



## INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, ECONOMICS AND MANAGEMENT

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## ASSESSING THE IMPACT OF POPULATION EXPLOSION ON GLOBAL ENVIRONMENT

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### ABSTRACT

Historically, the world population used to grow very slowly from about 2.5 million at the beginning of urbanization and it grew to some 50 million around the time of the black plague of the middle ages. It is only with the industrial, scientific and medical revolution and during the era of colonial expansion of the western powers that the number of the population risen as unmanageable thereby climbing to the dizzying heights. During the 20<sup>th</sup> century, the world's population increased almost fourfold, from 1.6 to 6 billion. Until very recently, there were fears that in the next century, if the explosion is not checked by wise leaders of the world, the world population would explode to some 12 billion leaving little room for wilderness areas to preserve wildlife and putting extreme pressure on food production, water and non-renewable resources. The increase of population increases the demand for more food, cars and energy. To satisfy their food requirement, they will have to clear forests in order to grow crops for food. Deforestation may result in destruction of homes of the most diverse wild-animals and plants again resulting in the extinction of many species, possibly including hundreds that are yet unidentified by scientists. It also adds to the problem of global warming, because trees naturally absorb carbon dioxide from the atmosphere. When there are trees, they take in carbon dioxide from the air and turn it into oxygen and release it back into the air again. When the trees are cut down, the carbon dioxide is released back into the air and helps trap heat near the earth and raises the temperature which may contribute in global warming. Therefore, the explosion of population should be checked in such a way the resources on the earth may be used sufficiently and economically preserving some non-renewable resource even for the future use.

### KEYWORDS

Carbon dioxide, deforestation, global warming, non-renewable resources, population explosion, wild animals and plants.

### INTRODUCTION

In these days, the number of world population is enormously increasing more than ever before. Most of poor countries overpopulated in such a way there could arise striking food shortage. Overpopulation is defined as the condition of having more people than can live on the earth in comfort, happiness and health and still leave the world a fit place for future generations. A population explosion occurs when there is a significant increase in numbers of people in a location in such a way it is difficult to supply necessary resources to maintain and sustain the existence of life of all living things including human being. Some effects include a pressure upon resources as there are more people (e.g. Food has to be distributed among more people), prices of goods will increase as the demand for the products increase (higher demand means higher prices, ecological disturbance will take place when more people go for more use of resources. According to some scientists, the greatest threat to the future may come from overpopulation.

During this century, the world's population has grown rapidly, doubling from 2 to 4 billion between 1925 and 1976, and reaching 5.3 billion by 1990 (Paul, 1993, p.22). Much of this growth occurred after World War II.

Some of the possible reasons for rapid growth of population after 1945 were peace, using fertilizers for mechanization farming, urbanization, industrialization, more income generation and medical facilities. In the 1950s and '60s, authors and policy makers who worried about rapid population growth noted that improved sanitation and health care in the postwar period helped more children survive infancy and enabled adults to live longer. It was common in nineteenth-century Europe for one-quarter of all infants to die before the age of 2.5 years, and one-half of adults by age 37.5. But a century later, one-fourth had not died until age 62.5, and one-half had not died until age 72.5 (Hauser, 1971, p. 107). Consequently, the rapid growth of the world's population over the past hundred years is believed as resulted from a difference between the rate of birth and the rate of death. As it may be known by all of us, in the past, infant and childhood deaths and short life spans used to limit population growth. In today's world, thanks to improved nutrition, sanitation and medical care, more babies survive their first few years of life. The combination of a continuing high birth rate and associated low death rate is creating a rapid population increase in many countries such as Asia, Latin America and Africa. The rapid explosion of human population around the world affects all people through its impacts on the economy and environment. The current growth rate of population is now a significant burden to human well-being.

Improved sanitation and health care in the postwar period helped more children survive infancy and enabled adults to live longer and fueled the explosion of population after the World War II. For instance, while the world's population increased annually by 20 million people during the 1940s, it increased by more than 50 million every year in the 1950s, 65 million a year in the 1960s (My T., 1975). In 1966, the United Nations estimated that world population would reach 7.5 billion by the end of the century (Philip M., 1971). These projections persuaded government officials around the world that rapid population growth was a serious problem and that steps should be taken to slow it down. In 1969, President Nixon announced that the U.S. government would "give population control and family planning a high priority," and called on other governments to take "prompt action" to slow population growth (Bonnie). And in 1974, the United Nations convened its first world population conference in Bucharest, Romania. At the time, government officials expected that population growth would lead to a series of problems: food shortages and hunger, conflict and war, environmental destruction, and the depletion of natural resources. Events in the mid-1970s initially seemed to confirm their worst fears.

Widespread public recognition of population growth as a global social problem emerged slowly in the 1950s and '60s. It was assisted by the publication of two books with the same title: *The Population Bomb*. In 1954, T. O. Greissimer published a pamphlet with this title that was widely distributed by the Hugh Moore Fund, a private foundation started by the Dixie Cup Corporation. In it, Greissimer argued that "the population bomb threatens to create an explosion as disruptive and dangerous as an explosion of the atom bomb, and with as much influence on prospects for progress or disaster, war or peace (Ibid, p.40). Then in 1968, Paul Ehrlich published a book with the same title that borrowed some of Greissimer's ideas and extended them to explore the environmental consequences of population growth. These two books, and the work of private philanthropic groups like the Hugh Moore Fund, and the Population Council, a group organized in 1952 by John D. Rockefeller III, helped bring rapid population growth to the attention of policy makers and the public (Ibid, p.37).

The availability of sufficient food and sanitation facilities lowered death rates in countries around the world. As a result, people continued to have children at pre-1950 rates. Because people adjusted their behavior slowly to changed circumstances, healthier babies and longer lives contributed to world population grew rapidly. Policy makers concerned about population growth worried that it would result in a series of social, political, and environmental problems. First, they thought that the growing population had or would soon outstrip the amount of food available to eat, resulting in a Malthusian crisis: *too many people, too little food*. "The battle to feed all of humanity is over," Ehrlich argued. "Sometime around 1958, the stork passed the plow." He expected this to lead to widespread hunger and starvation. "In the 1970s," Ehrlich predicted in 1968, "the world will undergo famines hundreds of millions of people are going to starve to death. . . ." Ehrlich and others who supported this view were often called "Malthusians" because this argument relies on Robert Malthus's 1798 *Essay on Population*, which proposed that "the power of population is indefinitely greater than the power in the earth to produce subsistence [food] for man."

The growing gap between population and food supply would lead first to starvation, population control advocates expected. And the onset of starvation would lead to a second problem: war. As one population control group explained in a 1967 newspaper ad, "There can be no doubt that unless population is brought

under control at an early date, the resulting human misery and social tensions will inevitably lead to chaos and strife to revolutions and wars, the dimensions of which it would be hard to predict." During the 1960s, many U.S. government officials viewed social unrest, communist insurgency, and guerrilla warfare in poor countries as the likely political product of "overpopulation."

Third, the new Malthusians argued that a growing population would increase levels of pollution and waste, which would result in environmental degradation. As Ehrlich wrote, "The causal chain of [environmental] deterioration is easily followed to its source. Too many cars, too many factories, too much detergent, too much pesticide . . . inadequate sewage treatment plants, too little water, too much carbon dioxide all can be easily traced to *too many people*." But in 1990 he still maintained that "Global warming, acid rain, depletion of the ozone layer, and exhaustion of soils and ground water are all related to population size."

And fourth, the new Malthusians believed that the growing population would consume finite natural resources such as minerals and oil at an accelerated rate, resulting in raw material shortages and rising prices for the goods produced by industrial societies. As the Club of Earth argued in 1988, "Overpopulation and rapid population growth are intimately connected with . . . [the] rapid depletion of non-renewable resources. . . ." Because they expected rapid population growth to lead to starvation, war, environmental degradation, and the depletion of natural resources, private groups and government officials began advocating population control in the late 1960s and early 1970s. And they urged governments to adopt programs that would slow population growth. These included the creation of educational family planning programs, the distribution of contraceptives, and sometimes the provision of clinics that performed abortions and sterilizations, usually on a voluntary but sometimes on an involuntary basis. Population control advocates in government and the private sector believed that rapid population growth was such an urgent problem that drastic steps needed to be taken quickly. Some even advanced the concept of triage as a way to address the problem.

## STATEMENT OF THE PROBLEM

Now-a-days, the number of world population is increasing at an alarming and astonishing rate. According to some scientists, the greatest threat to the future may come from overpopulation. Overpopulation and rapid population growth are intimately connected with the rapid depletion of non-renewable resources. Some effects include a pressure upon resources as there are more people (e.g. Food has to be distributed among more people), prices of goods will increase as the demand for the products increase (higher demand means higher prices, ecological disturbance will take place when more people go for more use of resources. To mitigate food shortage, the simplest solution is to increase the area of cultivation land and plant it with the food crops. To this effect, they cleared forests and planted food crops. When forests are cut down, they released carbon dioxide gases into the air which highly contributed for global warming. In 1974, scientists discovered that man-made gases called chlorofluorocarbons (CFCs) that were used in aerosol sprays, solvents, and Styrofoam destroyed the ozone layer, which protects people and plants from the sun's damaging rays. They also observed that the increase of populations contributed to most of the atmospheric pollution resulting from CFC use. The same is true of global warming. During the mid-1980s, scientists discovered that the burning of fossil fuels and forests had increased the level of carbon dioxide in the atmosphere. They predicted that high carbon dioxide levels would trap heat in the atmosphere and make the planet warmer. Rapidly rising temperatures could create serious problems for people in different settings, scientists argue. Rising temperatures could melt polar ice and raise sea levels, inundating islands and low-lying coastal plains where millions live. A one-meter rise would flood deltas on the Nile, Po, Ganges, Mekong, and Mississippi Rivers, displacing millions of people and swamping the croplands now used to feed them. Higher sea levels could drown coral reefs, destroying the fish and ruining the livelihood of people who depend on reefs in the Caribbean and the Pacific. And warmer water could increase the strength of hurricanes and typhoons, causing greater damage for people living along their path in the Western Atlantic and Western Pacific. The insurance industry is particularly concerned about this prospect because windstorms caused \$46 billion in losses between 1987 and 1993.

Higher temperatures could also disrupt agriculture. While farmers in northern latitudes North America and northern Europe and Asia could benefit from higher temperatures, longer growing seasons, and higher levels of carbon dioxide (which plants use to grow), even modest increases could devastate farmers in tropical zones in Asia, Africa, and Latin America. Rice yields decline significantly if daytime temperatures exceed 95 degrees, and in many Asian countries, temperatures are already near this limit. One group of scientists predicted that cereal prices could increase between 25 and 150 percent by the year 2060, a development that would cause hunger and starvation for between 60 million and 350 million poor people, most of them in the tropics.

Because of increased number of people, they are highly involving in deforestation. They are using more cars in number. They are using more energy for cooking and heating. There are, for example, sound environmental and social reasons to reduce energy consumption and car use and slow deforestation. Because these activities also release vast quantities of carbon dioxide, efforts to curb the consumption of fossil fuels and wood might also reduce global warming. (The carbon dioxide released by these activities accounts for about half of all greenhouse gases.) The same is true for other activities that produce other greenhouse gases.

People are attempting to satisfy their food demand from different sources. To this effect they increased the number of cows to get meat, milk and milk byproducts. However, the increased number of cows contributed for deforestation and resulted in hunger on the part of human being because of global climate change effect. A reduction of world cow herds would reduce hunger and deforestation, and also curb emissions of methane, which makes up about 18 percent of all greenhouse gases. The ban on CFCs, scheduled to take effect at the turn of the century, will slow destruction of the ozone layer, about which there is no serious scientific dispute, and reduce its contribution (about 14 percent) to global climate change. And if nitrogen fertilizer use was curbed, the problems associated with groundwater pollution could be addressed and nitrous oxide levels in the atmosphere (about 6 percent of the total) could be reduced. However, in the case of nitrous oxide, fertilizer reductions could adversely affect global food supplies and contribute to hunger, which suggests that efforts to curb fertilizer use should be approached with great caution.

Because of explosion of population, the people around the world are using more energy from different sources like fire, petroleum or fuel. For example, to get energy from fire they have to cut down forests for firewood. These would result in releasing more carbon dioxide into the air which may be thought as a major source for global warming. When they want to get energy from fuel, they have to buy the petroleum from the countries endowed with it. This, in turn, hurts the economy of the countries buying fuel from fuel rich countries.

These and others related problems pushed the researcher to investigate the case based on Descriptive Research with the help of secondary data from published texts on globalization in order to arrive at possible solutions as the findings of the study.

## OBJECTIVE OF THE STUDY

The general objective of this study is to communicate the effects of problems of population explosion to the people of the world to generate awareness about the problems associated with the alarming increase of population and push everybody to contribute and heed towards slowing down the number of population all over the world at the earliest.

### SPECIFIC OBJECTIVES

- To show the impact of population explosion to the people of world
- To make the world leaders heed and take corrective actions towards the explosion of population.
- To generate awareness of the danger of population explosion to householders and make them limit the number of their children thoroughly understanding the impact of the problem and the devastation it causes if not mitigated.

### RESEARCH QUESTIONS

- Is population explosion mercy or curse to our planet at present? How?
- If it is curse, then how it can be checked?
- Who is more responsible for global warming, the advanced or underdeveloped countries? Why?

## SIGNIFICANCE OF THE STUDY

The number of world population is increasing at an alarming rate. If it continues at the same rate, it is becoming a real danger, worry and curse to the earth. As it is obvious to many of us, we are increasing the number of our children sometimes not knowing the consequences of it. Other times, we are increasing the number of them simply being shy of cultural products like children are wealth gifted from God and people should not involve themselves in checking of such blessings and they should bear as many children as possible. The importance of this study is to generate the awareness of the danger of population explosion and make every concerned body understand the problem and make the decision on the number of his/her children in such a way that the planet (earth) could provide them all necessary facilities of life. Because the increase of population if not supported by economy it is curse rather than mercy. It becomes mercy only when it is managed appropriately and commensurately with the available resources on the earth.

## METHODOLOGY OF THE STUDY

The present study is based on Descriptive Research with the investigation of secondary data. The secondary data are collected from the published sources on globalization.

## SCOPE OF THE STUDY

The study is entirely focused on consequences of the explosion of population based on Descriptive research with the assistance of secondary data from the texts written on globalization. The study is about the impact of explosion of population on environment all over the world.

## FINDINGS OF THE STUDY

1. Overpopulation is resulting in a striking food shortage because more farm land is being used for urbanization and industrialization in larger quantity in order to accommodate the exploding large number of population. Thus, the greatest threat to the future may come from overpopulation (*too many people, too little food*).
2. Much of the growth of population occurred after World War II due to peace, using fertilizers for mechanization farming, urbanization, industrialization, more income generation and medical facilities (improved sanitation and health care).
3. To maintain the life of people on the earth, the scientists and other concerned bodies should focus on innovations and increase productivity in many folds from the available smaller farm land employing advanced technologies as to feed more people.
4. A growing population would increase the levels of pollution and waste, which would result in environmental degradation. Too many cars, too many factories, too much detergent, too much pesticide, inadequate sewage treatment plants, too little water, too much carbon dioxide all can be easily traced to *too many people*.
5. The growing population would consume finite natural resources such as minerals and oil at an accelerated rate, resulting in raw material shortages and rising prices for the goods produced by industrial societies. Moreover, unbalanced utilization of resources may ultimately lead to the depletion of natural resources.
6. The number of population, thus, should be checked as increasing of population is believed as to leading to the destruction of population thereby creating acute shortage of resources necessary for existence of life.
7. To minimize global warming, every person in the world has to plant one seedling every year personally initiating the Motto "one seedling for one person". Then, the plants absorb the carbon dioxide thereby releasing oxygen and global warming can be checked.
8. Rich countries are more disturbing the environment though industrialization and deforestation. They have to fund the projects of poor countries in order to plant trees to maintain the environmental balance.

## CONCLUSION

Now-a-days, the number of world population is significantly increasing. The increase of population has been followed by food shortage. To produce more food crops, they involved themselves in deforestation and planting more food crops. To that effect, they cleared or cut-down more trees from the forest. The cut-down of trees contributed to releasing more carbon-dioxide into the air. That, in turn, contributed to global warming. To curb these all problems resulting from the expansion of population, it should be checked as more increase may mean danger to population itself. Finally, for what is happening all over the world, the advanced countries should take more responsibility as they are more disturbing environment in which human being can live through industrialization and technological advancement.

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**INFLATION AND EXCHANGE RATE, AND ITS IMPACT ON TRADE IN PAKISTAN (1980-2010)****DR. ABDUL QAYYUM KHAN****ASST. PROFESSOR****COMSATS INSTITUTE OF INFORMATION TECHNOLOGY****WAH CANTT CAMPUS****PAKISTAN****ABSTRACT**

*The paper explicates expected inflation in Pakistan, UK and USA and inaugurate inflationary/deflationary gap between Pakistan and USA and between Pakistan and UK. Further, this paper appraises predictions for appreciation/depreciation of currency on the basis of inflationary/deflationary gap, and evaluates expected gains/losses from export receipts and import payments on the basis of depreciation/appreciation of currency. For analysis, ARIMA model with ordinary least square method is used. The study reveals that positive gap in inflation between two countries is responsible for domestic currency depreciation, while negative inflationary gap insinuates appreciation of domestic currency. This study further reveals that comparative high inflation increases our export receipts and import payment, whereas comparative low inflation reduces our export receipts and import payments. The findings of the study suggest that parallel and harmonized fiscal and monetary policies are required to check inflation as well as foreign reserve outflow. Monetary policy needs more attention as inflationary/deflationary situation is mostly dealt with interest rate. Fiscal policy is then more involved in planning for extra receipts from export due to devaluation and extra payments from import due to appreciation of currency.*

**KEYWORDS**

Forecasting of inflation, exchange rate, ARIMA model and exports/imports, gain/loss.

**INTRODUCTION**

In the present unstable economic condition it is very hard for the Government of Pakistan to dole out its debt from revenues, and is borrowing to finance its debt servicing obligations. The large debt burden problem facing Pakistan's economy has pushed policy makers to pay special attention to this particular issue, with the objective of trying to introduce proper policy to reduce the debt burden without creating inflationary situation for the economy. Inflation is considered as the main problem for all developing countries, as these countries are more prone to external shocks due to limited financing opportunities, inequitable corrective policies, baggy political situation, and bounded donor' conditionality. Most of the developing countries meet their excess expenditure than their revenue, and confine in a budget deficit. Pakistan is one of the developing countries facing the same situation.

Exchange rate policy has considerable implications for developing countries. Pakistan followed fixed exchange rate policy, from early 1950 to 1982. In the entire period, the currency was devalued against US dollar once in May 1972. There is extensive literatures on devaluation and its related features. Many developing countries followed this practice in 1980s, after the success of floating exchange rate policy. Pakistan implemented the managed floating exchange rate policy in 1982.

Exchange rate estimates the price the country currency's expressed in terms of one unit of another country's currency. After World War II a system of adjustable peg known as Britton Woods's system was commenced. Under this system United State dollar was pegged to gold at fixed parity of US\$ 35 per ounce of gold. The authorities of United States (US) prepared to buy and sell unlimited amounts of gold at the official rate. All of the other countries currencies were pegged against the dollar. Chronic inflation and escalating depreciation of currency have become major concerns both for developed and developing countries.

**LITERATURE REVIEW**

An extensive theoretical and empirical literature has been developed to examine the relationship between the inflation and exchange rates. Friedman (1968) argued that the monetary authorities could control the inflation rates, especially in the long run, with control of the money supply. Sargent and Wallace (1981) have supported the proposition that Central Bank will be obliged to monetise the deficit either at the same time or in later periods. Such monetisation results in an increase in the money supply and the rate of inflation in the long run. Miller (1983) argues that government budget deficits are necessarily inflationary irrespective of the situation whether the deficits are monetised or not. Barro (1978, 1979) has hypothesized that deficits are as a result of inflation, rather than inflation being a result of deficits. Hossain (1986) argues that changes in the prices of traded goods in international market, real income, real money supply, the expected rate of inflation, and changes in terms of trade between traded and non-traded goods are the major determinants of inflation in Pakistan.

Chaudhary and Anjum (1996) argue that sustainability of fiscal deficit have an important bearing on macroeconomic policies. Inflation and increasing burden of debt servicing are linked with budget deficit. Bundt and Solocha (1988) focus on the relationship between budget deficits and exchange rate. They argue that in an open economy, portfolio crowding-out can arise through the exchange rate affecting the current account. Mundell (1963) and Fleming (1962), argue that in a small open economy model, where prices are fixed and exchange rate are expected to be static, fiscal policy with expansionary debt-financing is completely crowded out under a flexible exchange rate and perfect capital mobility. Bisignano and Hoover (1982) show how increases in the deficit may appreciate or depreciate the exchange rate depending on the relative importance of wealth effects and relative asset substitution effects. They conclude that the deficit, combined with tight monetary policy, will cause the currency to appreciate. Burney and Akhtar (1992) argue that, budget deficits have significant positive impact on the real exchange rate directly as well as indirectly through the price level.

The latest studies in Pakistan present consistent evidence that domestic price level retorts significantly but steadily the exchange rate devaluation (Ahmad and Ram, 1991; Bilquees, 1988; Hassan and Khan, 1994; Khan and Qasim, 1996). It has also been observed that domestic inflation is the main energetic force behind the principal objective of currency adjustment to conserve a competitive Real Exchange Rate (Burney and Akhtar, 1992; and Mahmood et al. 1996). There are numerous ways through which the domestic price level retorts to the changes in prices of traded goods due to currency adjustments (Sodersten and Reed, 1994). The literature has also exposed that domestic inflation is the strong driving force behind the practices of currency devaluation (e.g. Sodersten and Reed, 1994a).

The recent experience of currency devaluation and price inflation in Pakistan gives interesting information to deal with the above issue. An ordinary insight is that the practice of repetitive currency devaluation is the main cause of inflation in Pakistan. This would indicate that the general price level in Pakistan bends quickly to the traded goods prices. On the other hand, the policy makers believed that currency devaluation is essential to maintain competitive strength in the world market as inflation rate in Pakistan is higher than the world inflation rate.

Keeping in view this background, this research aims to study the relationship between the difference in increase/decrease in inflation rates between two countries and nominal exchange rate. This framework allows us to trace the expected difference in inflation and its impact on depreciation/appreciation of currency. The research will enable us to make financial planning for extra export receipts and payments for import in case of depreciation, and less export receipts and payments for import in case of appreciation.

The main objectives of the present study are: (i) to calculate expected inflation for Pakistan, UK and USA (ii) to find inflationary/deflationary gap between Pakistan and USA, and between Pakistan and UK (iii) to make prediction for appreciation/depreciation of currency on the basis of inflationary/deflationary gap

(iv) to estimate expected gain/loss from export receipts and import payments on the basis of depreciation/appreciation of currency (v) to suggest policy measures for inflation control and their ultimate impact on export (import) gain (loss) due to domestic currency depreciation (appreciation).

## DATA AND METHODOLOGY

This study will use annual data for the period 1980-2010 for Pakistan, UK and USA respectively. Different sources for the data have to be reached (Pakistan government, private sector, and international organizations) to find out the nature of the available data. A non-seasonal ARIMA model denoted by ARIMA (p, d, q), (Box and Jenkins, 1976) will be used with ordinary least square method for estimation of results.

$$Y_t = \eta + \alpha_1 Y_{t-1} + \alpha_2 Y_{t-2} + \dots + \alpha_p Y_{t-p} + \beta_0 \mu_t + \beta_1 \mu_{t-1} + \beta_2 \mu_{t-2} + \dots + \beta_q \mu_{t-q} + \mu_t \dots \quad (1)$$

Where  $\eta$  is constant,  $\mu_t$  is residual term. p is the order of auto regressive process, d is the order of homogeneity i.e. the numbers of difference to make the series stationary and q is the order of moving average process.

The data utilized for the estimation will be yearly data from 1980-2010. However, it will be necessary, before starting to perform any empirical estimation of the model, to analyze the time series data, which will be used in this study. The analysis of data depends on finding out whether the series are stationary or non-stationary. However, firstly, to test if a time series is non-stationary this study will use the Augmented Dickey-Fuller test, which examines the hypothesis that the variable in question has a unit root. If the series is found to have a unit root differencing the data is appropriate, to avoid the problem of spurious regression arising from non-stationarity in the time series. Statistical software packages like MINITAB and E.View have been used to estimate the coefficients of the model.

## RESULTS AND DISCUSSIONS

The results of this study are given in Tables 1, 2, 3, 4, 5, 6, 7 and 8 in details. The results in Table 1 and 2 of the unit root test indicate that inflation for three countries (Pakistan, UK and USA) are non-stationary at level whether trend is included or not. The results illustrate that first differenced series ("d") showed appropriate stationary behavior than the second differenced series ("d"). The selected value of 'd' was '1'. The selected value of parameters 'p' and 'q' were found '2' and '2' respectively. As such, ARIMA (2, 1, 2) model was selected and estimated. The model results for the three countries are given in tables 3, 4 and 5. The results indicate that parameters of ARIMA model used for Pakistan are statistically significance at 1% level of significance for AR(2) and MA(2), parameters for USA are statistically significance at 1% level of significance for MA(2), while parameters for UK are statistically significance at 10% level of significance for AR(2).

Forecasts for inflation (with 95% confidence intervals) were generated by using ARIMA (2, 1, 2) model for the period 2011 to 2030. Forecasts (with their upper & lower limits at 95% confidence intervals) are presented in Table 4. Data presented in Table 4 show that inflation would increase for all the three countries but intensity of increase in Pakistan is greater than that of USA and UK. This means that the difference in increase between Pakistan and USA and between Pakistan and UK is positive for most of the predicted years. The positive difference in increase in inflation between Pakistan and any other country lead to depreciation of Pakistani currency by the difference margin. Similarly, the negative difference of increase in inflation between Pakistan and any other country lead to appreciation of Pakistani currency by the difference margin.

Tables 7 and 8 depict Pak Rupees value against US dollar and UK pound and expected gain/loss from export receipts and import payments due depreciation and appreciation of rupees. The results indicate that gain from export receipts and loss from import payment in US dollar and UK pound increase for 2011 and 2012 due to depreciation of local currency against US dollar and UK pound. In the next two years i.e. in 2013 and 2014 gain from export receipts and loss from import payments in US dollar and UK pound decreases due to appreciation of rupees against dollar and pound. In 2015 and 2016 the gain from export receipts and loss from import payments in US dollar and UK pound increase, while, in 2017 the gain from export receipts and loss from import payments in US dollar and UK pound decrease (see Table 8). The results of Table 8 further indicate that gain from export receipts and loss from import payments in US dollar and UK pound increase in 2018 and 2019, decrease in 2020 and 2021, increase in 2022 and 2023, decrease in 2024, increase in 2025 and 2026, decrease in 2027 and 2028, and increase in 2029 and 2030 due to depreciation/appreciation of Pak rupees against UK pound.

TABLE 1: ADF TEST FOR STATIONARITY (INCLUDES INTERCEPT BUT NOT A TREND)

Variables	I(0)		I(1)		I(2)		Result
	Test statistics <sup>1</sup>	Critical value	Test statistics	Critical value	Test statistics	Critical value	
INF Pakistan	0.3205[0]	-3.6422	-6.2061[0]	-3.6496			I(1)
INF UK	-1.7403[1]	-3.6496	-5.5255[1]	-3.6496			I(1)
INF USA	-2.8745[0]	-3.6422	-5.7169[0]	-3.6496			I(1)

<sup>1</sup> Figures in square brackets besides each statistics represent optimum lags, selected using the minimum AIC value. INF stands for inflation.

TABLE 2: ADF TEST FOR STATIONARITY (INCLUDES INTERCEPT AND A TREND)

Variables	I(0)		I(1)		I(2)		Result
	Test statistics <sup>1</sup>	Critical value	Test statistics	Critical value	Test statistics	Critical value	
INF Pakistan	-1.9760[0]	-4.2605	-6.3844[0]	-4.2712			I(1)
INF UK	-1.9677[0]	-4.2605	-4.8225[1]	-4.2826			I(1)
INF USA	-2.8357[0]	-4.2605	-5.5901[0]	-4.2712			I(1)

<sup>1</sup> Figures in square brackets besides each statistics represent optimum lags, selected using the minimum AIC value. INF stands for inflation.

TABLE 3: ESTIMATES OF THE PARAMETERS (PAKISTAN)

Parameter	Value	Coef	SE Coef	t-value
AR (p)	1	-0.4056	0.2556	-1.59
	2	-1.0081	0.2442	-4.13
MA (q)	1	-0.0287	0.3706	-0.08
	2	-0.8566	0.3714	-2.31
Constant		0.910	1.100	0.83

TABLE 4: ESTIMATES OF THE PARAMETERS (USA)

Parameter	Value	Coef	SE Coef	t-value
AR (p)	1	-0.4827	0.3097	-1.56
	2	0.0401	0.2922	0.14
MA (q)	1	0.0423	0.2683	0.16
	2	0.8945	0.2661	3.36
Constant		-0.15231	0.03159	-4.82

TABLE 5: ESTIMATES OF THE PARAMETERS (UK)

Parameter	Value	Coef	StDev	t-value
AR (p)	1	0.1988	0.4100	0.48
	2	-0.6578	0.4100	-1.60
MA (q)	1	0.1723	0.5114	0.34
	2	-0.3604	0.5187	-0.69
Constant		-0.2139	0.2147	-1.00

TABLE 6: FORECAST FOR INFLATION IN PAKISTAN, USA AND UK

Year	Pakistan			USA			UK		
	Forecast Value	Lower Limit (95%)	Upper Limit (95%)	Forecast Value	Lower Limit (95%)	Upper Limit (95%)	Forecast Value	Lower Limit (95%)	Upper Limit (95%)
2011	15.5	8.9	22.1	2.8	0.6	5.0	3.5	1.59	5.4
2012	20.8	13.1	28.4	1.0	-1.3	3.5	3.2	0.42	5.9
2013	15.5	6.7	24.3	1.8	-0.6	4.2	2.7	-0.33	5.9
2014	13.2	2.2	24.2	1.2	-1.2	3.7	2.7	-0.66	6.07
2015	20.4	8.1	32.7	1.4	-1.0	3.8	2.7	-0.99	6.4
2016	20.7	7.9	33.5	1.1	-1.3	3.6	2.5	-1.54	6.7
2017	14.2	0.3	28.1	1.1	-1.3	3.6	2.3	-2.11	6.7
2018	17.5	2.0	32.9	0.9	-1.5	3.4	2.1	-2.51	6.8
2019	23.6	7.6	39.6	0.8	-1.5	3.3	2.0	-2.82	7.0
2020	18.8	2.3	35.2	0.7	-1.7	3.2	1.9	-3.21	7.1
2021	15.5	-2.2	33.2	0.6	-1.8	3.1	1.7	-3.65	7.2
2022	22.6	3.9	41.3	0.5	-1.9	3.0	1.6	-4.04	7.2
2023	23.98	5.0	42.9	0.4	-2.0	2.9	1.4	-4.37	7.3
2024	17.1	-2.5	36.8	0.3	-2.1	2.8	1.3	-4.71	7.4
2025	19.4	-1.3	40.2	0.2	-2.2	2.7	1.1	-5.07	7.4
2026	26.3	5.0	47.6	0.1	-2.3	2.6	1.03	-5.43	7.5
2027	22.1	0.5	43.7	0.03	-2.4	2.5	0.89	-5.76	7.5
2028	17.8	-4.7	40.3	-0.06	-2.5	2.4	0.75	-6.08	7.5
2029	24.7	1.3	48.0	-0.17	-2.6	2.3	0.61	-6.41	7.6
2030	27.1	3.5	50.7	-0.27	-2.7	2.2	0.45	-6.74	7.6

TABLE 7: FORECAST FOR USA AND UK CURRENCIES RATES AGAINST PAK RUPEES

Year	USD vs PKR	UK vs PKR
2011	87.34	141.22
2012	93.45	149.20
2013	86.91	141.87
2014	85.44	138.74
2015	91.46	148.68
2016	91.96	149.34
2017	86.02	140.07
2018	88.94	144.85
2019	94.47	153.83
2020	90.00	146.55
2021	87.11	141.99
2022	93.43	152.38
2023	94.78	154.61
2024	88.41	144.24
2025	90.55	147.82
2026	96.86	158.20
2027	92.88	151.76
2028	88.99	145.45
2029	95.22	155.70
2030	97.65	159.73



TABLE 8: EXPECTED GAIN/LOSS FROM EXPORT RECEIPTS AND IMPORT PAYMENTS

Year	Receipts from Exports		Payments for Imports	
	Against USD	Against UKP	Against USD	Against UKP
2011	Increase ↑	Increase ↑	Increase ↑	Increase ↑
2012	Increase ↑	Increase ↑	Increase ↑	Increase ↑
2013	Decrease ↓	Decrease ↓	Decrease ↓	Decrease ↓
2014	Decrease ↓	Decrease ↓	Decrease ↓	Decrease ↓
2015	Increase ↑	Increase ↑	Increase ↑	Increase ↑
2016	Increase ↑	Increase ↑	Increase ↑	Increase ↑
2017	Decrease ↓	Decrease ↓	Decrease ↓	Decrease ↓
2018	Increase ↑	Increase ↑	Increase ↑	Increase ↑
2019	Increase ↑	Increase ↑	Increase ↑	Increase ↑
2020	Decrease ↓	Decrease ↓	Decrease ↓	Decrease ↓
2021	Decrease ↓	Decrease ↓	Decrease ↓	Decrease ↓
2022	Increase ↑	Increase ↑	Increase ↑	Increase ↑
2023	Increase ↑	Increase ↑	Increase ↑	Increase ↑
2024	Decrease ↓	Decrease ↓	Decrease ↓	Decrease ↓
2025	Increase ↑	Increase ↑	Increase ↑	Increase ↑
2026	Increase ↑	Increase ↑	Increase ↑	Increase ↑
2027	Decrease ↓	Decrease ↓	Decrease ↓	Decrease ↓
2028	Decrease ↓	Decrease ↓	Decrease ↓	Decrease ↓
2029	Increase ↑	Increase ↑	Increase ↑	Increase ↑
2030	Increase ↑	Increase ↑	Increase ↑	Increase ↑

## CONCLUSION

Results of this study are highly meaningful in general and particularly for policy makers. Outcomes of the study reveal that the positive difference in inflation growth of host country with respect to foreign country almost leads to the same level of depreciation, while negative difference in inflation growth of host country with respect to foreign country leads to same level of appreciation of currency. Depreciation of currency increases both receipts and payments in foreign currency, while appreciation reduces both receipts and payments in foreign currency. The results of the forecasting indicate that government planning authority should arrange extra payments for import bills and have to plan for extra receipts from export bills due to depreciation of currency. Similarly, planning authority should plan for retrieving fund obtained from less payments of import bills and have to prepare for less receipts from export bills due to appreciation of currency. The conclusion of this study suggests that Pakistan needs to harmonize the fiscal policy with exchange rate policy for sustainable trade deficit planning. This will help to reduce country reliance on foreign borrowings both for budget deficit and trade deficit financing as well.

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