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Performance of arrivals and prices of major rabi crops in APMC Hinganghat

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Abstract

The present study examined the variability and seasonal behaviour of arrival and prices of Wheat, Jowar and Chickpea, three major rabi crops handled at the Agricultural Produce Market Committee (APMC), Hinganghat, in Wardha district of Maharashtra. Agricultural markets in this region are characterised by sharp fluctuations in the quantity of produce arriving and the price it commands, and understanding the extent and pattern of these fluctuations is essential for improving farmer income and market efficiency. The study was based on twenty years of monthly secondary data (2004-05 to 2023-24) obtained from APMC Hinganghat records and Agmarknet. The coefficient of variation (CV) was used to measure the extent of instability in arrival and price for the first period (2004-05 to 2013-14), the second period (2014-15 to 2023-24) and the overall period, while seasonal indices were computed by the simple average method to identify months of peak and lean arrival and the corresponding price behaviour within the marketing year. Results showed that arrival was considerably more unstable than price for all three crops in every period studied, with Jowar recording the highest arrival instability (up to 146.59 per cent) and Chickpea the lowest, despite handling by far the largest trading volumes. All three crops exhibited a clear inverse relationship between seasonal arrival and price, with arrivals peaking sharply during the harvest months of March to May and prices correspondingly at their lowest during this period, before recovering during the lean months preceding the next harvest. The findings suggest that improved storage infrastructure and staggered marketing by farmers could help reduce the price disadvantage associated with selling immediately after harvest, and that Jowar's increasingly thin and erratic trading pattern may warrant closer market attention.

Keywords: Agricultural marketing, Coefficient of variation, Seasonal indices, APMC, Rabi crops, Wardha

1. Introduction

Agriculture continues to be the backbone of the Indian economy, and efficient marketing systems play a crucial role in ensuring that farmers receive fair prices for their produce. Agricultural Produce Market Committees (APMCs) occupy a central position in this system, having been established under state Agricultural Produce Marketing (Regulation) Acts to protect farmers from exploitation by unorganised middlemen and to create a transparent system of price discovery through open auction. Over time, these regulated markets have evolved into vital centres for market intelligence, and their long-maintained records of daily arrivals and prices provide a valuable and largely underused resource for systematic market research.

Fluctuations in the arrival and price of agricultural commodities directly affect both farmer income and consumer prices. During peak harvesting months, markets typically witness heavy arrivals, which places downward pressure on prices; conversely, restricted arrivals during lean months generally allow prices to recover. Beyond this seasonal rhythm, arrivals and prices also vary considerably from one year to the next, driven by weather conditions, production levels, storage behaviour, and shifting cropping patterns. Understanding both dimensions of this variability, the year-to-year instability and the within-year seasonal pattern, is essential for farmers in planning the timing of their sales, for traders in anticipating market behaviour, and for policymakers in designing measures for price stabilisation and market infrastructure development.

A number of studies have examined these questions for individual crops and markets across India. Kumbhar and Amale (2016) ^[5] analysed long-term trends in arrivals and prices of

major pulses across several APMCs of Maharashtra using compound growth rates and coefficient of variation, and found that price variability was particularly high for gram and tur, driven by production risk and shifting consumer demand, while arrival variability differed considerably from pulse to pulse depending on regional production stability. Working specifically on sorghum, Chopade *et al.* (2022) ^[1] examined trends and market integration of kharif sorghum in Beed district of Maharashtra, finding a significant negative growth rate in arrivals at two of three markets studied, reflecting a shift by farmers away from sorghum toward more remunerative crops, while prices nonetheless rose across all three markets. In a more recent study, Jagtap *et al.* (2026) ^[3] examined intra-year variability in sorghum arrivals and prices across six major APMCs of Maharashtra and found that in every single market studied, variation in arrivals was consistently and substantially greater than variation in prices, a pattern the authors attributed to the buffering effect of storage, trader behaviour and government price-support measures even where supply itself remains highly erratic.

For wheat, Ragade *et al.* (2020) ^[8] studied price behaviour across five major APMCs of Maharashtra using the moving-average ratio method and found that wheat prices were consistently higher from July to December while arrivals were concentrated between March and June, the classic post-harvest supply glut, with the underlying trend in both arrivals and prices found to be rising over the study period. Thakare *et al.* (2024) ^[10] examined the effectiveness of agricultural price policy on wheat in Maharashtra and reported medium variability in wholesale prices alongside significantly positive growth in wholesale price, farm harvest price and minimum support price series alike.

For chickpea, Naik *et al.* (2015) ^[7] studied trends in arrivals and prices in the Solapur district of western Maharashtra using compound growth rates on eleven years of monthly data, while more recently Khairnar *et al.* (2026) ^[4] analysed the seasonal behaviour, price trends and market integration of chickpea across major APMCs in Maharashtra, finding that seasonal indices estimated by the moving-average method revealed a peak in arrivals during February to April, coinciding with the post-rabi harvest, with prices moving in the reverse direction. Sonawane *et al.* (2024) similarly examined the growth and instability of chickpea performance in Maharashtra, applying compound growth rate and an instability index across defined sub-periods, an approach closely mirrored in the methodology of the present study.

While these studies provide valuable evidence on individual crops and markets, no earlier study has examined Wheat, Jowar and Chickpea together within a single market over an extended period. APMC Hinganghat, located in Wardha district of Maharashtra, is the largest regulated market yard in the Vidarbha region and handles substantial arrivals of all three crops during the rabi marketing season, making it a suitable site to address this gap. The present study was therefore undertaken with the following objectives: (i) to study the variation in the market arrivals and prices of Wheat, Jowar and Chickpea in APMC Hinganghat, and (ii) to analyse the seasonal variation in the arrivals and prices of the selected crops.

2. Materials and Methods

2.1 Study Area

The study was conducted at the Agricultural Produce Market Committee, Hinganghat, known as the Chhatrapati Shivaji Market Yard, located in Wardha district of Maharashtra. Wardha district lies in the Vidarbha region under the Nagpur revenue division and is predominantly agricultural, with black cotton soil formed from the underlying Deccan trap supporting a cropping pattern in which cotton dominates the kharif season while Wheat, Jowar and Chickpea anchor the rabi season. APMC Hinganghat is recognised as the largest regulated market yard in the Vidarbha region, equipped with an auction platform, weighbridge, and storage facilities, and conducts all sales through the open auction method prescribed under the Maharashtra Agricultural Produce Marketing (Regulation) Act, 1963.

2.2 Data Source and Period

The study is based entirely on secondary data. Monthly data on the arrival and prices of Wheat, Jowar and Chickpea were collected from the official records maintained by APMC Hinganghat, supplemented where necessary by data available on Agmarknet. The study covers a period of twenty years, from 2004-05 to 2023-24. To examine whether the extent of instability changed over time, this twenty-year period was further divided into two equal sub-periods of ten years each: the first period (2004-05 to 2013-14) and the second period (2014-15 to 2023-24), in addition to the overall twenty-year period.

2.3 Analytical Tools

Coefficient of Variation. The degree of instability in the annual arrival and price of each crop was measured using the coefficient of variation, computed separately for the first period, second period and overall period:

$$CV (\%) = (\sigma / \bar{X}) \times 100$$

where σ is the standard deviation and $\bar{X}$ is the arithmetic mean of the variable (arrival or price) over the period concerned. A higher CV indicates greater year-to-year instability, while a lower value indicates comparatively stable market behaviour.

Seasonal Indices. The seasonal pattern of arrival and price within the marketing year was examined using seasonal indices computed by the simple average method. For each month, the average value across all twenty years was first calculated; the average of these twelve monthly averages then formed the grand average, and the seasonal index for each month was obtained as:

$$\text{Seasonal Index (Arrival or Price)} = (\text{Actual average for the month} / \text{Moving average for the month}) \times 100$$

An index above 100 indicates that arrivals or prices in that month typically run above the annual average, while an index below 100 indicates the opposite. For the price series, months in which no trading occurred were excluded from the monthly average, since a recorded price of zero reflects an absence of trading rather than an actual market price, and its inclusion would have understated the true seasonal price level.

3. Results and Discussion

3.1 variability in arrival and prices

The coefficient of variation in arrival and price of Wheat, Jowar and Chickpea is presented in Table 1.

Table 1: Coefficient of Variation (%) in Arrival and Price of Wheat, Jowar and Chickpea, APMC Hinganghat (2004-05 to 2023-24)

Crop	Period	CV - Arrival (%)	CV - Price (%)
Wheat	First (2004-05 to 2013-14)	72.83	24.25
	Second (2014-15 to 2023-24)	69.20	15.66
	Overall (2004-05 to 2023-24)	72.91	30.78
Jowar	First (2004-05 to 2013-14)	140.63	33.34
	Second (2014-15 to 2023-24)	103.78	23.03
	Overall (2004-05 to 2023-24)	146.59	40.69
Chickpea	First (2004-05 to 2013-14)	45.89	27.22
	Second (2014-15 to 2023-24)	48.78	18.14
	Overall (2004-05 to 2023-24)	77.34	37.79

For Wheat, the coefficient of variation in arrival remained consistently high across all three periods, ranging between 69.20 and 72.91 per cent, while price instability was markedly lower, falling from 24.25 per cent in the first period to 15.66 per cent in the second, before rising to 30.78 per cent when the full period was considered together, reflecting the wider price range spanned once both sub-periods were pooled. Jowar recorded the highest instability in arrival among the three crops in every period, reaching 146.59 per cent overall, a pattern consistent with the very small and, in a number of months and years, entirely absent quantities of Jowar traded at APMC Hinganghat, reflecting its marginal and declining position in the local cropping pattern. Even Jowar's price instability, at 40.69 per cent overall, was the highest recorded among the three crops. Chickpea, in contrast, recorded the lowest arrival instability of the three crops in every period, though this instability rose noticeably, from 45.89 per cent in the first period to 77.34 per cent overall, as the scale of Chickpea trading at the market expanded rapidly over the two decades. Across all three crops and all three periods, arrival proved consistently more unstable than price, indicating that the

physical quantity of produce reaching the market fluctuates far more sharply from year to year than the price farmers actually realise. This finding is consistent with Jagtap *et al.* (2026) [3], who reported the same systematic gap between arrival and price variability across six sorghum markets of Maharashtra, and with Kumbhar and Amale (2016) [5], who similarly found price variability in Maharashtra's pulse markets to be comparatively contained relative to the swings observed in arrival volumes. The comparatively low price instability observed for all three crops in the present study suggests that trader behaviour, storage practices and, for wheat, minimum support price operations, may be absorbing a substantial share of the volatility that would otherwise be transmitted directly from arrivals to prices.

3.2 Seasonal Variation in Arrival and Prices

The seasonal pattern of arrival and price for the three crops is summarised in Table 2.

Table 2. Peak and Lean Seasonal Indices of Arrival and Price of Wheat, Jowar and Chickpea, APMC Hinganghat (2004-05 to 2023-24)

Table 2: Seasonal Indices of Arrival and Price of Wheat, Jowar and Chickpea, APMC Hinganghat (2004-05 to 2023-24)

Month	Wheat Arrival	Wheat Price	Jowar Arrival	Jowar Price	Chickpea Arrival	Chickpea Price
January	31.15	109.04	98.48	101.65	5.28	90.14
February	31.59	102.23	119.63	75.22	116.08	96.38
March	175.96	99.54	88.88	101.13	353.97	96.18
April	163.57	94.28	138.49	108.14	251.48	98.39
May	183.08	94.13	192.40	109.42	193.83	97.51
June	145.88	93.91	100.62	91.30	114.39	98.01
July	86.19	97.09	71.51	102.55	74.93	104.02
August	93.79	100.43	84.92	104.05	37.02	104.98
September	97.21	98.81	85.34	102.44	20.18	108.44
October	87.55	99.09	74.68	101.67	14.14	105.97
November	54.81	105.31	50.39	95.96	11.72	103.09
December	49.23	106.14	94.66	106.48	6.98	96.90

Wheat arrivals rose sharply through the harvest window, peaking in May at more than 1.8 times the annual average, before falling to their lowest point in January, when arrivals were less than a third of the average month. Prices moved in the opposite direction, reaching their lowest point during the peak arrival months of April to June and recovering to their highest level in January, precisely when arrivals were at their thinnest. Jowar followed a broadly similar pattern, with arrivals peaking in May and falling to their lowest in November, though its price behaviour was considerably more erratic; the seasonal price index collapsed to 75.22 in February, well below the otherwise narrow band observed in the other eleven months, a pattern consistent with the very thin and irregular trading recorded for Jowar in Table 1. Chickpea displayed by far the sharpest seasonal swing of the

three crops: arrivals in March alone reached nearly three and a half times the annual average, while January arrivals were almost negligible, at just over five per cent of the average month. chickpea prices were correspondingly firmest in September and October, during the lean arrival period preceding the harvest, and weakest in January.

This consistent inverse relationship between seasonal arrival and price across all three crops reflects the classical harvest-glut effect widely documented in Indian agricultural markets, whereby heavy post-harvest supply depresses prices and restricted off-season supply allows them to recover. The pattern closely mirrors that reported by Ragade *et al.* (2020) [8] for wheat markets across Maharashtra, where arrivals concentrated between March and June produced a corresponding seasonal dip in prices, and by Khairnar *et al.*

(2026) ^[4] for chickpea, where arrivals peaking during the post-rabi harvest period were met with a clear reverse movement in prices. The particularly pronounced seasonal swing observed for Chickpea in the present study, considerably sharper than that of Wheat or Jowar, is consistent with Chickpea's position as the fastest-growing and most heavily traded of the three crops at APMC Hinganghat, where a rapidly expanding harvest-time supply appears to be concentrated within an even narrower window than for the other two crops.

4. Conclusion

The study concludes that arrival, rather than price, is the more volatile and unpredictable element of the market for Wheat, Jowar and Chickpea at APMC Hinganghat, a pattern that held consistently across both sub-periods and the study period as a whole. Jowar emerged as the most unstable crop by a considerable margin, reflecting its diminishing importance within the local rabi cropping pattern, while Chickpea, despite the rapid expansion of its trading volume, remained comparatively the most stable of the three crops in terms of arrival. A clear and consistent seasonal pattern was also observed across all three crops, with the harvest months of March to May bringing the heaviest arrivals and the lowest prices, and the lean months preceding the next harvest bringing the firmest prices. These findings suggest that expanding storage infrastructure in and around Hinganghat, and encouraging farmers to stagger their sales beyond the immediate post-harvest period, could help improve price realisation, particularly for Wheat and Chickpea, while the increasingly thin and erratic trading pattern observed for Jowar may warrant closer monitoring by the market committee to sustain effective price discovery for the crop.

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