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Determinants of Energy Inflation in Pakistan: An Empirical Analysis

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1. INTRODUCTION

Energy inflation has remained a significant topic in macroeconomic policy for the past few decades. This is due to several reasons pertaining to both demand and supply sides. In addition, the history of energy prices has also been characterised by extreme volatilities, Hamilton (2008). This makes forecasting and modelling of energy prices difficult, nevertheless it is important to model and forecast energy prices in all economies. In this paper we have tried to identify the determinants of energy inflation in Pakistan.

Energy products are a critical component in any economy, serving as a core input, particularly in manufacturing industries. Moreover, the demand for energy and fuel comes from households fuelling cars and kitchens for which other alternatives are not easily available. This renders the demand inelastic compared to any other good [Edelstein and Kilian (2009)], making economies vulnerable to supply and price shocks. The energy price inflation therefore through cost push inflation and demand-pull inflation has a major impact on core inflation itself, thereby playing a significant role in macroeconomic health of a country. As predicted by Ben Bernanke for the US in 2006, "*in the long run energy prices can reduce the productive capacity of US economy if high energy costs make businesses less willing to invest new capital*". The nature of the energy market itself creates a major gap between the oil consumers and oil producers. Whilst demand is inelastic everywhere, supply is limited and is difficult to increase, and confined to certain regions on Earth. This is true particularly for two of the most common energy types: oil and gasoline. The supply of oil is controlled by a few countries, and supply shocks therefore lead to an immediate surge in prices. The oil shock of 1970s created by OPEC

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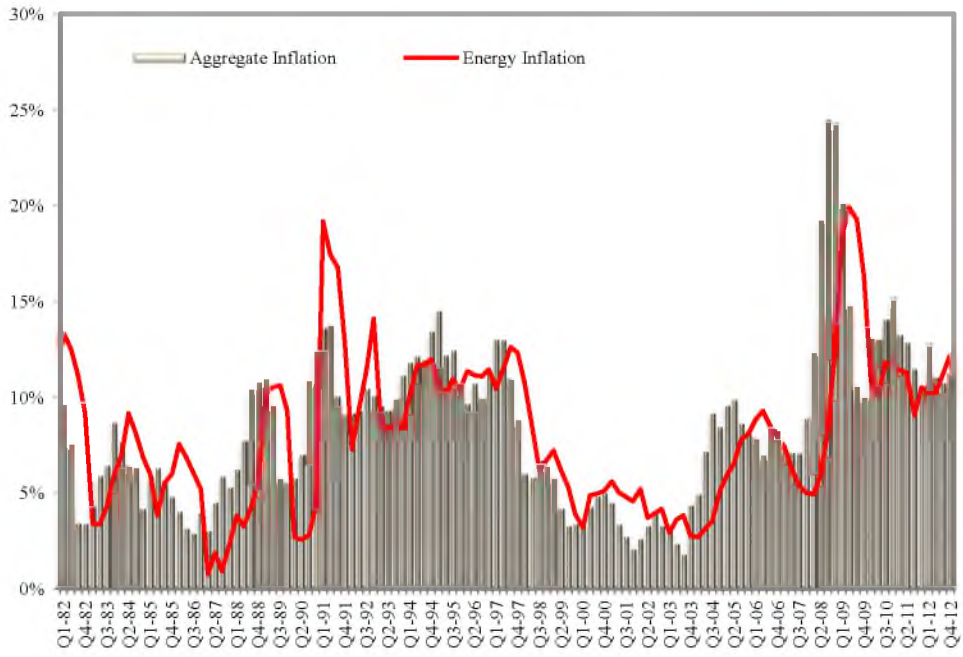
caused a major setback for all oil importing countries of the world, resulting in a global recession. Energy prices shot up, creating huge demand supply gaps. This is the case particularly for energy importing countries, which were helpless in the face of a strong demand and supply gaps. Energy policy now aims to bridge this gap so that such recessions do not occur again [Kolev and Riess (2007)].

In an emerging economy like Pakistan, the issue is of prime concern. With growing industrialisation and high population growth rates, the demand for energy in Pakistan is set to increase in the coming years. Pakistan is a net importer of oil, which makes it vulnerable to oil supply shocks putting subsequent pressure on its import bills. It has become of critical importance to address the main causes underlying energy price inflation, and take policy measures to mitigate such concerns in a timely manner. Energy inflation in Pakistan is no different than the normal inflation. As we can see in Figure 1, the trend of energy inflation moves in accordance with the aggregate inflation. In the past there have been several studies identifying determinants of the aggregate inflation and more specifically, those studies were focused on food inflation. Our attempt in this paper is targeted specifically to study energy inflation.

Fig.1. A Comparison of Energy Inflation with Overall Consumer Price Inflation in Pakistan



Source: Pakistan Bureau of Statistics (PBS, Price Survey datasets).

In the next section, we will be talking about some stylised facts about energy. Section 3 will cover the literature review. Section 4 will discuss the methodology and data. Section 5 will talk about the results and the last section will conclude the paper along with policy recommendations.

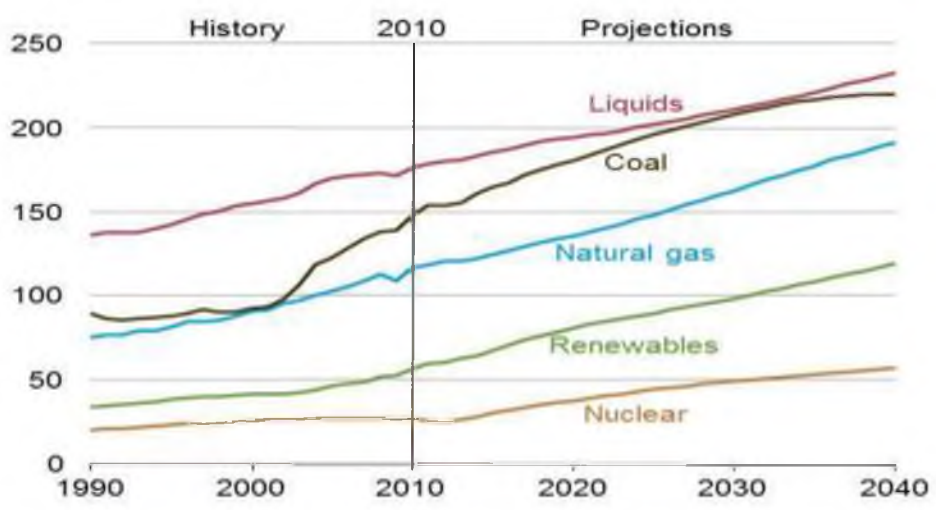
2. SOME STYLISED FACTS

This section provides some stylised-facts and an overview about energy outlook both globally and domestically.

2.1. International Energy Outlook

Before analysing domestic energy scenario, some highlights are obtained from Global Energy Outlook 2012. International energy consumption pattern is changing globally over the years. According to International Energy Outlook (IEO) 2012, liquids supply the largest share of world energy consumption over the projection period, but their share falls from 34 percent in 2010 to 28 percent in 2040, largely in response to a reference case scenario in which world oil prices are expected to remain relatively high. Due to this surge in international oil prices, use of gas and coal has been gaining importance. Natural gas, and coal are expected to continue supplying much of the energy used worldwide, meanwhile, the share of nuclear energy has remained stagnant (see, Figure 2). Although growth in the energy consumption was 11 percent in 2010, the annual increase of only 1.6 percent would lead to a 15 percent growth in consumption by 2040.

Fig. 2. World Energy Consumption by Fuel Type (1990-2040)

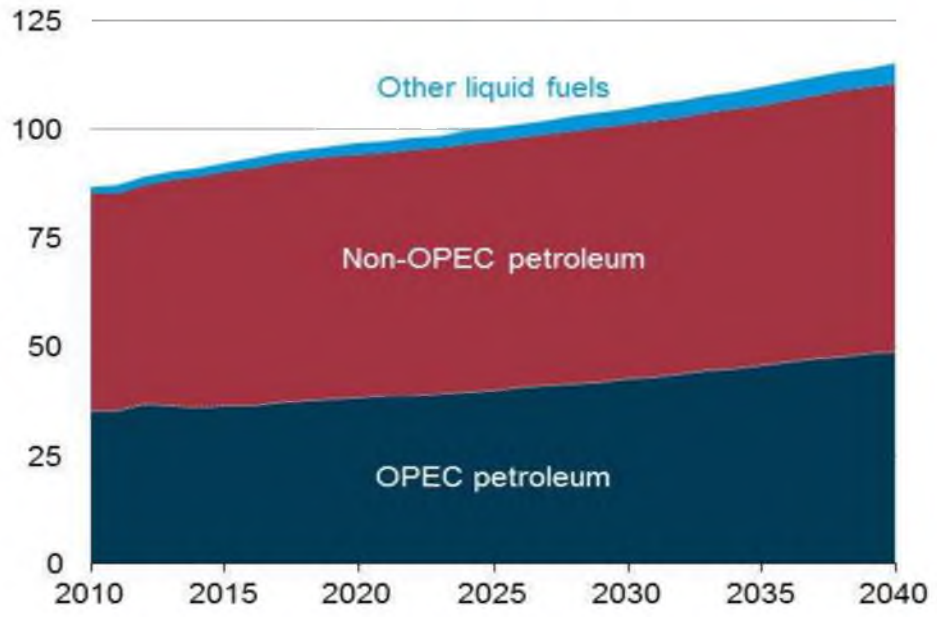


Source: International Energy Outlook, 2012.

The IEO 2012 has also projected a steady rise in the demand for oil in Asia by 2040. This rise in demand is due to higher economic growth and it is expected that oil consumption of the Asian region will exceed the North America by 2010; and by 2020 its demand will become nearly half of the world's total demand for oil. The use of liquids and other petroleum grows from 87 million barrels oil equivalent per day in 2010 to 97 million barrels per day in 2020 and 115 million barrels per day in 2040. The liquids share of world energy consumption declines through 2030, however, as other fuels replace liquids where possible. In most regions of the world, the role of liquid fuels outside the transportation sector continues to be eroded.

Liquids remain the most important fuels for transportation, because there are a few alternatives that can compete widely with liquid fuels. On a global basis, the transportation sector accounts for 63 percent of the total projected increase in liquids use from 2010 to 2040, with the industrial sector accounting for virtually all of the remainder.

Fig. 3. World Liquid Production (2010–2040)



Source: International Energy Outlook, 2012.

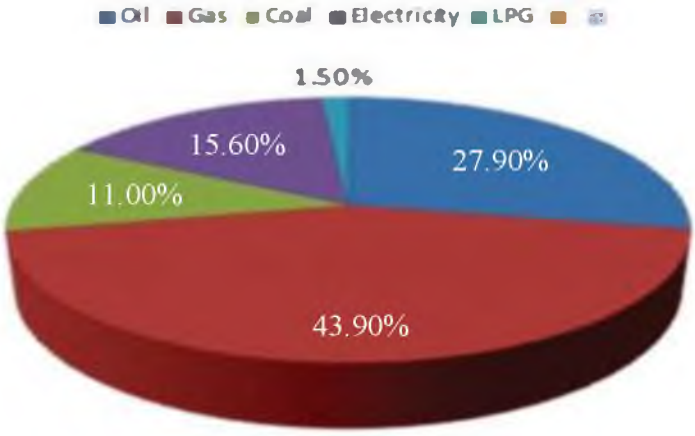
The rising demand for oil and its limited supply has created deep concern throughout the world as it is believed that nearly all the largest oil fields have already been discovered and are being exploited. To meet this demand pressure, total supply in 2040 is projected to be 28.3 million barrels per day higher than the 2005 level of 84.3 million barrels per day. It is also assumed that OPEC producers will choose to maintain their market share of world liquids supply, and that OPEC member countries will invest in incremental production capacity so that their conventional oil production represents approximately 40 percent of total global liquids production throughout the projection period. Increasing volumes of conventional liquids (crude oil and lease condensates, natural gas plant liquids, and refinery gain) from OPEC members contribute 13.8 million barrels per day to the total increase in world liquids production, and conventional liquids supplies from non-OPEC countries add another 11.5 million barrels per day (see, Figure 3).

2.2. Pakistan's Energy Outlook

Pakistan with a population of more than 180 million has been on the path of rising GDP growth for the last four years, however a decline in output growth is observed in FY12 but its growth is still on the higher side as compared with other developing countries. Real GDP growth reached 3.4 percent in FY11, after a recovery in FY12, real output growth reached 7 percent. However, after a moderate decline it dropped to 5.8

percent in FY08. Since energy sector has a direct link with the economic development of a country. So energy consumption has also grown rapidly consistent with the high growth rate of real GDP.

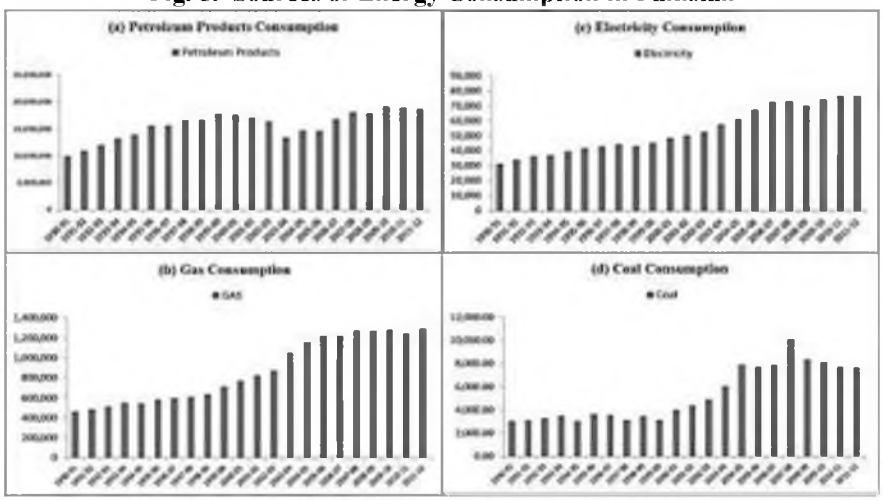
Fig. 4. Energy Consumption in Pakistan (2011-12)



Source: Pakistan Energy Year Book, 2011-12.

There has been a consistent energy consumption mix pattern in Pakistan since FY91. Per capita energy consumption of the country is estimated at 14 million btn. The energy consumption has grown at an annual average rate of 4.5 percent from 1990-91 to 2011-12. The major change in energy mix has taken place in the share of oil and gas consumption. The share of oil in energy consumption mix has dropped from 48 percent in FY97 to 32 percent in FY11. Figure 4 demonstrates the energy mix in 2011-12, where oil accounts for 29 percent of the total energy used.

Fig. 5. Sources of Energy Consumption in Pakistan

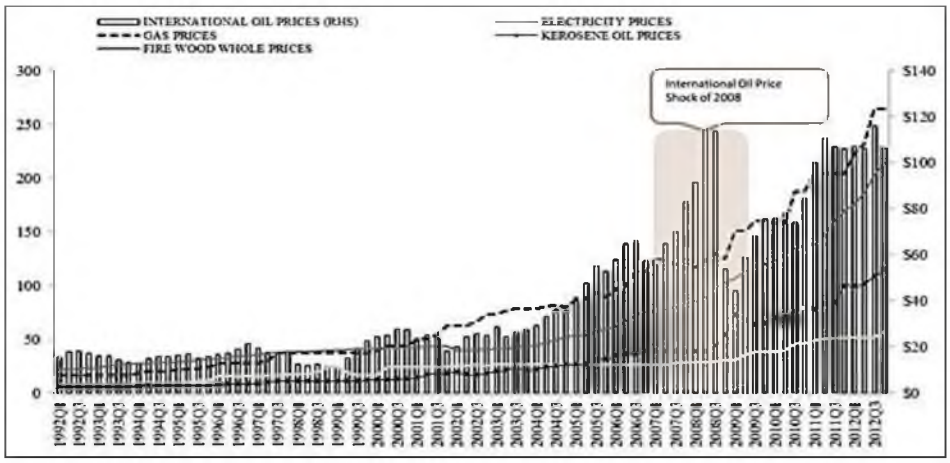


Source: Pakistan Energy Year Book, 2011-12.

Figure 5 (a to d) shows the trend in the use of different sources of energy in the last ten years. Oil consumption although has declined in the last few years but still accounts for 29 percent of the total energy consumed. Consumption of other energy sources shows rising trend with a moderate decline in last fiscal year. When we talk about energy inflation, the first variable, which comes to our mind is international oil price. What affect does oil price have on energy inflation? An increase in oil price is expected to have a reduction in standard of living by 20 percent for the oil importing countries and vice versa for the oil exporting countries [Thoresen (1982)]. If the direct impact does not reflect itself in wage reduction, it will be evident through high inflation. Although in some countries, the inflationary effect of oil price is limited despite the fact that fluctuations in crude oil price is a key element in inflation variation [Alvarez, *et al.* (2011)]. In Pakistan, we experience an indirect effect of Oil price. Figure 6 shows the overall trend of energy inflation in Pakistan and oil prices for the period of 1991–2012.

The fact that inflationary effect of oil price is weak can be witnessed from Figure 6. During FY08, a spike in oil prices was witnessed due to the global financial crises but on the other hand energy inflation in Pakistan has been consistent and showed a smooth behaviour. Nevertheless, we have been experiencing a rise in fuel and electricity charges over the years. This graph also shows the prices of crude oil, gas, firewood, electricity and kerosene-oil for the period 1991-2012. We can see that prices of different commodities have been growing at different exponential rates with different volatilities over time.

Fig. 6. Energy Prices in Pakistan at Disaggregate Level



Source: Pakistan Bureau of Statistics (PBS, Price Survey datasets).

The crude oil prices have increased significantly over time, showing high volatility. There have been cyclical rises and falls, with prices peaking during the International Oil Shock during mid-2008. After facing a huge downfall right after the price shock, the prices soon rose to high levels in 2012. The rise in gas prices is relatively less sharp than crude oil, showing little volatility in the earlier periods, and increasing volatility in the later periods. It is also notable that the crude oil prices have been rising

and falling about the steady trend of gas prices, such that the average prices of both commodities appear to be fairly similar. Only in the 2008 Oil Shock, the crude oil prices drastically differed from the gas prices. The firewood prices too have been rising steadily with no volatility. The prices of kerosene oil rose very slowly in the earlier periods but began to show higher growth rates after 2008. The electricity prices were fairly stable and experienced a slow growth in comparison to the prices of other commodities. It is evident however, that over time there has been a rise in all types of commodity prices, contributing to overall energy price inflation. However, these sudden increments in prices lead us to investigate the determinants of energy inflation in the case of Pakistan.

3. SELECTED LITERATURE REVIEW

A low and stable level of inflation is one the major goals of any economy. The question then arises that how to achieve a low level of inflation or how to maintain inflation at the current level. To understand this, one needs to look at the causes of inflation. Inflation can be caused in two broad situations. One is where "too much money is chasing too few goods" i.e., demand pull inflation. The other is when increase in prices of raw materials drive up costs of production, which feed into the prices of finished goods. This is referred to as cost push inflation. Inflation has a twofold effect on the economy. It can be bad as well as good. There is a threshold level beyond, which inflation can be harmful to the economy [Bruno and Easterly (1998); Khan and Senhadji (2001); David, *et al.* (2005)]. In the case of Pakistan that threshold happens to be 9 percent [Mubarik (2005)]. However, Hussain (2005) suggests a 3 percent - 6 percent inflation rate to have positive effects on Pakistan's economy. It provides incentives to production, investment and growth in wages. Friedman (1970) presented the theoretical foundations on the quantity theory of money, which is the part of classical economic theory. He argued that "*inflation is always and everywhere a monetary phenomenon*". Friedman and Schwartz (1970) tested it empirically. The classical are of the views that increase in the money supply results in proportionate increase in prices, assuming economics agents are rational and output and real money balances are constant.

In the context of Pakistan, the history for analysing the determinants of inflation started 30 years ago when [Khan (1982)] concluded that demand for money improves the variation in the rate of inflation. Till 1989, inflation has been seen as a monetary phenomenon. Saleem (2008) also suggested the same. Her argument was inflation, interest rate and money supply move in the same direction.

A look at recent inflation trends in Pakistan helps give a snapshot of inflation as well as factors affecting inflation as a whole. [Khan, *et al.* (2007)] endorse a dynamic approach to determining causes of recent inflation in Pakistan in 2005-06. High growth rates were also accompanied with sharp rises in inflation. Keeping in context the volatile economies of developing countries they apply a structuralist approach, which includes both demand and supply side factors. They find that adaptive expectations have been one of the key determinants of inflation in Pakistan over the decades as well as in the period of 2005-06. This is through the channel of food prices as more than half of the budget of the poor comprises of food expenditure. Overall for the year 2005-06, the adaptive expectations contributed 3.66 percentage points to the inflation rate of 8 percent, explaining 45.73 percent of headline inflation rate. Non-government sector borrowing

was the second largest contributor (which explained 35 percent of headline inflation or contributed 2.8 percentage points to the inflation rate of 8 percent).

Knowing inflation trends in general is not enough [Khan and Schimmelpfennig (2006)] rightly point out that determining what causes inflation will determine which policy makers are to tackle it. If inflation is a monetary phenomenon then it is appropriate for the Central Bank to control it. However if inflation is affected by supply side factors, and here they look at support prices of wheat, then it becomes more appropriate for the Ministry of Agriculture to devise a course of action to deal with inflation. Focusing on headline inflation and using monthly data, they find that wheat support prices affect inflation only in the short run, whereas monetary variables of broad money and private sector credit affect inflation in the long run and by a lag of 12 months.

Refining the argument further, determining which factors affect which type of inflation will also determine which policy makers are most appropriate to deal with the situation. Not much work has been done to identify the determinants of energy inflation in Pakistan. From the international perspective, a recent study in Finland [Irz, *et al.* (2011)] about determinants of food inflation with its linkages with energy inflation was conducted. A long run relation was evident between food inflation and energy prices as well as some other agriculture products. Similarly, energy inflation is itself a determinant of various other factors e.g. house prices etc. The correlation was found in a study conducted for Euro Area. In U.S, it was also evident that energy prices are a key determinant of inflation [Dhakal, *et al. (*1994)].

4. DATA AND EMPIRICAL METHODOLOGY

We have used data from 1973–2012 on an annual frequency basis. It is taken from multiple sources including State Bank of Pakistan, World Development Indicators, Pakistan Bureau of Statistics. Table 1 provides list of sources along with descriptive statistics of selected variables.

Table 1

List of Variables with Descriptive Statistics

Variables	Energy Inflation	Growth in MS	Exchange Rate	Oil Prices	Energy Import-Gap Ratio	Tax Revenue of Manufacture Sector
Data Sources	PBS	SBP	SBP	SBP	WDI	PES
Mean	9.25	15.68	36.01	32.35	9.72	0.82
Median	8.06	14.85	26.21	23.66	9.65	0.87
Maximum	27.40	26.19	94.42	108.88	12.17	1.04
Minimum	3.28	6.15	9.90	3.27	8.06	0.54
Std. Dev.	5.20	5.15	25.85	25.58	0.98	0.15
Skewness	1.97	0.37	0.67	1.58	0.52	–0.60
Kurtosis	7.46	2.58	2.19	4.58	2.81	2.09
Jarque-Bera	57.45	1.18	4.08	20.77	1.87	3.82
Probability	–	0.55	0.13	0.00	0.39	0.15
Sum	360.78	611.44	1440.48	1293.92	388.84	32.75
Sum Sq. Dev.	1028.19	1006.65	26054.73	25519.71	37.12	0.85
Observations	39.00	39.00	40.00	40.00	40.00	40.00

Note: *PBS = Pakistan Bureaus of Statistics.
*SBP = State Bank of Pakistan.
*WDI = World Development Indicators.
*PES = Pakistan Economic Survey.

Given the dynamics of our country and past literature, we have estimated the following equation:

$$P_t^{Energy} = \boldsymbol{f}\left(\begin{matrix} P_t^{Oil}, M_{2,t}^{S}, Exch.Rate_t, EnergyImportGapRatio_t, \\ Tax.\dfrac{Revenue}{ValueaddedManufc_t}, Dum_{2008}, P_{t-1}^{Energy} \end{matrix}\right) + \varepsilon_t$$

In this functional form, P_t^{Energy} is energy price inflation. Other variables, Oil Prices, Money Supply, Nominal Exchange Rate, Energy Import-Gap Ratio (EIMPR), Govt. Tax Revenue as a ratio of Value Added to Manufacturing Sector and Adaptive Expectation are used to determine the energy inflation. $\varepsilon_t$represents residual term. All the variables except Energy Imports-Gap ratio and Tax Revenue as ratio of Manufacturing Sector are taken in logarithmic form. To estimate the model, we have used Ordinary Least Square (OLS), Generalised Least Square (GLS) and Generalised Method of Movement (GMM) methods. EIMPR is the ratio of energy imports and energy gap that is prevailing in our country. The rationale behind this key variable is that it will reflect the significance of energy shortages on prices. Given the ground realities of our country we expect it to have a positive sign. Tax revenue as the ratio of the manufacturing sector value added has also been included as one of the independent variables. The main rationale behind this variable is that most of the industries get affected due to the rising electricity prices. Due to energy shortages, government tends to raise taxes and thus it ought to affect the energy prices. Any surge in International Oil prices or any depreciation in the domestic Exchange Rate affect the Import Bill significantly, which ultimately put pressure on energy inflation. The temporal relationships of these variables with energy inflation are shown in Scatter plots available in Appendix. Constantly increasing prices can create expectations for future inflation. The role of expectations is critical in analysing future prices. With the increase in prices, individual expects higher salaries, speculation in asset prices increases, credit diverts to real estate and stock markets etc. and rent seekers become active in expecting a higher price in future. A similar pattern of expectations goes for energy inflation therefore to incorporate all of these elements we have used a variable of lag of energy inflation. We expect it to show a positive sign as well.

5. RESULTS AND DISCUSSIONS

This section discusses the results based on our estimation. The first task was to diagnose the stationary properties of individual variable. For this purpose we have tested the variables for unit root using Augmented Dicky-Fuller and Philips-Perron tests. As shown in Table 2, all the variables appear to have an integration of order 1.

After diagnosing the stationarity properties we have estimated the model using three estimation approaches, OLS, GLS and GMM. Our prime task is to analyse the long run relationship. For this purpose we have carried out the co-integration tests. Both Engle-Granger and Johansen-Juselius show the existence of co-integration vector. Considering the co-integration results, we estimated our model at level. The estimation results in Table 3 are promising and show theoretically correct signs of the coefficients. Broad money, Oil prices, Exchange rate, Tax Revenue as ratio of Value Added of Manufacturing Sector and dummy for 2008, are statistically significant. Since the

variables are in log form, the estimated coefficients can be termed as elasticities. For example, a 10 percent change in Tax Revenue as ratio of Value Added to Manufacturing Sector can in turn affect the energy inflation by 2.6 percent. Oil prices have an indirect effect on the energy inflation in our country. It is significant with a lag of one year. The coefficient of 0.082 does not show a large impact but the t-stats of 4.52 make it quite a significant variable. We have discussed immense literature that talks about inflation being a monetary phenomenon and therefore Broad Money has always been a significant variable in determining the inflation. In our results, it is highly significant with t-stats of 9.8. The coefficient of 0.34 can be interpreted as when there is a 10 percent increase in money supply, it will affect energy prices by 3.4 percent. Energy Import-Gap ratio shows a positive sign but it is insignificant. Primarily because it is a ratio and the quantum of energy imports is low. Exchange Rate is another highly significant variable with t-stats of 5.74 and with coefficient of 0.38. In Pakistan, exchange rate plays a vital role in affecting inflation. It has the pass through effect through currency depreciation, which is quite evident from our results. After adaptive expectations, exchange rate is the most critical variable that affects energy prices given its elasticity.

Table 2

Stationarity Diagnostics: Tests of Unit Roots

	Augmented Dicky-Fuller Test			Phillips-Perron Test		
Variables	Level	Difference	Order of Integration	Level	Difference	Order of Integration
Energy Inflation	0.974	0.002	I(1)	0.463	0.002	I(1)
Money Supply	0.560	0.002	I(1)	0.632	0.002	I(1)
Exchange Rate	0.991	0.000	I(1)	0.986	0.000	I(1)
Oil Prices	0.984	0.000	I(1)	0.997	0.000	I(1)
Energy Import-Gap ratio	0.761	0.001	I(1)	0.124	0.000	I(1)
Tax Revenue as Ratio of Manf Sector	0.846	0.032	I(1)	0.819	0.000	I(1)

Note: Authors' Calculations.

Table 3

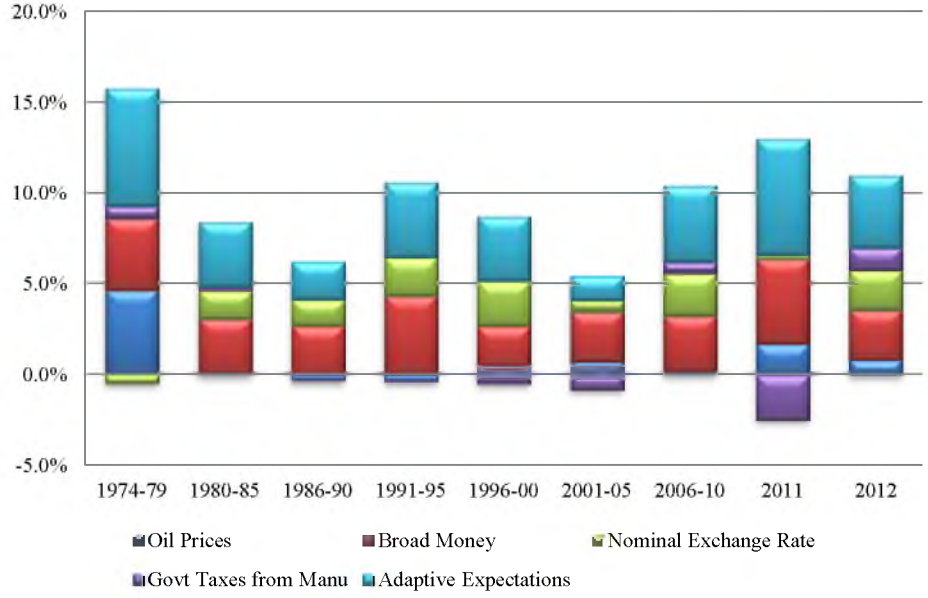
Estimation Results (Dependent Variable CPI-Energy Inflation)

Sample (Adjusted): 1973-2012	OLS		GLS		GMM	
Variables	Coefficients	t-Stats	Coefficients	t-Stats	Coefficients	t-Stats
Constant	–2.333	–7.75	–0.961	–3.236	–0.961	–2.885
Lagged Oil Price	0.082	4.568	0.051	3.005	0.051	2.680
Broad Money	0.341	9.817	0.128	3.348	0.128	2.985
Govt. Taxes as a Ratio of Manufacturing Sector	0.260	2.580	0.149	2.117	0.149	1.887
Exchange Rate	0.387	5.741	0.274	4.755	0.274	4.239
Energy Import-Gap Ratio	0.005	0.687	0.011	1.790	0.011	1.595
Dummy Variable for 2008	–0.057	–2.284	–0.015	–2.316	–0.015	–2.117
Adaptive Expectations	0.668	4.880	0.497	5.473	0.497	4.879
R-squared	0.999		0.999		0.999	
Adjusted R-squared	0.999		0.999		0.998	
Durbin-Watson Stat	1.425		1.592		1.618	
J-Statistic*	–		–		0.037	
Cointegration (Engle-Granger)	Yes		Yes		Yes	
Cointegration (Johansen and Juselius)	Yes		Yes		Yes	

*Instruments list:= lag terms and lag difference terms.

The effect of inertia cannot be ignored when we analyse inflation, especially in Pakistan. Based upon the estimation results, we have calculated the contribution of the explanatory variables in explaining energy inflation. In Pakistan, Adaptive Expectations have always been a major contributory factor in explaining inflation, food as well as energy. People in Pakistan, expect prices to grow rather than decline. As expected, the significance of Adaptive expectations is quite evident. Over the last 30 years, it has contributed almost 42 percent on an average to the total energy inflation. The second contributing factor is the broad money with an average contribution of 37 percent over the same period. During the early 70s, energy inflation was 15.3 percent, highest ever in the past 30 years. It was mainly because of the 70s oil price shock, which created an expectation of high inflation. This can be seen since adaptive expectations are contributing almost 42 percent with a value of 6.5 percent in the overall inflation of 15.3 percent.

Fig. 7. Temporal Contribution to Energy Inflation



Note: Authors' Calculations.

Early 80s and 90s are the era of low inflation. Private sector borrowing, broad money and adaptive expectations were the main factors contributing to this energy price growth. Contribution during the 80s and 90s remained consistent to 40 percent as far as inertia is concerned. As for exchange rate, its contribution surged from 18 percent in early 80s to 29 percent in the late 90s. Such an increase was probably due to the frequent change in governments and inconsistency of policies, nuclear explosion and other political uncertainities. During this time period, energy inflation was around 8.2 percent. In early 2000, energy inflation declined to 4.5 percent and broad money was the major contributor to it, explaining almost 60 percent of energy inflation. During 2006, inflation

shot up again to 10.4 percent, adaptive expectations alone explained almost 40 percent of it. It was considered to be the highest compared to the average inflation of 4.5 percent during the millennium decade. The major hike in inflation during this time was probably due to the surge in house rents. In 2008-09 energy inflation took a sudden bump to 18 percent due to the oil price shock. However the impact was not significant enough to last for a longer period. This may be probably because our economy is not directly affected by international oil prices. By 2011-12, energy inflation came back to 11 percent with adaptive expectation contributing 6.4 percent (60 percent of energy inflation). It was because of the oil price shock that people were expecting that the effects of the shock will last for coming years or so. But in 2012 this expectation dropped by 4 percent explaining 36 percent of energy inflation. Other factors such as Nominal Exchange rate and broad money were other major contributors with 2.2 percent (explaining 20 percent of energy inflation) and 2.7 percent (25 percent of energy inflation) respectively.

The second most important factor was broad money. Broad money over the period of last three decade has contributed around 3 percent (38 percent of energy inflation) on an average to the energy inflation according to our finding. In 80s and 90s broad money contributed around 3.1 percent (37 percent if energy inflation) on an average. It was the second major contributor after adaptive expectations. During the first half decade of 2001-05 its contribution shot up to 2.8 percent (60 percent of energy inflation) when energy inflation was 4.6 percent and growing. From 2006-2012, energy inflation has been growing and reached 11 percent and contribution of broad money has declined to 2.7 percent (25 percent of energy inflation). It was mainly because other factors such has house prices, oil prices came into play that resulted in high energy inflation. Nominal Exchange rate contributed 1.6 percent (16.5 percent of energy inflation) over the last 3 decades. Its highest contribution was witnessed in late 90s when it rose to 2.5 percent (30 percent of energy inflation) after adaptive expectations. This may have occured due to the uncertain changes in governments and frequent changes in policies, nuclear explosion and other political situation that was prevailing during that era.

The above mentioned factors were not the sole contributors to energy inflation. By 2008-09 the issue of circular debt came into play, which raised the electricity prices to a great extent. The period of 2008-12 was a period of power sector inefficiencies, which have cost the country significantly directly in the form of budget costs in the last five years.

6. CONCLUSION

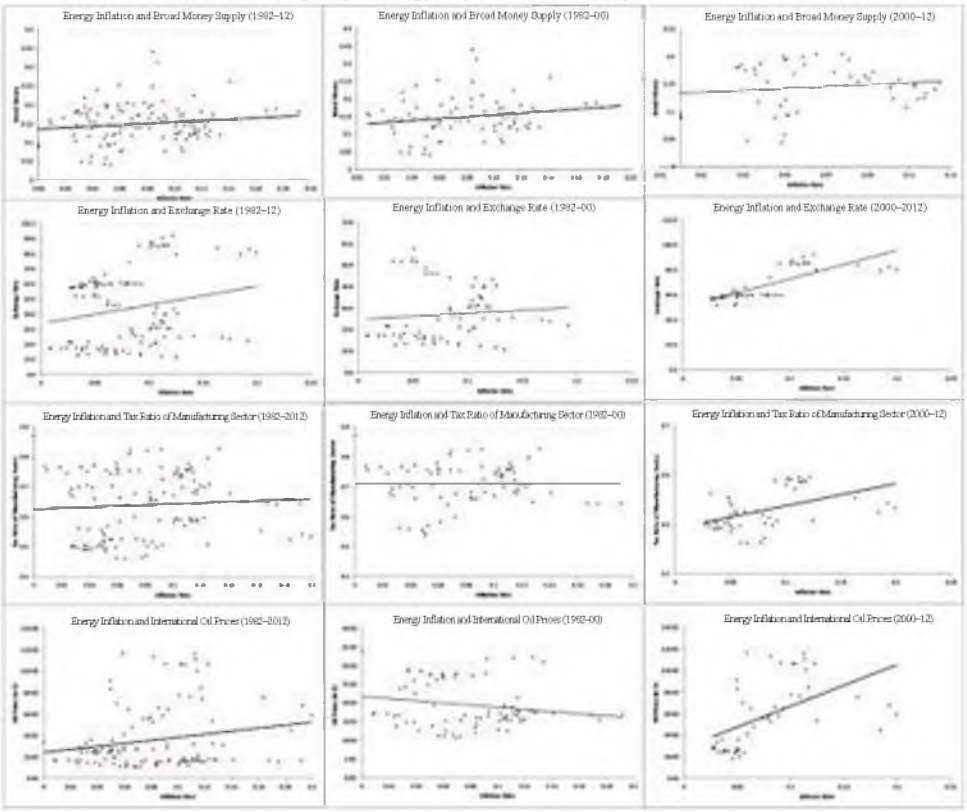
This paper talks about the determinants of energy inflation in Pakistan. It evaluates the role of various factors in explaining energy inflation, which include broad money, exchange rate, international oil prices and adaptive expectations. These are the most prominent factors in explaining energy inflation. Others includes tax revenue as a ratio of the manufacturing sector value added and energy import-gap ratio. Our results conclude that the behaviour of monetary (State Bank of Pakistan) and fiscal (Ministry of Finance) authorities seems to be pro-cyclical in response to energy supply side bottlenecks. This pro-cyclical behaviour along with any international oil price shock and exchange rate depreciation put upward pressure on energy inflation. The heavy reliance of government on indirect taxation of energy items strongly hits the poor segment of the society.

Supreme-court of Pakistan has also observed this behaviour of the government, which reduces the overall welfare. As expected approximately 60 percent of the energy inflation is explained by adaptive expectations. Given such issues including that of circular debt, it is only logical to expect the prices to go up.

Also, there are certain shortcomings in the infrastructure that need to be taken care of. There is a complete disconnect among all the stake holders involved at the policy level. The Ministry of Water and Power being the critical stakeholder does not have a roadmap for itself. It is more reactive than proactive to the power sector reforms, which is perceptibly due to lack of political will to improve the system. There is lack of professional attitude at the regulatory level. The regulator fails to address the problems of the power sector and is working in isolation. Furthermore there is no governance at the entities level. Despite the fact that they are being micro-managed by policy makers and regulators, they themselves have no attitude of moving forward and are satisfied in maintaining a status quo. Until and unless there is a serious accountability for the above mentioned issues, inflation expectations will always play a significant role. There must be proper structural reforms that require effort from all. There should be a roadmap outlined and roles defined for all the entities so that there is no ambiguity in achieving the ultimate objective.

APPENDIX

Relationships of Energy Inflation with Key Determinants



Source: Author's calculations.

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