



IS PROTECTIONISM RATIONAL UNDER THE FINANCIAL CRISIS? ANALYSIS FROM THE PERSPECTIVE OF INTERNATIONAL POLITICAL RELATIONS

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ABSTRACT

Protectionism against economic globalization (free trade and FDI) always surges in the financial crises as the pressure from unemployment mounts. This paper aims to assess the rationality of the protectionism. Instead of analyzing from the pure economic efficiency perspective, this paper assesses the rationality of protectionism from the political relation perspective. By building a costly signal model, we demonstrate that the financial crisis does not change the role of trade and FDI as a signal to reduce the international conflicts and foster cooperation among countries. By employing simultaneous equation models, it is empirically found that trade/FDI and cooperation exhibit significant positive reciprocity, even in the presence of the shock. Variance decompositions from generalized VAR indicate that trade and FDI work in complement to each other to increase the cooperation. It is therefore concluded that using protectionism as a measure to deal with financial crisis is not a well-grounded policy.

Keywords: Protectionism, Financial crisis, Political relation.

1. INTRODUCTION

It is widely believed among economists that economic globalization represented by free trade and unfettered capital flows is a welfare-enhancing state that every country should embrace. Numerous theoretical models suggest that free trade and capital flows will eliminate production and consumption distortion and channel the funds to the most profitable places. However, the widespread belief does not represent the whole story in reality, few countries is anywhere in the

proximity of free trade.¹ Protectionism against globalization surges frequently, especially during crisis times. The notorious example is the Smoot-Hawley Act passed during the great depression. When the global economy teeters on the verge of the collapse, countries resort to various kinds of trade-protective measure as a pro their domestic economy. The United States Government, for example, included the “buy American” clause in the “Recovery and Reinvestment Act 2009” to encourage the purchase of domestic products. Other countries imitate or retaliate by implementing similar measures.² As a result, multinationals foreign affiliate sales fell by 4.6 percent in 2008, in sharp contrast to the 24 percent growth rate the year before (see (UNCTAD, 2009))³. Thus, one natural question to be raised is: is the protectionism a rational response toward the financial crisis?

In terms of the typical cost-benefit analysis of efficiency, it is quite agreed upon that protectionism merely aggravates the recessionary forces and pushing the economy into prolonged contraction. It is the free trade and free capital flows that will lift the world economy out of the doldrums. During the Asian financial crisis, the volume of FDI fell 45% percent in the year 1998 alone, followed by a decline in 1999 due to various restrictive trade measures (Garrick *et al.*, 2008). It seems that protectionism is not a rational response toward the financial crisis from the perspective of cost and benefit analysis.

However, from the perspective of international political economics, it is often debated in the literature whether economic globalization (typically international trade and FDI) reduces or increases international conflicts. The first school of thought argues that globalization contributes to greater cooperation and less conflict; because the desire to achieve the “gains from trade” creates incentives for trading countries to maintain cooperative relations (Polachek, 1978; 1980). The representative literature, to name a few, includes Dorussen and Ward (2010), Hegre *et al.* (2010), Dorussen (2006), Polachek (1980), Schneider and Günther (2005), Süheyla and Nur (2001), Valentin (2006). The second school of thought holds that interdependence can lead to greater conflict, because the economic interdependence creates some difficulties for policymaking, such as US-Japanese tension over Japanese auto and steel exports (Keohane, 1975). Typical researches include Barbieri (1997), Gartzke and Li (2003), O Neal and Russett (1999), Reuveny and Kang (2003).

One should realize that a financial crisis usually produces more international conflict than during normal times. First, the financial crisis will change the structure of power, according to the “window theory” proposed by Stephen V. E., the change of the power structure is a cause of international conflict. Declining countries have the motivation to let other countries bear the brunt in order to be protected from being attacked (Stephen, 1999). Second, the financial crisis increases

¹ The city of Hong kong may be the only economy with virtually no tariffs or import quota.

² Source: “International Trade After the Economic Crisis: Challenges and New Opportunities” by United Nations, 2010. International trade: After the economic crisis: Challenges and new opportunities.

³Source: UNCTAD, 2009. World investment report, Available from http://unctad.org/en/docs/wir2009_en.pdf.

the incentive of scabbling for economic profit (Yuan, 2008; Zhang, 2008; Zhu, 2008; Collier *et al.*, 2009), as economic conditions are important determinants of the outbreak and recurrence of conflicts. In particular, growth collapses are often followed by wars (Bloomberg and Hess, 2002). Sharp economic slowdowns and low levels of income per capita appear to increase the likelihood of conflicts (Collier and Hoeffler, 2002). Third, for some already conflict ridden continents in the world, e.g. sub-Saharan African countries, an exacerbation of resource scarcity caused by the financial crisis will increase the conflict across the countries (Bloomberg and Hess, 2002; Bakrania and B., 2009).

Therefore, the topic on whether economic globalization increases or reduces international conflict is even more important during times of crisis. If globalization does reduce conflict during the financial crisis, then vigilance and leadership are required to further the commitment to free trade and capital flow, since it is more rational and beneficial both economically and politically. If globalization does lead to or increase the intensity of the conflict, then protectionism toward globalization during times of crisis may not be completely irrational. It's important to analyze the net effect of trade and FDI on political relation during times of financial crisis to determine whether the countries should adopt the protectionism policies.

Rather than assessing the benefit gained from globalization from the standard trade theory, this work aims to investigate the effects of economic integration from the perspective of international political relations, specifically, does economic integration reduce conflict and increase cooperation among countries in times of financial crises? By building a multi-player costly signaling model with a financial crisis shock, we show that higher trade and FDI flows make conflicts less likely by enhancing the efficacy of costly signaling. The more countries participate in the economic integration, the higher the benefit and the lower the cost of maintaining the good economic relationship. Most importantly, the conclusion does not change in the face of financial crisis shocks. We empirically test the relationship between trade (FDI) and the conflict/cooperation variable with the financial crisis shocks by employing a simultaneous equation model. According to Reuveny and Kang (1996; 1998) and Goenner (2011), conflict and total bilateral trade tend to be reciprocal on both aggregate and disaggregate trade levels, which suggests that they should be investigated in a unifying framework. It is found that trade and FDI decreases the conflict and increases cooperation, as proved in the costly signaling model, even with the financial crisis shocks. From there, a vector autoregression (VAR) model is engaged to assess whether trade and FDI are complementary or substitute to each other. Instead of using Choleski decomposition, we choose to use generalized VAR. Because the results from generalized VAR are invariant with respect to ordering and thus avoids problems associated with "ordering" in orthogonalized shocks. Because the global event data during the 2008 financial crisis is not available, our study is placed within the context of Mexican and East Asia Crisis. It is found that trade and FDI works complementarily in eliminating conflicts during these financial crises.

The paper is organized as follows. Section 2 develops a multi-player costly signaling model with financial crisis shocks. Section 3 presents the empirically results from simultaneous equations

model and generalized VAR model. Section 4 concludes and offers the policy implications of this research.

2. COSTLY SIGNALING MODEL WITH INTRODUCED FINANCIAL CRISIS SHOCKS

We build a costly signaling model to illustrate the effect of trade and FDI on international conflict/cooperation during financial crisis. It shows that the general situation equilibrium (higher trade and FDI flows make conflicts less likely by enhancing the efficacy of costly signaling) does hold in the financial crisis.

Costly signaling models originate from evolutionary biology that refer to a body of theoretical work examining communication among animals in sexual selection, such as what kind of call should a male bird use to make sure he will get a female's acceptance. Considering that the process of countries choosing allies is much similar to the sexual selections among animals, costly signaling models are used as a game-theoretical framework to illustrate countries' interaction. [Morrow \(1999\)](#) is the first to build a costly signaling model to explain why trade can reduce conflict. Different from the common explanation that trade leads countries to avoid violent conflict out of "fear of losing the trade", [Morrow \(1999\)](#) and [Morrow \(2003\)](#) illustrate that trade can reduce conflict because it increase the menu of signals available and make the signals more costly and thus more informative and credible. Conflict occurs because states cannot fully observe one another's resolve for war (value for going to wars), so trade prevents conflict by enhance costly signaling, and thus make disputes more likely to be resolved peacefully. [Gartzke et al. \(2001\)](#) also use costly signaling model to test whether the increasing economic interdependence lead to the prospect of a more pacifist global system.

We build the costly signaling model based on [Gintis et al. \(2001\)](#), financial crisis shocks are introduced to the model. Our model illustrates that trade as a costly signal is more likely to be accepted by other countries to establish good economic relation and thus reduce conflicts and enhance welfare level, and this conclusion does not change in the face of financial crisis shocks. We detail the model in the following paragraphs.

Consider the world has n countries which participate in economic globalization. In each period each country has cost C in participating the economic globalization and confers benefit b to other member countries, b is not public good. Assume the financial crisis shock coefficient is λ , which affects the benefit and cost of signaling. In the financial crisis, the cost of participating economic globalization increases to c/λ ($0 < \lambda < 1$). The benefits generated to each country is λb , so maintaining good economic relation is worthwhile if the benefit is greater than cost, i.e., $\lambda b(n-1) > c/\lambda$.

Two factors are added into the model to show the evolution of the benefit. First, each country has a profitable and costly relation with other $n-1$ countries, and there are two kinds of personal

characteristics: preference over good economic relation and preference over bad economic relation. Trade or investment protection represents the preference over bad economic relation. We assume bad economic relations must pay more to signal than good economic relations $c' > c$, $c' > c$. However, the financial crisis has greater impact on good-economic-relation countries than the bad ones, so we assume $\lambda' < \lambda$. Thus, the expected cost of good economic relations are less than the cost of the bad one, $0 < c/\lambda < c'/\lambda'$. Second, the partner of the country who enters economic integration system will receive benefits. Partners in good economic relation get benefits λg , where $g = g_0 + a\lambda b > 0$ ($a \geq 0$). g_0 represents the benefit what country gains by itself, and a represents the possibility that a country may receive greater benefit from allying a good-economic-relation-preference country. The benefits in bad economic relations is $\lambda' d$, and $\lambda' d < \lambda g$. If no partner is chosen, the payoff is zero. For a given partner, p is the probability of preference over good economic relation with the remaining $n-1$ countries. Every country knows its own p but not the preference of the other $n-1$ countries, and every country in the economic system receives a payoff f from each of other country, $f > 0$. The cost of monitoring signals is v , $v > 0$.

We construct a multi-player game in which the countries choose whether or not signal to others. The signalers have four strategies $\{ss, sn, ns, nn\}$, represent “always signal, regardless of relation”, “signal in good economic relation and do not signal in bad economic relation”, “do not signal in good economic relation and signal in bad economic relation”, “always not signal, regardless of relation” respectively. Among n countries, the partners have the right to choose an ally. Thus the partner has four strategies $\{aa, ar, ra, rr\}$ that represents “always accept”, “accept if the signaler signals, reject if the signaler does not signal”, “reject if the signaler signal, accept if the signaler does not signal”, “always reject”, respectively.

A country’s preference is characterized as preference over good economic relation with probability p and preference over bad economic relation with probability $1-p$. Countries know their own preference and decide whether to signal or not, and other countries choose whether or not to accept the signalers as a partner. When $p\lambda g + (1-p)\lambda' d > 0$, there is a non-signaling equilibrium (nn, aa) . Under this circumstance, no one signals and countries choose partners randomly. If $p\lambda g + (1-p)\lambda' d < 0$, there is a non-signaling equilibrium in which no country

signals and partners do not choose allies. The (sn, ar) is honest signaling equilibrium, demonstrating that the signalers only signal when the country prefers good economic relation, and partners choose from those good-will countries randomly.

If a country chooses randomly, the payoff is $(p\lambda g + (1-p)\lambda'd)$. Assume all signalers are honest and define $\delta(x) = 1 - (1-p)^{x(n-1)}$. Then the expected payoff for a country from monitoring is $\lambda g\delta(1) + \lambda'd(1-\delta(1)) - v$. Because a country finds a good-will country with probability $\delta(1)$ and bad-will country with probability $(1-\delta(1))$. Only if

$$\lambda g\delta(1) + \lambda'd(1-\delta(1)) - v > (\lambda gp + \lambda'd(1-p)) \quad (1)$$

i.e. $(\lambda g - \lambda'd)(\delta(1) - p) > v$, the monitoring is worthwhile. We have the following proposition.

Proposition 1: The more countries that enter the multi-system, the higher payoff that the good economic relation can bring, and the less costly the signal monitoring.

$\delta(x)$ is increasing in p and n . Suppose $n \rightarrow \infty$, the $\delta(x) \rightarrow 1$, the efficiency of monitoring condition is approximately $(\lambda g - \lambda'd)(1-p) > v$. Suppose $n = 1$, the $\delta(x) \rightarrow 0$, the condition is $(\lambda g - \lambda'd)(-p) > v$, $v > 0$, $p > 0$, therefore the $\lambda g - \lambda'd < 0$. In this extreme situation, the payoff from good economic relations are worse than those from bad economic relations. Only when n is sufficiently large, the payoff of a good economic relation is satisfactory enough.

In the honest equilibrium (sn, ar) , the conditions are $pc'/\lambda' > f > pc/\lambda$ and $\lambda g > \lambda'd$. The benefits of signaling should exceed the expected cost of signaling for the good economic relation and less than the expected cost of signaling for the bad economic relation. The benefit of cooperating with a good-will country is higher than a bad-will country.

Proposition 2: As long as the payoff for the signalers is positive, countries prefer to cooperate with good-will countries. If and only if the signaling is more costly for bad economic relations than good economic relations, does there exist an honest signaling equilibrium.

$pc'/\lambda' > f > pc/\lambda$ can be reduced into $f < c'/\lambda'$ because $p < 1$. If these parameter inequalities hold, then for any $p > 0$, the $(\lambda g - \lambda' d)(\delta(1) - p) > v$ is sufficient to ensure ar is the best response for the partner. As long as $f < c'/\lambda'$, there still exists an honest signaling equilibrium for p .

In a dynamic system, the whole range of value $\alpha \in [0, 1]$. Assume the fraction of sn is α , and the fraction of ar is β . The number of countries in type ar is $\beta(n-1)$. In good economic relation, the expected number of good relation signalers is $\alpha p(n-1)$, and the payoff for each signaler is $f\beta(n-1)/\alpha p(n-1)$.

The expected payoff for honest signaling is

$$\pi_{sn} = \beta f / \alpha + (1 - p) \beta f (1 - \delta(\alpha)) + (1 - \beta) f - pc / \lambda \quad (2)$$

The expected payoff for the never signaling countries is π_m , which is $\beta f (1 - \delta(\alpha)) + (1 - \beta) f$. The expected payoff for the partners who always accept countries

is $\pi_{aa} = p\lambda g + (1 - p)\lambda' d$, and that for partners who accept if signalers signal is

$\pi_{ar} = \delta(\alpha)\lambda g + (1 - \delta(\alpha))(\alpha\lambda g + (1 - \alpha)(p\lambda g + (1 - p)\lambda' d)) - v$. The average

payoff for the signaling countries is $\bar{\pi}^s = \alpha\pi_{sn} + (1 - \alpha)\pi_m$, and the average payoff for the

partner countries is $\bar{\pi}^p = \beta\pi_{ar} + (1 - \beta)\pi_{aa}$. Put the value of π_m and π_{aa} into equations, and

we get $\alpha' = \alpha \left(\pi_{sn} - \bar{\pi}^s \right)$, $\beta' = \beta \left(\pi_{ar} - \bar{\pi}^p \right)$. α' is the symbol of

$\alpha(1 - \alpha) \left(f\beta(1 - \alpha(1 - \delta(\alpha))) / \alpha - pc / \lambda \right)$, β' is the symbol of

$\beta(1 - \beta) \left((\lambda g - \lambda' d)(\delta(\alpha) - p + (1 + \alpha) * p(1 - \delta(\alpha))) - v \right)$.

There are five equilibria, including $\{\alpha = 0, \beta = 1\}$, $\{\alpha = 1, \beta = 0\}$, $\{\alpha = 0, \beta = 0\}$, $\{\alpha = 1, \beta = 1\}$, and the fifth is a mixed strategy equilibrium. At the equilibrium of $\{\alpha = 0, \beta = 0\}$, its eigenvalues is

$$\{-pc/\lambda, -v\} \quad (3)$$

They are strictly negative assuming the cost of signaling is positive.

At the equilibrium of $\{\alpha = 1, \beta = 1\}$, the Jacobian has eigenvalues

$$\{pc/\lambda - (1 - (1 - \delta(1))p)f, v - \lambda(g - d\lambda'/\lambda)(\delta(1) - p)\} \quad (4)$$

Both of these are strictly negative if $c/f < (1 - (1 - \delta(1))p)$ and $(\lambda g - \lambda'd)(\delta(1) - p) > v$. This is a stable equilibrium for honest signaling.

The eigenvalues of equilibrium $\{\alpha = 0, \beta = 1\}$ and $\{\alpha = 1, \beta = 0\}$ are not stable, because the sign is indeterminate.

Proposition 3: Suppose the conditions for an honest signaling equilibrium hold. If inequity (1) and $c/f < (1 - (1 - \delta(1))p)$ hold, both the honest and the non-signaling equilibria are stable. At honest signaling equilibrium, countries gain more benefit.

From the analysis, we can see that the financial crisis shock does not change the equilibrium in the game. Thus the conclusion is qualitatively the same with financial crisis shocks, except that the benefit level in the crisis is different from that in the non-financial crisis period. The implication of the three propositions is that when countries prefer to establish good economic relations and use trade and FDI as honest signals, the partner prefers to accept this cooperation. Trade and FDI as costly and credible signals are more likely to be accepted and thus conflict is reduced and good economic relation is fostered. Furthermore, the more countries enter the economic globalization system, the higher the payoff and the less signal monitoring cost.

To summarize, the financial crisis is not a turning point but a one-time shock to the international economic and political order, the general equilibrium during non-crisis time can be extended to the financial crisis periods. Therefore, protectionism against economic integration as a measure to tackle financial crisis is not a well-grounded policy.

3. THE EFFECT OF TRADE AND FDI ON INTERNATIONAL CONFLICT WITH FINANCIAL CRISIS SHOCKS

In the empirical research on the relation between trade and international conflict/ cooperation, we use the data of 33 Asian countries'. In studying the relation between FDI and international cooperation/ conflict, we employ 29 countries' data, which includes China, Singapore, and most OECD countries. The choice of the dyads (two trading partners) is dictated by the data availability. In addition, samples covering both developed and developing countries can establish the universality of the conclusion. The dyadic cross section and time series data of these countries is pooled. The data is yearly and ranges from 1991-2000. The bilateral trade and FDI data are obtained from OECD. We use the sum of import and export volume between the dyad to measure the trade flow and the inflow of FDI of a country from its partner to measure the capital flow.

The conflict/cooperation data set used here is the Virtual Research Associated data (VRA). They come from analyzing the first sentence of a lot of news report by the computer driven formulas. Because most of political behavior can be described as "who did what to whom", computers determine source country (country originate an action), target country (the country that is imposed by the action), as well as the event from the first sentences of news reports. In our study we use the data developed by Gary King. The original data include 3.7 million international dyadic events during the period of 1991-2000, there are 450,000 remaining observations after deleting the intrastate events. As discussed in Polachek *et al.* (2007), VRA data are chosen for two reasons. First, rather than just confined solely to higher levels of conflicts involving military power, this data set contains all types of hostile actions such as diplomatic protests, hostile propaganda statements and so on. As such, it allows us to define conflict as the aggregate level of hostility directed by source country to target country rather than merely "armed conflict". Second, VRA data is more suitable in that it contains both conflict and cooperation, which enables us to correct for a potential bias caused by the data that solely comprised of conflicts.

After identifying the event data source on conflict/cooperation, we need to decide the coding program, which includes choosing the evaluation scale and code. There are several event coding evaluation scales. The weightings scheme of COPDAB (conflict and peace data bank) developed by Azar (1982) utilizes a fifteen-point cooperation-conflict scale for determining degree of cooperation and conflict. The limitation of this scale is that it cannot completely discriminate among different events. The Violent Intranational Conflict Data Project (VICDP) goes one step further by making a distinction between some different types of "resolution". However, it only has advantage to evaluate the intranational events instead of international ones. This paper adopts scale in Goldstein (1992), in which the events are represented by 195 integrated data with the positive values representing cooperation and negative ones conflict, and zero express natural disasters and neutral social activities. The minimum negative value is -10, which corresponds to the extreme conflict such as wars. The maximum value is 8.3, which represent affording military aid. IDEA (Integrated Data for Events Analysis) is the coding to evaluate the event data set. We compute the weighted sum of all events for each dyad of each year by the formula:

$$Total_{AB} = \sum_{t=1}^{t=12} (conflict_{ABt} + cooperation_{ABt})$$

Where $conflict_{ABt}$ is weighted conflicts and $cooperation_{ABt}$ represents weighted cooperative events between country A and B in a given month. Therefore, $Total_{AB}$ is net conflict generated by actor country A toward target country B in one year, with positive $Total_{AB}$ implies net cooperation, whereas a negative value implies net conflict.

3.1. The Simultaneous Equation Model

We address the economic interdependence and political relationship in a simultaneous two-equation model. Based on the theory, trade (FDI) and political relationship are expected to influence each other. On one hand, mutual economic dependence established between countries influence a country's resolve of engaging in conflicts. On the other hand, political climate plays a significant role in determining the FDI flows and trade volume (Shaheen, 2005). Therefore, trade/FDI and conflict/cooperation should be both treated as endogenous variables. Only by looking at both in a unifying model do we get unbiased results.

The simultaneous model is as follows:

$$Y = b_{10} + b_{11}X + b_{12}V_1 + b_{13}financial + b_{14}financial * X + e_1 \quad (1)$$

$$X = b_{20} + b_{21}Y + b_{22}V_2 + b_{23}financial + e_2 \quad (2)$$

Where:

$Y = Total$ = net conflict or cooperation of a year

X = trade volume between dyads/FDI inflow from source country to target country

V_1 = a vector of control variable which affect the bilateral political relation. V_2 = a vector of control variable which affect trade volume between dyads or FDI inflow from source country to target country

$financial$ = dummy variable, with "1" representing the periods in either Mexican financial crisis or the Asia financial crisis, "0" otherwise.

\mathcal{E} = a random error term assumed normally distributed with mean zero.

We include the dummy variable for the financial crisis shock in both equations, because financial crisis will affect trade/FDI as well as the relationship among the countries (Chung, 2005; Alfaro and Chen, 2010). The Mexican Crisis broke out at the end of 1994 and the East Asia Crisis broke out at 1997. Therefore, we assign "1" for the periods of the two financial crises.

An interaction term of financial crisis with the trade/FDI is included in the Y equation, from which we can examine whether the impact of trade/FDI on *Total* changes during the financial crisis period.

The vector of control variables deserves some discussion. Because many country attributes will affect the inter-relationship, failure to include the control variable will cause the results biased.

Distance influences the economic interdependence as well as the political strategies between the dyads (Gleditsch, 1995; Oneal *et al.*, 1996; Polachek *et al.*, 2006). According to the gravity model of international trade, longer distance increases the transportation cost, thereby decreases the trade volume. As to the effect of distance on political relationship, there are two views. One school of thought claims that distance increases the cost of involvement in conflicts, thereby decreases the conflict (Gochman, 1991; Bremer, 1992; Gleditsch, 1995; Barbieri, 1996; Oneal *et al.*, 1996; Polachek *et al.*, 2006). The other school of scholars argues that the distance will decrease the opportunity for cooperation, and thus increase the net conflict indirectly (Tinbergen, 1962; Dearthoff, 1984; Gowa, 1994; Polachek *et al.*, 1999). Geographical distance between the source country and the target country is included in this paper, which is denoted as “*distance*”, and the value does not change with time.

The state of being alliance influences the political interdependence. According to Maoz (2006), the state of being alliance, regardless of the types (defense ententes, armed neutral, agreements, no agreements), will decrease international conflicts. However, there is a lot of contradictory evidence that shows alliances expand conflict (Siverson and Tennefoss, 1984; King, 1989; Oren, 1990; Kim, 1991), because an allied nation is far more likely to intervene in a conflict than a nonallied nation. If a nation becomes involved in a conflict then it might expect its allies to intervene on its behalf. In accordance with Polity IV code, we use “1” denote “defense pact”, “2” denote “neutrality”, “3” denote “entente”, “4” denote “no agreement”. The variable is represented by “*alliance*”, the data comes from COW (Correlate of War) data set.

Population affects both the level of economic integration and political relationship. High population generates more market demand, thereby leads to greater exchange of goods and more opportunities for FDI. As to the effect of population on political relationship, it is hypothesized that high population density leads to higher levels of aggression than observed in less dense aggregation, according to the crowding hypothesis (Morrow, 1999). We use *pop1* and *pop2* to denote the population in source country and target country respectively. *popgap* is the difference of nation size between the source and target country.

Economic gap matters for international conflict/cooperation. Rosecrance (1999) and Hegre (2000) hold the view that the more developed countries have fewer motives to deplete the resource of other countries; thereby larger economic gap decreases conflicts. In contrast, Organski and Kugler (1980) argues that more developed countries are more inclined to scramble for the hegemony, which will lead to conflicts, so economic gap increases conflicts. We use GDP per capita, *gdppcl* and *gdppc2*, as a measure of economic development for source countries and

target countries, respectively. The economic gap ($gdppc2 - gdppc1$), $gdppcgap$, is included in the net conflict equation.

Democracy plays an important role in determining conflicts. The more democratic a country is, the less likely it initiates conflict. In addition, according to the weak link assumption (Dixon, 1993), the country with weaker constraints (less democratic) in a dyad is the stronger determinant of how events proceed. The more democratic and more interdependent the weak-link country is, the less likely the country will resort to military force, and therefore the dyads will be more peaceful.

Democracy gap, $demogap$, is included to capture the effects of difference of democracy on conflicts. The data are obtained from “Polity IV Project” data set.

Percentage of secondary school enrollment for source and target countries ($education1, education2$) are included in the FDI equation to control for quality of labor in both countries. Telephone mainlines per 100 people in source and target countries ($telephon1, telephon2$) are included in the FDI equation to control for the quality of infrastructure. Capital formations and GDP in source and target countries ($capital1, capital2, GDP1, GDP2$) enter FDI equation as an approximation for the size of the market. It is hypothesized that higher quality of labor, better infrastructure and larger size of the markets will lead to more FDI inflow.

In sum, the simultaneous equation model for Trade-Conflict relationship is:

$$Total = b_{10} + b_{11} \log(trade) + g_{10} financial + g_{11} financial * trade + g_{12} alliance + g_{13} distance + g_{14} demogap + g_{15} \log(pop1) + g_{16} \log(pop2) + g_{17} \log(gdppcgap) + g_{18} Total_{t-1} + g_{19} Total_{t-2} + u_1 \quad (3)$$

$$\begin{aligned} \log(trade) = & b_{20} + b_{21} Total + g_{20} financial + g_{21} distance + g_{22} \log(pop1) \\ & + g_{23} \log(pop2) + g_{24} \log(gdppc1) + g_{25} \log(gdppc2) + g_{26} trade_{t-1} + g_{27} trade_{t-2} + u_2 \end{aligned} \quad (4)$$

The simultaneous equation model for FDI-Conflict relationship is:

$$Total = b_{10} + b_{11} \log(inflows) + g_{10} financial + g_{11} financial * inflows + g_{12} alliance + g_{13} distance + g_{14} demogap + g_{15} \log(pop1) + g_{16} \log(pop2) + g_{17} \log(gdppcgap) + g_{18} Total_{t-1} + g_{19} Total_{t-2} + u_1 \quad (5)$$

$$\begin{aligned} \text{Log}(\text{inflows}) = & b_{20} + b_{21} \text{Total} + g_{20} \text{financial} + g_{21} \log(\text{popgap}) + g_{22} \log(\text{gdp1}) + g_{23} \log(\text{gdp2}) \\ & + g_{24} \text{telephone1} + g_{25} \text{telephone2} + g_{26} \log(\text{capital1}) + g_{27} \log(\text{capital2}) + g_{28} \text{education1} \\ & + g_{29} \text{education2} + g_{30} \text{inflows}_{t-1} + g_{31} \text{inflows}_{t-2} + u_2 \end{aligned}$$

(6)

Regression of each dependent variable on two lags of its own is to control for the autocorrelation. One should also note that, economic development gap (*gdppcgap*) enter the net conflict equation while it is economic development of source and target countries (*gdppc1*, *gdppc2*) enter the trade equation. This is because it is the difference in economic development causes the conflict, while it is the absolute economic development level of each country determines the bilateral trade volume.

3.2. Results from Simultaneous Equation Model

Table-1. Three-Stage Least Square Estimation of Trade-Conflict Relationship

Independent Variables	Dependent Variables	
	<i>Total</i>	$\log(\text{trade})$
<i>constant</i>	-15.675*** (4.694)	-30.554*** (1.512)
$\log(\text{trade})$	0.453** (0.199)	
<i>financial</i>	0.031 (0.663)	-0.034 (0.111)
<i>financial</i> * <i>trade</i>	0.00008*** (0.00003)	
<i>alliance</i>	2.196*** (0.634)	
<i>distance</i>	-0.0005** (0.0002)	-0.0004*** (0.00005)
<i>demogap</i>	-0.233*** (0.081)	
$\log(\text{pop1})$	0.660*** (0.199)	0.624*** (0.047)
$\log(\text{pop2})$	0.195 (0.202)	0.520*** (0.040)
$\log(\text{gdppcgap})$	-0.033 (0.218)	
Total_{t-1}	0.038 (0.035)	
Total_{t-2}	-0.041 (0.035)	
<i>Total</i>		0.097*** (0.033)

$\log(gdppc1)$		1.557*** (0.075)
$\log(gdppc2)$		1.366*** (0.055)
$trade_{t-1}$		-5.91e-06 (4.29e-06)
$trade_{t-1}$		-6.87e-06* (3.96e-06)
R^2	0.095	0.705
N	587	587

Note: *** p<0.01; ** p<0.05; * p<0.1.

Table-2. Three-Stage Least Square Estimation of FDI-Conflict Relationship

Independent Variables	Dependent Variables	
	Total	$\log(inflows)$
<i>constant</i>	-31.804* (19.130)	-4.245 (7.762)
$\log(inflows)$	1.881*** (0.573)	
<i>financial</i>	-4.833*** (2.270)	-0.698** (0.437)
<i>financial * inflows</i>	-0.0001 (0.0002)	
<i>alliance</i>	0.414 (0.811)	
<i>distance</i>	-0.0006 (0.0005)	
<i>demogap</i>	0.296 (0.562)	
$\log(pop1)$	2.679** (1.098)	
$\log(pop2)$	1.912* (1.017)	
$\log(gdppcgap)$	-2.347* (1.271)	
$Total_{t-1}$	0.485*** (0.078)	
$Total_{t-2}$	0.181** (0.077)	
<i>Total</i>		0.057*** (0.013)
$\log(popgap)$		-0.256 (0.214)
$\log(gdp1)$		1.028*** (0.277)
$\log(gdp2)$		0.483** (0.214)
<i>telephone1</i>		0.008 (0.010)

<i>telephone2</i>		0.033*** (0.007)
$\log(\text{capital1})$		-0.827*** (0.140)
$\log(\text{capital2})$		-0.124 (0.086)
<i>education1</i>		0.018 (0.014)
<i>education2</i>		0.019** (0.008)
inflows_{t-1}		0.00007** (0.00003)
inflows_{t-2}		-0.00004 (0.00003)
R^2	0.675	0.545
N	144	144

Note: *** p<0.01; ** p<0.05; * p<0.1.

Table 1 and 2 presents the results for the trade/FDI-conflict relationship model. Both trade and FDI have significant positive effects on the net cooperation. For every one percent US dollar increase in trade (FDI) for a dyadic pair, the net conflict decreases 0.453 (1.881) units or net cooperation increase by 0.453 (1.881) unit on average. Financial crisis, as expected, have negative impact on trade volume and FDI inflow, and the effect is significant at 5% level in the FDI-conflict equation. According to Collier *et al.* (2009) and many other papers, conflicts are more likely to arise during times of financial crisis. We do find such significant and negative coefficient for the financial crisis in the FDI-conflict relationship. The interaction term of financial crisis and trade is significant and positive, indicating that the role of trade in increasing net cooperation is even stronger during the financial crisis. The interaction term of financial crisis and FDI is insignificant in the FDI-conflict equation, indicating that the impact of FDI on net cooperation does not change during the financial crisis time, which bodes well with the prediction from the costly signaling model that financial crises does not change the relationship between trade/FDI and conflict. By providing a wider range of costly signals, trade and FDI inflow still exert the role of eliminating the conflict and enhancing the cooperation even during the financial crisis. The results renders that protectionism under financial crisis is irrational from both pure economic perspective and political perspective.

The majority of the other coefficients are consistent with the expectation and standard theory. First, alliance does decrease net conflict in both models, and especially significant in the trade-conflict relationship. The result is consistent with Maoz (2006). Distance increases net conflicts in both equations, and the effect is significant in the trade-conflict relation, which is more supportive of the view that distance will decrease the opportunity for cooperation and thus increase the net conflict indirectly (Tinbergen, 1962; Deardorff, 1984; Gowa, 1994; Polachek *et al.*, 1999). The democracy difference between source and target countries does increase the conflict, especially

among the Asian countries that have bigger gap of democracy. Larger economic development gaps between source and target countries decrease net cooperation statistically significantly in the FDI-conflict model. The larger population size of source countries and target countries also contribute to more harmonious bilateral relations as evidenced by the positive coefficient of 2.679 and 1.912. Second, maintaining good political relationship will increase the trade volume significantly. Distance decreases the trade volume significantly, as predicted by the gravity model. Population, economic development levels in both source and target countries positively contribute to the bilateral trade. Third, good political relationship will bring in more FDI inflows. Thus, FDI and net conflict also exhibit positive reciprocity as trade-conflict relationship. Larger market size represented by GDP, better infrastructure characterized by telephone mainlines and higher quality of labor all lead to more FDI inflow.

3.3. Trade and FDI: complement or substitute?

The previous two sections demonstrate empirically that trade and FDI can increase net cooperation and mitigate conflict both in developed and developing countries regardless of the financial crisis. The subsequent question which would basically affect the result is: Do trade and FDI substitute for each other in promoting cooperation or complimentary to each other? If the answer is “substitute”, the total economic influence on world peace is constrained. If the answer is “complementary”, the joint effect of trade and FDI would reduce conflict on mutual benefit.

The samples of countries used in this section are the same with that in the FDI-conflict relationship test. We address this question by employing a VAR model. Because the three variables are all endogenous, treating them in one unifying model will yield unbiased results. In order to have economically interpretable shocks, researchers usually rely on the choleski decomposition in which the orthogonalization requires imposition of restrictions on contemporaneous coefficients of the underlying structural VAR. Therefore, the decomposition involves imposing a particular “causal” order on the relationship and the orthogonalised impulse responses vary with re-ordering of the variables in the VAR model. As such, we adopt the generalized VAR model, which is invariant to the reordering of the variables in the VAR. Generalized VAR is appealing in that it takes into account the historical patterns of correlation observed amongst the different shocks and hence does not require orthogonalization while it can simulate the model's response to conditions similar to that occurred in the sample period.

Before we estimate the generalized VAR model, we need to make sure that all the variables are stationary. We conduct several unit root test which includes Levin, Lin and Chu*t test, Im, Pesaran and Shin W-stat test, and PP - Fisher Chi-square test. Table 3 indicates that the null hypothesis of unit root can be rejected at 1% significant level for all the data series. The variables thus enter the VAR in the log level.

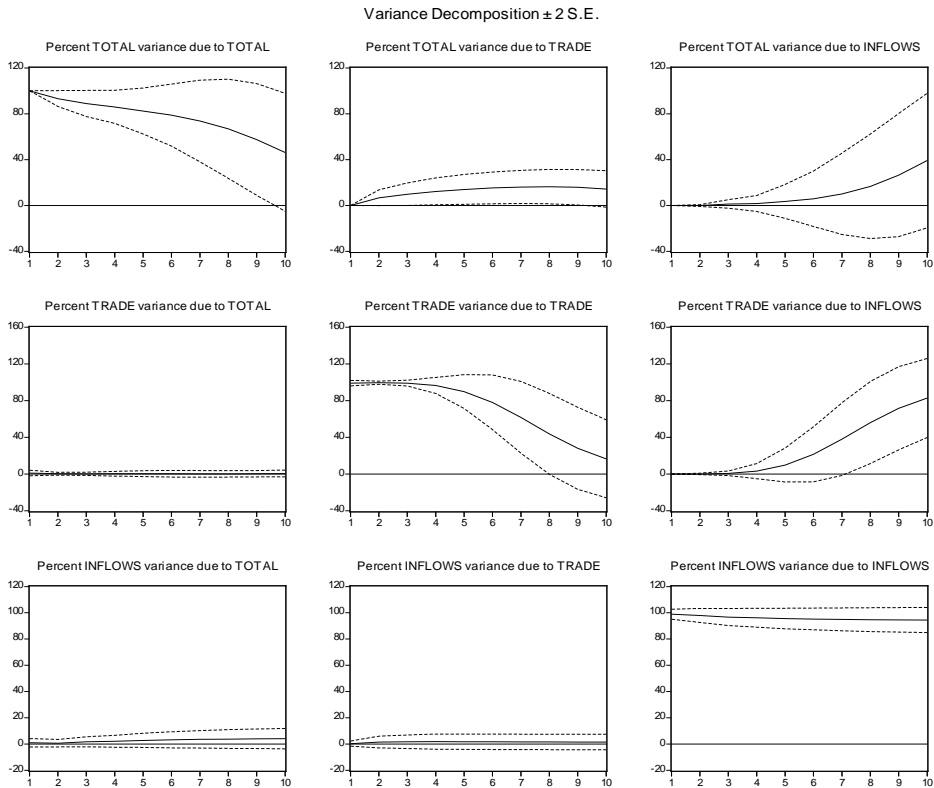
Table-3. Unit Root Test of Trade, FDI and International Conflict/Cooperation

Variables	Tests		
	Levin, Lin and Chu*t	Im, Pesaran and Shin W-stat	PP - Fisher Chi-square
International Conflict/Cooperation	4.7499***	4.4307***	300.269***
Trade	-37.8172***	-4.9321***	1277.22***
FDI	-71.8828***	-5.3021***	911.542***

Note: *** p<0.01; ** p<0.05; * p<0.1.

The generalized variance decomposition is then computed and plotted in figure 1. The variance decompositions are a convenient measure of the relative importance of each shock to the system. They measure the average, relative contribution to forecast error variance of each shock as a function of forecast horizon. Figure 1 reveals that trade makes greater contributions in abating international conflict in the first several periods, while FDI contributes more in later periods. In addition, the effect of FDI is more long-lasting. The interaction of trade and FDI in eliminating conflict is rather complementary than alternative, which renders some support to the findings in Polachek *et al.* (2006; 2007). The positive effect of trade and FDI on promoting international cooperation is not diminished or eliminated by the financial crises.

Figure-1. Variance Decomposition of Trade, FDI and Conflict/Cooperation



In sum, trade (FDI) and net cooperation are significantly interrelated with positive reciprocity. In addition, trade and FDI augment each other in reducing conflict and promoting peace even facing the financial crises. Protectionism during the financial crises will not only reduce trade and FDI, but also is detrimental to international relations. As such, the economy is put into a vicious cycle.

4. CONCLUSION

This paper evaluates, from the perspective of political relation, the rationality of protectionism in trade and investment that frequently surged during the financial crises.

The costly signaling model is extended by introducing financial crisis shocks. The model shows that free trade and FDI can increase the menu of signals available, facilitate effective communication and consequently, reduce conflict and promote cooperation even under the financial crisis. The introduction of financial crisis shocks in the model only changes the level of benefit in equilibrium. The equilibrium and thus the qualitative results do not change in the presence of the financial crisis shocks.

By using the simultaneous equation model, we have empirically measured the trade-conflict and FDI-conflict relationship within the context of the Mexican and East Asian crises. Consistent with the prediction of the costly signal model, our empirical results show that trade and FDI do have significant positive effects on reducing conflict even during the financial crisis. In addition, good political relations are also conducive to bilateral trade and FDI inflow. We then employ the generalized VAR model to assess the role of trade and FDI in reducing conflicts. It is found that trade and FDI work in augment to each other in promoting peace and reducing conflict.

The policy implication of the study is that protectionism as a response to financial crisis shock is not a rational or well-grounded policy. According to the positive reciprocity found between trade/FDI and conflict, protectionism only generates more conflicts, and conflicts again slow the pace of economic integration and thus economic recovery, slow economic development generates more conflict, and this constitute a vicious circle. Just as OECD report says, "Protectionism inhibits, it prevents us from realizing our economic potential. It is a distortion and it leads to inefficiencies and we all are losers when it is employed...Efforts to revive stalled trade reforms would help the major emerging economies to build on the progress already achieved over the past two decades." It is therefore called for of the leaders around the world to stamp out protectionism, which threatens world peace as well as stunts the world economic recovery.

In addition, we must admit one limitation of our study. Although we have empirically tested that trade and FDI can reduce international conflict and increase cooperation, we do not identify through which channel does trade and FDI reduce conflicts. Is it because trade and FDI make conflicts more costly that countries avoid so out of the fear of losing gains from trade? Or is it because costly signal explanations as proposed in this paper and [Morrow \(2003\)](#) that trade and FDI reduce conflicts since it can enhance the efficiency of costly signaling? We leave this to future studies.

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