al. (2008a) find a strong and significant effect of this kind. Of course, war is costly, period. Therefore, all countries stand to gain from ex-ante arrangements that reduce its probability. The link with trade can be exploited for this purpose: A free trade agreement with neighboring countries creates mutual economic dependence,

1. See Oneal and Russett (1999), Polachek (1980), Martin, Mayer and Thoenig (2008b), Spolaore and Wacziarg (2009).

which increases over time as specific investments are made in response to the favorable trade treatment. Prevention of another war was offered as a strong argument justifying the creation and expansion of the European Union in the six decades following World War II. More generally, Long (2003) and Long & Leeds (2006) find a complementarities between mutual defense pacts and trade agreements. Bilateral trade is higher between countries in alliances that include commitments of mutual defense, but no higher in weaker alliances that promise only neutrality, nonaggression, or consultation, than between non allies. Conversely, trade is higher when a security alliance specifically includes economic cooperation than when it does not; trade in the latter situation is insignificantly different than trade between non allies. Similarly, Martin et al. (2010) find “complementarity between economic and political gains.” Of course, preferential trade agreements can lead to trade diversion; comparing possible gains from a reduced risk of war and economic losses from trade diversion remains problematic.

The reverse implication—more war, less trade—is perhaps too obvious to need detailed evidence. But it is interesting to note that not only formal wars, but also civil wars have a substantial trade-reducing effect (Bayer & Rupert, 2004). So does a country’s response to security threats from foreign terrorists,

2. Does International Trade Promote Peace?

Does trade interdependence promote peace among states? A long intellectual tradition suggests as much, as liberals have argued that the formation of global trade ties and institutions creates incentives to settle disputes before they come to violence (Angell, 1913; Doyle, 1997; Mitrany, 1966; Nye, 1971; Russett and Oneal, 2001). Trade with foreign nations fosters economic interdependence among governments, generates expectations about wealth gains, now and into the future, and may even create a sense of community among nations (Deutsch, 1957; Gartzke, 1998; Haas, 1960; Polachek, 1980; Russett et al., 1998). International institutions like preferential trade arrangements (PTAs) or the World Trade Organization (WTO) that organize trade ties reinforce these peace-making processes. They provide a formal institutional mechanism through which states

lengthen the shadow of future trade relations, credibly commit to economic interdependence, and cooperate to overcome coordination problems. In the process, trade institutions increase trust through creating strong expectations of future gains, enhancing political relations and preserving peace among trade partners (Fernandéz and Portes, 1998; Mansfield and Pevehouse, 2000; Mansfield et al., 1999; Schiff and Winters, 1998).

Trade can be a powerful driver of growth, reducing poverty and creating jobs. In theory at least, there are a number of ways that regional trade integration can support peace:

1. Given the relatively small size of many economies in the developing world, and their dependency on a handful of primary commodities, regional trade integration offers poorer countries mutual development gains through pooled resources, expanded markets, increased regional trade and investment, and greater economic diversification.
2. Economic integration makes conflicts more costly for individual states. Attacking a neighboring economy becomes just as damaging as attacking one's own.
3. Through interdependence, nations can use trade to access one another's resources, instead of using violence to capture them.
4. Regional groupings such as MERCOSUR and SAARC can serve as aspirational clubs and can play a stabilizing role for countries on their borders.
5. Regional cooperation can help reduce the trade in small arms and conflict resources such as blood diamonds and illegal timber. In 1998, the Economic Community of West Africa States (ECOWAS) established the world's first regional moratorium on small arms, banning imports of new weapons without approval from other member states.¹
6. Regional Trade Agreements provide non-military ways to resolve disputes and promote understanding and dialogue between countries. Many such agreements have institutional dispute settlement mechanisms to mediate economic conflicts that have also been used for

1. UNDP, "Human Development Report 2005. International cooperation at a crossroads: Aid, trade and security in an unequal world", UNDP, 2005, p. 173

managing wider political disagreements.

Various scholars have contested this liberal argument (Baldwin, 1980; Barbieri, 1996; Buzan, 1984; Gilpin, 1981; Hirschman, 1945), yet most of the evidence available today suggests that the liberals might be right: economic interdependence can promote collective security among trade partners and trade institutions are central to the peacekeeping process. Studies illustrate that trade partners are systematically less likely to resort to military conflict than states that do not trade (Gartzke et al., 2001; Maoz, 2009; Oneal et al., 1996; Oneal et al., 2003). Others show that when trade becomes institutionalized through PTAs, members of the same arrangement are even less likely to go to war than are other states and that PTAs are most effective in preventing conflict as trade between members grows (Dembinski et al., 2004; Mansfield and Pevehouse, 2000; 2003; Mansfield et al., 1999).

In the absence of international cooperation to reduce political tensions, military spending may be ratcheted up throughout a region as each country tries to outspend its neighbors to ensure its own security, resulting in higher levels of military expenditure but no increase - or even a decrease - in the security of the region. While political tensions themselves can weaken various aspects of economic performance, there are two direct and interrelated avenues by which higher military spending may adversely affect long-run output growth. First, increases in military spending may reduce the total stock of resources that is available for alternative domestic uses such as investment in productive capital, education, and market-oriented technological innovation. Second, high spending on the military may aggravate distortions that reduce the efficiency of resource allocation, thereby lowering total factor productivity.

If these effects turn out to be empirically significant, then a converse proposition is also likely to be valid: the sustained military spending cuts that would become feasible as a result of improved international security should yield a "peace dividend" in the form of higher long-run levels of capacity output. It would then follow that forms of international cooperation that succeeded in reducing tensions, and thus in lowering military spending, would be to the long-run economic benefit of all countries. Interest in the potential size of

this peace dividend has risen considerably in recent years with the improvements in international security that have become evident for both industrial and developing countries with the end of the Cold War and the more recent initiatives aimed at achieving a comprehensive peace in the Middle East as Iran.

3. Trade Integration and Global Financial Crisis

While trade and financial integration has been gathering significant momentum for the past decade, the current global financial crisis has manifested an extraordinary case and timing for us to reassess and rethink carefully about the future course of further integration among our regional economies and beyond. Therefore, it is very timely to talk about the global financial crisis and its implications for economic integration. The ‘crisis’ is defined here as the bursting of the housing market bubble in late 2007, the ensuing collapse in the sub-prime mortgage market and related financial markets and the subsequent collapse of Lehman Brothers in 2008 which resulted in a sharp increase in risk around the world. The effect of the financial crisis on global trade is therefore the difference between a world where there was no crisis and one where there is. That is, to assess the effects of the crisis on trade, a baseline, or “business as usual”, view of a world without a crisis has to be produced.

During 2004-2006, one of the main potential threats to the world economy centered around the global financial imbalances arising from the chronic and rising US current account and fiscal deficits. Although most economists believed that the situation was not sustainable, no one could predict the timing and extent of the unwinding process, nor whether would the US face a hard on soft landing. The current crisis, unfortunately, manifests an abrupt unwinding of the imbalances. The trigger point of the crisis is clearly the subprime lending problem in the US, a new phenomenon. However, most economists would agree that the root cause of the crisis lies beneath excessively accommodative monetary policy that led to excessive credits, and in turn, to asset price bubbles, a repeating cause of past crises. Other important driving factors behind rising credit expansion and bubbles included rising financial innovation and its complexity and lax supervision.

The global financial imbalances could not have heightened rapidly since the early 2000s without fast rising global economic integration. Both global trade and financial integration aided the growing domestic consumption as well as the twin deficits of the current and fiscal accounts. Trade integration facilitated exports. On the other hand, increasing financial integration allowed emerging economies with fast rising export revenues to invest the money in markets where there is a wide variety of financial assets and instruments. At the same time, financial institutions in most advanced economies and a number of emerging economies have invested in opaque financial products and spread globally through financial integration. Therefore, with economic integration at the global level, the large global saving-investment mismatches between countries, which are a net spender, and emerging market, who are net savers, were allowed to persist for a continued period.

International trade links play an important role in the so-called contagious effect, that is, a crisis in one country causes a new crisis in another country with relatively good fundamentals. Glick and Rose (1999) provided some analysis of the relationship between trade and contagion; while Forbes (2001) went further to construct some statistics measuring the importance of trade linkages in transmitting crises.

In the context of a global crisis, openness to trade is considered one of the channels for the propagation of the crisis. Several authors, including Eichengreen et al. (1996), Glick and Rose (1998), and Kaminsky and Reinhart (1996) find that trade links are the most important channels of propagation of economic crises. Among the most recent papers in this literature, Kali and Reyes (2005) combine a network approach with data on international trade linkages in order to map the global trading system as an interdependent complex network, with the countries as nodes and trade relationships as links between them. The authors use the structure of the international trade network as a proxy for different types of country ties, including credit arrangements and financial flows. Using the network approach, the authors find that a crisis is amplified to other countries if the epicenter country is better integrated into the trade network. They also find that other countries affected by such a shock are in turn better able to dissipate the impact of the shock if they are well integrated into the

network. With respect to the 2008/9 crisis, Rose and Spiegel (2009) analyze the role of three types of linkages with the US as the origin of the crisis: trade linkages, foreign asset exposure, and international credit. They do not find any strong evidence that linkages with the US can be associated with the incidence of the crisis. Instead, Baldwin (2010) argues that the decline in world trade during the 2008/9 crisis was synchronized across almost all important trading countries as global production networks reacted to rising uncertainty and companies around the world postponed whatever investments and purchases they could postpone. Thus, exposure to trade in general, rather than exposure to a certain market, was probably more important for transmission of the crisis.

In the context of a domestic crisis, Berman (2009) looks at two channels through which a crisis affects exports: A change in relative prices, which affects net exports positively, and a financial effect which reduces net exports due to the presence of a fixed cost to exports and foreign currency borrowing. He empirically shows that currency crises affect exports negatively, and it takes around six years for exports to return to their natural level. This is particularly true for firms highly dependent on external finance or facing high entry fixed costs to exporting. Similarly, Iacovone and Zavacka (2009) analyze the impact of financial crises on export growth. They distinguish between a supply and a demand channel. The authors show that banking crises affect export growth negatively in sectors more heavily dependent on external finance or characterized by a lower share of tangible assets. The authors also show that supply side effects are distinct to the effects owing to a drop in demand.

4. Trade and Environmental Policy

Theories of international trade and location support the idea that relatively strict environmental policies can have a strong impact on international trade and location of firms, notably in the case of “footloose” industries (see, for instance, the surveys by Ulph, 1999 and Markusen, 1999).

A number of hypotheses have emerged concerning the relationship between environmental regulations/pollution policy and trade that lead to different expectations.

First, the PHH states that differences in environmental regulations are the main motivation for trade. The hypothesis predicts that trade liberalization in goods will lead to the relocation of pollution intensive production from countries with high income and tight environmental regulations to countries with low income and lax environmental regulations. Developing countries therefore will be expected to develop a comparative advantage in pollution intensive industries, thus becoming pollution havens. In this scenario developed countries will gain (clean environment) while developing countries will lose (polluted environment).

The second hypothesis is the factor endowment hypothesis (FEH) that claims that pollution policy has no significant effect on trade patterns but rather differences in factor endowments determine trade. This implies that countries where capital is relatively abundant will export capital intensive (dirty) goods. This stimulates production while increasing pollution in the capital rich country. Countries where capital is scarce will see a fall in pollution given the contraction of the pollution generating industries. Thus, the effects of liberalized trade on the environment depend on the distribution of comparative advantages across countries.

The race-to-the-bottom is the third hypothesis, which asserts that developed countries refrain from adopting more stringent environmental regulations due to competition with countries that have lax environmental regulation (Stoessel, 2001; Esty and Geradin, 1998).

Finally, the “Porter hypothesis” assumes a race-to-the-top, meaning that strict environmental regulations have the potential to induce efficiency while encouraging innovation that helps to improve competitiveness (Porter and Van Der Linde, 1995; Stoessel, 2001). Ambec and Barla (2006) follow the same line of thinking and argue that environmental regulations force managers to adopt profitable technologies earlier. While the “weak” version of the hypothesis states that stricter regulation leads to more innovation, the strong version states that stricter regulation enhances business performance.

The literature identifies the existence of both positive and negative effects of pollution policy on trade. More recently, Levinson and Taylor (2008) presented evidence for the NAFTA countries indicating

that pollution control expenditures have important effects on trade flows and showed that aggregation issues, unobserved heterogeneity, country heterogeneity and endogeneity can bias the results against finding a PHH. As regards aggregation, Grether and De Melo (2002) and Mathys (2002) note that an aggregate analysis hides specific patterns in each industry and hence, may mask pollution haven effects in specific industries. They argue that if there is indeed a PHH story in the data, it is more likely to be found at the disaggregated level.

As regards the “Porter hypothesis”, empirical tests are mainly based on specific industries with certain characteristics that profit the most from stringent regulations. For example, Albrecht (1998) analyzes only industries affected by the Montreal Protocol and finds evidence supporting the Porter Hypothesis for Denmark and the US, whereas Murty and Kumar (2003) focus their analyses on water-polluting industries in India and also find weak support for the hypothesis. Finally Ambec, Cohen, Elgie, & Lanoie (2011) provide a summary of theoretical and empirical studies on the Porter hypothesis. On the empirical side, the evidence about the weak version of the “Porter Hypothesis” is fairly well established, while the empirical evidence on the strong version is mixed, with only recent studies supporting it. However, most studies use productivity as the target variable. One exception is the study conducted by Constantini and Crespi (2008). The authors use exports of specific industries related to renewable energies as target variables and find support for the strong version of the hypothesis.

5. Theoretical Background, Model Specification, Data Sources and Results

5.1. Theoretical Background, Model Specification

The aim of our empirical analysis is to estimate whether and how trade integration between Iran and its important trading partners, include Italy, Germany, Greece, Spain, France, Switzerland, Russia, Netherland, Belgium, Sweden, UK, Austria, exerted a significant impact on Iran’s national security over 1980-2015 in a 2SLS and gravity setting.

We estimate a system of simultaneous equations, in which the national security and trade integration index are endogenously determined by country-specific characteristics. This system approach

takes into account the endogeneity of trade integration index.

We estimate a two-equation system using 1980–2012 panel data for Iran and its important trade partners. For the first equation we assume that the national security and trade integration index are joint products, produced by country-specific factors: net migration, CO₂ emissions per capita, and energy production, telephone lines, secure internet servers and GDP per capita.

We suppose t and i are time and a proxy for Iran in describing the model. The joint the national security index function is:

$$F(\text{NSI}_{it}, T_{ijt}) = G(\text{NM}_{it}, \text{CO2}_{it}, \text{EP}_{it}, \text{TL}_{it}, \text{SIS}_{it}, \text{GDPP}_{it})$$

The National Security Index (NSI), constructed by the staff of the National Security Council Secretariat (NSCS), has not yet received the attention it deserves. The NSI is an average of five other indices, the Human Development Index (HDI), the Research and Development Index, the Gross Domestic Product Performance Index, the Defense Expenditure Index and the Population Index.

Migration can also exacerbate environmental and economic problems in receiving areas. In addition, high population pressure limited migration opportunities led to communal tension within the country and between the countries. Barnett (2003) and Scheffran and Battaglini (2011) found that climate change; human migration and political instability have been inextricably linked. They also noted that arrival of environmental migrants can burden the economic and pressures of resources are expected to arise in the receiving area. The excess demand for resources may also generate lateral pressure, expansion of economic and political activities beyond the regions' or state's borders in order to acquire resources, which increases the risk of conflict among people as well as political instability. Therefore, to avoid climate-induced migration and the subsequent risk of threats, ultimately reducing the amount of greenhouse emissions, including governmental social support, public private relationship, good governance and institutional system, intellectual property right as well as enhancing adaptive capacity is essential.

Migrations, displacement of persons, increasing multiculturalism and ageing as well as other changes in the operating environment have security effects. Social exclusion, increasing inequality and

urbanisation as well as increasing immigration are trends in society that can already be seen. The structural change of Finnish society is happening at a fairly rapid tempo. In the future the effects of population growth and migrations in our operating environment will be exacerbated by the ageing of the population.

Although the bursting of the technology bubble as well as heightened security concerns are casting a shadow, the selective dismantling of rich country barriers to immigration of the highly skilled from poor countries will continue, driven by three powerful long-term trends:

First, the combination of the skill-bias of much recent technological advancement with governments' desire to have a competitive advantage in emerging knowledge based industries. Modern growth is about innovation and it is here, rather than in labor market effects that the long-term gains of human capital inflows are probably most manifest.

Second, the aging of rich-country populations that on the labor market side, this trend is likely to increase demand for service providers for an older population. But the huge fiscal costs of population aging are also likely to drive targeted attempts to attract higher-earning foreign workers to help pay for pension and health care benefits for the domestic population. With the alternatives being greater tax increases on the working population or more substantial benefit cuts for the retired population, there will be strong pressures to "import" taxpayers at the margin.

Finally, although in theory international product and capital market integration can substitute for international labor market integration, in practice the broader globalization of production and trade tend to evolve together. For example, multinational companies desire the flexibility to move their staff between locations, and sometimes use the threat of moving jobs to win more flexibility to hire foreign workers domestically. Looking forward, the evolving liberalization of trade in services is likely to blur the lines between trade and migration.

The intensification of product market competition will increase the pressure on governments to ease immigration restrictions so as to provide domestic firms with a source of competitive advantage through improved and cheaper access to a diverse set of skills. When

it comes to the innovation-intensive sectors of the economy, governments of rich countries will be more and more sensitive to claims that other countries are providing more conducive competitive environments to their firms.

Net migration (NM) is the net total of migrants during the period, that is, the total number of immigrants less the annual number of emigrants, including both citizens and noncitizens. Data are five-year estimates. To derive estimates of net migration, the United Nations Population Division takes into account the past migration history of a country or area, the migration policy of a country, and the influx of refugees in recent periods. The data to calculate these official estimates come from a variety of sources, including border statistics, administrative records, surveys, and censuses. When no official estimates can be made because of insufficient data, net migration is derived through the balance equation, which is the difference between overall population growth and the natural increase during the 1990-2000 intercensal periods.

Climate change has a profound effect on the operating environment. Disasters, such as floods and environmental catastrophes are increasing. Global warming will bring new animal species into country, the environmental impact of which is yet unknown. Moreover, various diseases will proliferate and extend into new areas.

Climate change may cause conflicts (e.g. rising water levels, lack of potable water, food shortages, migration, energy issues). Then again, some of the effects may also generate positive things, such as various technological breakthroughs.

CO₂ emissions (metric tons per capita) (CO₂): Carbon dioxide emissions are those stemming from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring.

Availability of energy and the scarcity of natural resources is one of the most obvious trends affecting the operating environment is the rising price of energy as well as challenges related to its availability. Trends associated with the security of supply of energy include dwindling stockpiles and the ageing of skilled personnel as well as the diminishing fleet of transport equipment. As global natural resources become increasingly scarce this may lead to a lack of resources and conflicts.

Energy production (kt of oil equivalent) (EP) :Energy production refers to forms of primary energy--petroleum (crude oil, natural gas liquids, and oil from nonconventional sources), natural gas, solid fuels (coal, lignite, and other derived fuels), and combustible renewables and waste--and primary electricity, all converted into oil equivalents.

Society's vulnerability: Society becomes more and more vulnerable as functions continue to specialise and increasingly rely on technology infrastructures. Vulnerability will increase in the future because of progressively more encompassing and complex IT systems and due to society's reliance on disturbance-free technical systems. Technical infrastructure will increasingly rely on the private sector. Information networks are becoming global, which increases cyber-crime. The significance of the human factor is accentuated. Domestic knowledge capital in technical systems is decreasing. In addition to the business sector, technology is affecting the everyday life of citizens more and more.

Telephone lines (per 100 people)(TL): is telephone lines are fixed telephone lines that connect a subscriber's terminal equipment to the public switched telephone network and that have a port on a telephone exchange. Integrated services digital network channels and fixed wireless subscribers are included.

The development of information and communications technologies is as a two folds consequence. Although it is much easier to find information from networks, it is also much easier to exploit the easy access of the information for criminal activities. Nonetheless, ICT will also play an increasing role in the provision of security. Technological solutions will advance the compiling and replicating of situation pictures as well as in certain communication features, to name a few. The utilisation of ICT must not only be improved in regard to crime prevention, it is invaluable in identifying many of the abovementioned threats as well as in preparedness.

Secure Internet servers (per 1 million people) (SIS) are servers using encryption technology in Internet transactions.

GDP per capita (GDPP) is aggregate wealth index, because of a country's wealth affects national security. The fall in the GDP per capita (GDPP), combined with the need to drastically reduce the government expenditures in order to avoid credit defaults has led in many countries to

the reduction of defense budgets as the most obvious effect of the economic problems on the security and defense area.

Gravity has long been one of the most successful empirical models in economics. The gravity equation in international trade is one of the most robust empirical finding in economics, bilateral trade between two countries is proportional to their respective size, measured by and the product of the importer's and exporter's GDP, as proxies of the 'mass', and population and inversely proportional to the geographic distance, as a proxy of transport costs, between them.

In line with recent works, we augmented the gravity equation with a bilateral trade degree of connection index. Starting from Ivan et al., (2006), the inclusion of 'bilateral trade degree of connection index' in empirical papers has been widely used to obtain a specification of a gravity equation.

In the world economy, the relative flow from economy j (Iran's important trade partners) to economy i (Iran) in terms of the total flow of economy j , T_{ij} , is given by

$$T_{ij} = \frac{X_{ij}}{\sum_{j \in N} X_{ij}}$$

Let T_{ij} be the square matrix of relative flows: the component ij of matrix T_{ij} .

We invert the relation $F()=G()$ to obtain the function of the bilateral trade between Iran and its trade partners: $T_{ij}= f(\text{GDPP}_i, \text{GDPP}_j, \text{Dis}_{ij}, P_i, P_j, \text{FCI}_i, \text{FCI}_j, \text{EP}_i, \text{EP}_j)$, which represents the relation between T_{ij} and the variables of Iran's and its trade partner GDP per capita, geographic distance, population, financial crises and environmental policy index.

According Lukman Hakim (2009), we will incorporate the Exchange Market Pressure (EMP) as the financial crisis index to the model to determine the influence of financial crisis on trade integration. The EMP Index was the simple sum of the rate of change in international reserves and rate of change in the exchange rate.

Our measure of environmental policy is energy efficiency (energy use/GDP). The goal to reduce the amount of energy required to provide products and services. There are various motivations to improve energy efficiency. Reducing energy use reduces energy costs

and may result in a financial cost saving to consumers if the energy savings offset any additional costs of implementing an energy efficient technology. Reducing energy use is also seen as a solution to the problem of reducing emissions. According to the International Energy Agency, improved energy efficiency in building, industrial processes and transportation could reduce the world's energy needs and help control global emissions of greenhouse gases.

5.2. Data Sources

The time period covered in the estimation is 1980-2015 across Iran and its important trading partners (include Italy, Germany, Greece, Spain, France, Switzerland, Russia, Netherland, Belgium, Sweden, UK and Austria). Data are obtained from the World Bank's 2015 World Development Indicators' (WDI's) CD-Rom and on-line WDI 2016 (<http://publications.worldbank.org/wdi>).

5.3. Main Results

As for the empirical strategy, we use a 2SLS panel data technique. A major motivation for this choice is the possibility to control for the correlated time invariant heterogeneity.¹

We test the stationarity of variables in the model. Therefore, I make the unit root test of Levin, Lin & Chu and Im, Pesaran & Shin W-stat to test for it. The results show that all variables are stationarity at level in the region (Table 1).

1. OLS suffer from heterogeneity bias in a gravity setting. The two most widely used panel data models are the random effect model (REM) and fixed effect model (FEM): both can control for heterogeneity. Their assumptions are different. REM models require that unobserved bilateral effects are ~ n.i.i. and orthogonal to the remaining part of the error term. regressors have to be uncorrelated to individual effects and error term for all cross sections and time periods. If the orthogonality conditions hold, the REM provides more efficient estimates than FE estimators. If explanatory variables are correlated with unobserved individual effects FEM is consistent.

Table 1: Variables Stationarity Tests

Variables	Levin, Lin & Chu-Test		Im, Pesaran and Shin W-stat -Test	
	Statistic	Prob	Statistic	Prob
NSI _{it}	3.36672	0.0000	4.84604	0.0000
GDP Per Capita _{it}	-3.84767	0.0000	-4.20259	0.0001
GDP Per Capita _{jt}	-5.56337	0.0000	-5.56347	0.0001
Net Migration _{it}	-4.76166	0.0000	-5.38136	0.0000
CO ₂ emissions per capita _{it}	-3.70375	0.0442	-3.23834	0.0001
Energy Production _{it}	3.95384	0.0000	3.84562	0.0000
Telephone lines _{it}	-3.76847	0.0001	-3.94342	0.0000
Secure Internet servers _{it}	2.66335	0.0000	2.02245	0.0000
T _{ijt}	-5.33756	0.0000	-5.22526	0.0000
Geographic Distance _{ijt}	2.80451	0.0001	-2.69354	0.0000
Population _{it}	-3.28537	0.0000	4.56879	0.0001
Population _{jt}	-4.01643	0.0000	-2.63468	0.0000
Financial Crises Index _{it}	-3.55804	0.0001	-5.49820	0.0002
Financial Crises Index _{jt}	-3.98131	0.0000	-3.87846	0.0000
Environmental Policy Index _{it}	-3.58957	0.0001	-5.32614	0.0000
Environmental Policy Index _{jt}	-3.72814	0.0000	-4.60123	0.0000

We perform a Hausman specification test to check the presence of correlation between explanatory variables and individual effects. Results are reported in Table 2: the null hypothesis of zero correlation is rejected, showing that for our purposes FEM seems more reliable than REM.¹ However, FEM suffers from the major shortcoming of not being able to provide estimates of time invariant regressors.

1. The test statistic of 16.90 is greater than the chi-squared critical value with 14 degrees of freedom therefore the null hypothesis that the REM is consistent is rejected.

Table 2: The Model Estimation as Trade Integration and National Security Index are Endogenously

Variable	Random Effect	Fixed Effect ⁽¹⁾
C	.6558443* (3.31)	.6568882*(3.14)
Net Migration _{it}	-1.26071* (-3.89)	-1.70607* (-4.47)
CO ₂ emissions per capita _{it}	.6129922* (12.59)	-.6093981* (-11.87)
Energy Production _{it}	8.49065 (1.37)	7.96706(1.26)
Trade Integration Index _{ijt}	12.89374 (1.29)	92.91235* (2.90)
Telephone lines _{it}	.0595515** (2.79)	.0565361* (2.56)
Secure Internet servers _{it}	-.0042838** (-2.43)	-.0038222**(-2.05)
GDP Per Capita _{it}	-.0007658* (-12.54)	.0008838*(11.28)
Hausman Test ⁽²⁾		90.67
Prob> chi2		0.0000

Note: T-statistics are shown in parentheses. Significance at the 99%, 95% and 90% confidence levels are indicated by *, **and ***, respectively.

(1) The acceptance of model by the Hausman test.

(2) The hausman test tests the null hypothesis that the coefficients estimated by the efficient random effects estimator are the same as the ones estimated by the consistent fixed effects estimator. If they are (insignificant P-value, Prob>chi2 larger than .05) then it is safe to use random effects. If you get a significant P-value, however, you should use fixed effects.

The all coefficients of the variables except telephone lines are significantly. The outward migration from Iran generates welfare losses. Losses include public investments in education and training and possible shortages of labor (Commander et al., 2003). Losses are smaller if there is a surplus of labor to replace those who leave. Although skilled migrants tend to remit more than unskilled migrants, skilled migration is found to generate more welfare losses than gains (Puri and Ritzema, 2000). Skilled workers could also be made to pay for their own education so that public investments in education would not be wasted once they leave the country (Commander et al., 2003). However, many professions such as teachers and medical personnel are tightly regulated and require training in public institutions.

The loss of skilled workers or brain drain can slow Iran's economic growth (Lucas, 1988). However, brain drains can be turned into brain gains through return of skilled migrants return with higher human capital or through networks of skilled migrants with those at home.

But, Iranian skilled migrants outflow are more than the ones return to home. Therefore, Iran should restrict the flows of workers to some extent in order to induce gains from skill creation and slow brain drain. Private education and better incentive may also lower losses due to public investments in education and encourage skilled workers to stay (Docquier et al., 2007).

The inward immigrant groups also may pose a security threat to Iran by smuggling arms or people, forming alliances with domestic opposition groups, or participating in drug trafficking. In addition to potentially affecting the course of violent conflicts, migration flows can impact on Iran's security when they become intertwined with organized crime. Perhaps the most obvious link between migration and organized crime is the global industry in human smuggling and trafficking that has emerged to meet the demands of individuals seeking to cross national borders. This is an instance in which market-based mechanisms take over when the demand for opportunities to immigrate outstrips the supply provided by official channels in Iran's migration policies. The nexus between organized criminal groups, armed rebel organizations, and terrorist networks is often quite difficult to disentangle. Scholars have pointed out the extent to which transnational criminal networks provided the material basis for the country conflict.

Some of the costs of using fossil fuels—coal, oil, and natural gas—are obvious, such as the cost of labor to mine for coal or drill for oil, of labor and materials to build energy-generating plants, and of transportation of coal and oil to the plants. These costs are included in our electricity bills or in the purchase price of gasoline for cars.

Some energy costs are not included in consumer utility or gas bills, nor are they paid for by the companies that produce or sell the energy but they effect on national security. These include human health problems caused by air pollution from the burning of coal and oil; damage to land from coal mining and to miners from black lung disease; environmental degradation caused by global warming, acid rain, and water pollution; and national security costs, such as protecting foreign sources of oil.

Since such costs are indirect and difficult to determine, they have traditionally remained external to the energy pricing system, and are

thus often referred to as externalities. And since the producers and the users of energy do not pay for these costs, society as a whole must pay for them. But this pricing system masks the true costs of fossil fuels and results in damage to human health, the environment, and the economy. Many of the environmental problems our country faces today result from our fossil fuel dependence. These impacts include global warming, air quality deterioration, oil spills, and acid rain.

Climate change has a profound effect on the operating environment. Disasters, such as floods and environmental catastrophes are increasing. Global warming will bring new animal species into country, the environmental impact of which is yet unknown. Moreover, various diseases will proliferate and extend into new areas. Climate change may cause conflicts, e.g. rising water levels, lack of potable water, food shortages, migration, energy issues.

Iran's current energy supply system is highly inefficient. It produces high levels of CO₂ emissions and harmful substances with considerable consequences for the health of the population in metropolitan areas, as well as considerable follow-up costs for the economy as a whole in the long term. In addition, from a budgetary point of view, the current substantial subsidies for the energy supply are also a problem. Therefore, Iran is now faced with a considerable energy policy challenge which makes it a matter of urgency to restructure the energy supply system, taking into account economically reasonable and technologically feasible alternatives. These alternatives already exist and Iran could realistically use them, both in the interests of its own population and economy and in the interests of climate protection.

Careful planning for Iran's future energy supply and the convincing substantiation for developing nuclear power plant capacity require a thorough investigation into the options for increasing efficiency and reducing electricity production capacity by using more modern technologies both among electricity consumers and for electricity production itself. Furthermore, an investigation must be carried out into the profitability of nuclear power plants, considering all operational and economic costs, in comparison to fossil-fuel power plants and renewable energies (wind power, solar-thermal power plants etc.). However, nuclear energy is a better option than the

alternatives, the question of supply security and energy independence, which is the most important matter for Iran's security.

International trade issues, such as bilateral economic agreements and the formation of regional trading blocs, are high on the national agendas of both Iran and Western countries. Implied in this movement for increased economic cooperation is the notion that consumers, industries, and the public sector all benefit from increased international trade, and that the ensuing growth and affluence will create a tendency away from North-South tension and interstate or non-state conflict.

The trade integration helps to enhance Iran's national security, because it enlarges the level of trade between member countries and, in so doing, increases familiarity between the people of the member countries and lessens the degree of misconceptions. Enlarged economic integration could discourage war because it makes war more costly. Thus security issues provide a rationale for discriminating against non-members and limiting trade preference to member countries.

The internet and digital technologies are transforming our society by driving economic growth, connecting people and providing new ways to communicate and co-operate with one another. The internet will become increasingly central to our economy and our society. But the growing role of cyberspace has also opened up new threats as well as new opportunities. Criminals from all corners of the globe are already exploiting the internet to target countries in a variety of ways. There are crimes that only exist in the digital world, in particular those that target the integrity of computer networks and online services. But cyberspace is also being used as a platform for committing crimes such as fraud, and on an industrial scale. Identity theft and fraud online now dwarf their offline equivalents. The internet has provided new opportunities for those who seek to exploit children and the vulnerable. Cyberspace allows criminals to target countries from other jurisdictions across the world, making it harder to enforce the law. As businesses and government services move more of their operations online, the scope of potential targets will continue to grow.

Some of the most sophisticated threats to Iran in cyberspace come from other countries which seek to conduct espionage with the aim of spying on or compromising our government, military, industrial and

economic assets, as well as monitoring opponents of their own regimes. 'Patriotic' hackers can act upon states' behalf, to spread disinformation, disrupt critical services or seek advantage during times of increased tension. In times of conflict, vulnerabilities in cyberspace could be exploited by an enemy to reduce our military's technological advantage, or to reach past it to attack our critical infrastructure at home.

Cyberspace is already used by terrorists to spread propaganda, radicalize potential supporters, raise funds, communicate and plan. While terrorists can be expected to continue to favor high-profile physical attacks, the threat that they might also use cyberspace to facilitate or to mount attacks against Iran is growing. We judge that it will continue to do so, especially if terrorists believe that our national infrastructure may be vulnerable.

The fall in the GDP, combined with the need to drastically reduce Iran's government expenditures in order to avoid credit defaults has led in many countries to the reduction of defense budgets as the most obvious effect of the economic problems on the security and defense area. At national level, a short term negative impact of reduced expenditures refers to the national defense capabilities, as the diminished defense budgets determine the military decision makers to take some difficult decisions as to where to allocate the scarce resources. Besides the most obvious and direct effects on military budgets, the economic crisis generates other indirect effects, such as a sharpening of the international competition between manufacturers and a decrease in activity or even bankruptcies for the less competitive. These negative effects would not be confined only from textiles to electronic components manufacturers, but would see their business activities slow down due to reduced or cancelled orders from manufacturers.

6. Conclusions

The potential impact of trade agreements with the European Union on Iran's economy is important and has been the focus of much study, as have been the possible general benefits for Iran and the EU. Conversely, trade integration between Iran and the European Union and its impact on Iran's national security has been the subject of less

study.

As the holder of the bulk of the world's oil reserves and the location of several political crises that affect Iran's security interests, Iran is a strategic country for Europe. At the same time, Iran has an unfulfilled potential as a stronger trade partner with the West; thus, in recent years, the EU has pursued more active trade agendas with Iran, promoting stronger bilateral and regional trade ties—but with political ends in mind.

As will be explained, mutual dependence makes conflict more costly, thereby increasing the incentives toward cooperation, and hence toward peace. Probably many kinds of mutual dependencies affect dyadic conflict-cooperation levels. However, if valid, the results may serve as the impetus to refine and extend the relationships studied here. In this article, international trade is taken as a measure of mutual economic dependence. Our results indicate that the trade integration between Iran and its trade partners has positive effect on Iran's national security over 1980-2015 and the best-known hypothesis is valid. It is hypothesized that holding other factors constant, dyadic conflict would be negatively related to dyadic trade patterns. Thus, Iran and EU countries with the most mutual international trade should exhibit the least conflict. In addition, it is argued that the more essential and strategic the trade (i.e., the stronger the dependence), the greater the deterrent effect of trade on conflict.

References

- Albrecht, J. (1998). Environmental Costs and Competitiveness: A Product-Specific Test of the Porter Hypothesis. *University of Ghent, Working Paper*, Retrieved From https://papers.ssrn.com/sol3/papers.cfm?abstract_id=137953&rec=1&srcabs=69089&alg=7&pos=10
- Ambec, S., & Barla, P. (2006). Can Environmental Regulations be Good for Business? An Assessment of the Porter Hypothesis. *Energy Studies Review*, 14(2), 42-62.

Ambec, S., Cohen, M. A., Elgie, S., & Lanoie, P. (2011). The Porter Hypothesis at 20: Can Environmental Regulation Enhance Innovation and Competitiveness? *Discussion Papers*, Retrieved from <http://core.ac.uk/download/pdf/9305644.pdf>.

Baldwin, J. (2010). The Pacific Asian Financial Crisis, Indonesian Forests, and 'US': Synthesizing a Multi-Perspective Application of Massey's Space. *The California Geographer*, Retrieved From https://sonoma-dspace.calstate.edu/bitstream/handle/10211.3/176421/baldwin_pacific.pdf?sequence=1.

Baldwin, R. E. (2010). 21st Century Regionalism: Filling the Gap between 21st Century Trade and 20th Century Trade Rule. *WTO Staff Working Paper*, Retrieved From http://www.wto.org/english/res_e/reser_e/ersd201108_e.pdf.

----- (1980). *Economic Development and Growth* (2nd Ed.). Huntington, NY: R.E. Krieger Pub Co.

Barbieri, K. (1996). Economic Interdependence: A Path to Peace or a Source of Interstate Conflict? *Journal of Peace Research*, 33(1), 29-49.

Barnett, J. (2003). Security and Climate Change. *Global Environmental Change*, 13, 7-17.

Bayer, R., & Rupert, M. C. (2004). Effects of Civil Wars on International Trade 1950–92. *Journal of Peace Research*, 41(6), 699-713.

Bazzi, S., & Blattman, C. (2011). Economic Shocks and Conflict: The Evidence from Commodity Prices. *American Economic Journal*, 6(4), 1-38.

Berman, N. (2009). Financial Crises and International Trade: The Long Way to Recovery. *EUI Working Papers*, Retrieved From <http://www.iae.csic.es/investigatorsMaterial/a822215060357763.pdf>

Bruckner, M., & Ciccone, A. (2010). International Commodity Price Shocks, Growth, and the Outbreak of Civil War in Sub-Saharan Africa. *Economic Journal*, 120, 519-534.

Buzan, B. (1984). Economic Structure and International Security: The Limits of the Liberal Case. *International Organization*, 38(4), 597-624.

Commander, S., Kangasniemi, M., & Winters, A. L. (2003). Brain Drain: Curse or Boon? *IZA Discussion Paper Series*, Retrieved From <http://www.abdeslammarfouk.com/uploads/1/6/3/4/16347570/wber.pdf>

Constantini, V., & Crespi, F. (2008). Environmental Regulation and the Export Dynamics of Energy Technologies. *Ecological Economics*, 66, 447-460.

Dembinski, M., Hasenclever, A., & Wagner, W. (2004). Towards an Executive Peace? The Ambivalent Effects of Inter-Democratic Institutions on Democracy, Peace and War. *International Politics*, 41(4), 543-564.

Dixit, A. (2009). Governance Institutions and Economic Activity. *Journal of American Economic Review*, 99(1), 5-24.

Docquier, F., Lohest, O., & Marfouk, A. (2007). Brain Drain in Developing Countries. *UCL Discussion Paper Series*, Retrieved from <http://www.jstor.org/stable/40282242>.

Eichengreen, B., Rose, A. K., & Wyplosz, C. (1996). Contagious Currency Crises. *NBER Working Paper*, Retrieved from <https://pdfs.semanticscholar.org/9eb6/53b58afc2d21f2b7feadb885c04b6f271ca3.pdf>.

Esty, D., & Geradin, D. (1998). Environmental Protection and International Competitiveness: A Conceptual Framework. *Journal of World Trade*, 32(3), 5-46.

Forbes, K. (2001). The Asian Flu and Russian Virus: Firm Level Evidence on How Crises are Transmitted Internationally. *NBER Working Paper*, Retrieved from

https://www.researchgate.net/profile/Kristin_Forbes/publication/2829823_The_Asian_Flu_and_Russian_Virus_Firm-Level_Evidence_on_How_Crises_are_Transmitted_Internationally/links/0c96052995c258fe53000000.pdf.

Gartzke, E., Li, Q., & Boehmer, C. (2001). Investing in the Peace: Economic Interdependence and International Conflict. *International Organization*, 55(2), 391-438.

Gilpin, R. (1981). *War and Change in World Politics*. Cambridge: Cambridge University Press.

Glick, R., & Rose, A. K. (1999). Contagion and Trade: Why are Currency Crises Regional? *Journal of International Money and Finance*, 18, 603-617.

Grether, J. M., & De Melo, J. (2002). Globalization and Dirty Industries: Do Pollution Havens Matter? *CEPR/NBER International Seminar on International Trade "Challenges to Globalization"*, Retrieved from <https://archive-ouverte.unige.ch/unige:55390/ATTACHMENT01>.

Hakim, L. (2009). The Global Financial Crisis and Economic Integration. *Indonesian Regional Science Association (IRSA)*, Retrieved from [http://iseisolo.org/sites/isei/files/hasil-kajian /The %20 Global% 20F inancial %20Crisis%20and%20Economic%20Integration_paper.doc](http://iseisolo.org/sites/isei/files/hasil-kajian/The%20Global%20Financial%20Crisis%20and%20Economic%20Integration_paper.doc).

Hirschman, A. O. (1945). *National Power and the Structure of Foreign Trade*. Berkeley, CA: University of California Press.

Iacovone, L., & Zavacka, V. (2009). Banking Crises and Exports: Lessons from the Past. *World Bank Policy Research Working Paper Series*, Retrieved from

http://www-wds.worldbank.org/servlet/WDSContentServer/WDS/IB/2009/08/18/000158349_20090818165636/Rendered/PDF/WPS5016.pdf.

Kali, R., & Reyes, J. (2005). Financial Contagion on the International Trade Network. *University of Arkansas Working Paper*, Retrieved from <http://comp.uark.edu/~kali/networkcontagion.pdf>.

Kaminsky, G. L., & Reinhart, C. M. (1996). The Twin Crises: The Causes of Banking and Balance of Payments Problems. *Federal Reserve Board Discussion Paper*, Retrieved From <https://ideas.repec.org/p/fip/fedgif/544.html>

Levinson, A., & Taylor, M. S. (2008). Unmasking the Pollution Haven Effect. *International Economic Review*, 49(1), 223-254.

Long, A. G., & Leeds, B. A. (2006). Trading for Security: Military Alliances and Economic Agreements. *Journal of Peace Research*, 43(4), 433-51.

Long, A. G. (2003). Defense Pacts and International Trade. *Journal of Peace Research*, 40(5), 537-52.

Lucas, R. (1988). On the Mechanics of Economic Development. *Journal of Monetary Economics*, 22(1), 3-42.

Mansfield, E. D., & Pevehouse, J. C. (2003). Institutions, Interdependence, and International Conflict. In G. Schneider, K. Barbieri, & N. P. Gleditsch (Eds.), *Globalization and Armed Conflict*. London: Routledge.

----- (2000). Trade Blocs, Trade Flows, and International Conflict, *International Organization*, 54(4), 775-808.

Mansfield, E. D., Pevehouse, J. C., & Bearce, D. H. (1999). Preferential Trading Arrangements and Military Disputes. *Security Studies*, 9(1-2), 92-118.

Maoz, Z. (2009). The Effects of Strategic and Economic Interdependence on International Conflict across Levels of Analysis. *American Journal of Political Science*, 53(1), 223-240.

Markusen, J. R. (1999). Location Choice, Environmental Quality and Public Policy. In J. C. J. M. Van Den Bergh (Ed.), *Handbook of Environmental and Resource Economics*. Cheltenham: Edward Elgar.

Martin, P., Mayer, T., & Thoenig, M. (2010). The Geography of Conflicts and Free Trade Agreements. *CEPR Discussion Paper*, Retrieved from https://halshs.archives-ouvertes.fr/docs/00/97/30/14/PDF/cepr-dp_7740.pdf.

----- (2008a). Make Trade Not War? *Review of Economic Studies*, 75(3), 865-900.

----- (2008b). Civil Wars and International Trade. *Journal of the European Economic Association*, 6(2-3), 541-550.

Mathys, N. (2002). In Search of Evidence for the Pollution Haven Hypothesis (Unpublished Master's Thesis). Université de Neuchâtel, Switzerland.

Murty, M. N., & Kumar, S. (2003). Win-Win Opportunities and Environmental Regulation: Testing of Porter Hypothesis for Indian Manufacturing Industries. *Journal of Environmental Management*, 67(2), 139-144.

Oneal, J. R., Russett, B., & Berbaum, M. L., (2003). Causes of Peace: Democracy, Interdependence, and International Organizations. *International Studies Quarterly*, 47, 371-393.

Oneal, J. R., Oneal, F. H., Maoz, Z., & Russett, B. (1996). The Liberal Peace: Interdependence, Democracy, and International Conflict 1950-85. *Journal of Peace Research*, 33(1), 11-28.

Porter, M. E., Van Der Linde, C. (1995). Toward a New Conception of the Environment-Competitiveness Relationship. *Journal of Economic Perspectives*, 9(4), 97-118.

Puri, S., & Ritzema, T. (2000). Migrant Worker Remittances, Micro - Finance and the Informal Economy: Prospects and Issues. *International Labor Organization (ILO) Working Paper*, Retrieved from <http://www.gdrc.org/icm/remittance/shivani.html>.

Rose, A. K., & Spiegel, M. M. (2009). Cross-Country Causes and Consequences of the 2008 Crisis: International Linkages and American Exposure. *NBER Working Paper*, Retrieved from https://www.researchgate.net/profile/Andrew_Rose/publication/227356663_Cross-Country_Causes_And_Consequences_Of_The_2008_Crisis_International_Linkages_And_American_Exposure/links/0fcfd508576e836531000000.pdf

Stoessel, M. (2001). Trade Liberalization and Climate Change. *The Graduate Institute of International Studies*, Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.489.2901&rep=rep1&type=pdf>.

Ulph, A. (1999). *Strategic Environmental Policy and Foreign Trade*. In J.C.J.M. Van Den Bergh (Ed.), *Handbook of Environmental and Resource Economics*. Cheltenham: Edward Elgar.