

Rising Prices And Falling Wages: An Analysis Of India's Informal Sector Workforce

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Abstract

As global commodity prices continue to climb rapidly, the one question that economies face is if this ubiquitous inflation spiral is indicative of an 'era' of higher inflation. Caused by both supply-side and demand-side factors, the price-hike across countries from 2021 finds its seeds in factors that integrate the global economy like the pandemic and the conflict between Russia and Ukraine. Nonetheless, the impact of inflation itself is asymmetrical not only across economies, but even within them. Therefore, it is suggested that the term 'era' of higher inflation not be applied universally, but be interpreted in a country-specific context since countries react and cope with inflation in different ways- making it an 'era' of inflation for some and merely transitory for others. In this context, it is crucial to look at the consequences of inflation in one of the world's fastest growing economies, projected to grow even in 2023- India.

Despite policies aimed at curbing inflation, the informal and formal sector divide continues to be one of the relatively under-researched areas in terms of inflation impact. And so, we focus our analysis on the impact inflation has on India's informal sector that employs over 90 percent of its workforce. A diverging trend is observed between real wages in the agricultural sector and real GDP, indicating that inflation has negatively impacted wages. Almost all of the employment in agriculture is informal and so correlations are examined between wages and rural food inflation. Upon observing high correlations, VAR granger causality tests are conducted which reveal that there is no causal relationship between wages and inflationary pressure indicating that there is no wage-price spiral. Potential risks of the indicated falling purchasing power are indicated and policy suggestions are made to curb the same to revive the informal economy.

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I. Introduction

Inflation refers to the rise in the general price level which eventually translates into a general drop of purchasing power. Conventionally, the causes of inflation include demand-pull and supply-push factors, leading to a temporary imbalance between the demand and supply for money. However, herein lies the distinction between 'transitory' and 'permanent' inflation- while the former refers to an ephemeral price rise due to certain underlying factors, the latter refers to a permanent increase in the price level which is indicative of a general inability to bring back the inflation to its previous level. Theoretically, inflation works in a simple and logical manner- being determined by aggregate factors. However, the consequences of inflation are multifaceted and deep rooted in the lives of individuals. While a healthy level is indicative of higher consumption and a hypothetically booming economy, high levels of inflation have pervasive effects as they reduce the very ability to demand goods and services. This is why Central Banks around the world strive to control inflation and maintain it at a healthy level- while their policies and effects can vary across the world, they all work towards the goal of controlling the money supply in the economy so that its negative effects can be minimized.

However, there is a complication in the current world. While globalization has led inflation to become a global phenomenon, it has become more personal than ever given the rising inequalities and asymmetries in its impact on different countries and sectors of the society. This brings us to analyze the current problem- between March 2021 and March 2022, inflation more than doubled, creating disruptions across the world's commodity markets and the global patterns of trade. Diagnosing the problem provides a clear cause- the revival in demand after the drastic economic shock following the COVID-19 pandemic caused a 'demand-pull' inflation. Thus, the inflation in 2021 was believed to be transitory. However, the inflation only aggravated in 2022, with prices rising as high as the 1980s levels and finishing close to 9 per cent. With rising food and fuel prices, long-term supply chain disruptions, OPEC oil supply cuts, and the hike in oil prices following Russia's invasion of Ukraine, inflation seemed to be driven by supply-side factors. Moreover, a rise in core inflation, which accounts for commodities other than food and fuel, implies that inflation is here to stay.

Now while the inflation surge is evidently universal, there are vast variations in the way the inflation impacted different economies, and the way the economies 'fared' in dealing with the same. For instance, while countries like the UK saw a 23 percent rise in living costs over a 12-month period, India did not seem to have

been as negatively affected- at least statistically. For instance, according to an SBI Ecowrap report, India has performed the best in terms of keeping rising prices of food and shelter under control. Central banks around the world are targeting inflation, but there are several external factors which can affect the transmission of their policies to the economy itself. While some countries may be experiencing an 'era' of higher inflation, for others the problem may as well be transitory.

Being one of the largest emerging economies of the world in terms of both population and economic output, India is a country of contradictions. While its per capita income has increased over the years, its benefits have simply not accrued to all. For instance, the share of the top 10 percent of the population in the GDP of the economy is 57 percent, while that of the bottom 50 percent is 13 percent. Moreover, over 90 per cent of the workforce is employed in the informal sector and over 45 percent of the workforce in agriculture in India. Thus, the aggregate statistics may not always indicate the situation of the individuals. We therefore study the impact of inflation in the Indian context, since consequences on the livelihoods require more comprehensive analysis.

II. Literature Review

We start by looking at the existing literature regarding inflation and its impact within an informal economy. Castillo and Montoro (2012) investigate the impact of informal labour markets on inflation dynamics and the transmission of aggregate demand and supply disturbances. As in the Diamond-Mortensen-Pissarides model, they include the informal sector in a modified New Keynesian model with labour market frictions. Their primary findings indicate that the informal economy produces a "buffer" effect that mitigates the impact of demand disruptions on inflation. This finding is consistent with the empirical literature on informal labour markets' effects on business cycle fluctuations. This result suggests that in economies with sizable informal labour markets, changes in interest rates stimulate real output more effectively and have a smaller impact on inflation. In addition, the model generates cyclical transitions from informal to formal employment, which are consistent with the available data.

Many studies focus on the empirical relationship between inflation and other macroeconomic factors. Samal et al. *Future Business Journal* (2022) examines the effect of macroeconomic factors on food price inflation in India using monthly time series data from January 2006 to March 2019. The long-term relationship between the variables is confirmed using the ARDL bounds testing method of cointegration. Long-run estimates indicate that per capita income, money supply, global food prices, and agricultural wages have a positive and significant impact on food price inflation both in the short and long term. In both the short- and long-term, food grain availability has a negative and significant impact on food price inflation. Moreover, the short-term estimates revealed that the real exchange rate influences food price inflation positively. In the near term, the coefficient is insignificant. Granger causality estimates confirm a short-run bidirectional causal relationship between per capita income, the exchange rate, per capita net food grain availability, and food price inflation. In addition, there is evidence of unidirectional causation between global food prices and food inflation. However, there is no short-term causal relationship between money supply, agricultural wages and food price inflation.

Another key macroeconomic indicator, particularly unemployment holds an empirically ambiguous relationship when analyzed in the real-world context. In order to determine whether there is a trade-off between inflation and unemployment, Singh and Verma (2016) calculate the short-run trade-off between inflation and unemployment for the Indian economy over the period 2009–2015. In the near term, there is an inverse relationship between inflation and unemployment; as inflation rises, unemployment falls, and vice versa. With unemployment as its dependent variable in the first model, inflation in the second model, and real GDP in the third model, this variable is the topic of a bi-variants regression analysis. The results displayed a relationship between unemployment and inflation conditions as well as between unemployment and real GDP conditions, but this study determined that it was not statistically significant for the time period taken. The main policy consequence of these findings is that policymakers should work towards managing price instability, level of employment, and economic restructuring.

A more recent analysis by Vijay Victor et al. (2021) compares the impact of the pandemic on the inflation-economic output nexus in two countries- India and the United Kingdom. In the case of India, the short-run trade-off between inflation and unemployment does not exist since there is a positive relation between the two as indicated by the high inflation and unemployment. This implies India is going through a period of stagflation post the pandemic. In the UK, the short-run trade-off holds true as there is low inflation and high unemployment, which is bringing down the demand further causing a deeper recession in the economy.

There are a few studies that analyze the existence of a wage-price spiral in India, which has several implications for the agricultural informal sector, a key aspect of our analysis. For instance, by Sujata Kundu (2019, RBI) finds the impact of rural prices on the agricultural wages in India for the period January 2001 to February 2019. It finds that while agricultural and non-agricultural wages are positively related to rural prices in the long run, Indian agricultural wages do not move in tandem with inflation due to wage stickiness. This prevents a wage-price spiral from occurring in the Indian economy. Moreover, while the study provides evidence for inflation

induced wage pressures, it finds that the impact of wages on inflation is weaker. Thus, while in the short run the Indian economy does not experience the wage-price spiral, it can lead to worse conditions for the agricultural and informal sector due to inflation's negative impact on real wages.

Gaurav Datt et al (2007) analyse the impact of farm wages and food prices on poverty in India. Their study finds that there is an independent adverse effect of higher food prices on poverty. Moreover, inflation has a statistically significant effect on food prices. This study also finds evidence for wage-price stickiness, which implies that the short-term gains to the poor are much lower than the average long-term gains. This study has important implications for the far-reaching consequences of inflation on poverty in developing countries.

Studies covering the impact of inflation on the consumption patterns in India are critical in that they help infer the real impact of inflation on the day-to-day consumption by the masses. Amit Saha and Debopriya Kar (2022) find that over the ten-year period 2012-2021, inflation adversely affected the consumption of essential commodities. While prices of fish and meat almost doubled, the price of oils and fats grew by 77% and that of cereal by a reasonable 46%. The pandemic-driven downturn aggravated the impact of inflation since it led to increased volatility in income and prices. Moreover, there were far-reaching distributional consequences; for instance, while those with monthly income under Rs 50000 were majorly impacted by the inflation with a cut in consumption of fruits, pulses and cereals, those with monthly income exceeding Rs 100000 saw hardly any change. Combined with a lack of drastic increase in wage rates, the inflation seems to have aggravated the impact of the pandemic on the poor.

A study by P. Maneesh and Shaharban (2015) analyzes the impact of food inflation on change in consumption for those below the poverty line (BPL) and above the poverty line (APL) in the Kannur district of Kerala. The study finds that while majority of the BPL households spend a higher proportion of their income on food, the proportion of APL who do the same is much lower indicating lower average spending on food by this group. Moreover, roughly 58.4% of the BPL households and 48.67% of the APL households surveyed reduced their consumption of pulses, egg, meat and fish, cereals, fruits and vegetables. The study suggests strict control over the prices of essential commodities.

Lastly, we observe a recent study by Reis (2022) which provides possible explanations for the inflation of 2021-22. The study examines as to why despite having institutional arrangements for monetary policy have produced low and stable inflation for over two decades, central banks were unable to prevent a surge in inflation in 2021 and 2022. This paper examines four possible explanations for why this occurred. The first is a misdiagnosis of the character of shocks during a period of great uncertainty, which results in an excessively long period of expansionary policy. The second is a disregard for expectations data based on a strong belief that inflation expectations are firmly anchored and, therefore, that inflation increases will be transitory. The third is an excessive reliance on prior credibility, which creates the illusion of too much room to focus on the recovery of real activity while underestimating the resulting inflation. The fourth is a revision of strategy that made central banks more tolerant of higher inflation as a result of the trending decline in the return on government bonds, despite the high return on private capital. This paper suggests that primacy of price stability must be the goal that drives policy and that interest rates must be raised immediately to re-anchor inflation expectations rather than a wait and watch approach. After covering the existing literature in the prospective area of research, we move on to providing our analysis on the consequences of inflation in India, with a focus on its informal economy.

III. Methodology

Inflation in India is largely driven by food with it comprising around 40%¹ of India's inflation mix and food inflation due to the global supply chain disruptions has been one of the major reasons for India's growing inflation. With 61.5%² of rural employment coming from the agricultural sector, employment in agriculture being largely informal (97.1%)³, it was the perfect metric to see what has been driving inflation and to secondly see if wages are being able to keep up with inflation. We use the following two models to check for Granger Causality:

$$\Delta\text{CPI} = \alpha_1 + \beta_1\Delta\text{Wages} + \varepsilon_1$$

$$\Delta\text{Wages} = \alpha_2 + \beta_2\Delta\text{CPI} + \varepsilon_2$$

Here, Wages denote agricultural daily wages for the month, and CPI is the consumer price index for food in rural areas.

¹ Rangan, A. (2022, November 9). Time to Revisit India's Consumer Price Inflation Construct – Is Food Eating More than its Share? *The Probe*.

² Ramesh Chand, J. S. (2022). *Workforce Changes and Employment*. Niti Aayog.

³ Murthy, S. V. (n.d.). *Measuring Informal Economy in India _ Indian Experience*.

IV. Results and Discussion

Correlation and Graphical Analysis

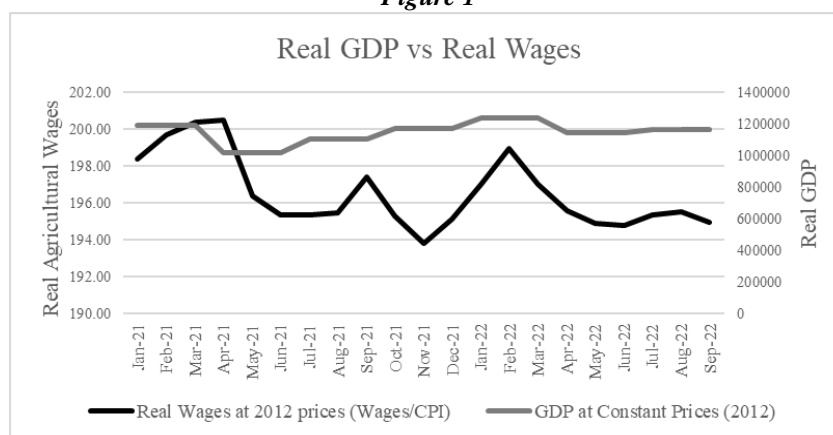
We analyze the correlation matrix between agricultural wages, combined Consumer Price Index, rural CPI, real agricultural wages at 2012 prices and real GDP at 2012 prices to check if the recent surge in price is accompanied by a rise in wages and output (Table 1). First, we find that real output is weakly positively related to inflation, implying that it seems to have risen or remained constant over the period 2021 and 2022. Second, we find that agricultural wages are highly correlated with CPI, rural CPI, and CPI for food which is a given considering all variables have more or less increased over the period of time. Third, not only are real agricultural wages significantly negatively related to CPI and rural CPI (-0.68 and -0.7 respectively), but also negatively related to agricultural wages. This means that during the period under study, while agricultural wages have risen, the real wages have fallen. In other words, wages haven't risen fast enough to cope up with the inflation, hence negatively impacting a major proportion of the country's population. Finally, real wages have a high negative correlation with rural CPI for food which helps conclude that the informal sector, particularly agricultural sector workers are impacted by the fluctuation in food prices to a greater extent.

Table 1

	Agricultural Wages	CPI Combined	CPI Rural	CPI Food Rural	Real Wages at 2012 prices	GDP at Constant Prices (2012)
Agricultural Wages	1					
CPI Combined	0.98035699	1				
CPI Rural	0.97580295	0.99938936	1			
CPI Food Rural	0.95242066	0.990720075	0.992835	1		
Real Wages at 2012 prices	-0.53135098	-0.685953763	-0.70361	-0.75011358	1	
GDP at Constant Prices (2012)	0.35793028	0.285088168	0.28311	0.27332304	0.063117584	1

When we analyze the movement of the real Gross Domestic Product and the Real Agricultural Wages over the period of 2021 and 2022, we find that the two seem to be diverging (Figure 1). While the real GDP seems to have remained more or less constant over the period of time, the real agricultural wages have seen not only large-scale fluctuations, but a downward trend during this time. Clearly, while the aggregate level data shows that India seems to be maintaining its growth in GDP despite the rising inflation, the stark contrast with the real income of people engaged in the informal sector, particularly agriculture shows otherwise. We can conclude that the inflation of 2021 and 2022 have had drastic impacts on the incomes, and in turn the consumption and livelihoods of millions in India- more so because the poor spend a large proportion of their income on consumption of essential commodities like food and shelter.

Figure 1



Source: Database on Indian Economy, RBI

VAR Granger Causality Tests

As shown previously, there is a high correlation between agricultural wages and CPI food rural for the period between 2021 to 2022. And so, to see if the degree of correlation implied causation, we conducted Granger Causality tests to see if one granger causes the other and vice versa.

Table 2

Granger causality H0: diffagwages do not Granger-cause diffcpifoodrural		
F-Test = 2.0833	p-value = 0.1967	
Granger causality H0: diffcpifoodrural do not Granger-cause diffagwages		
F-Test = 0.27925	p-value = 0.9271	

In order to make the data stationary and viable for testing, the first difference of the variables is considered (Table 2). As the results show, there is no causality relationship between the change in agricultural wages and food inflation in rural India. To account for potential seasonality with respect to food inflation, we further looked at correlation between Year-on-Year food inflation and agriculture wages growth. A value of 0.2142 indicates a low correlation between the variables. We further conducted granger causality tests on these variables as well.

Table 3

Granger causality H0: diffagwagesyoy do not Granger-cause diffcpifoodruralyoy		
F-Test = 0.24806	p-value = 0.943	
Granger causality H0: diffcpifoodruralyoy do not Granger-cause diffagwagesyoy		
F-Test = 3.8647	p-value = 0.06228	

We observe that at the generally accepted 5% level of significance there is no granger causality between year-on-year food inflation growth in rural India and year-on-year agricultural wages growth (Table 3). This allows us to conclude that food inflation in rural India is not driven by wages but due to other systemic factors that also implies that real wages are in fact on the decline, reducing purchasing power in rural India.

V. Conclusions and Policy Implications

In the last section, we summarize the main findings and suggestions regarding the impact of inflation on the informal sector in India. A lack of causality implies that there is no evidence of a wage-price spiral in India. In other words, in 2021-22, while inflation has not caused major changes in wages, the wages have not caused changes in inflation either. While this is positive in the sense that it prevents a feedback loop for higher inflation, it implies that the informal sector laborers, particularly the agricultural sector have witnessed a fall in their purchasing power.

Such a fall in purchasing power has far reaching implications in the economy. With a large part of the workforce earning their livelihood from the informal sector, the wages not being able to keep up with inflation has led to poor demand conditions in the economy. Given the informal sector's woes during and post the pandemic, the threat of the economy entering stagflation is a real and imminent one. And although policies are being implemented with a view to generate employment through PLIs for strategic industries, the decline in India's largest workforce employer has been simply dismissed as a 'slack in farm activities'.

One of the important aspects of dealing with the informal sector consequence of inflation is that agricultural sector growth should be promoted. As B. Dhar (2021) points out, it is critical to have a comprehensive agricultural policy in India since the sector has not experienced a 'high-growth' phase yet. While other sectors are driving the GDP in India as seen by the slow rising real GDP growth in 2021-22, agriculture has a long way to go. Moreover, the falling wages for agriculture are indicative of a skewed terms of trade between agricultural and industrial sectors at an aggregate level. Solving this would require "infusion of more buying power in the hands of 14 crore people" which would "create demand, help expand production and help increase employment in other sectors." (S. Varma, 2022).

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