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Does Political Risk Lead to Purchasing Power Disparity? A Panel Disaggregated Approach

by

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Till date, few studies have attempted to study the impact of political risk on the purchasing power disparity. The studies conducted thus far have been restricted in terms of the political risk components used, countries examined and time span. We add to the existing literature by being the first to examine how thirteen different political risk indices introduced by International Country Risk Guide (henceforth, ICRG) affect the real exchange rate. In this study, we use 86 OECD and Non-OECD countries over the time period of 1984-1997, and carry out panel estimation techniques, which include one-way fixed-effects, two-way fixed-effects, one-way random-effects, and two-way random-effects. It is found that regardless of whether countries are classified according to income or region, in most of the cases political risk does have a significant impact on real exchange rate in that risk leads to either real appreciation or depreciation and is instrumental in purchasing power disparity.

I. INTRODUCTION

Common sense dictates that in the absence of any trade barriers or transportation cost an identical basket of goods should cost the same in any two countries when denominated in terms of the same currency. This proposition is known as the Purchasing Power Parity (PPP). According to the absolute version, the PPP based exchange rate is expressed as the ratio of the prices of comparable basket across borders that is P/P* where P is the national price level, P* is the foreign price level. This PPP has been used for calculating inflation rates and instrumental in

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forecasting medium and long term real exchange rates for independent countries. Real Exchange Rate (henceforth, k) is defined as P/eP* where e is the equilibrium exchange rate which is observed in reality. Numerous economic literature uses the real exchange rate which is nothing but the deviation of the equilibrium exchange rates (e) and the PPP based exchange rates (P/P*) as an indicator of whether PPP holds or not. If the PPP holds the ratio (P/eP*) is supposed to be equal to one. Hence, if the value seems to be greater or less than one it is an indication of purchasing power disparity.

Numerous studies have revealed that in reality the PPP doctrine often does not hold. It is important to identify factors which make the PPP based exchange rate (P/P*) to deviate from the equilibrium determined exchange rate (e), because a deviation from the PPP is indicative of the existence of a misalignment in the economy. When there is purchasing power disparity, it implies that there may be serious distortion in the economy. In order to address such distortions, it is important to first identify the factors that cause the distortion. For this very reason, this study aims to delve into the literature of the purchasing power disparity and identify the underlying factors causing such a distortion.

Economists have attempted to explain this deviation by using both the supply side and the demand side channels.[1] On the supply side, we start with the work of Balassa (1964) and Samuelson (1964) who in separate publications identifies productivity differentials as the root cause of the deviation of the PPP based rate from the equilibrium rate. Formally known as the "Productivity Bias Hypothesis," they highlight that countries with higher productivity tend to have more appreciated exchange rates, while countries with lower productivity tend to have relatively depreciated exchange rates. So, they argue that following a positive productivity shock in the traded goods sector relative to the domestic and foreign non-traded goods sector and the foreign traded goods sector, a country's national price level rises and thus the country experiences a real appreciation. Thus they conclude that rich countries which rank high on productivity have an appreciated real exchange rate while poor countries with low productivity tend to have depreciated real exchange rate.

Kravis and Lipsey (1983) and Bhagwati (1984) also attempt to explain the same doctrine by using the factor endowment theory.[2] Bhagwati uses the two factor general equilibrium model where he states that production of services is labour

[1] To get a detailed overview of literature on PPP refer to Rogoff (1996) and Bahmani-Oskooee and Nasir (2005).

[2] Kravis and Lipsey (1983) and Bhagwati (1984) use a supply side approach to explain the PPP doctrine.

intensive while production of goods is capital intensive. So capital abundant rich countries have comparative advantage in the production of goods and services requiring more capital intensive production methods, while poor countries have comparative advantage in service production which is labour intensive by nature. Traded goods are priced somewhat equally across border while the non-traded goods not. As poor nations produce services which are mostly non-traded items at lower prices, this leads to a lower national price level which is the weighted average of traded and non-traded price. This, in turn, leads to a depreciated real exchange rate. Clague (1985) uses a sector specific model to explain the systematic deviation of the PPP based rate in various countries and he came to the same conclusion as Kravis and Lipsey (1983).

There is another set of studies such as Bergstrand (1991, 1992), Falvey and Gemmel (1991), Asea and Mendoza (1994), which attempt to explain the deviation of the PPP based rate by focusing on the demand side. Such studies assert that developed countries with higher per capita income have greater demand for services, thus leading to a higher price for services. This is translated into a higher national price level which, in turn, leads to an appreciated exchange rate in developed countries.

To sum it up various studies have been done to test the validity of the productivity bias hypothesis since Balassa and Samuelson developed it in 1964. Cross-sectional studies that have been done so far have yielded mixed results with Kravis and Lipsey (1983), Clague (1986,1988), Rogoff (1992), Bergstrand (1991, 1992), Falvey and Gemmel (1991) supporting the hypothesis while other studies like that of Clague and Tanzi (1972), Officer (1976), Clague (1986) and Bahmani-Oskooee and Niroomand (1996) rejecting the hypothesis.

There has been another set of studies, which has mostly relied on time series analysis; such studies lend support to the "productivity bias hypothesis." Studies in this category include Hsieh (1982), Rogoff (1992), Bahmani-Oskooee (1992), Bahmani-Oskooee and Rhee (1996) and Bahmani-Oskooee and Nasir (2004). The third set of studies that have been conducted to test the validity of the Balassa-Samuelson hypothesis extend the literature by using panel estimation on a larger group of countries over a longer time period; such studies mostly lend support to the hypothesis and include works of Asea and Mendoza (1994), Bahmani-Oskooee and Nasir (2001, 2002), Chin (1997, 2000) and more. So, the gist of the matter is, by conduction cross-sectional, time series, and panel estimation techniques, the Balassa Samuelson theory has been proved to hold for most cases and thus it can be relied upon as a sound starting point for this study.

But explaining the deviation of the PPP based rate from the equilibrium rate in terms of productivity differentials is only one part of the story. There are various other factors that may lead to such a deviation. Kravis and Lipsey (1983) include real GDP per capita, openness, share of non-tradables in GDP, and money supply growth as explanatory variables of the real exchange rate. Clague (1986) includes variable such as mineral as a percentage of GDP, trade balance, tourism, education and money supply growth to explain the deviation of real exchange rate from one. He finds the first three variables to have a significant impact on real exchange rate, while the impact of the latter two is insignificant. Rogoff (1992) adds variables like oil price and government spending to explain the deviation. Asea and Mendoza (1994) add variables like capital-output ratio in tradables, capital-output ratio in non-tradables, investment-output ratio and relative price of non-tradables and examine their effect on the real exchange rate using panel estimation techniques for 14 Organization for Economic Cooperation and Development (OECD) countries. Other variables such as share of government expenditure to GDP (De Gregorio, Giovanni, and Krueger 1994), share of private spending in non-tradables (De Gregorio, Giovanni, and Krueger 1994), difference of the rate of inflation (De Gegorio, Giovanni and Wolf 1994) and relative price of non- tradables (Egert *et al.* 2002), trade restrictions, speculation in the foreign exchange market, higher expectation of inflation, real changes in the economy, long term capital movements and government intervention (Officer 1976) have also been included to explain why the PPP does not hold.

In more recent studies, Bahmani-Oskooee and Nasir (2002) find that corruption has a significant positive impact on real exchange rate. Since for each measure of corruption (law and order, bureaucracy, and corruption), a lower score indicates higher corruption rate, a positive sign indicates that as corruption increases, the real exchange rate decreases i.e. there is real depreciation. Smuggling (Bahmani-Oskooee and Goswami 2003), lack of political rights, and civil liberties (Bahmani-Oskooee and Goswami 2004) have also been identified as factors contributing to the deviation of PPP based rate from the equilibrium exchange rate. The impact of military spending on real exchange rate is examined by studies conducted by Bergstrand (1992), but the result is insignificant due to the fact that a small number of observations are included (21 cross-sectionals). However, in a later panel study of 37 developing countries for the years 1985-1999 Bahmani-Oskooee and Goswami (2005) identify military spending as a significant determinant of real exchange rate; their finding reveals that the higher the military spending, the higher the national price level and thus the more appreciated the real exchange rate.

In this paper, we intend to extend the literature by adding the political risk factor to the original Balassa-Samuelson model of real exchange rate. We plan to

examine the impact of risk at a disaggregate level by examining the effect of thirteen different indicators of political risk prepared by ICRG and their effect on the real exchange rate. True variables like corruption, law and order, bureaucratic quality, political rights, and civil liberties have already been included in previous literature but they have been examined in a limited sense.[3] For instance, Bahmani-Oskooee and Nasir (2002) deal with only three indicators, but our study deals with thirteen disaggregate indicators of political risk.[4]

Similarly, Bahmani-Oskooee and Goswami (2004) also examine how political rights and civil liberties impact the purchasing power disparity. But the study only focuses on one aspect of political risk while our study is a more in-depth and comprehensive one in determining the role of political risk in bringing about the purchasing power disparity. So far, by looking at the compilation of existing literature on purchasing power disparity, it is obvious that no such comprehensive study focusing on political risk and the purchasing power disparity has yet been attempted where thirteen different indicators of political risk are examined on an individual basis. This gives us adequate motivation to embark upon this study.

It should also be noted that Bahmani-Oskooee and Goswami (2005) identify military spending as a significant determinant of PPP deviation. Our study, on the other hand, examines, among other things, the impact of military in politics as a determinant of PPP deviation in the framework of political risk, which basically looks at how the military can influence the government, its policies, and the institutional framework and so on. Thus, military spending and military's influence on politics are not the same concepts; in this respect, this study is quite different from that of Bahmani-Oskooee and Goswami (2005).

In addition, this paper aims to carry out panel estimation for a larger group of countries and a longer (and different) time period. Bahmani-Oskooee and Nasir (2002) conduct the study for 65 countries for the period 1982 to 1990; Bahmani-Oskooee and Goswami (2004) carry out their study for 69 developing countries for the period 1972 to 1998. We plan to add to existing literature by not only including a larger number of 86 countries, both developed and developing, but we also examine a different time period spanning from 1984 to 1997.

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[3] See Bahmani-Oskooee and Nasir (2002) and Bahmani-Oskooee and Goswami (2004).

[4] Note that Bahmani-Oskooee and Nasir (2002) do not differentiate countries according to income or geographical location; this is also another key area where we mean to extend the literature.

Before proceeding further, let us first highlight how the study will be divided. Section II explores the theoretical link between the disparity and political risk and proposes a model, while Section III gives detailed definition of variables and information regarding data. Section IV examines the descriptive statistics and correlation analysis for each of the political risk indices while Section V gives details on the alternative panel estimation methods used in this study. Section VI examines and attempts to explain the empirical results and Section VII makes some concluding remarks.

II. THEORY AND ECONOMETRIC MODEL

It must be noted that the various forms of political risk impact the real exchange rate through different channels. First, under conditions of high political risk, there is likely to be an unfavourable climate for conducting business in the economy. Producers will be reluctant to start operations or expand if they fear that at any time they may face sudden policy change or high degree of tension which might force them to drastically change their own operations or even close down. In such a situation, both local and foreign investors will be discouraged to invest in the domestic economy. In addition, increased political risk may induce migration which may lead to a shortage of human resource for the country in question. Thus there will be sub-optimal production in the economy (supply-side shock) which according to the simplest of macroeconomic theory is likely to create an upward pressure on domestic prices.

In particular, if the goods sub-optimally produced are non-tradables, underproduction is bound to lead to higher price level of non-tradables which will eventually lead to an increase in the national price level which is the weighted average of the prices of non-traded and traded goods. Since the national price level is a component of real exchange rate, the real exchange rate will thus increase i.e. there will be real appreciation. In addition, increased risk in domestic country may induce many to migrate to foreign lands in search of greater security and stability. Thus there will be an outflow of human resources which may mean that the country under question will be unable to produce at its full potential. Again, there will be sub-optimal production and, *ceteris paribus*, there will be real appre-ciation.[5]

Second, there might also be a demand side impact on the economy. As pointed out by Bahmani-Oskooee and Goswami (2005), greater political risk in the form of lack of political rights and civil liberties is likely to induce autocrats to divert funds

[5] But if the migrants send remittance back to their home country, the effect on price may be dampened.

from health, education, etc. to military spending, thus placing upward pressure on aggregate demand and national price level. Thus, political risk is seen to impact real exchange rate through various channels, via both supply side and demand side shocks.

Third, when there is increased political risk, increased uncertainty may lead to increased capital flight or currency substitution. In both instances, since people's confidence in the domestic currency decreases with increased political risk, individuals in the economy sell the domestic currency and buy foreign currency, thus bringing about a nominal depreciation of domestic currency. *Ceteris Paribus*, this nominal depreciation leads to real depreciation. This is the line of thought followed by Bahmani-Oskooee and Nasir (2002), where corruption is identified as an underlying factor causing purchasing power disparity. Bahmani-Oskooee and Nasir (2002) point out that since corruption tends to be inflationary by nature, this inflation leads to nominal depreciation.[6] *Ceteris paribus*, this nominal depreciation is likely to translate into real depreciation. Hence, the impact of political risk on real exchange rate can take any direction depending on the nature of political risk. Whatever the direction of the effect we can term it as disparity if the relationship is statistically significant.

In this study, in order to assess the impact of political risk on the real exchange rate, we rely upon a simple model from the existing literature i.e. the model that is usually used to test the Balassa-Samuelson model of "productivity bias hypothesis" and add fourteen different indices of political risk one by one. Assuming the U.S. as the base country and the U.S. Dollar as the reserve currency, let e_{it} denote country *i's* currency per U.S. Dollar at time *t*; let P_{it} denote the national price level in country *i* and $P_{u.s.t}$ denote the aggregate price level in the U.S. Hence, the PPP based exchange rate can be defined as $P_{it} / P_{u.s.t}$; we can go one step further and define the deviation of the PPP based rate from the equilibrium exchange rate as $(P_{it} / P_{u.s.t}) / e_{it}$ or as $P_{it} / P_{u.s.t} \cdot e_{it}$, which is also the real exchange rate defined as number of U.S. goods per unit of country *i's* goods. Thus our proposed model takes the following pooled OLS form:

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[6] More corrupt countries have an inefficient tax system; so government has to fall back on an inflationary tax policy. In addition, a country dominated by an unstable political climate with conflicting parties vying for power not only leads to corrupt practices but political instabilty. This drives away foreign investors and leads to revenue loss for the goevernmnt. To compensate for revenue loss, the government resorts to an inflationalry tax policy.

$$\ln RER_{it} = \beta_0 + \beta_1 \ln RPROD_{it} + \beta_2 \ln(1 + POLRISK_{it}) + \varepsilon_{it} \quad (1)$$

where $RER_{it} = P_{it} / P_{u.s.t} \cdot e_{it}$; $RPROD_{it}$ is a measure of productivity of country i relative to productivity of the U.S. defined as $RPROD_{it} = (PROD_{it} / PROD_{u.s.t})$. $POLRISK_{it}$ is a measure of political risk in country i, and ε_{it} is an error term that follows the standard distributional assumptions. Following Balassa (1964), a more productive country will experience real appreciation while a less productive country will experience a real depreciation and thus β_1 is expected to be positive. The sign of β_2 depends on the direction of the effect of political risk indicators. If β_2 is found to be significantly positive or negative, we can say that the PPP is violated. For example, if β_2 is found to be significantly positive, it implies that political risk leads to real appreciation which is a violation of the PPP. If β_2 is found to be significantly negative it implies that political risk leads to real depreciation which is again another violation of the PPP.

III. VARIABLES AND DATA

Each of the variables denoting political risk is expressed in index form between zero and 100, where zero indicates least amount of risk while 100 indicates maximum risk in country i at time t.[7] As mentioned earlier, the expected sign of β_2 is positive or negative depending on the relative strength of movement in national price level and nominal depreciation. This study strives to examine how different risk measures affect the purchasing power disparity. Hence, each of the fourteen different indicators of political risk is put into the framework of equation (1), one by one, in order to carry out different panel estimation techniques. We estimate equation (1) for each risk indicator by pooling cross sectional annual data from 86 countries over the period 1984–1997. In this study, 86 countries are used for which consistent set of data is found for all the variables for the 14-year period under consideration. The real exchange rate and the productivity data are taken from Penn

[7] For each of the political risk indices, originally, zero implied very high risk while 100 implied no risk at all. Following the practice of Bahmani-Oskooee and Goswami (2005), we redefine the risk index by subtracting each observation from 100, so that a higher risk point total is indicative of higher risk and vice versa. Each of the risk measures have also been transformed by adding 1 and then applying the natural logarithm i.e. ln (1 + $POLRISK_{it}$) because there are numerous observations which are zero. If log transformation is done directly without adding 1, then many of the observations will be lost which might necessitate elimination of certin years or countries. In order to prevent that, 1 is added to the risk component.

World Tables 6.0 (Heston, Summers, and Aten 2001).[8] Thirteen different indices of political risk are obtained from ICRG Online.[9]

IV. DESCRIPTIVE STATISTICS OF POLITICAL RISK INDICES

Before reporting the outcome of various panel estimation techniques, first let us take a look at the descriptive statistics of the transformed political risk indices, which is reported in Table I.

TABLE I
UNIVARIATE DESCRIPTIVE STATISTICS FOR POLITICAL RISK INDICES

Panel A: All Countries				
	MEAN	STD. DEV	MIN	MAX
Socioeconomic Conditions (A)	50.98	14.20	8.33	91.67
Economic Planning (B)	51.17	14.15	8.33	91.67
Government Stability (C)	46.66	15.74	8.33	91.67
External Conflict (D)	17.96	21.57	10.00	100.00
Corruption (E)	40.60	23.93	0.00	100.00
Military in Politics (F)	37.36	30.79	8.33	100.00
Religion in Politics (G)	22.78	21.96	0.00	100.00
Law and Order (H)	39.40	26.88	0.00	100.00
Ethnic Tensions (I)	31.98	24.98	0.00	100.00
Political Violence (J)	33.48	27.10	0.00	100.00
Civil War Threat (K)	24.46	25.28	0.00	100.00
Party Development (L)	36.80	25.33	0.00	83.33
Bureaucracy Quality (M)	42.48	26.46	0.00	83.33
ICRG Composite Risk Index (N)	36.64	15.16	4.00	75.00

(Contd. Table I)

[8] The detailed discussion on the construction of real exchange rate and the productivity ratio is the same as Bahmani-Oskooee and Nasir (2002) and Bahmani-Oskooee and Goswami (2005).

[9] ICRG is the abbreviation of International Country Risk Guide. Detailed definition of each of the thirteen indicators of political risk is available from their website (ICRG online).

(Contd. Table 1)

Panel B: OECD Countries

	MEAN	STD. DEV	MIN	MAX
Socioeconomic Conditions (A)	40.65	13.01	8.33	83.33
Economic Planning (B)	41.17	13.78	8.33	75.00
Government Stability (C)	37.05	14.35	8.33	75.00
External Conflict (D)	4.30	8.68	10.00	50.00
Corruption (E)	16.39	17.86	0.00	66.67
Military in Politics (F)	8.10	17.29	8.33	83.33
Religion in Politics (G)	10.03	15.57	0.00	83.33
Law and Order (H)	11.74	17.47	0.00	66.67
Ethnic Tensions (I)	14.34	16.53	0.00	66.67
Political Violence (J)	13.63	18.96	0.00	70.83
Civil War Threat (K)	4.52	9.78	0.00	33.33
Party Development (L)	10.98	17.41	0.00	66.67
Bureaucracy Quality (M)	14.14	19.09	0.00	66.67
ICRG Composite Risk Index (N)	20.88	9.90	4.00	56.00

Panel C: Non-OECD Countries

	MEAN	STD. DEV	MIN	MAX
Socioeconomic Conditions (A)	55.45	12.23	16.67	91.67
Economic Planning (B)	55.51	11.94	22.92	91.67
Government Stability (C)	50.83	14.44	8.33	91.67
External Conflict (D)	23.88	22.77	10.00	100.00
Corruption (E)	51.10	17.84	0.00	100.00
Military in Politics (F)	50.04	26.41	0.00	100.00
Religion in Politics (G)	28.31	22.03	0.00	100.00
Law and Order (H)	51.39	20.69	0.00	100.00
Ethnic Tensions (I)	39.63	24.14	0.00	100.00
Political Violence (J)	42.07	25.54	0.00	100.00
Civil War Threat (K)	33.09	25.05	0.00	100.00
Party Development (L)	47.99	19.34	0.00	83.33
Bureaucracy Quality (M)	54.76	18.62	0.00	83.33
ICRG Composite Risk Index (N)	43.48	11.51	15.00	75.00

Source: Authors' own calculation.
Note: 100 stands for maximum risk and 0 stands for no risk.

This indicates that, on average, most of the nations world wide experience relatively less amount of threat from political risk factors like external conflict, religious tension, and civil war Most of the countries are more vulnerable to political risk factors such as military influence on politics, law and order, ethnic tensions, political violence, and party developments. Here again, it is not surprising to find that there are many countries which experience maximum risk (denoted by 100) while there are some who are not at all vulnerable to political risk factors like ethnic tensions, political violence and so on. Political risk components like socioeconomic conditions, economic planning, government stability, corruption, and bureaucracy quality pose the greatest threat to most countries. Amongst the five just mentioned, it is economic planning that is of greatest concerns to most countries since its average risk point total amounts to 51.17 which is indicative of "high risk."

Thus, a simple look at descriptive statistics about the political risk components reveals that while several indices like religious tensions, civil war threat, and external threat pose relatively low threat to most countries, it is factors like bad socioeconomic conditions, government instability, lack of law and order, bad bureaucracy quality are of greater concern.

However, it is likely that the political risk indices that are of importance to OECD countries may not be equally important for non-OECD countries.[10] Thus, we go one step further, and examine the univariate descriptive statistics for OECD and non-OECD countries respectively. As can be seen from Table I, for OECD countries the political risk indices that have the highest mean risk point total, on average, are socioeconomic conditions, economic planning, and government stability. What is quite obvious from Table I is that, on average, most of the political risk indices display a higher risk point total for non-OECD countries as opposed to OECD countries. In addition, non-OECD countries are vulnerable to more political risk indices than OECD countries. Thus, while OECD countries suffer from high risk for only three risk components, non-OECD countries are vulnerable to additional risk factors such as corruption, and bureaucratic quality, etc.

Before proceeding further, however, let us strive to explain why we choose to scrutinise each of the political risk indices separately. For that purpose, we introduce Table II which reports the bivariate correlation analysis and enables us to look at how the political risk indices are correlated on a bilateral basis.

From Table II it can be observed that most of the political risk indices are very highly correlated at 1 per cent significance level, with correlation coefficients

[10] For a detailed list of all the countries under OECD and non-OECD, see Appendix 1.

ranging from 0.6 to 0.8, on average. There are some political risk indices though, that display lower correlation coefficient ranging from 0.5 to 0.6. And, only in very few cases do risk indices display low correlation coefficients like 0.2 or 0.3. Thus, simply by looking at the above table, we can conclude that, on average, the risk indices are highly correlated.

TABLE II
BIVARIATE CORRELATION ANALYSIS OF POLITICAL RISK INDICES

	ICRG (N)	A	B	C	D	E	F	G	H	I	J	K	L	M
ICRG (N)	**1.00**	0.75	0.72	0.64	0.65	0.70	0.74	0.49	0.84	0.56	0.72	0.79	0.74	0.79
A	0.75	**1.00**	0.85	0.62	0.37	0.47	0.46	0.26	0.53	0.31	0.44	0.52	0.47	0.58
B	0.71	0.85	**1.00**	0.67	0.32	0.46	0.48	0.24	0.51	0.28	0.38	0.48	0.48	0.56
C	0.64	0.62	0.67	**1.00**	0.32	0.46	0.48	0.20	0.54	0.35	0.46	0.52	0.43	0.48
D	0.65	0.37	0.32	0.32	**1.00**	0.33	0.45	0.40	0.54	0.42	0.58	0.63	0.50	0.39
E	0.70	0.47	0.46	0.45	0.33	**1.00**	0.69	0.42	0.75	0.43	0.52	0.52	0.69	0.78
F	0.74	0.46	0.48	0.40	0.45	0.69	**1.00**	0.44	0.68	0.41	0.57	0.61	0.71	0.70
G	0.50	0.27	0.24	0.20	0.40	0.42	0.44	**1.00**	0.48	0.48	0.44	0.44	0.37	0.35
H	0.84	0.53	0.51	0.55	0.54	0.75	0.68	0.48	**1.00**	0.58	0.76	0.76	0.69	0.74
I	0.56	0.31	0.28	0.36	0.42	0.43	0.41	0.48	0.58	**1.00**	0.63	0.57	0.40	0.37
J	0.72	0.44	0.38	0.47	0.58	0.52	0.58	0.44	0.76	0.63	**1.00**	0.77	0.51	0.51
K	0.79	0.52	0.48	0.52	0.63	0.52	0.61	0.44	0.76	0.57	0.77	**1.00**	0.56	0.58
L	0.74	0.47	0.48	0.43	0.50	0.69	0.71	0.37	0.69	0.40	0.51	0.56	**1.00**	0.75
M	0.78	0.58	0.56	0.48	0.39	0.78	0.70	0.34	0.74	0.37	0.51	0.58	0.75	**1.00**

Source: Authors' own calculation.

Note: For all the pair of risk indices, p-value = 0.0001 which indicates that all the correlation coefficients are significant at 1% significance level. Alphabet A=Socioeconomic Conditions, B=Economic Planning, C= Government Stability, D=External Conflict, E=Corruption, F=Military in Politics, G=Religion in Politics, H=Law and Order, I=Ethnic Tensions, J=Political Violence, K=Civil War Threat, L=Party Development, M=Bureaucracy Quality, and N=ICRG Composite Risk Index.

High correlation coefficients indicate that all the political risk indices have strong positive linear association when they are used for representing the political institutions. Thus we are justified by looking at each of their impacts on real exchange rate on an individual basis. Had all the thirteen indices been incorporated in the framework of equation (1), there would have been the problems of multicollinearity.

V. ALTERNATIVE PANEL ESTIMATION TECHNIQUES

As already mentioned, this study aims to explore how risk affects the deviation of the PPP based exchange rate from the market based exchange rate. In order to explore this relationship we carry out four different estimation techniques titled Case 1 to Case 4 in the tabulated results. As pooled OLS fails to account for country and/or time specific factors, other than the independent variables, which may have an impact on real exchange rate we use fixed-effects estimation. In order to explore if country specific factors, which remain unchanged over time, affect the real exchange rate, we apply "one-way fixed-effects model" (Case 1). But, for each country, different events that occur in different years may have significant impact on the real exchange rate.

To examine both country-specific and time-specific dimensions, we go one step forward by carrying out "two-way fixed-effects model" (Case 2). The advantage of the fixed-effects models is that they yield regression output even if there is correlation between the independent variables and the intercepts in the model. However, one problem with fixed-effects is that the model becomes too descriptive with individual intercepts for each of the countries under examination. So, individual heterogeneity comes at the cost of estimating too many parameters. In addition, often countries may differ from each other, but the underlying reasons for such differences may be random or stochastic. In such a case, we rely on the random-effects model.

So, in Case 3, we estimate the "one-way random-effects model" where the individual effect is considered to be a latent random variable and thus such effects are formally incorporated into the residual term of simple linear regression. In econometric literature one way random effects model is also known as "non-observable" heterogeneity. Next, in Case 4, we introduce the "two way random-effects model" where both the country specific and time specific effects are considered to be latent random variables and thus both such effects are incorporated into the residual term of simple linear regression.

As can be seen from the tables to be presented later, there is a column titled specification tests which gives the results of the F-Test for fixed-effects model and the Hausman Test for the random-effects model. F denotes the F statistic, while m denotes the statistic for the Hausman Test statistic. Note that a high value of F coupled with a low p-value implies that the null hypothesis of "no fixed-effects" is rejected, i.e. country-specific and or time-specific factors have significant impact on real exchange rate. Similarly, a high m value with an associated low p-value would indicate that the null hypothesis of "no correlation between the individual effects and the regressors" is rejected. This suggests us to use fixed-effects estimation.

Thus, as can be easily deduced, the F-test enables us to choose between OLS and the fixed-effects model, while the Hausman Test aids us in choosing between the fixed-effects and the random-effects model.

VI. RESULTS AND INTERPRETATION

Now that we have examined different panel estimation techniques that have been used to examine the impact of political risk on real exchange rate, we are in a position to report and interpret the results. In order to conduct a comprehensive study, we have not only attempted to examine the impact of political risk for all countries, we have also tried to find out if the results differ significantly when we classify countries according to income or geographical location.[11] Thus, first we report the results for 'The World' which looks at how political risk affects real exchange rate for all countries of the world that are included in the database. Then we classify countries according to income differentials and thus compare the results between OECD and non-OECD countries. Lastly, we divide the 86 countries according to the geographical locations and thus look at what role political risk plays in Africa, Asia, Europe, South America, Central and North America.[12]

Before proceeding further, however, in order to get a bird's eye view of how political risk affects real exchange rate, we report the results for 'The World' in Table III.

TABLE III
REGRESSION RESULTS FOR 'THE WORLD' (DEPENDENT VARIABLE IS LNRER)

Panel A: Regression Results With 'Socioeconomic Conditions' (A)					
Cases	Constant	lnRPROD	ln A	Specification Test	
Case 1	3.21(16.82)	0.23(4.12)	0.18(5.46)	F= 27.82	P= 0.0000
Case 2	3.34(16.94)	0.27(4.74)	0.17(5.22)	F=24.96	P= 0.0000
Case 3	3.87(28.97)	0.34(11.77)	0.15(4.61)	m= 30.77	P= 0.0000
Case 4	3.90(29.19)	0.35(12.01)	0.14(4.51)	m= 17.19	P= 0.0002
Panel B: Regression Results with 'Economic Planning' (B)					
Cases	Constant	ln RPROD	ln B	Specification Test	
Case 1	3.38(18.50)	0.24(4.43)	0.14(4.64)	F=27.51	P= 0.0000
Case 2	3.46(18.32)	0.28(5.02)	0.15(4.75)	F=24.80	P=0.0000
Case 3	3.97(31.05)	0.34(11.79)	0.12(3.97)	m=27.31	P= 0.0000
Case 4	3.97(30.67)	0.35(12.06)	0.13(4.96)	m= 14.51	P= 0.0007

(Contd. Table III)

[11] Detailed list of countries according to economic classfication is given in the Appendix 1.
[12] Regional classification has been done based on publications of the Penn World Tables.

(Contd. Table III)

Panel C: Regression Results with 'Government Stability' (C)					
Cases	Constant	lnRPROD	ln C	Specification Test	
Case 1	3.73(24.05)	0.26(4.61)	0.07(3.03)	F=27.25	P= 0.0000
Case 2	3.78(23.75)	0.31(5.44)	0.01(3.74)	F=24.69	P= 0.0000
Case 3	4.22 (43.84)	0.34(11.67)	0.06(2.69)	m=17.31	P= 0.0002
Case 4	4.18(40.52)	0.35(12.03)	0.07(3.10)	m=7.44	P= 0.0241
Panel D: Regression Results with 'External Conflict' (D)					
Cases	Constant	lnRPROD	ln D	Specification Test	
Case 1	3.89(27.99)	0.23(4.03)	0.01(2.21)	F=26.98	P= 0.0000
Case 2	4.01(28.31)	0.28(4.93)	0.02(3.15)	F= 24.45	P= 0.0000
Case 3	4.40(71.66)	0.33(10.60)	0.01(1.56)	m=8.72	P= 0.0128
Case 4	4.42(73.19)	0.34(11.37)	0.02(2.18)	m=0.02	P= 0.0156
Panel E: Regression Results with 'Corruption' (E)					
Cases	Constant	lnRPROD	ln E	Specification Test	
Case 1	3.67(24.24)	0.24(4.29)	0.07(4.11)	F=22.55	P= 0.0000
Case 2	3.80(24.08)	0.28(4.99)	0.07(3.70)	F=20.28	P= 0.0000
Case 3	4.41(67.84)	0.34(11.91)	0.01(0.74)	m=50.72	P= 0.0024
Case 4	4.42(67.66)	0.35(12.13)	0.01(0.61)	m=41.69	P=0.0078
Panel F: Regression Results with 'Military in Politics' (F)					
Cases	Constant	lnRPROD	ln F	Specification Test	
Case 1	4.05(28.84)	0.23(4.12)	-0.03(-2.60)	F=20.90	P= 0.0000
Case 2	4.16(28.87)	0.27(4.73)	-0.04(-2.72)	F=18.92	P= 0.0000
Case 3	4.51(78.56)	0.29(9.51)	-0.05(-4.65)	m=12.09	P= 0.0000
Case 4	4.52(80.27)	0.29(9.87)	-0.06(-4.80)	m=9.70	P= 0.0000
Panel G: Regression Results with 'Religion in Politics' (G)					
Cases	Constant	lnRPROD	ln G	Specification Test	
Case 1	4.03(29.06)	0.24(4.36)	-0.02(-2.47)	F=23.43	P= 0.0000
Case 2	4.12(29.06)	0.28(4.93)	-0.03(-2.42)	F=21.14	P= 0.0000
Case 3	4.50(80.94)	0.32(11.60)	-0.03(-3.89)	m=11.88	P= 0.0026
Case 4	4.511(80.08)	0.33(11.74)	-0.04(-3.88)	m=5.24	P= 0.0727
Panel H: Regression Results with 'Law and Order' (H)					
Cases	Constant	lnRPROD	ln H	Specification Test	
Case 1	4.01(28.37)	0.23(4.22)	-0.02(-1.39)	F=20.23	P= 0.0000
Case 2	4.11(28.45)	0.28(4.83)	-0.02(-1.15)	F=18.29	P= 0.0000
Case 3	4.52(3.28)	0.31(11.12)	-0.04(-3.69)	m=31.70	P= 0.0000
Case 4	4.53(82.32)	0.31(11.11)	-0.04(-3.68)	m=16.49	P= 0.0003
Panel I: Regression Results with 'Ethnic Tensions' (I)					
Cases	Constant	lnRPROD	ln I	Specification Test	
Case 1	3.85(28.08)	0.26(4.67)	0.04(4.06)	F=26.56	P= 0.0000
Case 2	3.99(28.37)	0.32(5.64)	0.05(4.60)	F=24.07	P= 0.0000
Case 3	4.38(74.73)	0.35(11.87)	0.03(2.95)	m=22.52	P= 0.0000
Case 4	4.38(73.72)	0.36(12.24)	0.03(3.31)	m=20.02	P= 0.0000

(Contd. Table III)

(Contd. Table III)

Panel J: Regression Results with 'Political Violence' (J)					
Cases	Constant	lnRPROD	ln J	Specification Test	
Case 1	3.98(28.88)	0.24(4.27)	-0.01(-0.85)	F=23.93	P=0.0000
Case 2	4.08(28.88)	0.28(4.91)	-0.01(-0.68)	F=21.58	P=0.0000
Case 3	4.46(80.15)	0.32(11.42)	-0.02(-2.03)	m=20.35	P=0.0000
Case 4	4.48(79.41)	0.33(11.57)	-0.02(-2.00)	m=6.66	P=0.0358
Panel K: Regression Results with 'Civil War Threat' (K)					
Cases	Constant	lnRPROD	ln K	Specification Test	
Case 1	3.94(28.72)	0.24(4.26)	0.01(0.91)	F=25.16	P= 0.0000
Case 2	4.06(28.89)	0.29(0.06)	0.01(1.76)	F=22.74	P=0.0000
Case 3	4.43(80.08)	0.33(11.62)	-0.00(-0.08)	m=29.38	P=0.0000
Case 4	4.44(79.45)	0.34(11.96)	0.00(0.36)	m=10.02	P=0.0067
Panel L: Regression Results with 'Party Development' (L)					
Cases	Constant	lnRPROD	ln L	Specification Test	
Case 1	3.97(27.59)	0.24(4.29)	-0.00(-0.17)	F=19.87	P=0.0000
Case 2	4.07(27.87)	0.28(5.01)	0.00(0.00)	F=17.99	P=0.0000
Case 3	4.50(82.83)	0.31(11.21)	-0.03(-2.88)	m=39.14	P=0.0000
Case 4	4.51(81.86)	0.32(11.37)	-0.03(-2.76)	m=31.99	P=0.0000
Panel M: Regression Results with 'Bureaucracy Quality' (M)					
Cases	Constant	lnRPROD	ln M	Specification Test	
Case 1	3.97(27.34)	0.24(4.23)	-0.01(-0.29)	F=20.15	P=0.0000
Case 2	4.07(27.43)	0.28(4.96)	0.00(0.02)	F=18.23	P= 0.0000
Case 3	4.54(78.50)	0.29(10.09)	-0.05(-3.62)	m=24.19	P=0.0000
Case 4	4.54(77.64)	0.30(10.31)	-0.05(-3.38)	m=24.87	P=0.0000
Panel N: Regression Results with 'ICRG Composite Risk Index' (N)					
Cases	Constant	lnRPROD	ln N	Specification Test	
Case 1	3.73(19.66)	0.24(4.35)	0.06(1.74)	F=22.27	P= 0.0000
Case 2	3.52(17.01)	0.32(5.55)	0.17(3.60)	F= 20.40	P= 0.0000
Case 3	4.46(34.75)	0.33(11.66)	-0.01(-0.24)	m= 48.46	P=0.0000
Case 4	4.37(32.19)	0.35(11.92)	0.03(0.64)	m=34.60	P=0.0000

Source: Authors' own calculation.

Note: Case 1 stands for One-Way Fixed-Effects; Case 2 stands for Two-Way Fixed-Effects; Case 3 stands for One-Way Random-Effects; and Case 4 stands for Two-Way Random-Effects. The figures in parentheses represent the absolute values for calculated t statistic.

If we look at the Table III, which reports results for the 'The World', we see that countries world wide experience real appreciation when there is increased risk from political risk indicators like socioeconomic conditions, economic planning, government stability, external conflict, corruption, and ethnic tensions. For the remaining political risk components, which include military in politics, religion in politics, law and order, political violence, party development, and bureaucracy quality, risk leads to real depreciation. So, in the case of the world, we get mixed results or no clear pattern is observable.

This mixed pattern can easily be explained by the relative strength of the movement in price level and nominal exchange rate. Political risk indicators which induce a stronger impact on the price level than on the nominal exchange rate tend to result in real appreciation. On the other hand, where political risk leads to nominal depreciation whose effect outweighs the upward pressure of prices, there is real depreciation. However, it must be noted that, the classification titled 'The World' contains numerous countries that are at opposite ends of the spectrum.

We are talking about countries like the United Kingdom, Japan, and France in the same breath as countries like Gabon, Ghana, Philippines, and Indonesia. This means that we are trying to group together countries with not only vast differences in the general income and wealth level, but we are also attempting to group together countries with vastly different characteristics when it comes to the system of governance, the political culture, the institutional framework, the business environment, the investment, and consumption culture and much more. This very divergence in characteristics of countries may lead to distorted results.[13]

Let us also take this opportunity to compare our results with that of Bahmani-Oskooee and Nasir (2002) who attempt to assess the impact of corruption on real exchange rate in the same framework of "productivity bias hypothesis". The three political risk components they use as proxies of corruption are corruption, law and order, and bureaucracy quality. We have the same three components of political risk listed in Table III. If we compare, it is observed that for law and order, and bureaucracy quality our results support that of Bahmani-Oskooee and Nasir (2002), i.e., there is real depreciation when such risk increases whereas increased corruption leads to appreciation in real terms instead of depreciation; this is contrary to the findings of Bahmani-Oskooee and Nasir (2002). For bureaucracy quality and law and order, an increase in such risks may lead to nominal depreciation, which then leads to a real depreciation, *Ceteris Paribus*. In this case, even though the national price level increases due to decrease in investment, the upward pressure of prices is most likely outweighed by the nominal depreciation, thus bringing about a real depreciation.

As already explained, trying to generalise the results for all the countries of the world, without accounting for country specific factors, may lead to mixed results, as observed in the case of 'The World'. So, we classify countries according to their income level such as OECD and non-OECD and then attempt to look at how political risk affects the deviation of the PPP based rate from the equilibrium rate. The regression result for OECD countries is reported in Table IV.

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[13] In order to prevent such a phenomenon, we divide the world into OECD and non-OECD countries which allows us to group together countries which display similar characteristics.

As can be seen from Table IV, for OECD countries which include countries like United Kingdom, France, Belgium, Japan and so on, again there are mixed results. But a clear trend can be observed this time, with seven out of the thirteen political risk components indicating a real depreciation. Only four components, i.e., socioeconomic conditions, economic planning, government stability and corruption, yield a real appreciation. In this case, the impact of the supply side shock is stronger. With increased political risk, uncertainity increases. Thus investment decreases which in turn leads to sub-optimal production. This is likely to put an upward pressure on prices and thus bring about a real appreciation, *Ceteris Paribus*.

TABLE IV

REGRESSION RESULTS FOR 'THE WORLD' (DEPENDENT VARIABLE IS LNRER)

Panel A: Regression Results With 'Socioeconomic Conditions' (A)					
Cases	Constant	lnRPROD	ln A	Specification Test	
Case 1	3.21(16.82)	0.23(4.12)	0.18(5.46)	F= 27.82	P= 0.0000
Case 2	3.34(16.94)	0.27(4.74)	0.17(5.22)	F=24.96	P= 0.0000
Case 3	3.87(28.97)	0.34(11.77)	0.15(4.61)	m= 30.77	P= 0.0000
Case 4	3.90(29.19)	0.35(12.01)	0.14(4.51)	m= 17.19	P= 0.0002
Panel B: Regression Results with 'Economic Planning' (B)					
Cases	Constant	ln RPROD	ln B	Specification Test	
Case 1	3.38(18.50)	0.24(4.43)	0.14(4.64)	F=27.51	P= 0.0000
Case 2	3.46(18.32)	0.28(5.02)	0.15(4.75)	F=24.80	P=0.0000
Case 3	3.97(31.05)	0.34(11.79)	0.12(3.97)	m=27.31	P= 0.0000
Case 4	3.97(30.67)	0.35(12.06)	0.13(4.96)	m= 14.51	P= 0.0007
Panel C: Regression Results with 'Government Stability' (C)					
Cases	Constant	lnRPROD	ln C	Specification Test	
Case 1	3.73(24.05)	0.26(4.61)	0.07(3.03)	F=27.25	P= 0.0000
Case 2	3.78(23.75)	0.31(5.44)	0.01(3.74)	F=24.69	P= 0.0000
Case 3	4.22 (43.84)	0.34(11.67)	0.06(2.69)	m=17.31	P= 0.0002
Case 4	4.18(40.52)	0.35(12.03)	0.07(3.10)	m=7.44	P= 0.0241
Panel D: Regression Results with 'External Conflict' (D)					
Cases	Constant	lnRPROD	ln D	Specification Test	
Case 1	3.89(27.99)	0.23(4.03)	0.01(2.21)	F=26.98	P= 0.0000
Case 2	4.01(28.31)	0.28(4.93)	0.02(3.15)	F= 24.45	P= 0.0000
Case 3	4.40(71.66)	0.33(10.60)	0.01(1.56)	m=8.72	P= 0.0128
Case 4	4.42(73.19)	0.34(11.37)	0.02(2.18)	m=0.02	P= 0.0156
Panel E: Regression Results with 'Corruption' (E)					
Cases	Constant	lnRPROD	ln E	Specification Test	
Case 1	3.67(24.24)	0.24(4.29)	0.07(4.11)	F=22.55	P= 0.0000
Case 2	3.80(24.08)	0.28(4.99)	0.07(3.70)	F=20.28	P= 0.0000
Case 3	4.41(67.84)	0.34(11.91)	0.01(0.74)	m=50.72	P= 0.0024
Case 4	4.42(67.66)	0.35(12.13)	0.01(0.61)	m=41.69	P=0.0078

(Contd. Table IV)

(Contd. Table IV)

Panel F: Regression Results with 'Military in Politics' (F)					
Cases	Constant	lnRPROD	ln F	Specification Test	
Case 1	4.05(28.84)	0.23(4.12)	-0.03(-2.60)	F=20.90	P= 0.0000
Case 2	4.16(28.87)	0.27(4.73)	-0.04(-2.72)	F=18.92	P= 0.0000
Case 3	4.51(78.56)	0.29(9.51)	-0.05(-4.65)	m=12.09	P= 0.0000
Case 4	4.52(80.27)	0.29(9.87)	-0.06(-4.80)	m=9.70	P= 0.0000
Panel G: Regression Results with 'Religion in Politics' (G)					
Cases	Constant	lnRPROD	ln G	Specification Test	
Case 1	4.03(29.06)	0.24(4.36)	-0.02(-2.47)	F=23.43	P= 0.0000
Case 2	4.12(29.06)	0.28(4.93)	-0.03(-2.42)	F=21.14	P= 0.0000
Case 3	4.50(80.94)	0.32(11.60)	-0.03(-3.89)	m=11.88	P= 0.0026
Case 4	4.511(80.08)	0.33(11.74)	-0.04(-3.88)	m=5.24	P= 0.0727
Panel H: Regression Results with 'Law and Order' (H)					
Cases	Constant	lnRPROD	ln H	Specification Test	
Case 1	4.01(28.37)	0.23(4.22)	-0.02(-1.39)	F=20.23	P= 0.0000
Case 2	4.11(28.45)	0.28(4.83)	-0.02(-1.15)	F=18.29	P= 0.0000
Case 3	4.52(3.28)	0.31(11.12)	-0.04(-3.69)	m=31.70	P= 0.0000
Case 4	4.53(82.32)	0.31(11.11)	-0.04(-3.68)	m=16.49	P= 0.0003
Panel I: Regression Results with 'Ethnic Tensions' (I)					
Cases	Constant	lnRPROD	ln I	Specification Test	
Case 1	3.85(28.08)	0.26(4.67)	0.04(4.06)	F=26.56	P= 0.0000
Case 2	3.99(28.37)	0.32(5.64)	0.05(4.60)	F=24.07	P= 0.0000
Case 3	4.38(74.73)	0.35(11.87)	0.03(2.95)	m=22.52	P= 0.0000
Case 4	4.38(73.72)	0.36(12.24)	0.03(3.31)	m=20.02	P= 0.0000
Panel J: Regression Results with 'Political Violence' (J)					
Cases	Constant	lnRPROD	ln J	Specification Test	
Case 1	3.98(28.88)	0.24(4.27)	-0.01(-0.85)	F=23.93	P=0.0000
Case 2	4.08(28.88)	0.28(4.91)	-0.01(-0.68)	F=21.58	P=0.0000
Case 3	4.46(80.15)	0.32(11.42)	-0.02(-2.03)	m=20.35	P=0.0000
Case 4	4.48(79.41)	0.33(11.57)	-0.02(-2.00)	m=6.66	P=0.0358
Panel K: Regression Results with 'Civil War Threat' (K)					
Cases	Constant	lnRPROD	ln K	Specification Test	
Case 1	3.94(28.72)	0.24(4.26)	0.01(0.91)	F=25.16	P= 0.0000
Case 2	4.06(28.89)	0.29(0.06)	0.01(1.76)	F=22.74	P=0.0000
Case 3	4.43(80.08)	0.33(11.62)	-0.00(-0.08)	M=29.38	P=0.0000
Case 4	4.44(79.45)	0.34(11.96)	0.00(0.36)	M=10.02	P=0.0067
Panel L: Regression Results with 'Party Development' (L)					
Cases	Constant	lnRPROD	ln L	Specification Test	
Case 1	3.97(27.59)	0.24(4.29)	-0.00(-0.17)	F=19.87	P=0.0000
Case 2	4.07(27.87)	0.28(5.01)	0.00(0.00)	F=17.99	P=0.0000
Case 3	4.50(82.83)	0.31(11.21)	-0.03(-2.88)	m=39.14	P=0.0000
Case 4	4.51(81.86)	0.32(11.37)	-0.03(-2.76)	m=31.99	P=0.0000

(Contd. Table IV)

(Contd. Table IV)

Panel M: Regression Results with 'Bureaucracy Quality' (M)					
Cases	Constant	lnRPROD	ln M	Specification Test	
Case 1	3.97(27.34)	0.24(4.23)	-0.01(-0.29)	F=20.15	P=0.0000
Case 2	4.07(27.43)	0.28(4.96)	0.00(0.02)	F=18.23	P= 0.0000
Case 3	4.54(78.50)	0.29(10.09)	-0.05(-3.62)	m=24.19	P=0.0000
Case 4	4.54(77.64)	0.30(10.31)	-0.05(-3.38)	m=24.87	P=0.0000
Panel N: Regression Results with 'ICRG Composite Risk Index' (N)					
Cases	Constant	lnRPROD	ln N	Specification Test	
Case 1	3.73(19.66)	0.24(4.35)	0.06(1.74)	F=22.27	P= 0.0000
Case 2	3.52(17.01)	0.32(5.55)	0.17(3.60)	F= 20.40	P= 0.0000
Case 3	4.46(34.75)	0.33(11.66)	-0.01(-0.24)	m= 48.46	P=0.0000
Case 4	4.37(32.19)	0.35(11.92)	0.03(0.64)	m=34.60	P=0.0000

Source: Authors' own calculation.

Note: Case 1 stands for One-Way Fixed-Effects; Case 2 stands for Two-Way Fixed-Effects; Case 3 stands for One-Way Random-Effects; and Case 4 stands for Two-Way Random-Effects. The figures in parentheses represent the absolute values for calculated t statistic.

In Table V, we attempt to examine the case for non-OECD countries like Argentina, Nigeria, Nicaragua, Bangladesh, India, Pakistan, Gabon, Ghana, Panama, and how political risk affects the real exchange rate in such countries characterised by low income level in Table V.

TABLE V

REGRESSION RESULTS FOR 'NON-OECD COUNTRIES' (DEPENDENT VARIABLE IS LNRER)

Panel A: Regression Results with 'Socioeconomic Conditions' (A)					
Cases	Constant	lnRPROD	ln A	Specification Test	
Case 1	3.68(14.25)	0.20(3.13)	0.05(0.93)	F= 17.73	P=0.0000
Case 2	3.81(14.25)	0.13(1.90)	-0.02(-0.45)	F=15.15	P=0.0000
Case 3	3.89(18.30)	0.20(0.54)	0.05(0.93)	m= 0.029	P=0.9925
Case 4	4.00(18.54)	0.18(5.17)	0.01(0.27)	m= 5.44	P=0.0658
Panel B: Regression Results with 'Economic Planning' (B)					
Cases	Constant	lnRPROD	ln B	Specification Test	
Case 1	3.83(14.58)	0.20(3.13)	0.01(0.22)	F=17.69	P=0.0000
Case 2	3.83(14.37)	0.13(1.90)	-0.03(-0.53)	F=15.15	P=0.0000
Case 3	4.01(18.48)	0.19(5.50)	0.01(0.29)	m=0.11	P=0.9463
Case 4	4.07(18.48)	0.18(5.13)	-0.004(-0.08)	m= 2.93	P=0.2313

(Contd. Table V)

(Contd. Table V)

Panel C: Regression Results with 'Government Stability' (C)					
Cases	Constant	lnRPROD	ln C	Specification Test	
Case 1	3.81(20.00)	0.20(3.17)	0.02(0.56)	F=17.72	P=0.0000
Case 2	3.76(19.05)	0.13(1.84)	-0.01(-0.34)	F=15.17	P=0.0000
Case 3	4.01(28.52)	0.20(5.52)	0.02(0.52)	m=0.08	P=0.9603
Case 4	4.03(27.13)	0.18(5.15)	0.01(0.15)	m=1.48	P=0.4759
Panel D: Regression Results with 'External Conflict' (D)					
Cases	Constant	lnRPROD	ln D	Specification Test	
Case 1	3.73(23.55)	0.17(2.62)	0.03(3.82)	F=0.65	P=0.0000
Case 2	3.69(22.10)	0.13(1.96)	0.01(1.41)	F=14.93	P=0.0000
Case 3	4.00(50.25)	0.19(5.55)	0.03(3.84)	m=0.21	P=0.9026
Case 4	4.00(49.63)	0.19(5.41)	0.03(3.31)	m= 3.78	P=0.1512
Panel E: Regression Results with 'Corruption' (E)					
Cases	Constant	lnRPROD	ln E	Specification Test	
Case 1	3.16(14.58)	14.58(2.92)	0.18(4.69)	F=18.57	P= 0.0000
Case 2	3.12(14.04)	0.13(1.88)	0.15(4.02)	F=15.71	P=0.0000
Case 3	3.52(22.78)	0.20(5.73)	0.15(4.13)	m=5.15	P= 0.0763
Case 4	3.54(22.94)	0.20(5.48)	0.14(3.87)	m= 2.45	P= 0.2939
Panel F: Regression Results with 'Military in Politics' (F)					
Cases	Constant	lnRPROD	ln F	Specification Test	
Case 1	3.86(22.61)	0.20(3.13)	0.003(0.15)	F= 17.24	P= 0.0000
Case 2	3.77(20.98)	0.13(1.91)	-0.02(-0.71)	F=14.79	P= 0.0000
Case 3	4.10(41.78)	0.19(5.43)	-0.01(-0.51)	m= 1.67	P=0.4341
Case 4	4.11(41.64)	0.18(5.04)	-0.02(-0.93)	m= 0.78	P= 0.6762
Panel G: Regression Results with 'Religion in Politics' (G)					
Cases	Constant	lnRPROD	ln G	Specification Test	
Case 1	3.90(24.25)	0.20(3.14)	-0.01(-0.51)	F= 17.41	P= 0.0000
Case 2	3.78(22.51)	0.12(1.77)	-0.04(-2.40)	F= 15.10	P= 0.0000
Case 3	4.11(46.96)	0.19(5.53)	-0.01(-0.87)	m= 0.74	P=0.6903
Case 4	4.12(46.48)	0.18(5.14)	-0.02(-1.86)	m=3.15	P= 0.2072
Panel H: Regression Results with 'Law and Order' (H)					
Cases	Constant	lnRPROD	ln H	Specification Test	
Case 1	3.60(20.32)	0.20(3.14)	0.7(3.21)	F= 18.12	P= 0.0000
Case 2	3.58(19.34)	0.15(2.16)	0.05(1.77)	F=15.27	P= 0.0000
Case 3	3.84(34.59)	0.20(5.65)	0.06(2.89)	m= 2.07	P= 0.3559
Case 4	3.85(33.73)	0.19(5.46)	0.06(2.53)	m= 0.84	P= 0.6582

(Contd. Table V)

(Contd. Table V)

Panel I: Regression Results with 'Ethnic Tensions' (I)					
Cases	Constant	lnRPROD	ln I	Specification Test	
Case 1	3.63(22.91)	0.22(3.44)	0.07(5.37)	F=18.85	P= 0.0000
Case 2	3.58(21.43)	0.18(2.62)	0.07(4.74)	F=15.92	P= 0.0000
Case 3	3.91(45.02)	0.22(6.04)	0.06(4.81)	m=6.48	P= 0.0392
Case 4	3.90(44.67)	0.21(5.84)	0.06(4.58)	m=0.05	P= 0.2093
Panel J: Regression Results with 'Political Violence' (J)					
Cases	Constant	lnRPROD	ln J	Specification Test	
Case 1	3.82(23.84)	0.20(3.09)	0.01(1.20)	F=17.38	P= 0.0000
Case 2	3.73(22.17)	0.13(1.89)	-0.01(-0.63)	F= 14.85	P= 0.0000
Case 3	4.06(47.21)	0.19(5.55)	0.01(0.76)	m=4.82	P= 0.0896
Case 4	4.06(46.91)	0.18(5.22)	-0.001(-0.11)	m=1.89	P= 0.3893
Panel K: Regression Results with 'Civil War Threat' (K)					
Cases	Constant	lnRPROD	ln K	Specification Test	
Case 1	3.81(24.38)	0.19(3.01)	0.02(2.54)	F=17.96	P= 0.0000
Case 2	3.72(22.35)	0.13(2.02)	0.01(0.86)	F=15.18	P= 0.0000
Case 3	4.02(49.42)	0.20(5.55)	0.02(2.42)	m=1.08	P= 0.5820
Case 4	4.02(48.95)	0.19(5.34)	0.02(1.85)	m=1.33	P= 0.5146
Panel L: Regression Results with 'Party Development' (L)					
Cases	Constant	lnRPROD	ln L	Specification Test	
Case 1	3.46(17.75)	0.18(2.86)	0.10(3.49)	F=18.12	P= 0.0000
Case 2	3.37(16.75)	0.12(1.82)	0.09(3.07)	F= 15.42	P= 0.0000
Case 3	3.76(30.42)	0.20(5.74)	0.09(3.35)	m= 1.04	P= 0.5948
Case 4	3.75(30.03)	0.19(5.46)	0.08(3.12)	m=1.66	P= 0.4363
Panel M: Regression Results with 'Bureaucracy Quality' (M)					
Cases	Constant	lnRPROD	ln M	Specification Test	
Case 1	3.48(17.32)	0.20(3.26)	0.11(2.98)	F=18.03	P= 0.0000
Case 2	3.43(16.58)	0.14(2.12)	0.09(2.33)	F= 15.32	P= 0.0000
Case 3	3.75(26.08)	0.21(5.83)	0.09(2.71)	m= 1.63	P= 0.4431
Case 4	3.77(26.22)	0.20(5.52)	0.08(2.43)	m=1.08	P= 0.5819
Panel N: Regression Results with 'ICRG Composite Risk Index' (N)					
Cases	Constant	lnRPROD	ln N	Specification Test	
Case 1	3.29(14.06)	0.19(2.99)	0.15(3.30)	F=18.07	P= 0.0000
Case 2	3.57(12.50)	0.14(0.03)	0.04(0.62)	F=15.11	P= 0.0000
Case 3	3.57(20.37)	0.20(5.75)	0.14(3.21)	m=0.63	P=0.7306
Case 4	3.60(19.43)	0.20(5.63)	0.13(2.75)	m=2.53	P=0.2820

Source: Authors' own calculation.

Note: Case 1 stands for One-Way Fixed-Effects; Case 2 stands for Two-Way Fixed-Effects; Case 3 stands for One-Way Random-Effects; and Case 4 stands for Two-Way Random-Effects. The figures in parentheses represent the absolute values for calculated t statistic.

For non-OECD countries, we get significant outcome for only six political risk components which include external conflict, corruption, law and order, ethnic tension, party development, and bureaucratic quality. For all these political risk indices, a rise in risk leads to a corresponding real appreciation. Thus, in the case of the non-OECD countries, *Ceteris Paribus*, increased risk must increase uncertainty for investors, thus inducing them to reduce supply, push up prices and bring about a real appreciation. A summary of all the findings of OECD and non-OECD countries is reported in Table VI.

TABLE VI
SUMMARY OF THE GENERAL DIRECTION OF THE EFFECTS OF POLITICAL RISK INDICATORS ON REAL EXCHANGE RATES

Risk Indices	Country Classifications		
	World	OECD	Non-OECD
Socioeconomic Conditions (A)	+	+	
Economic Planning (B)	+	+	
Government Stability (C)	+	+	
External Conflict (D)	+	-	+
Corruption (E)	+	+	+
Military in Politics (F)	-	-	
Religion in Politics (G)	-	-	
Law and Order (H)	-	-	+
Ethnic Tensions (I)	+		+
Political Violence (J)	-	-	
Civil War Threat (K)		-	
Party Development (L)	-	-	+
Bureaucracy Quality (M)	-	-	+
ICRG Composite Risk Index (N)		-	

Note: Only statistically significant outcomes at 5% level of significance are reported. Significantly positive sign of coefficients represent real appreciation and significantly negative sign of coefficients represent real depreciation. Either way we observe purchasing power disparity as a result of political risk.

Thus, we see that when we attempt to compare the impact of political risk in OECD and non-OECD countries a clear pattern emerges. In developed countries, political risk is more likely to result in depreciation in real terms, while in developing nations or the non-OECD countries, political risk unambiguously leads to real appreciation. For OECD countries, the relative impact of nominal

depreciation may be stronger than the impact of rising price level, thus bringing about a real depreciation. For instance, in OECD countries, there is stronger institutional framework in place along with a stronger regulatory framework which probably makes it easier for the economy to cope with increase in political risk. Thus, investors and consumer have confidence that their existing institutions will be able to absorb the risk. Hence, there is very small chance of fall in supply or sudden rise in demand; this implies that price level remains stable on average and thus the impact of nominal depreciation easily dominates any small change in price level that might result. In addition, in OECD countries, since there is greater flexibility in capital account, in the event of increased political risk, concerned individuals can easily carry out currency substitution. Thus, nominal depreciation can take place very quickly. Hence, for developed countries with a more or less stable price level, it is the movement in nominal exchange rate that is instrumental in explaining the real depreciation that results.

Here again, we take this opportunity to compare our results with that of Bahmani-Oskooee and Nasir (2002). For political risk components like bureaucracy, and law and order, there is a real depreciation and thus our results support the existing literature, at least partially, for OECD countries. However, for non-OECD countries, our results contradict that of Bahmani-Oskooee and Nasir (2002).This differential result has been revealed when we classify countries according to OECD and non-OECD and use thirteen indicators not just three indicators used by Bahmani-Oskooee and Nasir (2002).

Now we classify the 86 countries under scrutiny, by geographical location and try to see if political risk affects the real exchange rate differently when countries are classified by region. In the case of Asia, we get a significant outcome for only two components, i.e., ethnic tensions and political violence. In both cases, an increase in ethnic tensions or threat of civil war is likely to lead to a real appreciation.[14] In the case of Africa, we get significant relationship for six political risk components. Except for military in politics, all other political risk components, which include external conflict, corruption, law and order, and bureaucracy quality, yield a positive relationship, i.e., as political risk from such components increases, there is real appreciation. Here again, this real appreciation occurs namely because of the greater strength of the upward pressure of prices brought about by restriction

[14] For all other political risk components, we get a positive slope coefficient, indicative of real appreciation, but the results are insignificant. To save space additional tables are not reported but they are available from auhtors upon request.

of production by investors.[15] We get more robust results for Europe with significant outcome for majority of the risk components. However, the outcome can be said to be slightly mixed with real appreciation being reported for five risk components while real depreciation is reported for six political risk components. Again, this difference in results with some showing a positive relationship, while other displaying a negative relationship may be laid at the door of relative strength of nominal depreciation versus rise in national price level brought about by increased risk.

However, if we strive to compare the outcome for Europe with that of Bahmani-Oskooee and Nasir (2002), we find that for law and order and bureaucracy, there is real depreciation which corresponds with their outcome. In the case of South America, there are only five risk indices that yield a significant outcome. Except for corruption, all other political risk components, which include military in politics, religion in politics, and political violence, lead to a real depreciation when there is an increase in risk. Again, depreciation may occur in real terms because of the greater impact of nominal depreciation on the real exchange rate as opposed to the impact of upward pressure on prices. Our results partially support the findings of Bahmani-Oskooee and Nasir (2002), in the sense that corruption also leads to a real depreciation here.

For Central and North America, again we get very weak results. The only significant result is displayed for the political risk component titled bureaucratic quality, where an increased risk leads to real depreciation. It should be noted that this outcome matches with that of Bahmani-Oskooee and Nasir (2002). The main reason for this depreciation is probably because increased risk leads to nominal depreciation, which translates into real depreciation, *ceteris paribus*. Hence, the regional groupings display mixed outcome in terms of the pattern of purchasing power disparity resulting from political risk at disaggregated level.

However, the panel estimation results support the "productivity bias hypotheses" significantly no matter whether we are living in OECD, non-OECD, Africa, or South America. The slope coefficient of relative productivity is positive and statistically significant at 5 per cent level in majority of the cases, thus indicating that as productivity of any nation increases, there is real appreciation. This supports the Balassa-Samuelson conclusion that countries with higher

[15] Investors faced by an uncertain situation do not increase investment; they may cut down on production, thus, causing the aggregate supply curve to shift leftwards and hence pushing up the national price level.

productivity have an appreciated exchange rate, while those with lower productivity have a depreciated exchange rate.

At this stage we would like to focus on the specification test result. For all the estimated results, a high F-statistic coupled with a low p-value indicates that we can reject the null hypothesis of "no fixed-effects" at the 5 per cent significance level. This implies that individual heterogeneity is important to the determination of the real exchange rate and hence the fixed-effects model yields better results than pooled OLS technique which ignores the existence of country specific and time specific heterogeneity. On the other hand, the Hausman test gives mixed results and thus we cannot really come to a conclusion on whether the random-effects or the fixed-effects yield better results. But one thing that we are sure is that country and time heterogeneity, either in deterministic or in stochastic manner, play an important role in modelling purchasing power disparity.

VII. CONCLUSION

Numerous studies have been conducted to identify various factors that may lead to the purchasing power disparity. Balassa and Samuelson were the first to identify productivity differentials as an underlying factor leading to the deviation. Other authors identify factors like openness, share of non-tradables in GDP, money supply growth, trade balance, tourism, education, oil price, government spending in GDP, differences in the rate of inflation, nominal share of private spending in non-tradables, relative price of non-tradables, military spending, trade restrictions, speculation in the foreign exchange market, real changes in the economy, long term capital movement, government intervention, corruption, smuggling, lack of political rights and civil liberties, etc. as the underlying factors leading to the failure of the PPP.

Since only two studies so far attempt to explore the impact of political risk on real exchange rate, and such studies have been quite limited in terms of variables used, countries included in the study and time span, we decide to add to the existing literature by focusing on political risk in a more detailed manner by considering the effect of fourteen different indicators of political risk in a disaggregate manner. By adopting this approach we have the ability to examine the relative strength of each of the political risk components and whether there is any conflict in how they affect the PPP. Review of existing literature reveals that our study is the most comprehensive one, thus far in examining the impact of political risk on purchasing power disparity.

In this study we conduct panel estimation techniques for 86 countries for a 14 year time span from 1984 to 1997. We look at the impact of political risk on real

exchange rate for all the countries; we also conduct the study in a more disaggregate manner by first classifying countries according to income and regional divisions. When we conduct the study for the whole world, we get mixed results with increased risk leading to both real depreciation and real appreciation. However, on average, most of the results indicate a real appreciation. In the case of OECD countries, the general bias is towards a real depreciation, while for non-OECD countries there is real appreciation due to increased political risk.

When we focus on country classification by region, for Asian and African nations, on average, increased political risk leads to an appreciated currency. However, in the case of Europe, South America, and Central and North America, political risk tends to bring about greater real depreciation than real appreciation. However, it must be noted that for country groupings like Asia, and Central and North America, most of the results are insignificant; this might be due to the fact that countries which have vastly different characteristics are grouped under the same classification. Nevertheless, it is pertinent to point out that be it real appreciation or real depreciation, both result in the PPP to deviate from the equilibrium value; hence, the estimated results provide strong proof to our initial hunch that political risk is instrumental in bringing about a purchasing power disparity.

As already mentioned, a purchasing power disparity is indicative of some misalignment in the economy which must be addressed in order to bring the economy closer to equilibrium. Hence, steps must be taken in order to reduce the deviation of the PPP based exchange rate from the equilibrium exchange rate and thus bring the real exchange rate closer to one. The mixed results that we get for each regional classification or the markedly different results we get for OECD and non-OECD countries is proof enough that the same policy cannot be designed for all the countries. Instead, governments need to focus on designing and implementing a policy package that is tailored to the unique feature of each country. Nevertheless, it can be unanimously agreed upon that the policy attitude should be to reduce political risk and thus reduce the purchasing power disparity that is brought about by increased political risk.

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Appendix 1

CLASSIFICATION OF COUNTRIES

OECD	Non-OECD	
Australia	India	Uganda
Austria	Indonesia	Uruguay
Belgium	Iran	Venezuela
Canada	Israel	Zambia
Denmark	Jamaica	Zimbabwe
Finland	Argentina	Jordan
France	Bangladesh	Kenya
Greece	Bolivia	Malawi
Hungary	Botswana	Malaysia
Iceland	Brazil	Mali
Ireland	Burkina Faso	Morocco
Italy	Cameroon	Mozambique
Japan	Chile	Nicaragua
Luxemburg	China	Nigeria
Mexico	Columbia	Pakistan
Netherlands	Republic of Congo	Panama
New Zealand	Costa Rica	Papua New Guinea
Norway	Cuba	Paraguay
Poland	Ecuador	Philippines
Portugal	Egypt	Romania
South Korea	El Salvador	Senegal
Spain	Ethiopia	South Africa
Sweden	Gabon	Sri Lanka
Switzerland	Ghana	Syria
Turkey	Dominican Republic	Peru
United Kingdom	Guatemala	Tanzania
	Guinea	Thailand
	Haiti	Togo
	Honduras	Trinidad & Tobago
	Hong Kong	Tunisia