01

PIDE ANALYTICS

INFLATION

NOVEMBER 21

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INFLATION

Inflation is projected to fall between 10.0 to 10.5 percent for FY2022 and 11.0 to 11.5 percent for the first half of FY2023. Inflation (YoY) is expected to remain in the range of 11.5 to 12.0 percent for end-June 2022 and 8.5 to 9.0 percent for December 2022.

EXECUTIVE SUMMARY

Pakistan Institute of Development Economics (PIDE)'s inflation forecasting models predict inflation to remain between 10.0 to 10.5 percent for FY2022 and 11.0 to 11.5 percent for the first half of FY2023. Compared to forecasts made by the State Bank of Pakistan (7 to 9 percent), International Monetary Fund (8.5 percent) and Asian Development Bank (7.5 percent), PIDE forecasts inflation to remain substantially higher. PIDE also expects inflation to persist in double digits till December 2022 with an upward momentum through the remaining part of FY2022 and the first half of FY2023. PIDE strongly believe that there will be a significant upward revision in the State Bank of Pakistan's forecasts (expected range of 9.0 to 11.0 percent from the previous forecast of 7.0 to 9.0 percent).

Despite being significantly higher than forecasts from other institutions, PIDE's forecast is perfectly in line with the results of the Survey of Industry experts. More than 80 percent of the respondents expected that inflation for FY2022 would remain between 9.5 to 11.0 percent. Respondents also believe that inflation will stay in double digits for the next two fiscal years and will only be back in the single-digit in FY2024. Survey participants also expect GDP growth to remain between 4.0 to 4.7 percent for the next several years.

PIDE analysis also indicates that persistence in inflation has risen and will further rise in the next five quarters.

Out of 94 composite commodities, around 70 commodities are projected to continue with double-digit inflation. Out of these 70, more than 25 commodities projecting more than 14 percent inflation. PIDE also anticipates inflation to remain broad-based – both food and non-food contributing to high inflation. Measures of uncertainty, fan charts, also indicate that inflation is expected to remain between the range predicted by PIDE's models.

The increasing inflation trend with high persistence and broader base supports PIDE's suggestion for an immediate adjustment in the policy rate by at least 75 basis points. PIDE's inflation forecasting models anticipate a one percent increase in electricity prices, translating into 8 percent increase in fuel prices and upward policy adjustment policy adjustment of 75 basis points in policy rate within the next two months. Given the prior information, Pakistan requires at least a 14 percent increase in electricity prices to overcome the crushing burden of ever-increasing circular debt.

We introduce an additional shock of 13 percent in the next five months and found that with a full adjustment of electricity shock, inflation could go up 0.43 percent for FY2022 and 0.66 percent for the first half of FY2023. Similarly, the additional shock of 10 percent in fuel prices could further push the inflation by 0.32 percent for FY2022 and 0.46 percent for the first half of FY2023. Inflation forecast anticipates 8 percent policy rate and expects inflation to come down by 0.26 percent till December 2022 with every 100 basis points increase in the policy rate.

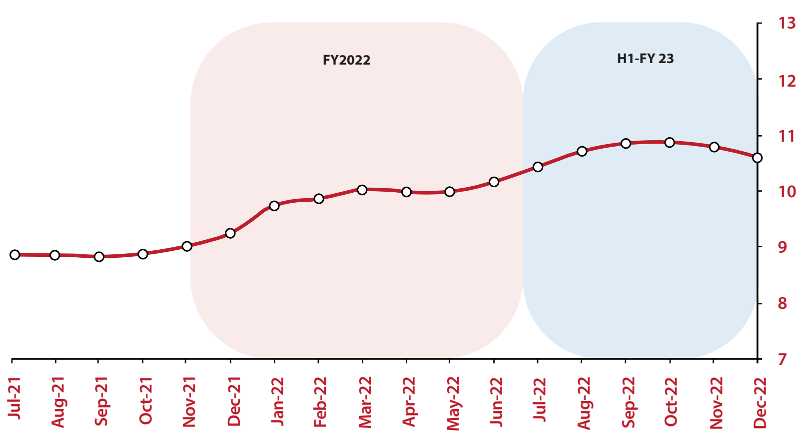
[1] *Here we means Inflation as: Average CPI (Consumer price Index) Inflation.*

[2] *PIDE conducted the survey and recorded responses of 61 respondents.*

BASELINE FORECAST

As per the forecasts obtained from the Pakistan Institute of Development Economics (PIDE)'s inflation forecasting models, the CPI inflation for FY2022 is to fall between 10.0 and 10.5 percent, with year-on-year inflation in June 2022 falling in the range of 11.5 to 12.0 percent. Designated as the baseline scenario, forecast from a wide range of econometric models , inflation and year-on-year inflation for FY2022 is expected to remain at 10.2 and 11.8 percent respectively. PIDE's inflation forecast indicates that inflation will not only persist in double digits for the remaining part of FY2022 but will also continue in the first half of FY2023. Inflation forecasting models also expect inflation to further increase, from the level expected for FY2022, during the first half of FY2023 – for which PIDE expects inflation to remain between 11.0 to 12.0 percent.

Figure 1: Average CPI Inflation Forecast-Base Line (percent)



PIDE forecasts inflation to peak in October 2022 and then gradually decline in November and December 2022 *(see figure 1).* From November 2021 till October 2022, inflation is expected to follow an increasing trend. YoY inflation is forecasted to peak in August 2022 and then decline significantly from September 2022 to December 2022. YoY inflation for December 2022 is expected to remain between 8.5 to 9.0 percent. However, it is important to mention that the decline will predominantly be the reflection of high base impact, as month-on-month growth in CPI is still expected to be positive for the period while YoY is expected to fall significantly.

COMPARISON WITH OTHER INSTITUTIONS

As compared to forecasts made by the State Bank of Pakistan, International Monetary Fund and Asian Development Bank, PIDE's inflation forecasts are on the higher side. None of these institutions expects inflation to remain above 9 percent – with the higher forecast coming from the State Bank of Pakistan with an expected range of 7-9 percent. However, it is important to note that the upside risks mentioned by these institutions in general, and the State Bank of Pakistan have already materialized and hence these forecasts are bound to be revised upward. For instance, the State Bank of Pakistan during its monetary policy decision of September 2021 mentioned that it expects inflation to remain between 7-9 percent but highlighted potential risks of high global commodity prices, high domestic fuel prices and pass-through of exchange rate depreciation.

3Models ranging from Univariate models with uncertainty to Structural Vector Autoregressive, Vector Error Correction, and disaggregated models.

Relative Comparison of Inflation Forecasts	
State Bank of Pakistan (September 2021)	7-9 percent
International Monetary Fund (IMF) – 13th October	8.5 percent
Asian Development Bank (ADB) – 23rd September	7.5 percent
Pakistan Institute of Development Economics (PIDE)	**10.0-10.5 percent**

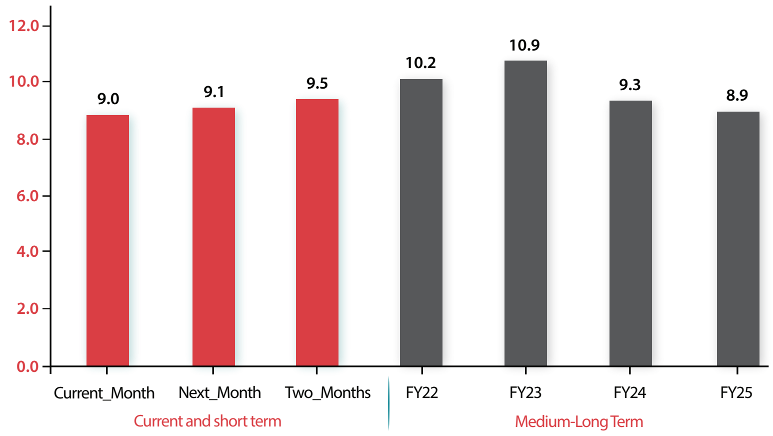
Given the fact that global commodity prices have already up, domestic fuel prices have seen a substantial increase in the last couple of months and exchange rate deprecation happened recently, PIDE expects all these institu tions to revise their forecasts sig nificantly upward. While IMF and ADB forecasts revision will take some time, the State Bank of Pakistan is scheduled to announce its monetary policy on November 26, 2021. Keeping our analysis in view, we are expecting a big revision of the inflation forecast by State Bank of Pakistan.

COMPARISON WITH PROFESSIONAL FORECASTERS

PIDE conducted a Survey of Industry Experts (SIE) to ascertain the collective view of experts, representing different sectors of the economy, on the future inflation and growth trends. In total 160 industry experts, representing the business community, academia, central bank, think tanks, banking industry and brokerage houses, were requested to provide their opinion. However, only 61 respondents - 38 percent of the total - provided their feedback. Importantly, these 61 respondents represent every sector included in the total sample and hence provides reasonably well and robust opinions.

Results of Survey of Industry Experts further validate the PIDE's forecast of 10.0 to 10.5 percent inflation for FY2022. Even for the first half of FY2023, PIDE's inflation forecast range remained well in line with the results of the survey. Out of 61 respondents, more than 80 percent believe that inflation for FY2022 and the first half of FY2023 will remain between 10.0 to 10.5 percent and 10.75 to 11.25 percent respectively. Respondents also support PIDE's finding that inflation will further increase in the first half of FY2023. In comparison to 10.2 percent inflation for FY2022, Industry Experts expect inflation to further increase to 10.9 percent during the first half of FY2023.

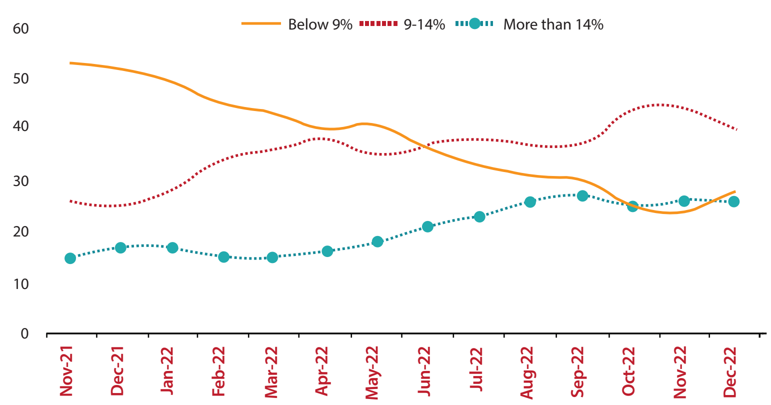
Figure 2: Industry Expert's Forecast for Average Inflation (In percent)



PERSISTENTLY HIGH INFLATION EXPECTED

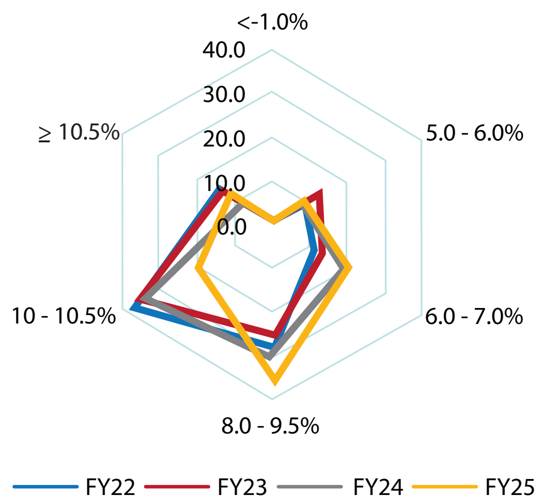
A disaggregated analysis of inflation indicates that inflation is not only expected to remain high but is also expected to persist in double digits at least for the next couple of years. Theoretically, CPI is an aggregation of 94 composite commodities and the distribution of these commodities with respect to inflation provides useful information about the persistence of inflation. . Intuitively, more commodities in double-digit inflation are a reflection that overall inflation is more persistent in double digits and will take significant policy intervention to come back. Figure 3 indicate that out of 94 composite commodities, currently, around 70 commodities are, and projected to continue with double-digit inflation. Out of the 70, more than 25 commodities projected more than 14 percent inflation. Commodities with below 9 percent inflation are expected to decline from 53 to 28 from Nov 2021 to Dec 2022. Contrary to that, commodities with inflation between 9 and 14 percent are projected to increase from 26 to 40. Additionally, commodities with inflation above 14 percent are also expected to increase from 15 to 26. These trends indicate that inflation during the period Nov 2021 to Dec 2022 will remain stubborn in double digits.

Figure 3: Distribution of 94 Composite Commodities (Based on Average Inflation)



Results of Survey of Industry Experts further validate the PIDE's view that inflation will persist in double digits for the next couple of years. As part of the survey, industry experts were requested to assign different probability values to different ranges of inflation. The web diagram in figure 4 generated from the industry experts' responses, indicates that the respondents associated more than 80 percent probability for inflation to remain between 10.0 to 10.5 percent for the next three consecutive years. The figure also indicates that industry experts believe that inflation will only come to a single digit in FY2025. There is an almost negligible difference between the probabilities assigned for FY2022, FY2023 and

Figure 4: Inflation Probabilities (FY2022 to FY2025)



BOX 1: Inflation Persistence – Resident Thief in Your Wallet

Inflation persistence is defined as the tendency for price shocks to push the inflation rate away from its long-run inflation for a longer period. In addition to that, inflation persistence means that how much the current inflation is dependent on the past values of the inflations. Often, the economies with persistent inflation on the higher side have less policy space. Therefore, it guides policymakers to see the policy interventions and the structural changes in the long run.

There are several approaches to calculate inflation persistence. However, we shall focus on the univariate analysis. For this purpose, we need a univariate time series that represent inflation. Under the univariate approach, persistence is investigated by looking at the univariate time series representation of inflation.

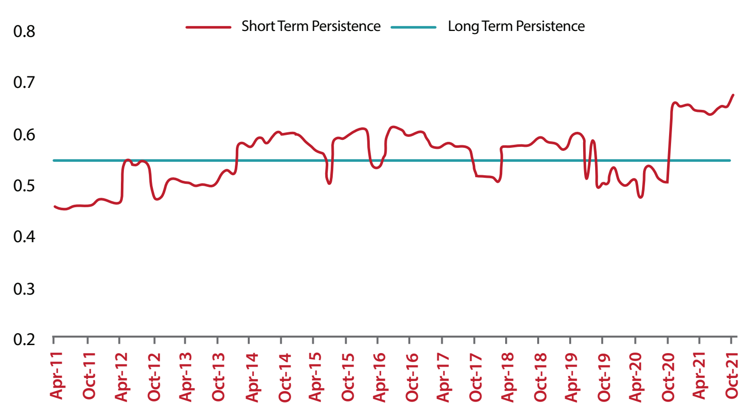
Further, we shall assume that the inflation follows a stationary autoregressive process of order P(AR(P)):

yt= +∑_(j-1)^p βj y_(t-j)+εt

To estimate the degree of inflation persistence, we shall run the first-order autoregressive model AR (1) model. Then in the second step, we shall check for the statistical significance of positive coefficients on the AR terms which implies a positive serial correlation, and thus inertia, in the inflation series.

The figure is evident that the short-run persistence is away from its steady-state path. More importantly, it is much higher than the long-term persistence and, more importantly, the short-term persistence is much higher and much rigid. This shows that in the in-coming months the inflationary will be built, which will continue to steal your resources away perpetually.

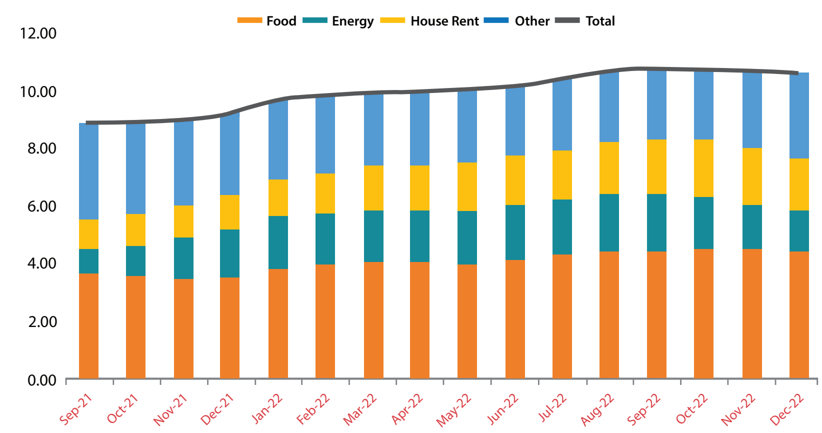
Inflation Persistence



INFLATION TO REMAIN BROAD-BASED

Inflation pickup in the last few quarters was broad-based, and the trends are projected to continue. Broad-based inflation is a clear indication that higher inflation is here to stay and will require serious policy interventions. Figure 5 explains the relevant contributions of food, energy, house rent and other products in total forecasted inflation. Unlike the general perception that current inflation is primarily coming from higher food prices (resulting from higher global commodity prices), figure 5 indicates that inflation has been and will remain broad-based. Food inflation contributes its share but is not the sole source of current inflation. Interestingly, the government's recent decision to increase the house rent ceiling of its employees has put upward pressure on the market house rent. This has led house rent to singularly cause 1.7 percent inflation in June 2022 number and 1.9 percent inflation in December 2022 number. Similarly, energy price direct contribution to inflation is not the major contributor of inflation. The broad nature of current inflation further validates PIDE's argument that inflation is persistent and will require policy intervention for any price stability in the coming months.

Figure 5: Contributions in Inflation

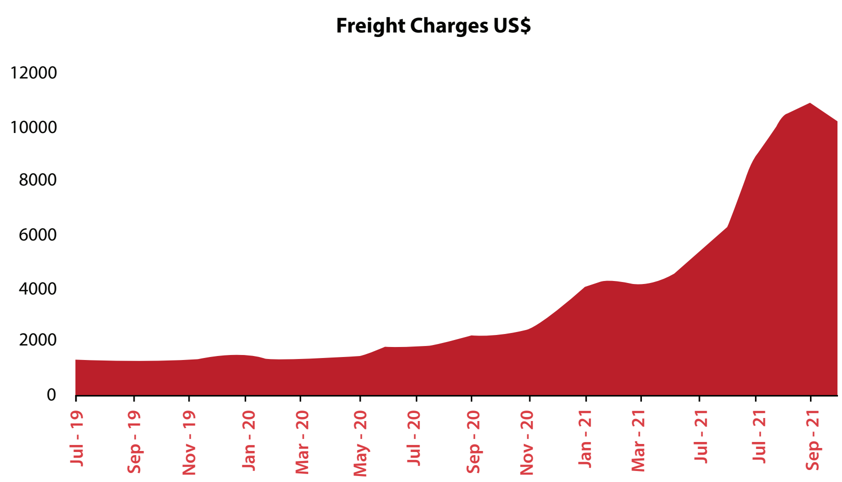


BOX 2: Supply-Side Challenges

The disruptions to the economy during the pandemic have dismayed the supply chains across the countries, created shortages of goods and services. The worrisome factor is that these disruptions are not getting much better probably due to a shortage of vessels that increased the freight to extraordinary heights (see Figure). The demand for containers increased on the back of changing consumption patterns during pandemic and lockdowns. During the pandemic, people were more inclined towards buying consumer goods and other electronic items

items due to restrictions on social activities. When the lockdowns were lifted, the countries have already consumed items imported in the pre-covid era because trade was restricted during lockdowns. Hence, increased demand for e-commerce and consumer goods is unable to match with the adequate supply due to shipping capacity.

The analysts across the world term these supply-side shortages and increased freight charges as a major



inflation determinant and are still uncertain when these supply chain issues would turn to normal. To tackle the rising inflation on the back of supply-side factors, the central bank is in a very formidable situation and must be very cautious in formulating monetary policy, such that these demand-supply mismatches might not get permanent.

At present, the debate is also going on the transient nature of inflation in Pakistan. However, keeping in view the exchange rate depreciation and other macroeconomic factors, we are of the view that inflation will remain persistent even if the freight charges get back to normal.

ELECTRICITY PRICES AND INFLATION

On top of econometric models for aggregated CPI inflation, PIDE's Inflation Analytics also include forecast at a disaggregated level. By relying on univariate models, Inflation Analytics forecasted 94 composite commodities to calculate the direct impact of shocks in different commodities – electricity is one of those, though the most important one. Disaggregated forecasting model captured one percent inertia in electricity prices. However, as part of the IMF extended fund facility, Pakistan and Fund are discussing at least a 14 percent increase in electricity prices to overcome the crushing burden of ever-increasing circular debt. In this backdrop, we introduced an additional shock of 13 percent in the next five months and found that with the full adjustment of electricity shock, inflation could go up by 0.43 percent for FY2022 and 0.66 percent for the first half of FY2023. To calculate the second-round impact of electricity prices on the rest of the CPI basket, we developed a model between the electricity price index and CPI-Excluding Electricity. The impulse response of the newly constructed CPI to a 10 percent shock in electricity reveals that there could be an additional 0.16 percent inflation in the first four months of the electricity price increase.

Figure 6: Average CPI Inflation Forecast (percent)

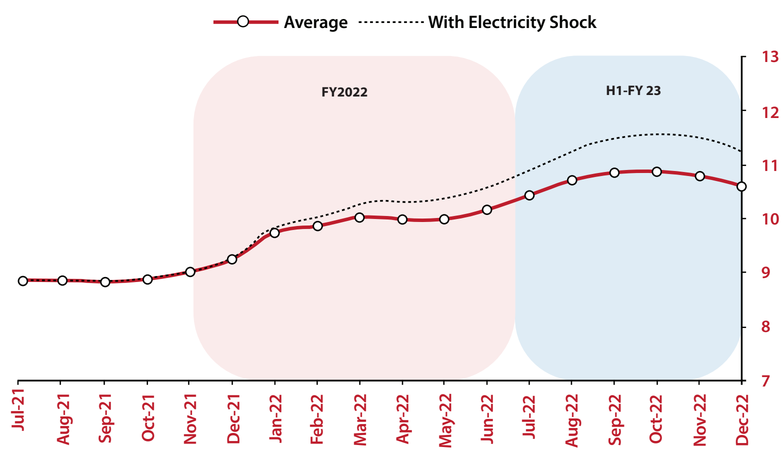
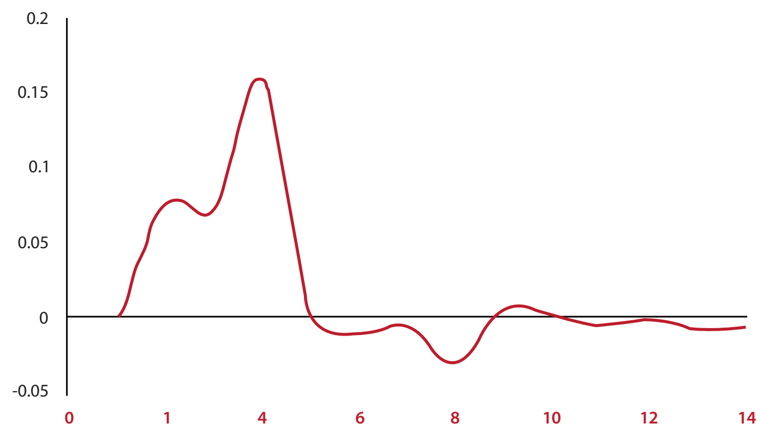


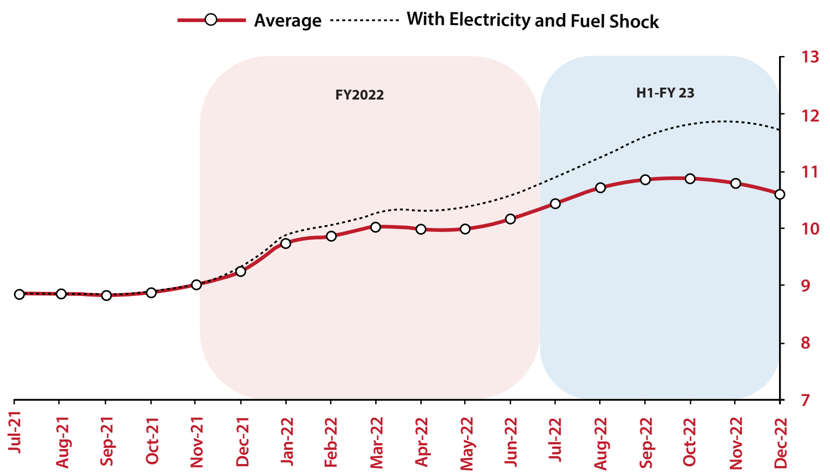
Figure 7: Impulse Response of CPI to Electricity Prices



FUEL PRICES AND INFLATION

Pakistan is an oil-importing country and is exposed to external shocks through global oil prices. In recent months, Pakistan has substantially increased domestic oil prices mainly due to high global oil prices and exchange rate depreciations. Disaggregated forecasting model captured 8 percent inertia in fuel prices. However, recent depreciation and trends of global oil prices suggest that there would be at least another 10 percent increase in fuel prices in the coming two months. Against this backdrop, we introduced an additional shock of 10 percent in the next two months and found that with the full adjustment of fuel price shock, inflation could go up by 0.32 percent for FY2022 and 0.46 percent for the first half of FY2023. To calculate the second-round impact of electricity prices on the rest of the CPI basket, we developed a model between the fuel price index and CPI-Excluding Fuel. The impulse response of the newly constructed CPI to a 10 percent shock in electricity reveals that there could be an additional 0.20 percent inflation in the first six months of the fuel price increase.

Figure 8: Average CPI Inflation Forecast (percent)

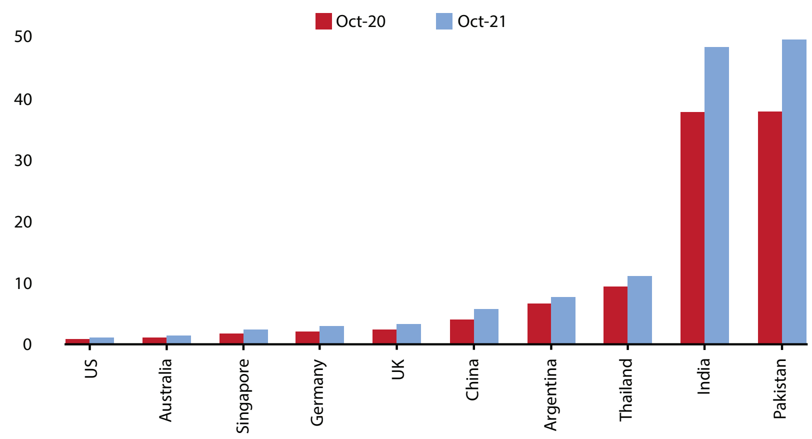


BOX 3: Petroleum prices – Perception vs Reality

There is no doubt that petroleum prices soared to unprecedented levels and every country is facing the charge of these rising prices globally. Sole comparison of prices only provides a half-truth, in a sense that it does not accommodate the purchasing power of the consumers.
Considering the per capita income as well as per capita petroleum consumption for several countries, we calculated the consumption expenditure on petroleum for an average person across countries. The per

We found that an average Pakistani consumer is spending almost half of his income on petroleum (49.7%), due to lower per capita income as compared to the other countries in October 2021 (see Figure). The increased petroleum prices have also increased consumption expenditure by more than 12 percent for an average Pakistani consumer compared with the last year. In other words, an average Pakistani has now 12 per cent fewer resources to manage expenditures on items other than petroleum.

Petroleum Per Capita Consumption Expenditure (in percent)



UNCERTAINTY ANALYSIS

The Fan Chart represents the forecasting distribution of a variable based on the information available at present. In comparison with the traditional forecast path and its corresponding symmetrical bands, the Fan Chart has two important advantages. First, it depicts the whole marginal forecast distribution. Second, this marginal distribution, on each period in the forecasting horizon, maybe non-symmetric. When this distribution is not symmetric, the probability that the variable takes on values above the central path differs from the probability that it takes on values below it, which makes it a desirable tool to show the risks of not fulfilling pre-established targets on future values of the variable[4].

Presentation of inflation forecast with fan charts is useful for several reasons like 1) it shows inflation forecast is inherently uncertain. Uncertainty is both about the potential shocks that can affect the economy in the coming period as well as uncertainty about the qualitative and quantitative nature of transmission mechanism, 2) fan charts allows the central bank to communicate with less ambiguity about the risks regarding inflation forecast, i.e. whether the central bank is expecting upper side risk or lower side risk. If the fan chart is dispersed equally around the central point, actual inflation for the future will most probably be the mode of fan chart distribution. If the fan chart is tilted towards the upper side, then actual inflation will most probably be higher than the mode of fan chart distribution and vice versa.

Figure 9: Fan Chart Utilizing Credit VAR

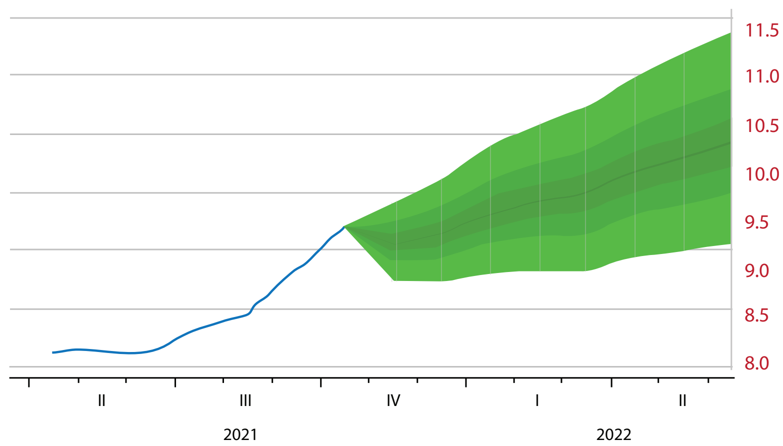
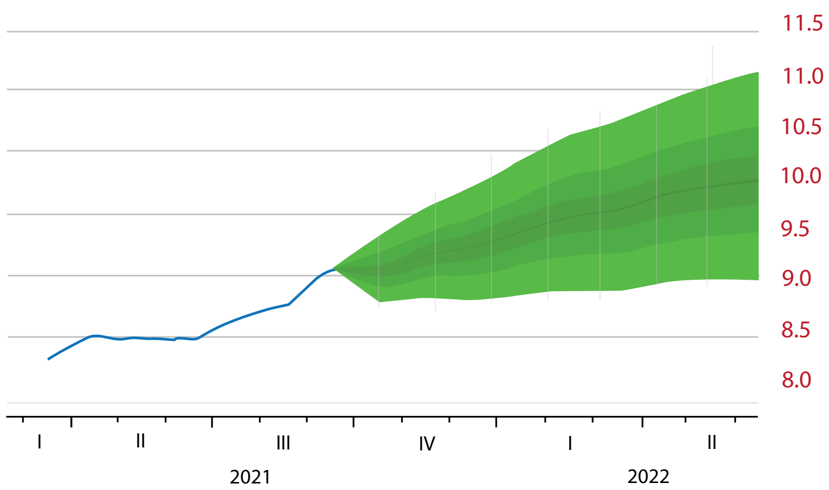


Figure 9 is the fan char utilizing credit Structural VAR. Fan chart is constructed by utilizing the forecast from ‘Credit SVAR’ and incorporation of exogenous errors based on Bootstrapping – with several simulations as 100,000. The shape of the fan chart from Credit SVAR indicates that the likelihood of the inflation forecast to remain between 10.0 to 10.5 is the highest and hence we can claim that the forecast range will hold, even if a few exogenous shocks materialised.

Figure 10 is the fan char utilizing monetary Structural VAR. Fan chart is constructed by utilizing the forecast from Monetary SVAR and incorporation of exogenous errors based on Bootstrapping – with several simulations as 100,000. The shape of the fan chart from 'Monetary SVAR' indicates that the likelihood of the inflation forecast to remain between 9.5 to 10.5 is the highest and hence we can claim that the forecast range will hold, even if few exogenous shocks materialised.

Figure 10: Fan Chart Utilizing Monetry VAR

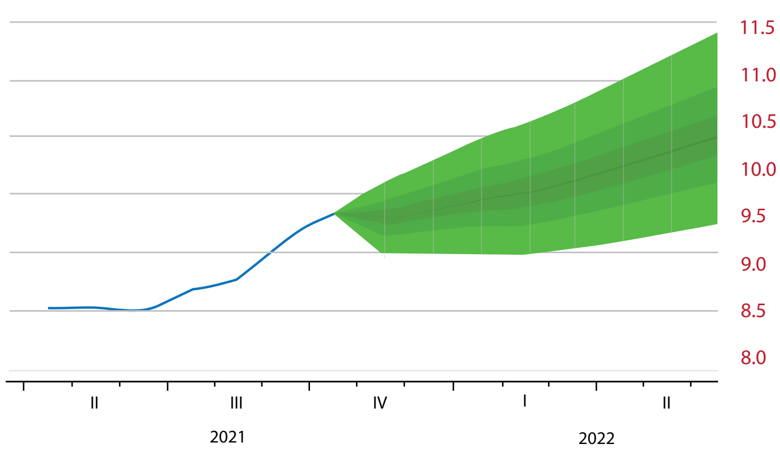


tral point, actual inflation for the future will most probably be the mode of fan chart distribution. If the fan chart is tilted towards the upper side, then actual inflation will most probably be higher than the mode of fan chart distribution and vice versa.

4 https://www.researchgate.net/publication/262467507_The_Fan_Chart_Implementation_Usage_and_Interpretation

Figure 11 is the fan char utilizing external Structural VAR. Fan chart is constructed by utilizing the forecast from External SVAR and incorporation of exogenous errors based on Bootstrapping – with several simulations as 100,000. The shape of the fan chart from 'External SVAR' clearly indicates that the likelihood of the inflation forecast to remain between 10.0 to 11.5 is the highest and hence we can claim that the forecast range will hold, even if few exogenous shocks materialised.

Figure 11: Fan Chart Utilizing External VAR



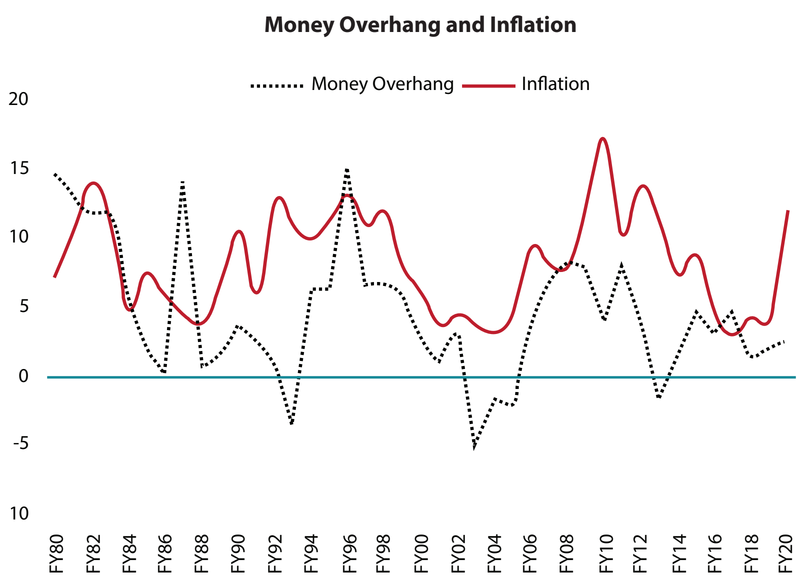
BOX 4: Monetary Overhang May Increase the Inflationary Pressures.

Further, we shall assume that the inflation followMonetary overhang means the economy is having more money than the real money

demand. In simple words, all the individuals (on aggregate) in the economy have more money than the avenues they can spend. It arises when there is an excess supply of money relative to the money supply. Therefore, the monetary overhang may create inflationary pressures. s a stationary autoregressive process of order P(AR(P)):
Following Moinuddin (2010), we calculate the monetary overhang by using the difference between the actual growth of money and the optimal growth of money . The optimal monetary growth, using the data from 1976 to 2021, is 11.3 percent of Pakistan economy, and any growth of money above that will be the monetary overhang thus affecting inflation and the monetary policy . It implies that the increasing money overhang would lead to an increase in inflation and vice versa. Historically, over the last four decades, 73 percent of the time -29 out of 40 episodes-(see table) the money overhang and inflation moved in the same direction.

Money Overhang (No of Episodes)			
Inflation (No of Episodes)		Increase	Decrease
	Increase	14	4
	Decrease	7	15

It is also interesting to note that the monetary overhang impacts inflation after some lags. It is evident from the figure that the MOH may impact inflation after three lags. The money overhang of the FY2020 and FY2021 is around 6 and 5 percent respectively. This implies that this will create further pressure on inflation in the coming months. This finding is in line with the ground realities. The people had fewer avenues to spend given the COVID situation in the last two years. The recovery period will lead to inflationary pressures.

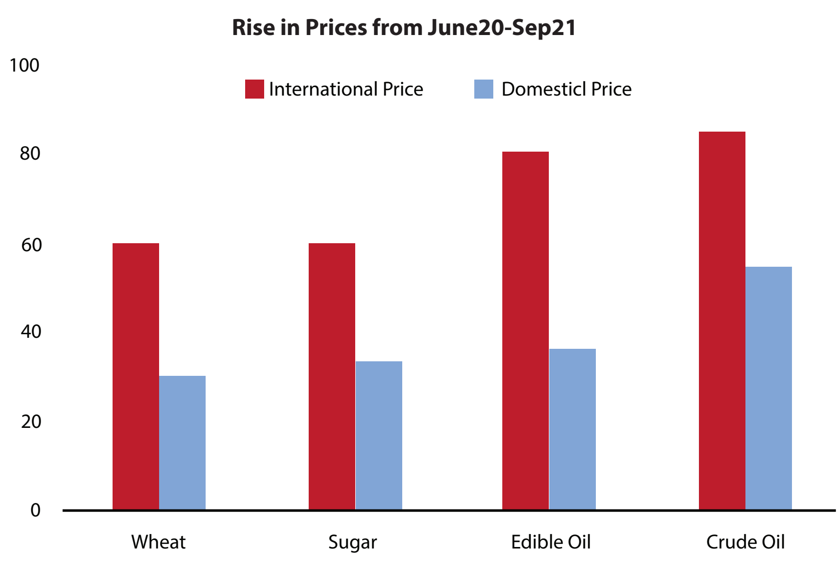


5This is also known as the reference monetary growth or the trend monetary growth.
6Moinuddin (2010) estimated 13.1 percent.

BOX 5: : Policy Choices in Backdrop of Rising Price: Between the Devil and the Deep Sea

Indeed, Pakistan's economy is grappling with multiple challenges at present that includes soaring international prices of crude oil and essentials, massive import bill (65% increase in Jul-Oct FY22), plunging exchange rate, unprecedented freight charges, lack of fiscal space and last but not the least uncertainty on the western border.

The impact of increased international prices with a compounding effect of freight charges hit hard the economy that resulted in a relentless increase in domestic prices raising concern that inflation remains transitory in post-pandemic recovery (see Figure). Exchange rate depreciation adds further in making imports more expensive.

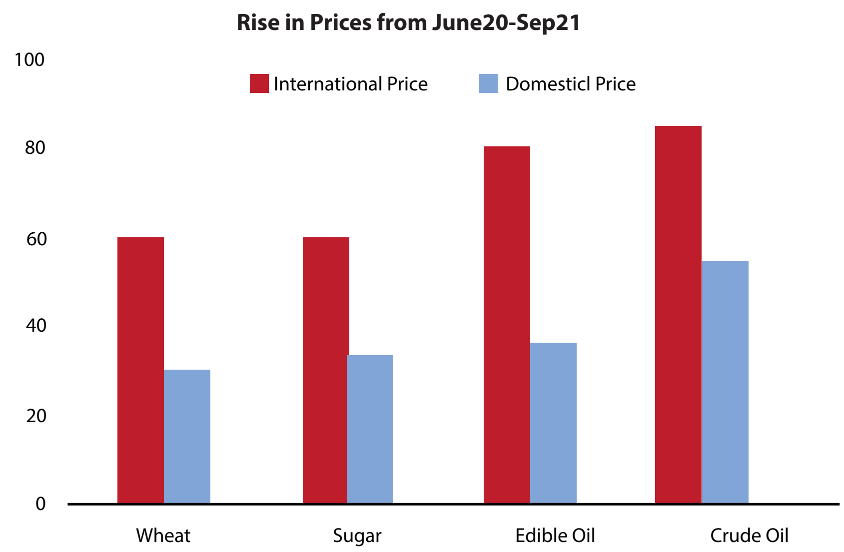


This raised concerns that in such circumstances what policy options government and central bank together must work out to contain the inflation without jeopardizing the post-pandemic economic recovery. Unfortunately, there is no band-aid solution available with the government in these unparalleled times. For example,

SBP may attempt to contain prices through contractionary monetary policy. However, without recognizing the determinants of domestic inflation, an undesirable tightening of monetary stance will result in delayed economic recovery. As monetary policy is purely a demand management strategy, the central bank must be cautious in its approach to addressing supply-driven inflation. Further, the slowdown in the economy will lead to decreased revenues exacerbating the aforestated fiscal problems.

Another approach to make imports cheaper is through strengthening the PKR and for that matter, the supply of foreign exchange must be greater than the demand for it in the market. For this option, we must have infinite foreign exchange reserves. Currently, the market forces are moving in an undesirable direction, and with the fewer level of forex reserves. Therefore, artificially supporting the exchange rate option is almost impossible to exercise.

One way is to reduce the import duties and taxes on essential imports, so that the pressure may ease on the domestic prices. Abolishing these duties/taxes, the government must compromise on fiscal targets.

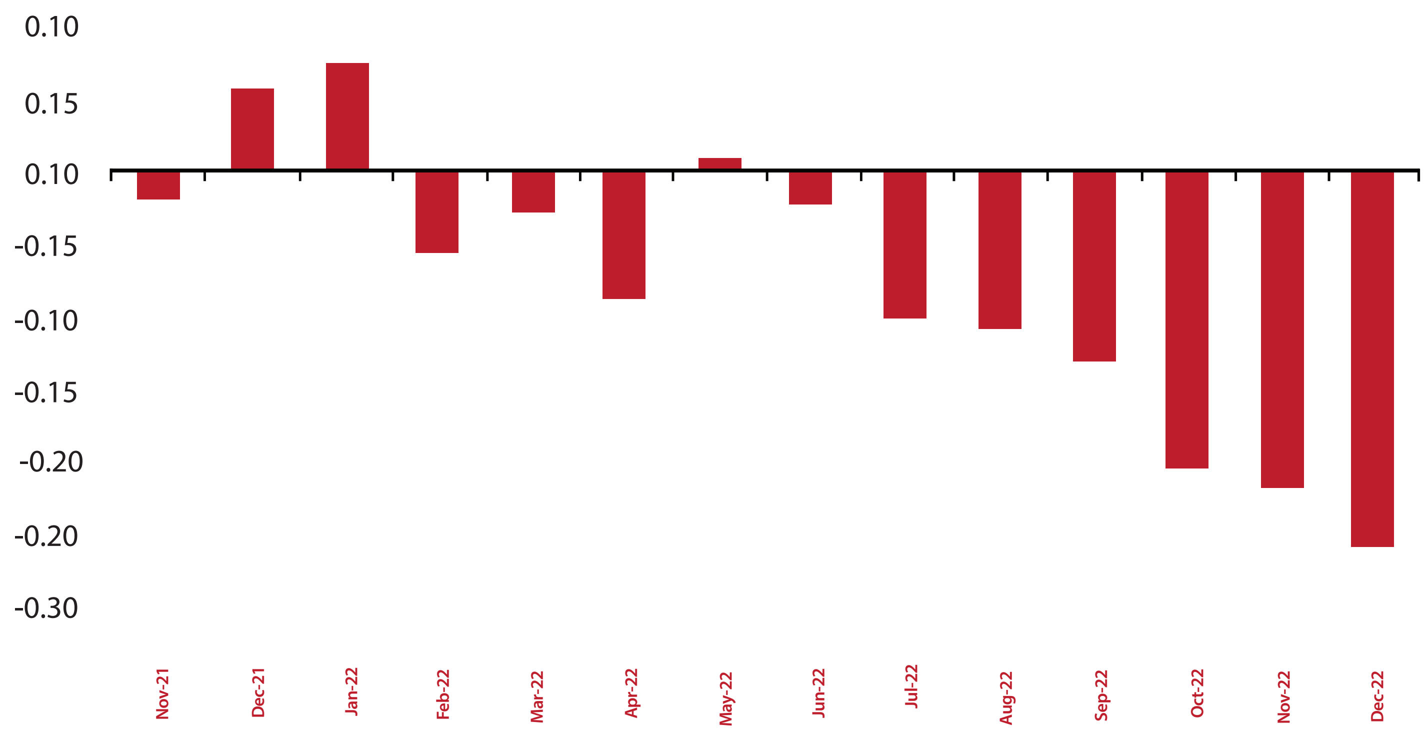


THEMATIC ADVICE: MONETARY POLICY AND INFLATION

As mentioned earlier, PIDE's inflation forecasting models expect inflation to remain between 10 percent to 10.5 percent. However, it is important to mention that this baseline forecast is subject to certain assumptions. The most important assumption is about the monetary policy, models are expecting an upward policy adjust ment of 75 basis points in discount rate-base line forecast assumes policy rate to be at 8 percent as compared to 7.25 percent as of now. Nevertheless, the baseline forecast is exposed to several upside risks. The most important to note is the recent level of exchange rate depreciation. By utilizing 'external sector SVAR' we found that depreciation of 10 percent can bring incremental inflation of 1.23 percent for 14 months. We strongly believe, given the nature of exchange rate pass-through and the lags it involves, that the actual impact of the recent happened depreciation is yet to witnessed. Against this backdrop, there is an immediate need for the relevant policy adjustment to ensure that inflation for FY2022 should not go beyond 10.5 percent.

Very recently, on the 13th of November 2021, SBP tightened the money supply by increasing banks' cash reserve requirement (CRR) by 1 percent. According to an estimate, this move will suck around Rs150-170 billion from the banking system. In addition to the recent use of macroprudential, increasing CRR, SBP also needs to use conventional monetary policy to ensure that they put a check on inflation and can achieve their goal of price stability. However, before making any policy adjustment SBP needs to know how much impact they can make on inflation through their policy adjustment- in form of an increase in the policy rate. By utilizing 'monetary SVAR', we calculated the Impulseresponse of inflation to 100 basis points shock in interest rates. We found that an increase of 100 basis points in interest rate can bring inflation down by 0.26 percent for a period of 12 to 14 months. Given this relationship, PIDE's inflation forecasting models suggest that with a status quo monetary policy, inflation for FY2022 can easily surpass the baseline scenario with additional inflationary pressures building through FY2023.

Figure 12: Accumulated response of Inflation to Monetry policyi



Monetary Policy Simulations

Monetary Policy Stance	FY2022 Inflation	First Half FY2023 Inflation
Status Quo (7.25 percent)	10.16	10.78
Policy Rate Increase by 75 basis points (8 percent) -Baseline	10.14	10.58
Policy Rate Increase by 175 basis points (9 percent)	10.12	10.32
Policy Rate Increase by 275 basis points (10 percent)	10.10	10.06
Policy Rate Increase by 375 basis points (11 percent)	10.08	9.80

The above table summarized different policy options, related to policy (discount) rate, and their impact on inflation for FY2022 and the first half of FY2023. If the State Bank of Pakistan decides to keep the policy rate at the status quo, 7.25 percent, inflation for FY2022 will be 0.02 percent higher than the baseline scenario, whereas inflation for the first half of FY2023 will be 0.20 percent higher. These policy simulations indicate that inflation will persist in double digits and a significant policy adjustment would be required to bring that back to a single digit in the next 14 months.

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