

Trade Openness and FDI Inflows: A Comparative Study of Asian Countries

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Abstract

This study presents the new regression estimates of relationship among openness of trade and Foreign Direct Investment inflows for India, Iran and Pakistan over the period 1982-2012. Fixed effect and Pooled OLS techniques are used to analyze the panel data for measuring individual country effects, group effects and time effects while exploring the relationship among openness of trade and FDI inflows. Results showed that higher openness of trade has significant positive impact on FDI inflows. The results also investigated that FDI inflows seem to be affected significantly by conventional determinants like as Exchange rate, Inflation (consumer price index) and GDP per capita etc. Based on results the author has concluded that increase in trade openness would be a better option for more and sustained FDI inflows for the long run and also improving the welfare of the people.

Keywords: Trade openness, FDI, Exchange Rate, Time effects, Group effects, Country effects

Introduction

Foreign Direct Investment and trade are often seen as imperative economic indicators. Trade openness contributes positively to FDI inflows (Liargovas, Skandalis & Konstantinos, 2012). According to World Bank databank in 2013, trade openness in last 5 years (from 2008 to 2012) is increasing in India and Pakistan excluding Iran but FDI inflows are decreasing in the same years for India, Iran & Pakistan. All three countries have specific boundaries, different political systems, policies and having separate currency units. Initially, the developing countries of the world followed the policies of restricted trade but with the passage of time, and with globalization emergence, all the countries realize the importance of trade liberalization. Country's trade is a key determinant for not only industrialization but it also improves the technologies. It is important, how much the trade policies are liberalized because it affects the level of output and economic activity also. On the other hand, the willingness of foreign investor for investing his/her resources is always toward favorable polices, market and good infrastructure facilities. Hence, foreign direct investment (FDI) inflows are purely induced by the host country environment. If host countries are successful in providing large consumer markets, favorable polices and good infrastructure facilities then they cause great economies of scale and economies of scope along with cost efficiency. If country is unable in providing such facilities explained above then low attraction for FDI inflows. Due to restricted trade policy framework, until 1991 FDI inflows were not significant in Pakistan (Ramzan & Kiani, 2012). The potential role of multinational corporations can be acknowledged as they spread the foreign knowledge and also help in fostering economic growth and development also. FDI comprises more capital and new technologies hence increase the knowledge level (Demello, 1999). FDI inflows

raises the process of competition, raises the amount of stock capital and transfer of technologies (Ellahi & Khan, 2011).

In different times FDI has different impacts on the host countries economies. Technology transfer in developing countries is especially important as they lack the essential infrastructure in terms of liberalized market, socially and economically stable economies. Apart from technologies, knowledge, capital; Foreign Direct Investment inflows frequently contains a bunch of resources, containing administrative and organizational skills, know-how with entry to international markets through the way of networks of Multinational Organizations (Kumar and Pradhan, 2002). In this way, FDI plays a two-fold role by capital accumulation/formation and by increasing the total factor productivity (Nath, 2005). In contrast, if the country is totally dependent in FDI inflows then it is expected to have negative effects on economic growth and development. FDI creates industrial structures in which the monopoly is predominant (Bornschier & Chase-Dunn, 1985). Because economic control by foreign persons would not be developed purely (Amin, 1974). FDI posits positive as well as some negative impacts on countries.

Does a country go for trade liberalization or not? Does trade openness increase the FDI inflows which in turn increase the wellbeing of the people? For last three decades, most debated issues are regarding trade policies (kakar & Khilji, 2011). Trade openness along with the combinations of others, enhance the FDI inflows. Trade openness is likely to influence the inflows of international capital (Adhikary, 2011). In last, free trade referred as engine of economic growth. Expanding trade activities or trade liberalization act as a stimulus in growing the level of demand at local that then establishes the large scale industries through FDI inflows.

Literature Review

Trade openness and FDI inflows have been addressed theoretically and also empirically. Liargovas *et al* in 2012 examine the significance of openness of trade for attracting the Foreign Direct Investment inflows while studying 36 countries from developing world for the time period 1990-2008. They found that trade openness positively affects the FDI inflows. Kakar and Khilji in 2011, examine the FDI and trade openness with special relation with economic growth for Malaysia and Pakistan for time period 1980-2010. They found that trade openness significantly positively affects the economic growth of Malaysia and Pakistan in the long run. Neumayer & Soysa in 2004 examine the affiliation between trade openness, FDI and child labor. They found that country more open towards the trade have higher stock of FDI inflows and this also lowers the incidence of child labor thus globalization is linked with reduced not additional child labor. Trevino and Mixon in 2004 explore the relationship between strategic factors and FDI for seven Latin American countries. They found that MNEs invest in those countries where distance between home and host country is not wide. Abrego in 1999, explore the relationship between trade liberalization and FDI while studying the economy of Costa Rica and OECD countries for the period of 1990-91. He investigated that complete trade liberalization ends up with reduced welfare as it leads to capital outflows and loss of tax revenue. Froot and Stein in 1991 explore the effect of official exchange rate on FDI. They found a country with weaker currency attracts more FDI inflows.

Barlow in 2006 finds that trade liberalization positively impacts the growth. Jenkins and Sen in 2006 inspect the impact of FDI and openness of trade for employment and maintenance for developing nations. Ynikkaya in 2003 indicates that trade openness is significantly related with increased per capita income growth. Wacziarg in 2001 finds that Trade openness has greater importance for long-run economic growth. Edwards in 1998 indicates that growth in poor countries

does not depend on trade openness, knowledge but skills and production cost also plays a key role. Thus, different researchers find dissimilar status for trade openness.

Data and Methodology

The data set consists of the period 1982 to 2012, which is thirty (31) years. The observed data was time series as well as cross sectional data, which is converted to Panel data/Pooled data.

Table 1 Descriptive Statistic

Variables	Mean	Std. Dev.	Minimum	Maximum	Observations
FDI	3.52E+09	8.16E+09	-3.62E+08	4.34E+10	N = 93
TRD	34.12258	12.30385	12	58.7	N = 93
ER	1311.531	3054.498	9.5	12175.5	N = 93
INF	11.91183	7.813253	2.9	49.7	N = 93
GDPPC	1344.89	1454.761	279.2	7228	N = 93

1. Source: World Bank Development Indicators.

2. Notes: FDI = Foreign direct investment, net inflows (current US\$), TRD = Trade (% of GDP), ER = Official exchange rate (LCU per US\$), INF = Inflation, consumer prices (annual %), GDPPC = GDP per capita (current US\$).

Total number of observations were 93 because there are three countries ($n=3$) and thirty one years' time period ($T=31$). Graphical presentation for FDI inflows, Trade openness, Inflation and GDP per capita for India, Iran and Pakistan are presented in appendix graphical presentation. Here, FDI inflow is a dependent variable.

The methodology adopted for this study is empirical and experimental. Present research has been carried out for developing countries India, Iran & Pakistan. All three countries have specific boundaries, different political systems, policies and having separate currency units. Research model after including explanatory variables is as follows.

$$FDI_{it} = f(TRD_{it}, ER_{it}, INF_{it}, GDPPC_{it}) \dots (i)$$

Where,

FDI = Foreign direct investment

TRD = Trade openness

ER = Exchange rate

INF = Inflation, consumer price index

GDPPC = GDP per capita growth

Here, 'i' shows individual country effects and 't' shows time effects and the assumptions of U_{it} is that $U_{it} \approx IID(0, \sigma_u^2)$, i.e. errors are independently identically distributed with zero mean and stable variances.

Empirical panel data can be analyzed through three different methods. First: the Ordinary Least Square (OLS), second: Random Effect Model, third: Fixed Effect Model. Akbar, *et al*, in 2011 has used OLS, FEM and REM for the estimation of GDP per capita for nine (9) Asian countries. OLS is used to estimate the equations of regression. But this type of estimation may create a problem of interpretation when we want to study the country specific characteristics like as, Policy changes; political regimes and good governance that affects the FDI inflows are not considered. The methodology is further divided into four subsections which are presented below.

Group effects with constant slope coefficients

The baseline model in order to check the group effects, where all coefficients are constant across time and countries, would be written as:

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$$FDI_{it} = \beta_0 + \beta_1 TRD_{it} + \beta_2 ER_{it} + \beta_3 INF_{it} + \beta_4 GDPPC_{it} + U_{it} \dots (ii)$$

Here, estimated model assumes that the values of intercept and slope coefficients for all explanatory variables are same for all three countries. Group effects may distort the true picture of the model and we have to find the Country effects of all three countries.

Country effects with constant slope coefficients

For checking the individuality of each country, let the intercept vary for all three countries but still we have to assume that the slope coefficients of respective countries are still constant. To see this model would be of following format:

$$FDI_{it} = \alpha_1 + \alpha_2 C_2 + \alpha_3 C_3 + \beta_0 + \beta_1 TRD_{it} + \beta_2 ER_{it} + \beta_3 INF_{it} + \beta_4 GDPPC_{it} + U_{it} \dots (iii)$$

All three countries have different intercepts that are due to different political systems, different monetary and fiscal policy styles, and different managerial abilities. As we have three countries, therefore we have to use only two country dummies to prevent dummy variable trap that would be a situation of perfect multicollinearity. It can be said that no dummy for India and α_2 represents the dummy for Iran & α_3 represents the dummy for Pakistan.

Time effects with constant slope coefficients

For checking the time effects, time dummies are introduced. As data set is for 31 years from 1982 to 2012, so we introduce only 30 dummies for preventing from dummy variable trap. The model would be of following type:

$$FDI_{it} = \gamma_1 + \gamma_2 T_{1983} + \dots + \gamma_{30} T_{2012} + \beta_0 + \beta_1 TRD_{it} + \beta_2 ER_{it} + \beta_3 INF_{it} + \beta_4 GDPPC_{it} + U_{it} \dots (iv)$$

Here, T_{1983} take the 1 value for observation in year 1983 and takes zero (0) otherwise, etc. Here, 1982 is treating as a base year that's intercept value is γ_1 .

All Coefficients (intercept & slope) vary across countries

Here, intercepts and slopes coefficients are different for all three countries. Here the slope dummies or interaction terms are used and they are account for differences in slope coefficients. We will multiply country dummies by each of the regressors. This can be shown in the following model:

$$FDI_{it} = \alpha_1 + \alpha_2 C_2 + \alpha_3 C_3 + \gamma_0 + \sum_{k=1}^3 \gamma_k TRD_{it} + \sum_{k=1}^3 \gamma_k ER_{it} + \sum_{k=1}^3 \gamma_k INF_{it} + \sum_{k=1}^3 \gamma_k GDPPC_{it} + U_{it} \dots (v)$$

Here, γ 's are differential slope coefficients just like α 's are differential intercepts. If one or more than one γ coefficients are presenting the value that is statistically significant, then it can be said that slope coefficients are different than base group.

Results

After conducting a panel data analysis we see some interesting results. For choosing the best model between FEM and REM, Hausman in 1978 test is used, which favors in all for FEM (Fixed Effect Model). The results are distributed further in four sections, which are as follows:

Group effects with constant slope coefficients

Results for all coefficients constant across countries and/or time are presented in table 2. Concluded fact is that null hypothesis cannot be rejected that explanatory variables in study does not enlighten the FDI inflows. Pooled OLS Model-1a fits the data in a well way and significant at the 1% level. Adjusted R^2 of .30 says that Model-1a accounts for 30 percent of the total variance in the FDI. In Model-1a, for 1 percent increase in trade openness the total FDI inflows for selected all three countries is expected to increase 4.78E+08, holding all other variables and intercept constant.

A good-ness of fit measure R^2 is increasing with the addition of more regressors which means that the included variables are going to response more for better explanation of the model.

Table 2 OLS Results for period 1982-2012. DV is FDI net inflows (BOP, current US dollars).

	Model-1a (Pooled OLS)	Model-1b (Pooled OLS)	Model-1c (Pooled OLS)
TRD	4.78E+08***	4.80E+08***	4.75E+08***
ER	-1323345***	-1201701***	-1523564***
INF		-1.51E+08	-1.97E+08
GDPPC			1007575*
Intercept	-1.10E+10***	-9.48E+09***	-9.70E+09***
F Test	20.45***	14.69***	11.45***
R^2	.31	.33	.34
Adj. R^2	.30	.31	.31
Obs.	93	93	93

***, **, and * represents significance level at 1%, 5% and 10% respectively.

Individual Country effects with constant slope coefficients

Table 3 FEM Results for period 1982-2012. DV is FDI net inflows (BOP, current US dollars).

	Model-2a (Fixed Effect)	Model-2b (Fixed Effect)	Model-2c (Fixed Effect)
TRD	6.36E+08***	6.37E+08***	6.26E+08***
ER	-1217859***	-1197241***	-1744939***
INF		7.58E+07	-7.45E+07
GDPPC			2338653***
C2(dummy for Iran)	-1.14E+10***	-1.23E+10***	-1.54E+10***
C3(dummy for Pakistan)	-1.17E+10***	-1.18E+10***	-1.06E+10***
Intercept(baseline or dummy for India)	-8.88E+09***	-9.50E+09***	-1.06E+10***
F Test	49.62***	39.76***	41.31***
R^2	.69	.70	.74
Adj. R^2	.68	.68	.72
Obs.	93	93	93

***, **, and * represents significance level at 1%, 5% and 10% respectively.

After conducting the Fixed Effect Model (FEM) with the technique of Least Square Dummy Variables (LSDV), results are presented in three models form Model-3a to Model-3c in table 3 to check the exact nature of relationship among FDI and openness of trade and some of the other explanatory variables. As we are interested in finding the country effects that are due to different political systems, different Monetary and Fiscal policies and different managerial abilities, so we are using the dummies to estimates the Country fixed effects, Which is also known as Least-Square Dummy Variables (LSDV) model in literature. Here we examine the fixed group effects by introducing group (country) dummy variables. The dummy variable c2 is set for Iran and c3 for Pakistan and no dummy for India. Here the results are obtained for c2 and c3 because we have to

include only two dummies to prevent from dummy variable trap. The differential intercept coefficient tells by how much the Iran and Pakistan is different from the intercept of India. In short, we can say India is a comparison country. Akbar *et al*, in 2011 uses Pakistan for comparison country.

This fixed effect model posits that each country has its own intercepts but share the same slopes of explanatory variables (i.e., trade openness, exchange rate, inflation and GDP per capita). The parameter estimate of c1 (dropped dummy) presented in Model-2a is $-8.88E+09$, which is the intercept of baseline for India. c2 and c3 dummy intercepts have deviation from its group specific intercept that is the baseline intercept (intercept for India). These differences in country intercepts are due to the unique features of managerial talent or managerial style etc.

Time effects with constant slope coefficients

Table 4 FEM Results for period 1982-2012. DV is FDI net inflows (BOP, current US dollars).

	Model-3a (Fixed Effect)	Model-3b (Fixed Effect)	Model-3c (Fixed Effect)
TRD	3.07E+08***	3.18E+08***	3.19E+08***
ER	-1521082***	-1394834***	-1333115***
INF		-1.31E+08	-1.18E+08
GDPPC			-212227
t2(1983)	-4.22E+08	-1.96E+08	-1.89E+08
t3(1984)	8.23E+08	6.05E+08	6.63E+08
t4(1985)	1.52E+09	8.29E+08	9.55E+08
t5(1986)	2.34E+09	2.34E+09	2.44E+09
t6(1987)	1.90E+09	2.39E+09	2.33E+09
t7(1988)	1.44E+09	2.12E+09	2.02E+09
t8(1989)	6.52E+08	7.08E+08	6.55E+08
t9(1990)	-8.70E+08	-1.20E+09	-1.23E+09
t10(1991)	-1.31E+09	-9.11E+08	-1.02E+09
t11(1992)	-1.24E+09	-6.54E+08	-7.87E+08
t12(1993)	-1.30E+09	-1.20E+09	-1.38E+09
t13(1994)	-2.57E+08	5.55E+08	3.08E+08
t14(1995)	7.52E+08	2.37E+09	2.09E+09
t15(1996)	6.85E+08	1.26E+09	1.09E+09
t16(1997)	1.41E+09	1.46E+09	1.34E+09
t17(1998)	1.56E+09	1.68E+09	1.55E+09
t18(1999)	7.60E+08	4.95E+08	3.98E+08
t19(2000)	1.00E+09	4.70E+08	3.97E+08
t20(2001)	1.94E+09	1.20E+09	1.16E+09
t21(2002)	4.22E+09	3.38E+09	3.21E+09
t22(2003)	3.30E+09	2.44E+09	2.26E+09
t23(2004)	3.59E+09	2.81E+09	2.65E+09
t24(2005)	3.48E+09	2.67E+09	2.54E+09
t25(2006)	7.67E+09	6.80E+09	6.71E+09
t26(2007)	1.07E+10*	1.00E+10*	1.00E+10*
t27(2008)	1.56E+10***	1.59E+10***	1.59E+10***

	Model-3a (Fixed Effect)	Model-3b (Fixed Effect)	Model-3c (Fixed Effect)
t28(2009)	1.36E+10**	1.33E+10**	1.33E+10**
t29(2010)	1.10E+10*	1.06E+10*	1.06E+10*
t30(2011)	1.34E+10**	1.31E+10**	1.33E+10**
t31(2012)	9.64E+09*	9.51E+09	9.63E+09
Intercept(baseline or dummy for 1982)	-8.44E+09*	-7.31E+09	-7.24E+09
F Test	2.41***	2.38***	2.28***
R ²	.56	.57	.57
Adj. R ²	.33	.33	.32
Obs.	93	93	93

***, **, and * represents significance level at 1%, 5% and 10% respectively.

Table 5 FEM Results for period 1982-2012. DV is FDI net inflows (BOP, current US dollars).

	Model-4a (Fixed Effect)
C2(dummy for Iran)	1.34E+10
C3(dummy for Pakistan)	1.10E+10
c1TRD(India)	9.23E+08***
c1ER(India)	-2.78E+08***
c1INF(India)	3.85E+08**
c1GDPPC(India)	5203543
c1TRD(Iran)	2546333
c1ER(Iran)	316748.1
c1INF(Iran)	-8330228
c1GDPPC(Iran)	87946.08
c1TRD(Pakistan)	4.39E+07
c1ER(Pakistan)	-6903944
c1INF(Pakistan)	3.57E+07
c1GDPPC(Pakistan)	3965086
Intercept(baseline or dummy for India)	-1.38E+10***
F Test	48.81
R ²	.90
Adj. R ²	.88
Obs.	93

***, **, and * represents significance level at 1%, 5% and 10% respectively.

Results for fixed effect model are presented in table 4; it is marked that F-Test is significant at the level of 1 per cent in all models from Model-3a to Model-3c. Therefore, it is concluded that we cannot reject the null hypothesis that that regressors variables does not clarify the FDI inflows and the selected determinants can be considered enough in order to explain the FDI inflows. Trade openness plays a very important role in determining the FDI inflows. In 2007, total inflows of Foreign Direct Investment (FDI) were US\$ 1833324 million in the world, only 27.3 per cent for developing and rest for developed world (UNCTAD, 2009). Dummy variables can also be used in checking for the time effects with making a sense that changes occurs in different countries over a

time, due to the factors like change in government regulatory, tax policies, technological changes, changes in overall education level and sometimes outdoor effects like as wars and other conflicts. In table 4, in all three Models include dummy variables that accounts for individual country effects. Same as we can allow the time effects in the sense that FDI inflows have been shift over a period of time, for this purpose time dummies are introduced we have taken 1982 as a base year. In model-3a, individual time dummies were individually statistically significant as they include year's 2007, 2008, 2009, 2010, 2011 and 2012 which suggest that FDI inflows have changed much over a time. The overall conclusion from table 4 was that there was propound individual country effects and also individual time effects. It can also be said that, FDI inflows for India, Iran and Pakistan have changed due to explanatory variables effects, individual country effects and as well as time effects.

All coefficients (intercept & slope) varies across countries

Table 5 presents the estimated FDI inflows where all the studied co-efficients vary across countries. Some of the differential slope coefficients are also statistically significant. In Model-4a for 1 percent increase in trade openness of Pakistan, FDI inflows for selected countries is expected to increased by 4.39E+07 units, holding all other variables constant.

Limitations

In terms of policy implications, the issues that are central in the exploration of the trade openness should also be investigated. Although analysis presented and empirical models constructed for research are as complete and comprehensive as possible but still there are some limitations causing further suggestions for future research, one of them is analysis covers only three (3) countries thus the results only presents the realities of three selected countries only.

Conclusion

We have used panel data of three selected developing countries India, Iran and Pakistan to capture time and country effects of trade openness on FDI inflows. Considering our data set of three countries between 1982 and 2012 periods, we have consistently found that high trade openness causes the increase in FDI inflows in all models. Research study first presents the importance of trade openness phenomenon. As we saw the FDI is very heatedly discussed in national as well as international level. FDI inflows of India, Iran and Pakistan are influenced by trade openness. All in all, the research study supports the view that there is scope for developing countries in order to correcting and maintaining the economic development indicators, so the FDI inflows would be sustainable. Research conclusion underlines the importance of trade openness to the FDI inflows, both on global and as well as on local level. Hence, the conclusion indicates that increased trade openness increases the FDI inflow in the short-run and well as in long-run.

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Appendix Graphical Presentation

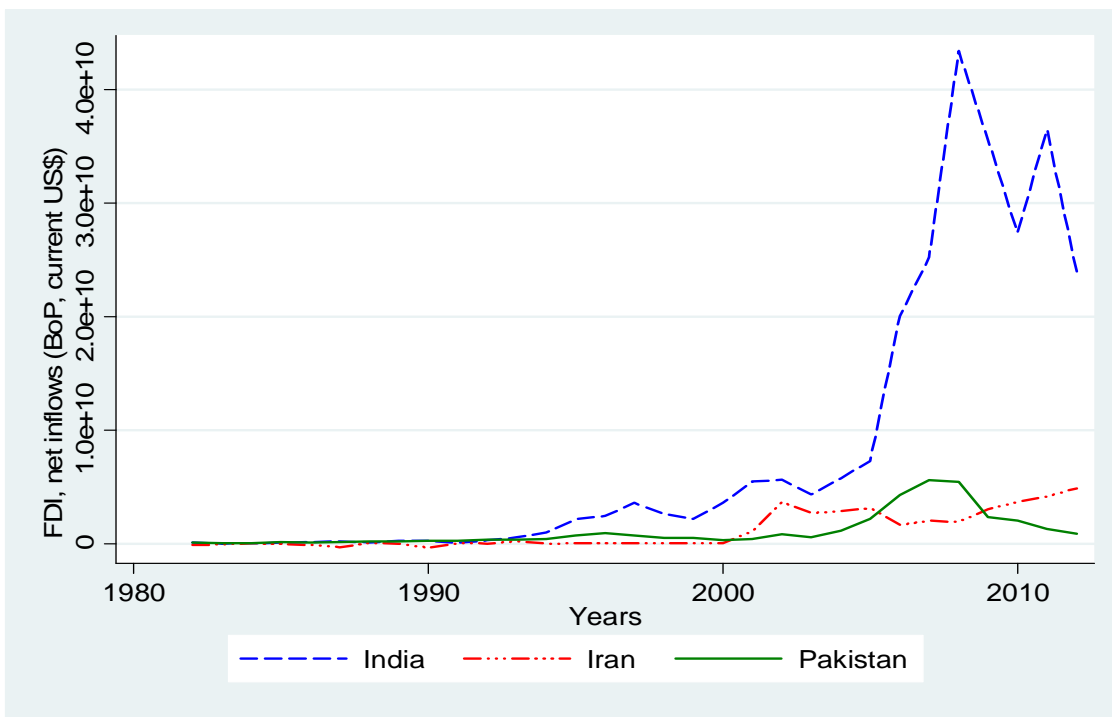


Figure 1 FDI differences between India, Iran & Pakistan

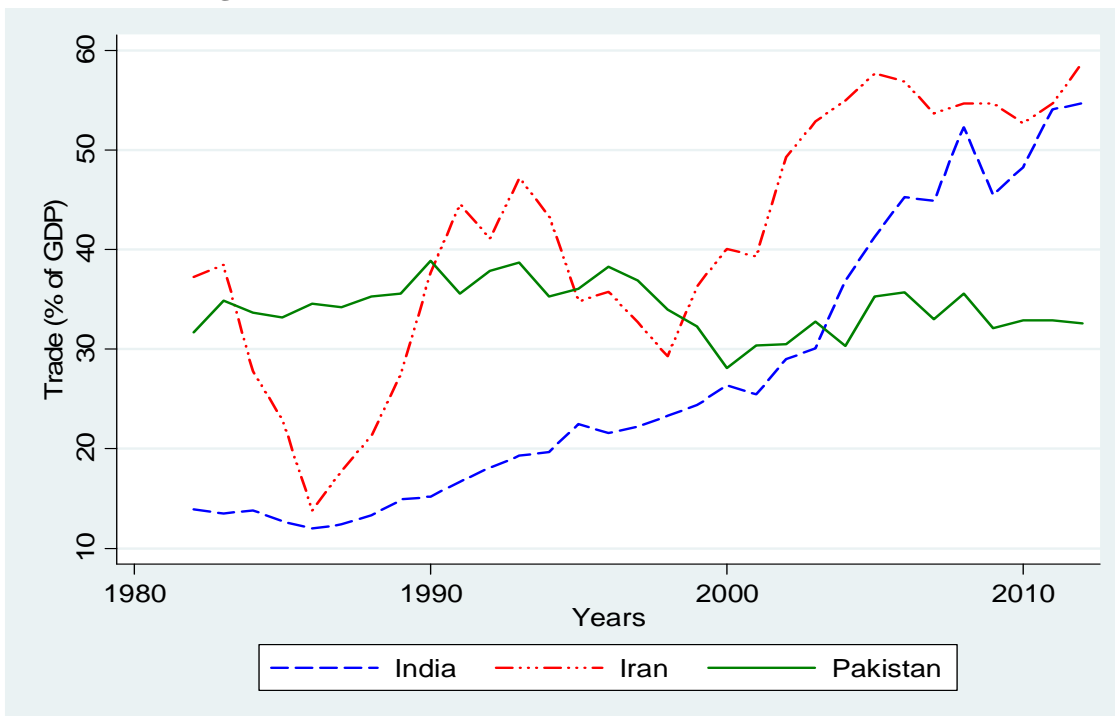


Figure 2 Trade openness differences between India, Iran & Pakistan

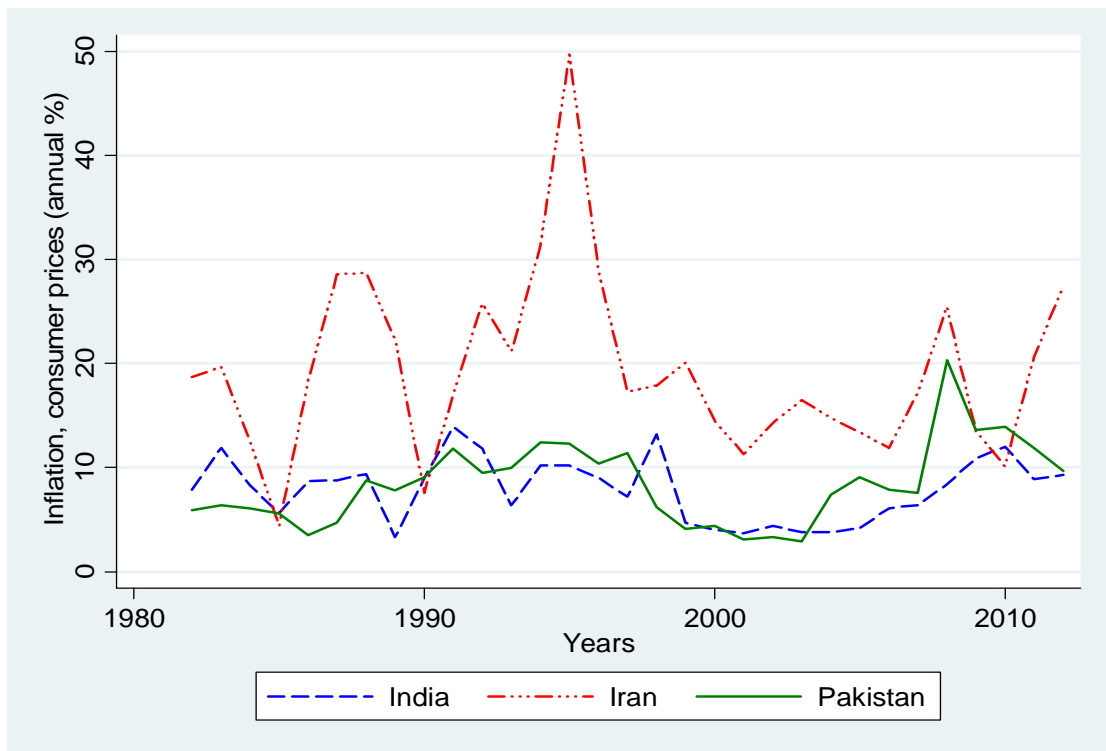


Figure 3. Inflation (CPI) differences between India, Iran & Pakistan

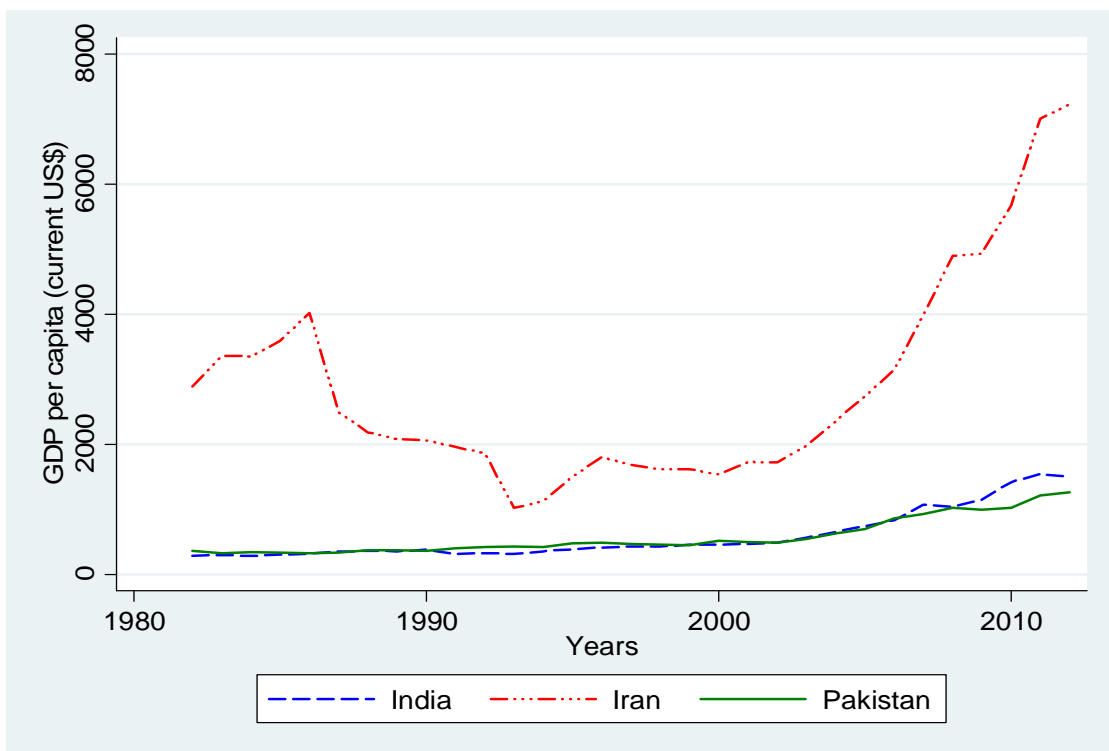


Figure 4. GDP per capita differences between India, Iran & Pakistan