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Collapse in Wage/Salary Income Growth in India, 2011-12 to 2017-18

Ravi Srivastava* and Balakrushna Padhi**

A comparison of the growth rate of wages and salaries in India over two time periods (2004-05 to 2011-12 and 2011-12 to 2017-18 shows that wage growth virtually collapsed in the second period. Surprisingly, this collapse was even more dramatic among regular workers and in urban areas and in the higher deciles of wage/salary earners. These results show that the manifestations of the economic crisis were already quite widespread and were not only restricted to the informal sector or to the urban/rural poor. The results also confirm other results and analyses which have also suggested that genesis of the economic crisis and slow down which is currently being debated goes back several years and is related to a series of economic policy shocks since the early years of the last decade, which intensified after demonetization and subsequent policy shocks.

The National Sample Survey Organization's Employment Surveys (now substituted by the Periodic Labour Force Survey of the renamed National Statistical Office) provide the most exhaustive data on employment and on wages and salaries in India. The Employment-Unemployment Surveys (EUS) and the Periodic Labour Force Surveys (PLFS) follow a different design but nevertheless provide robust estimates of employment and wages at the national and state level. This paper has compared the changes in weekly real earnings from wages/salaries between two time periods viz. 2004-05 to 2011-12 and 2011-12 to 2017-18. It concludes that wage growth collapsed in the latter period and even turned negative for several employment segments. It also shows that the wage and salary growth collapse was even more marked in the top deciles than in the bottom deciles.

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Choice of Cost of Living Indices

Analysis of real wage growth is sensitive to the choice of deflators and the manner in which they are used. In order to test how sensitive our results are to the choice of these deflators, we have compared wage growth between 2011-12 and 2017-18 using consumer price indices for Agricultural Workers and Industrial Workers, and the Consumer Price Index for Rural and Urban Areas. The construction of the different deflators is discussed in the Appendix. It may be mentioned that the latter series is available only from 2012 and hence cannot be used for longer term comparisons.

The results for wage growth (casual, regular, total) at the national level for male and female workers and for rural and urban areas for the different construction of the deflators is given in Table 1. These results show that growth rates based on the two indices based on CPI-AL and CPI-IW are broadly similar and these are also of similar magnitude to growth rates based on CPI-Rural and CPI-Urban at the All India level. But the other two indices built up from CPI-Rural and CPI-Urban at the state level give very differing results, with higher positive growth rates in wages (about 4 percent per year compared to about 1 percent in the other estimates).

Table 1

Growth Rate in Real Wages/Salaries 2011-12 to 2017-18 using different Deflators

	CPI-Al-IW-India	*CPI-Al-IW-States*	*CPI-Al-IW-States*	*CPI-Rural-Urban-India*	*CPI-Rural-Urban-States*	*CPI-Total-R+U-India*	*CPI-Total-R+U-States*
Rural	2.58	2.91	2.91	2.31	5.71	2.68	5.81
Urban	-1.52	-1.49	-1.49	-1.00	1.72	-1.39	1.62
Male	0.56	0.75	0.75	0.77	3.78	0.68	3.76
Female	2.33	2.31	2.31	2.55	5.57	2.44	5.54
Total	0.89	1.05	1.05	1.10	4.11	1.01	4.09

These variations may be kept in mind while discussing results in the rest of this paper. Since in any case, CPI-Rural and CPI-Urban indices are only available from 2012, the indices used in this paper are based on CPI-AL and CPI-IW and the methodology adopted is the same as for (b) above.

Growth Rate in Wages/Salaries, 2004-05 to 2011-12 and 2012 to 2017/18

A sharp deceleration in wage growth is observable in all segments (Table 2). Total wage growth rate declined from 6.47 percent in 2004-05 to 2011-12 to 1.05 percent during 2011-12 to 2017-18. Casual worker wage growth rate came down from 9.1

percent in the first period to 2.28 percent in the second period. Salaries of regular workers not only shrank but grew at a negative rate of 1.76 percent in the second period, compared a positive growth rate of 4.58 percent in the first period.

Table 2
Real Wage Growth for Workers Age 15-65 years

	2004-05 to 2011-12			*2011-12 to 2017-18*		
	Total	*Casual*	*Regular*	*Total*	*Casual*	*Regular*
Rural	6.10	8.04	3.02	2.91	2.34	-0.22
Urban	4.55	6.42	4.10	-1.49	1.10	-2.05
Male	4.77	7.08	3.78	0.75	2.23	-1.75
Female	7.92	8.24	4.87	2.31	1.34	-1.38
Total	5.52	7.75	3.91	1.05	2.26	-1.76

The decline in growth rate of wages was severe for both male and female workers, although wage growth of female workers continued to remain higher than male workers. Overall, wage growth rate for male workers declined from 5.59 percent to 0.75 percent, while that of female workers declined from 9.30 percent to 2.31 percent from period 1 to period 2 respectively. Among casual workers, growth rate of male casual wages declined from 8.31 percent to 2.25 percent while that of female casual workers declined from 9.68 percent to 1.36 percent respectively.

The brunt of the wage deceleration has been borne over the 2011-12 to 2017-18 period by urban workers and regular workers although all segments of workers have experienced sharp declines in growth rates in real wage/salaries.

Wage Growth across Industry Segments

There is a deepening of wage growth deceleration during 2011-12 to 2017-18 across all industry segments (Table 3). Interestingly, agricultural and construction which employ the highest proportion of casual workers show somewhat higher resilience with average wage growth rates during 2011-12 to 2017-18 of 1.36 percent and 1.86 percent respectively. Manufacturing shows a wage growth rate of 1.02 percent in 2011/12 to 2017/18 compared an annual growth rate of wages of 3.44 percent in the earlier period. Wages of workers employed by private households grew at annual rate of 0.99 percent compared to a rate of 5.48 percent per year in the earlier period. But all other industry groups, including transport, storage and communication, trade, hotels and restaurants, financial services and real estate, and public administration, show not only deceleration but also negative growth rate of real wages/salaries during 2011-12 to 2017-18. These results are largely determined

by the composition of the wage force in the industry groups. Industry groups with a higher proportion of casual workers continue to show positive but low wage growth, while those with a higher proportion of regular workers show negative growth rates over the recent period.

Table 3
Wage Growth by Industry Groups

Industry Group by Current Weekly Status (CWS)	*2004-05 to 2011-12*			*2011-12 to 2017-18*		
	Total	*Casual*	*Regular*	*Total*	*Casual*	*Regular*
Agriculture, hunting and forestry	8.27	8.40	6.05	1.36	1.45	-1.18
Mining and quarrying	5.36	4.06	5.33	-2.28	2.72	-7.29
Manufacturing	3.44	4.35	3.78	1.02	3.98	-1.27
Electricity, gas and water supply	-0.50	1.74	-0.68	-1.02	6.40	-1.06
Construction	5.56	5.45	4.80	1.86	1.68	1.86
Trade Hotels and restaurants	5.33	7.40	4.75	-0.26	0.41	-0.77
Transport, storage and communications	7.09	5.66	6.16	-2.23	0.52	-2.84
Financial & Real estate	3.45	-3.35	2.88	-4.30	10.87	-4.10
Public administration and defence	4.30	0.76	4.06	-0.82	-0.16	-0.74
Activities of private households as employers	5.48	4.76	5.45	0.99	4.48	0.27
Other Services	3.22	4.99	3.37	-0.76	3.90	-1.10
Total	5.52	7.75	3.91	1.05	2.26	-1.76

Wage Growth by Enterprise Size and Type and Type of Job Contract

We further analyse wage growth across types of job contracts, enterprise ownership type, and enterprise size between the two periods (Tables 4 to 6).

The EUS and the PLFS provide data on type of contracts of all wage workers with industry groups 014, 016, 017 and divisions 02- 99 i.e. wage workers in the non-agricultural sector and specific off-farm agricultural activities (broadly service and support activities related to animal production, and post harvest crop activities). Information is collected on whether the employees are without any written contract; or, if they have a written contract, whether the contract is (a) less than a year; (b) one to three years; (c) three years or more. The absence of a written contract indicates extreme precariousness, whereas very short-term contracts (now also permissible as fixed term contracts) also indicate precarious employment. Results on wage growth by type of contract for these workers (regular and casual) is given in Table 4.

Once again, wage growth decelerated sharply among all segments of wage workers – with or without contract and showed negative growth rate of 0.63 percent per year for all wage/salaried workers in these industry groups. Workers without contracts show a sharp decline from 5.04 percent per year during 2004-5 to 2011-

12 to 1.28 percent during 2011-12 to 2017-18 but wage growth remained positive for both casual and regular workers in the latter period. On the other hand, growth rate of workers' wages with written contracts not only decelerated compared to the earlier period but real wages actually declined in absolute terms between 2011-12 and 2017-18. The sharpest (negative) declines occurred for wage workers with short-term written contracts. Their wages declined by 4.18 percent a year between 2011-12 and 2017-18, while wages of this with longer term contracts declined at the rate of -.1.40 percent per year over this period.

Table 4
Real Annual Wage Growth of Workers by Type of Contract

Type of Job Contract	*2004-05 to 2011-12*			*2011-12 to 2017-18*		
	Total	*Casual*	*Regular*	*Total*	*Casual*	*Regular*
No-Written Contract	5.04	5.70	5.07	1.28	1.56	0.16
Any Written Contract	3.71	1.30	3.86	-1.88	-0.67	-1.90
Written Contract<1 year	5.81	1.25	6.62	-4.18	0.59	-4.82
Written Contract>1 year	4.13	2.54	4.12	-1.40	-2.67	-1.42
Total	3.45	5.63	3.70	-0.63	1.53	-1.80

Table 5 shows the growth of wages by enterprise size. Wage growth declined significantly across all size classes of enterprises. The percentage decline was largest for smallest sized enterprises (by 4.12 percent for enterprises with 9 or less workers), compared to 3.15 percent for enterprises with 10 to 19 workers, and by 3.71 percent for enterprises with 20 or more workers. *But during 2011-12 and 2017-18, wages in the largest size enterprises declined at the rate of -1.08 percent a year and regular wages in this segment declined by -2.03 percent a year. Regular workers' wages declined by -0.31 percent a year for enterprises with 10 to 19 workers, and by -0.14 percent a year for enterprises with less than 10 workers.*

Table 5
Real Annual Wage Growth of Workers Across Enterprises by Employment Size

Enterprise by Employment Size	*2004-05 to 2011-12*			*2011-12 to 2017-18*		
	Total	*Casual*	*Regular*	*Total*	*Casual*	*Regular*
>=20 workers	2.63	3.32	2.79	-1.08	1.89	-2.03
>9 <20 workers	4.07	4.76	4.30	0.92	1.36	-0.31
9 or less workers	4.81	6.31	4.70	0.69	1.20	-0.14
Not Known	3.09	5.47	3.98	-1.92	3.37	-4.08
Total	3.56	5.77	3.72	-0.60	1.56	-1.78

Table 6
Real Annual Wage Growth of Workers Across Enterprises Type

Enterprise Type by Ownership	*2004-05 to 2011-12*			*2011-12 to 2017-18*		
	Total	*Casual*	*Regular*	*Total*	*Casual*	*Regular*
Govt./Public	2.17	2.58	3.51	-0.85	-0.48	-1.60
Publ./Priv. Ltd.	3.30	4.95	2.80	-3.02	2.00	-3.74
Others	4.73	6.08	4.32	0.81	1.54	-0.08
Total	3.56	5.77	3.72	-0.60	1.56	-1.78

Table 6 compares the growth rate in wages across enterprise type. The sharpest decline in growth rate in wages across the two time periods took place in public/private limited enterprises (from 3.30 percent a year to -3.02 percent a year or by 6.32 percent a year), followed by others (individual, partnership etc.) – from 4.73 percent in the first period to 0.81 percent in the second period, or a decline in average growth rate by 3.92 percent a year in the recent period. Annual wage growth was *negative* in public sector enterprises during 2011-12 to 2017-18 and declined from 2.71 in the first period to -.0.85 percent in the second period. Wages/salaries of regular workers declined between 2011-12 and 2017-18 for all broad categories of enterprises and was negative for public/private limited enterprises, and public/government enterprises.

Wage Growth Across Decile Groups

Table 7 shows the annual growth rate in real wages across the decile groups (in terms of weekly total wages).

Table 7
Annual Real Wage Growth Across Decile Groups

Decile Group(s)	*2004-05 to 2011-12*			*2011-12 to 2017-18*		
	Total	*Casual*	*Regular*	*Total*	*Casual*	**Regular**
1 (Lowest)	7.67	6.39	5.85	3.42	3.90	2.41
2	7.69	8.91	4.97	3.35	1.95	2.04
3	7.43	9.36	4.37	3.22	1.78	2.00
4	6.95	8.84	4.23	3.14	2.03	1.32
5	6.96	8.75	3.91	2.79	2.39	0.37
6	6.22	8.38	3.24	2.67	2.78	-0.38
7	5.58	7.93	3.02	1.87	3.13	-1.60
8	5.24	7.56	3.34	1.41	3.27	-2.48
9	5.11	7.51	3.91	0.99	2.65	-2.14
10 (Highest)	4.48	6.81	4.47	-0.26	-0.01	-3.11
Top 30%	4.83	7.02	4.12	0.44	1.77	-2.69
Top 50%	4.92	7.34	3.93	0.77	2.23	-2.39
Bottom 30%	7.79	8.75	4.70	3.12	2.40	2.18
Bottom 50%	7.39	8.78	4.34	3.05	2.56	1.40
Total	5.52	7.75	3.91	1.05	2.28	-1.76

During 2004-05 to 2011-12, although the relationship was not systematic across decile groups, there was an inverse relationship between wage level (in terms of deciles) and wage growth. Wages of workers in the top 3 deciles grew at an average annual rate of 4.83 percent compared to a rate of growth of 7.79 percent a year for workers in the bottom 3 deciles. This was partly because both casual and regular workers in the bottom decile experienced a faster increase in wages. Another contributory factor was the composition effect: the percentage of casual workers whose wages grew at a higher rate than regular workers, was higher in the lower deciles.

Between 2011-12 and 2017-18, a sharper and systematic inverse relationship between decile groups and wage growth emerged. The rate of growth of wages was 3.42 percent in the lowest decile and -0.26 percent in the highest decile. Although growth of wages of casual workers was less systematically related to decile group, wage growth of regular workers declined systematically from the lowest to highest decile – from a positive annual growth rate of 2.41 percent in the lowest decile to -3.11 percent in the highest decile. Across the two time periods, wage growth declined from the first to the second period. The extent of decline was more or less similar across the decile groups - by 4.25 percent a year in the lowest decile and 4.49 percent a year in the highest decile.

These results have also been examined across different percentiles and are presented at the bottom of the table. Comparing the top 30 percent and the bottom 30 percent households we find that while wage growth declined in both segments, growth was comparatively more resilient in the low wage segment and for casual workers. The growth rate of casual wages for the top 30 percent wage earners was 7.02 percent in the first period and declined to 1.77 percent in the second period, while that of regular workers declined from 4.12 percent during 2004-05 to 2011-12 to -2.69 percent during 2017-18. Among the bottom 30 percent households, casual wages grew by annual rates of 8.75 percent and 2.40 percent, and casual wages by 4.70 percent and 2.18 percent, during 2004-05/2011-12 and 2011-12./2017-18 respectively.

State-level Growth in Wages

Although wage growth has decelerated across all major segments of workers, as we have shown above, there is higher wage growth at lower levels of wages. One explanation of this is the so-called base effect. A number of high wage states also

showed low and even negative growth rate of wages. This included states such as Kerala, Tamil Nadu, Karnataka, and Haryana. Wages of workers in most high wage states, including the ones mentioned above increased at low rates while wages of most low wage states (Bihar, Chhattisgarh, Odisha, Rajasthan, Uttar Pradesh) have increased at a higher level in the second time period. This is shown in Table 8. There are some exceptions to this trend among both high wage and low wage states, but in general, the catching up of wages in low wage states provides a partial explanation to the inverse relation between the results observed between wage levels and wage growth at the national level. The general relationship between average wage level and wage growth at the state level is shown in Figure 1.

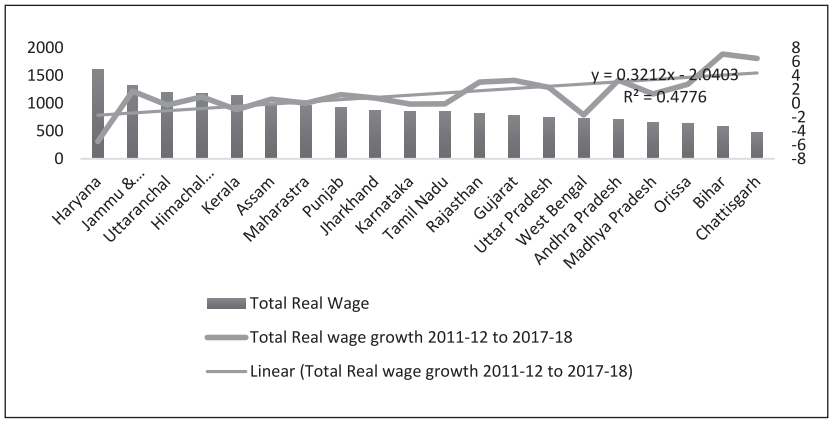
Table 8
Annual Rate of Growth of Real Wages Across Major States in India

	2004-05 to 2011-12			*2011-12 to 2017-18*		
	Total	*Casual*	*Regular*	*Total*	*Casual*	*Regular*
Jammu & Kashmir	3.54	2.90	4.67	1.79	2.73	0.27
Himachal Pradesh	3.22	4.65	2.32	0.95	2.07	0.02
Punjab	1.83	6.65	-0.13	1.26	-0.56	1.20
Uttaranchal	4.50	4.61	4.10	-0.23	1.68	-2.35
Haryana	9.42	7.33	10.15	-5.51	-1.43	-7.35
Rajasthan	3.38	4.89	3.27	3.07	2.82	-0.28
Uttar Pradesh	4.15	6.61	5.61	2.32	2.74	-1.53
Bihar	6.87	9.28	0.86	7.09	8.60	-1.23
Assam	6.14	5.31	4.84	0.60	5.72	-2.87
West Bengal	4.08	6.36	3.69	-1.67	1.51	-5.65
Jharkhand	4.01	8.31	2.39	0.77	1.58	-3.39
Orissa	5.60	8.10	1.57	2.74	3.12	-0.05
Chhattisgarh	2.36	5.06	0.60	6.47	5.01	1.00
Madhya Pradesh	6.16	7.43	5.43	1.37	3.27	-1.21
Gujarat	4.07	4.71	1.38	3.31	3.08	1.16
Maharashtra	5.27	6.65	3.30	0.05	2.08	-1.70
Andhra Pradesh	8.19	10.63	4.98	3.34	2.73	1.38
Karnataka	8.19	9.34	2.82	-0.12	1.09	-1.97
Kerala	6.99	7.08	5.85	-0.92	-3.72	-1.64
Tamil Nadu	6.43	10.20	5.00	-0.06	-1.12	-2.43
Total	5.52	7.75	3.91	1.05	2.26	-1.76

The inverse relationship between average total wages and wage growth between 2011-12 and 2017-18 is shown in Figure 1.

Figure 1

Average Wage across States (2011-12) and Growth in Wages 2011-12 to 2017-18



Genesis of the Present Economic Crisis

The dismal performance of wages/.salaries in 2017-18 shows that the onset of the present economic slowdown started earlier than the slowdown in GDP growth witnessed post-2018-19. The performance of the Indian economy in the recent period is being extensively debated. While wage incomes appear to have performed dismally between 2011-12 and 2017-18, paradoxically, the aggregate performance of the Indian economy, as measured by the growth rate was far more promising. GDP, in real terms, grew at an average annual rate of 7.3 percent between 2011-12 and 2017-18. However, two recent papers by the former Chief Economic Advisor to the Government of India (Subramaniam 2019a and 2019b) have contended that the GDP estimates are not consistent with several other macroeconomic indicators, and may be overstating the growth performance of the economy between 2011-12 and 2016-17 by about 2 ½ percent. Subramanian shows that data from 17 indicators show very low performance after 2011-12. He uses four key indicators (real export growth, import growth, credit growth and electricity consumption) to show that these growth rates were well correlated with GDP growth figures till 2011-12 but diverged from the GDP growth figures for the period 2011-12 to 2016-17. A multi-country econometric exercise on the relationship between these indicators and GDP growth also shows that India would be an outlier on the basis of the GDP growth for the post 2011-12 growth figures. This has been rebutted by the Prime Minister's Economic Advisory Council (Debroy et al 2019). Apart from mounting a defense of official GDP estimation methodology, the EAC paper suggests that there could have been a break in the relationship between different growth drivers and GDP

growth, with growth in the recent period being more consumption and investment but the paper fails to establish that such a break has occurred (Subramaniam 2019b).

We note that as this controversy regarding past growth performance was raging, the Indian economy was rapidly descending into a phase of severe growth slowdown, on the basis of the GDP figures. The recent NAS data on quarterly GDP show a downward trend since the first quarter of 2018-19. There is also a significant slowdown in private investment and consumption growth. A direct fallout of the slowdown in consumption growth is the fall in demand for a whole range of consumer products which is leading to an intensification of the slowdown. Manufacturing growth has decelerated and indicators of firm performance (profitability, capacity utilization) continue to be grim.

Subramaniam (2019b) refers to the series of economic shocks faced by the economy since 2011-12, which have included the collapse of exports and real credit growth, and demonetization in November 2016. After 2016, the ban on bovine trade imposed in May 2017, and the introduction of GST in June 2017 constituted further economic policy shocks which may have contributed to the economic slowdown and the reduced growth in wages and salaries through demand contraction and impacting adversely on the informal and small-scale sector. However, the impact of these shocks clearly rapidly percolated upwards and appears to have been economy wide and also felt by the organized sector of the economy and is clearly corroborated by recent data on sales and profit as well as macro data on exports, imports, and GDP growth.

Furthermore, the impact of the economic crisis has now been adequately shown by the survey results on employment and consumption. As is well known now, employment growth slumped after 2011-12. The Employment-Unemployment Survey carried out by the Labour Bureau, Ministry of Labour and Employment provided the first major evidence of the slump in employment. Between 2011-12 and 2015-16, employment declined at the rate of -1.92 percent per year for the 15+ age group. The PLFS report for 2017-18 which was released in June 2019 has provided further direct evidence on the trends in employment in the economy. The results from the PLFS reinforce the trends which were discernible from analysis of the EUS and the Employment-Unemployment Surveys of the Labour Bureau. They confirm that the aggregate labour force participation rates have continued to fall and more significantly unemployment rates, measured by any one of the available indicators has risen sharply between 2011-12 and 2017-18. Between 2011-12 and

2017-18, we estimate that total employment (all ages) declined at an annual rate of -0.24 percent. Moreover, the usual status unemployment rates also surged from 2.2 percent in 2011-12 to 6.2 percent in 2017-18.

On the consumption front, using data on consumption expenditure collected on usual consumption expenditure collected in socioeconomic surveys for 2014 (January-June 2014), 2014-15 (July 2014-June 2015) and 2017-18 (July 2017-June 2018), by the National Sample Survey Office (NSSO), as part of the other socioeconomic surveys, including the PLFS, Himanshu (2019) finds that in 2018, prices, average consumption expenditure in rural areas declined from ₹1,587 per person per month in 2014 to ₹1,524 ppm in 2017-18. The decline in urban areas was from ₹2,926 ppm in 2014 to ₹2,909 ppm in 2017-18. While per capita consumption did increase marginally in 2014-15, the first year of the Modi government, after 2015-16, it declined at 4.4% per annum in rural areas and 4.8% per annum in urban areas. Himanshu (ibid.) notes that NSSO consumption expenditure figures have been available, there has never been such a sharp decline. The results of the detailed consumption survey carried out in 2017-18 have not been released by the National Statistical Office. However, quoting from the unpublished NSO report, Jha (2019) states that the average per capita per month consumption expenditure fell by 3.7 per cent to ₹1,446 in 2017-18 from ₹1,501 in 2011-12. In rural areas, average per capita consumption declined by 8.8 percent between 2011-12 and 2017-18, while it rose only by 2 percent in urban areas over the six year period. Worryingly, average food consumption dipped over the period. In rural areas, per capita food consumption expenditure fell by 10 percent, while it remained almost unchanged in urban areas (₹946 each in 2017-18, compared to ₹943 in 2011-12. The expenditure on non-food items, such as durable goods, clothing, education, and rent, was lower by 7.6 per cent in 2017-18 in rural areas, and increased by 3.8 per cent in urban areas, compared to 2011-12.

Conclusion

This paper has analysed the wage trends which are provided by the PLFS. Forty-seven percent workers in 2011-12 and 48 percent workers in 2017-18 were wage earners. The paper has also analysed changes in wages/salaries of wage/salaried workers in the non-farm sector. These workers comprised 66 percent of all wage workers in 2011-12 and 74.8 percent of all workers in 2017-18. For these workers, the surveys provided additional data on enterprise size and type, nature of their employment contract, and availability of social security.

The results show that wage growth plummeted between 2011-12 and 2017-18. The low rate of growth of casual wages in recent years has already been noted in other articles and commentaries. The analysis on this paper shows wage growth deceleration was much more widespread and was indeed even more significant for regular waged workers, urban workers, and for workers in the higher deciles. In most segments regular workers experienced declines in real wages over the period. One of the reasons why wages at the lower levels remained more resilient was that average wages rose more in states with lower initial average wages than those in states with higher average wages in 2011-12.

The stagnation and decline of real wages and salaries between 2011-12 and 2017-18 provides direct evidence that the economic performance of the economy was impacted by a series of economic shocks which were policy induced. Interestingly, the stagnation/decline in wages and salaries was even more marked in the upper deciles of the wage distribution. This correlates with evidence on declining per capita consumption provided by the consumption surveys. Combined with declining labour force participation and higher unemployment rates, the picture of stagnant/declining wages and incomes underscores the serious nature of the crisis that the economy was already facing by 2017-18. These results also provide an explanation for the aggregate demand constraint faced by the economy since 2018-19, manifested even by industries marketing products demanded by the middle and upper income groups.

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APPENDIX

1. Use of CPI Deflators for Real Wage Changes

The EUS and PLFS nominal weekly wages have converted into real weekly wages by using the relevant Consumer Price Index (CPI-AL-IW & CPI-Rural-Urban). Broadly, a Consumer Prices Index (CPI) is planned to quantify changes over time in the level of retail prices of selected goods and services on which consumers of a defined group spend their incomes.

It is important to note that, the data on average weekly wage earnings received by casual labourers and regular wage/salaried employees during the reference week is collected from the NSSO surveys on Employment and Unemployment (EUS) and the daily and monthly wage data for casual and regular workers separately in the PLFS respectively. In the PLFS, the daily and monthly wages are converted into weekly wages by adding the daily wages together for casual wage workers and dividing 30.5/7=4.357 for the regular wage workers.

This study has used different CPI (AL-IW) adjusted indices to compare the real wage rates for the periods 2004-05, 2011-12 from the EUS and 2017-18 from the PLFS. These includes, CPI Agricultural Labour (AL) (on base 1986-87=100 converted to 2001 base) for rural area and Consumer Price Index Numbers for Industrial Workers (CPI-IW) for the urban area on base 2001=100. While defining the notion of IW and AL, study of Papola (2014) shows, "Target population for this index is the working class family. A working class family was defined as one which (i) was located within the centre (industrial area), (ii) had at least one member working as a manual worker in an establishment…" and the AL as "Target populations of these indices are agricultural and rural labour households. A rural labour household is defined as one, which derived major income during the last 365 days from wage paid manual employment (rural labour) vis-à-vis wage paid…"

Here, firstly, we have considered the CPI-AL (on base 1986-87=100 converted to 2001 base) (Rural) and CPI-IW-2001=100 (Urban) converted to the 2001 base for all India and states separately to convert the given nominal wages to real wages. For few states, where we have not got any information on state specific price indices (CPI-AL-IW separately), we have used the national price indices in those particular states. These indices (CPI-AL-IW-2001=Base) have been incorporated in the NSSO unit data. Accordingly, the real weekly wage rates have been calculated based on these price indices. So, we have computed the real wage rates firstly using national CPI (AL-IW) deflators and secondly using state specific CPI (AL-IW) deflators. The given nominal wages are converted into real wage rates for the regular wage workers, casual wage workers and total wage workers respectively.

Further, we have also taken the new price indices viz. CPI-Rural, CPI-Urban and CPI-Total price indices which are available for all India and states separately with 2012 as base year to estimates the real wages. This is only possible for the 2011-12 EUS and 2017-18 PLFS. With the recommendation of Dr C Rangarajan commission for the construction of

a CPI indices for rural and urban as well as combined for all-India and all states separately, CSO started compilation of a new series of CPI with Base 2010=100, with effect from January 2011. Also, the CSO, MOSPI has revised the Consumer Price Index (CPI) base year for Rural, Urban and Combined from 2010=100 to 2012=100 with effect from the release of indices for the month of January 2015. The only change in this index is the grouping of egg, fish and meat in the food item.

Secondly, the total real wage estimates for the period 2011-12 and 2017-18 are based on CPI Rural-Urban-2012=100 base and CPI combined rural and urban 2012=100 base for the national level and state level respectively. These indices (CPI-Rural-Urban-2012=100 base) have been incorporated in the NSSO unit data to get the real wage estimates for regular workers, casual workers and total workers.

Accordingly, the real wage estimates were calculated by using six different CPI indices. These includes,

- All India CPI-AL (Rural) and CPI-IW (Urban) in 2001 base
- States specific CPI-AL (Rural) and CPI (Urban) in 2001 base
- All India CPI-Rural and CPI-Urban in 2012- base
- State specific CPI-Rural and CPI-Urban in 2012- base
- Total All India CPI- Rural + Urban in 2012 base
- Total State specific CPI- Rural + Urban in 2012 base

It is interesting to note that, with the changes in the base year effect (CPI-AL-IW-2001=100 & CPI-Rural-Urban-100=2012), the corresponding real wage growth rates also change with the use of different price indices. We have presented the different results for comparision. However, in the final estimation we have only considered the state level CPI-AL and CPI-IW indices at 2001=100 base. This is because different state level CPI-AL-IW-2001=100 base gives better estimates as compared to national level aggregate CPI deflators.

2. Decile Computation

The given nominal wages are converted into real wages using required CPI deflators. Afterwards, the real wages (regular, casual and total separately) are converted into 10 decile groups. Broadly, a decile rank arranges the given datasets in order from lowest to highest and is done on a scale of one to ten where each successive number corresponds to an increase of 10 percentage points. Such as, in the 1st decile or D1, is the point which has 10% of the observations below it, D2 has 20% of the observations below it and so on. Namely, D1=Value of [n+1/10]th Data and so on.

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