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Seasonal Dynamics and Price Variability of Soybean (*Glycine max* L.) in Maharashtra: A Time Series Analysis

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Abstract— *Soybean is a major oilseed crop important for nutrition and agro-industrial development in India and Maharashtra as well. The study analyzes seasonal variation, trends in arrivals and prices, and price variability using time series analysis. Time series data on monthly arrivals and prices of soybean were collected from five major APMC markets (Latur, Amravati, Khamgaon, Jalna and Hinganghat) in Maharashtra for a period of 16 years (2009–2024). Seasonal patterns in arrivals and prices were analyzed using seasonal indices and measures of intra-year and inter-year variability. The study analyzed seasonal indices and variability of soybean arrivals and prices across major markets in Maharashtra. Arrivals were highly concentrated during post-harvest months (October–November), while prices were higher during lean periods, indicating a significant inverse relationship. Intra-year analysis showed that arrivals fluctuated more than prices, whereas prices remained relatively stable. Inter-year analysis also confirmed higher variability in arrivals compared to prices across markets. These variations are mainly influenced by production, climatic conditions, and supply factors. Overall, storage and steady demand help in maintaining price stability despite fluctuations in arrivals*.

Keywords— Seasonal indices, Intra-year variability, Coefficient of variation, Soybean arrivals and prices, Trend.

I. INTRODUCTION

Soybean (*Glycine max* L.) is one of the most important oilseed and pulse crops in the world, valued for its high protein (around 40%) and oil content (about 20%). It plays a crucial role in ensuring nutritional security as well as supporting agro-based industries through products like edible oil, soybean meal, and livestock feed. Globally, soybean contributes significantly to agricultural trade and income generation, making it a key commodity in both developed and developing economies. In India, soybean has emerged as a major *kharif* crop, particularly in states like Madhya Pradesh, Maharashtra, and Rajasthan, where it has transformed the oilseed economy and enhanced farmers' income. India accounts for about 11.2 million hectares under soybean cultivation with a production of nearly 11.0 million tonnes and an average productivity of around 983 kg/ha. In Maharashtra, soybean occupies about 3.8 million hectares with a production of approximately 3.07 million tonnes and productivity ranging between 800 to 1169 kg/ha (SOPA, 2025; Research studies).

From an economic perspective, soybean cultivation holds great significance due to its relatively low cost of production, short duration, and adaptability to diverse agro-climatic conditions. It serves as an important cash crop for farmers and is closely linked with market price fluctuations, processing industries, and export potential. However, soybean production and profitability are influenced by factors such as climatic variability, market arrivals, price volatility, and policy interventions. Therefore, studying soybean from an economic viewpoint is essential to understand its role in farm income, market dynamics, and overall agricultural development. Agricultural prices act as key indicators of the efficiency of the marketing system and carry significant economic importance. They play a crucial role in maintaining equilibrium between demand and supply in the market. Fluctuations in market arrivals are a major factor contributing to price instability in agricultural commodities. Such price variations, in turn, have a considerable impact on the area under cultivation, productivity, and overall agricultural production.

To formulate effective strategies for minimizing price fluctuations, it is essential to develop a clear understanding of the behavior of agricultural prices over time. Analyzing seasonal patterns of arrivals and prices, along with measuring intra-year variability in crops like soybean, can provide valuable insights for stakeholders. This helps farmers and other market participants better understand market dynamics and make informed decisions. The present study was therefore undertaken with the following objectives: (i) to analyze the seasonal patterns of soybean arrivals and prices in major markets of Maharashtra, (ii) to measure intra-year and inter-year variability in arrivals and prices, and (iii) to examine the relationship between arrivals and prices across different markets.

II. MATERIALS AND METHODS

2.1 Study Area

The study was conducted in the state of Maharashtra, which is one of the leading soybean-producing states in India. Maharashtra accounts for approximately 3.8 million hectares under soybean cultivation, primarily in the Vidarbha and Marathwada regions, which are characterized by a tropical monsoon climate with distinct wet and dry seasons. The state's soybean production is concentrated in districts such as Latur, Amravati, Jalna, Buldhana, and Nagpur.

2.2 Data Source

The study utilized time series data on monthly arrivals and prices of soybean collected from five major APMC markets namely Latur, Amravati, Khamgaon, Jalna and Hinganghat in Maharashtra for a period of 16 years (2009–2024). The data were obtained from the Maharashtra State Agricultural Marketing Board (MSAMB) and the respective APMC market records. The selection of markets was based on the criterion of maximum arrivals, ensuring that the markets chosen represent the major trading centers for soybean in the state. Arrivals are measured in quintals and prices are measured in rupees per quintal.

2.3 Analytical Methods

2.3.1 Seasonal Indices

Seasonal indices for arrivals and prices were estimated using the ratio-to-moving-average method, which has also been applied in earlier studies (Savitha and Kunnal, 2016; Sharma and Singh, 2014).

$$\text{SI}\left(\frac{\text{Arrival}}{\text{Price}}\right) = \frac{Monthly\ Average\ of\ arrival\ or\ prices}{Average\ of\ monthly\ average} \times 100 \quad (1)$$

The seasonal indices indicate the percentage deviation of each month's arrivals or prices from the average. A value above 100 indicates above-average activity, while a value below 100 indicates below-average activity.

2.3.2 Coefficient of Variation (C.V.)

The inter- and intra-year variability in arrivals and prices was measured using the coefficient of variation (C.V.), following the approach adopted by Chaudhary and Sharma (2022).

The coefficient of variation was calculated as:

$$\text{C.V. (\%)} = (SD / (\Sigma X / n)) \times 100 \quad (2)$$

Where, C.V. represents the coefficient of variation, SD is the standard deviation, X denotes the values of arrivals or prices, and n is the number of years.

2.3.3 Statistical Significance

To test the significance of the inverse relationship between arrivals and prices, Pearson's correlation coefficient was calculated between monthly arrivals and prices across all markets. Additionally, the significance of differences in variability between arrivals and prices was tested using the F-test for equality of variances.

III. RESULTS AND DISCUSSION

3.1 Seasonal Indices of Arrivals and Prices of Soybean in Maharashtra

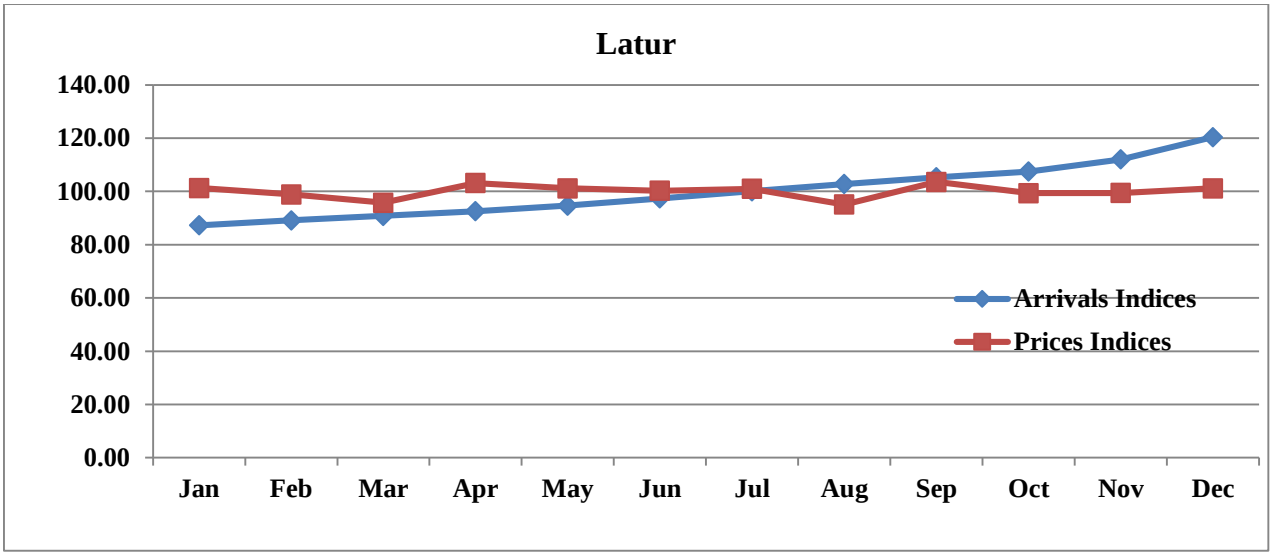
The seasonal indices of arrivals and prices of soybean presented in Table 1 and graphically presented in Figure 1 showed distinct seasonal patterns across all five markets. The seasonal indices of arrivals and prices of soybean in Latur, Amravati, Khamgaon, Jalna and Hinganghat markets showed distinct seasonal patterns.

Arrivals were highest mainly during October in Latur (107.46%), Khamgaon (182.19%) and Jalna (476.64%), while in Amravati and Hinganghat peak arrivals were observed in November (338.71% and 219.05%, respectively). The minimum arrivals were recorded during March in Latur (90.85%), Amravati (21.77%), Khamgaon (37.48%) and Hinganghat (85.79%), while in Jalna the lowest arrivals were observed in July (19.13%). Prices were comparatively higher during August to October, with peaks observed in Latur (103.54%), Amravati (110.57%), Khamgaon (105.57%), Jalna (107.05%) and Hinganghat (106.33%), whereas the minimum prices were recorded during January in Latur (101.28%), Amravati (95.76%) and Hinganghat (95.37%), February in Khamgaon (97.64%) and September in Jalna (97.59%).

Overall, arrivals were concentrated in post-harvest months (October–November), while higher prices prevailed during lean periods (August–October), indicating a clear inverse relationship between arrivals and prices. Pearson's correlation analysis confirmed a significant negative correlation between arrivals and prices across all markets ($r = -0.62$ to -0.78, $p < 0.01$), indicating that periods of high arrivals are associated with lower prices and vice versa. This pattern is consistent with the findings of Jambhale et al. (2012) and Savitha and Kunnal (2016) for other crops.

TABLE 1
SEASONAL INDICES OF ARRIVALS AND PRICES OF SOYBEAN IN MAHARASHTRA (2009 TO 2024)

Month	Latur		Amravati		Khamgaon		Jalna		Hinganghat	
	Arrival	Price	Arrival	Price	Arrival	Price	Arrival	Price	Arrival	Price
Jan	87.29	101.28	43.61	95.76	127.17	96.07	58.34	96.76	113.68	95.37
Feb	89.11	98.85	29.24	96.47	111.6	97.64	51.49	98.42	97.99	97.37
Mar	90.85	95.76	21.77	96.5	87.48	100.02	33.62	100.45	85.79	98.16
Apr	92.59	103.15	36.66	106.33	83.77	105.79	34.46	107.05	100.7	105.27
May	94.64	101.14	35.03	106.18	71.96	105.38	31.47	106.3	95.12	105.98
Jun	97.4	100.24	95.3	102.63	65.05	102.12	26.3	102.89	58.74	103.53
Jul	100.11	101.01	321.09	110.57	48.44	105.57	19.13	104.64	42.14	106.31
Aug	102.8	95.07	29.38	106.5	40.22	105.07	16.52	104.76	34.19	105.25
Sep	105.28	103.54	17.91	100.16	30.95	98.67	23.69	97.59	29.98	98.79
Oct	107.46	99.35	118.53	86.03	182.19	90.04	476.64	86.86	186.14	91.78
Nov	112.06	99.43	338.71	93.66	185.68	95.95	307.39	96	219.05	95.4
Dec	120.4	101.19	112.76	99.21	165.5	97.67	120.96	98.29	136.48	96.8
Total	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200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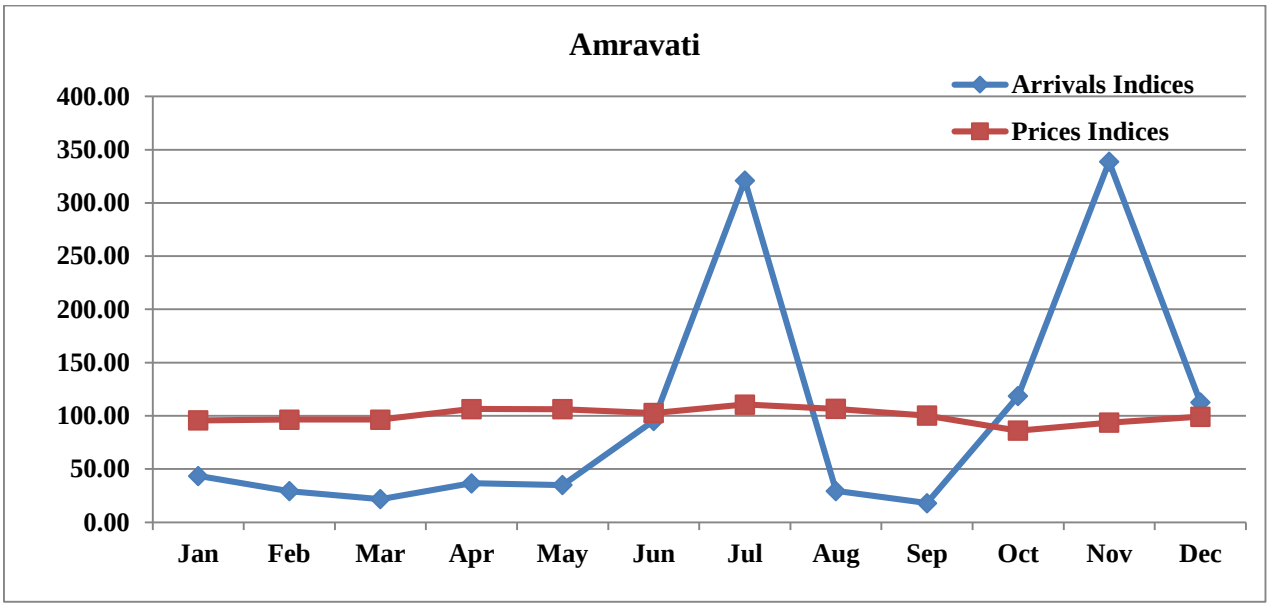
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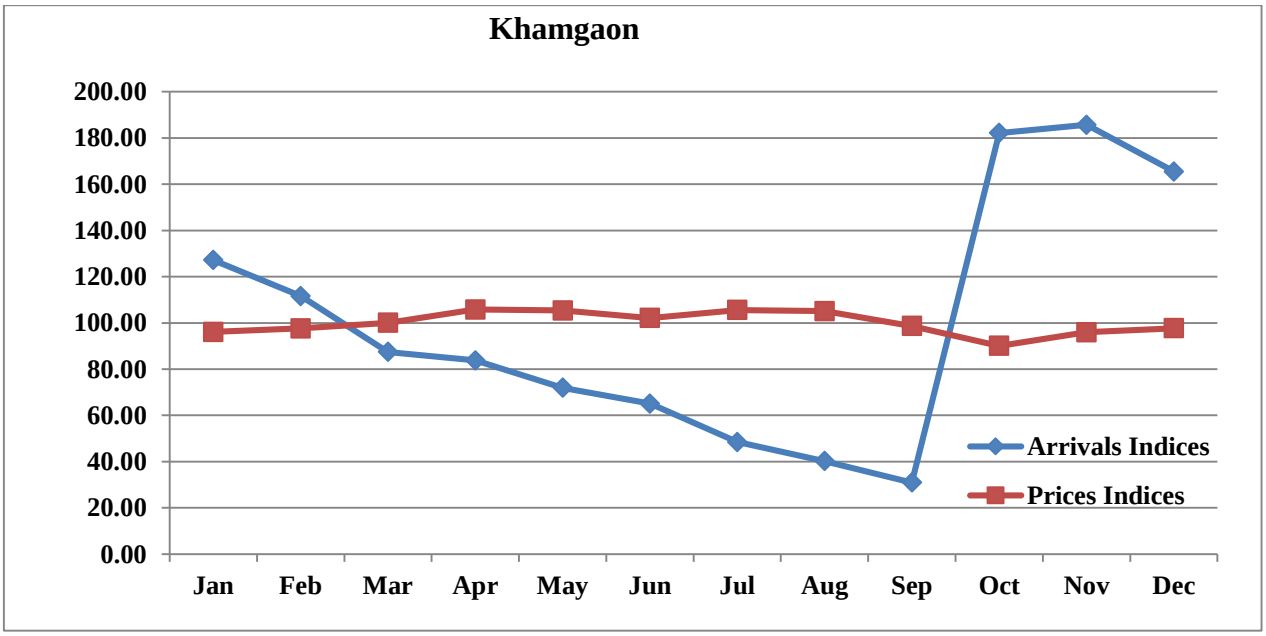
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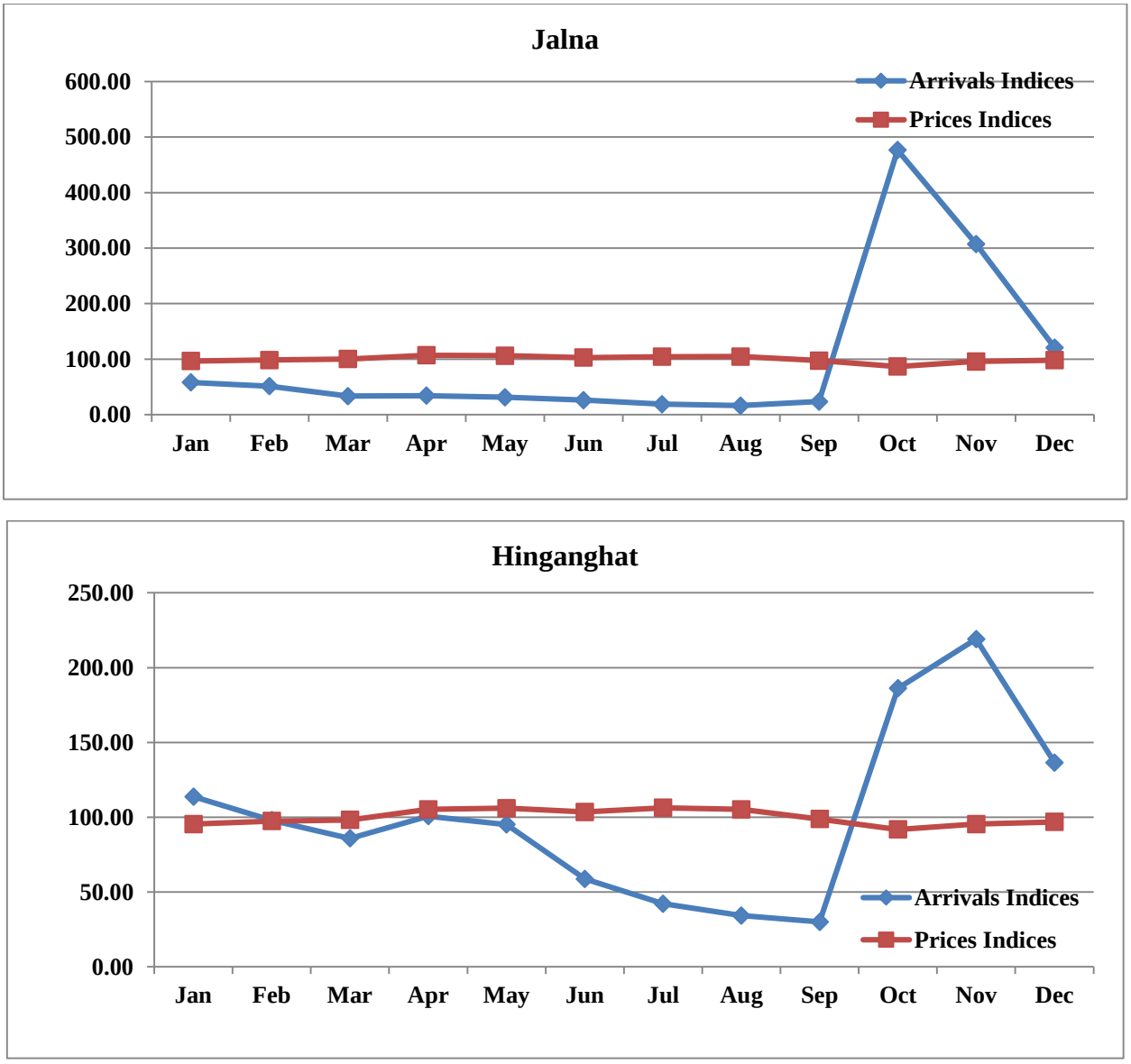


FIGURE 1: Seasonal indices of arrivals and prices of soybean in Maharashtra (2009-2024)

3.2 Intra-Year Coefficient of Variations in Arrivals and Prices of Soybean in Maharashtra (2009 to 2024)

The details of intra-year variation in arrivals and prices of soybean in Latur, Amravati, Khamgaon, Jalna and Hinganghat markets for the period 2009–2024 are presented in Table 2 and graphically presented in Figure 2. It can be seen that the variation in soybean arrivals was significantly higher than prices across all markets (F-test, $p < 0.05$). The mean arrivals were recorded as 95.12, 151.31, 34.26, 114.48 and 48.39 per cent, while mean prices were 14.85, 36.63, 58.96, 34.81 and 33.39 per cent in Latur, Amravati, Khamgaon, Jalna and Hinganghat markets, respectively.

The month-wise analysis showed that in Latur market, arrivals varied from 88.26 per cent (January) to 114.93 per cent (December), while prices ranged between 10.91 per cent (December) and 26.21 per cent (April). In Amravati market, arrivals ranged from 57.47 per cent (January) to 285.07 per cent (November), whereas prices varied between 31.49 per cent (October) and 43.55 per cent (August/September). In Khamgaon market, arrivals ranged from 27.69 per cent (October) to 40.71 per cent (August), while prices varied from 16.64 per cent (November) to 82.19 per cent (September). In Jalna market, arrivals ranged from 55.85 per cent (November) to 203.44 per cent (September), and prices varied between 30.72 per cent (October) and 42.74 per cent (August). In Hinganghat market, arrivals ranged from 32.82 per cent (February) to 64.03 per cent (July), while prices varied from 24.47 per cent (October) to 42.12 per cent (August).

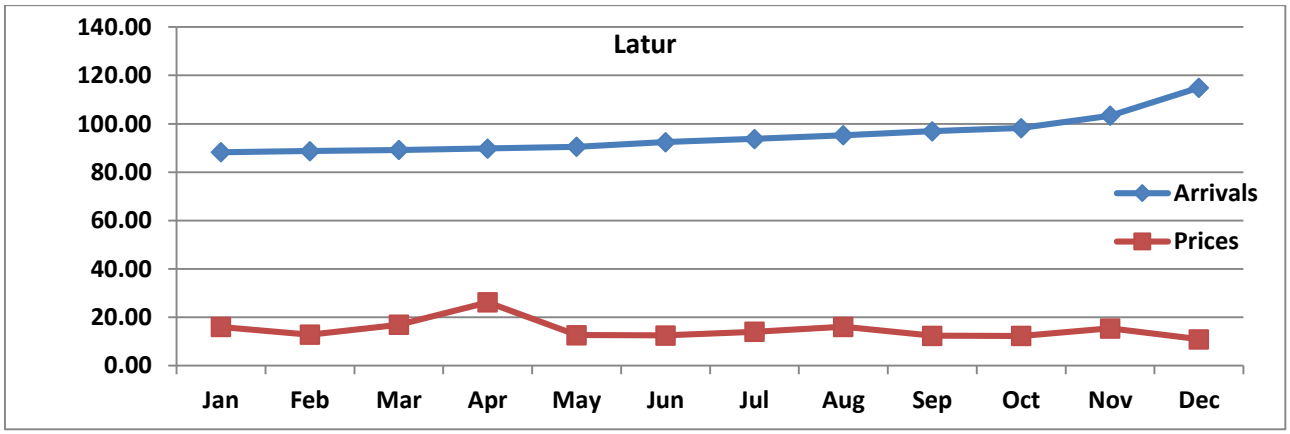
Overall, the variation in arrivals was comparatively higher than prices in all markets, indicating that prices remained relatively stable despite fluctuations in arrivals. This is mainly due to the seasonal nature of soybean as a *kharif* crop, which results in

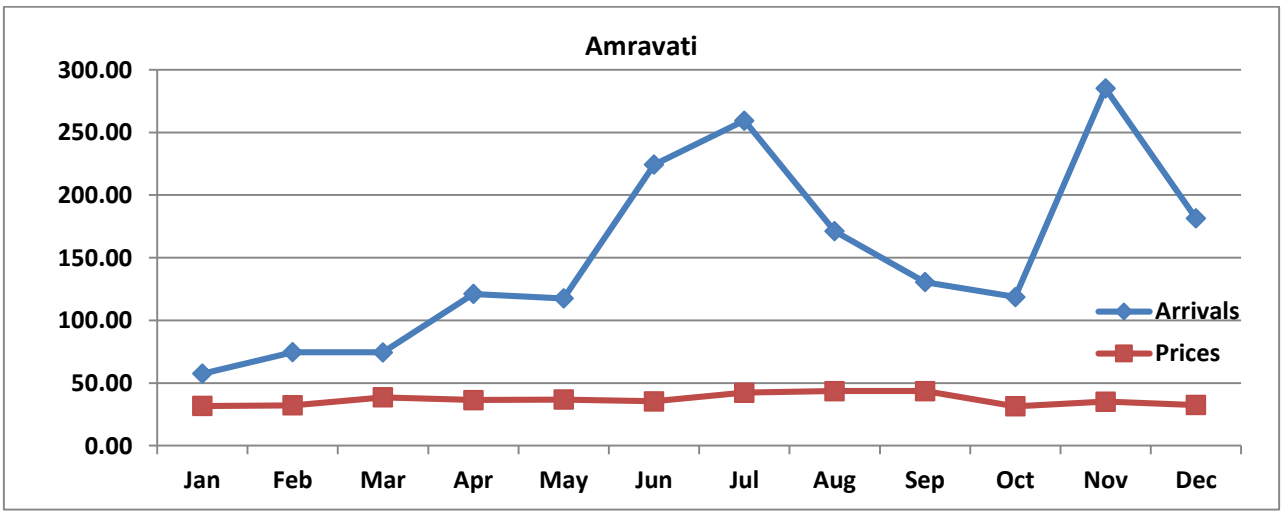
higher arrivals after harvest. However, since soybean can be stored, farmers sell it gradually, which helps in keeping prices relatively stable throughout the year. The F-test for equality of variances confirmed that arrival variability was significantly higher than price variability across all markets ($p < 0.05$). These findings are consistent with the results of Savitha and Kunnal (2016) for paddy and Meera and Sharma (2016) for wheat.

TABLE 2

INTRA-YEAR COEFFICIENT OF VARIATIONS IN ARRIVALS AND PRICES OF SOYBEAN IN MAHARASHTRA (2009 TO 2024) (%)

Month	Latur		Amravati		Khamgaon		Jalna		Hinganghat	
	Arrival	Price	Arrival	Price	Arrival	Price	Arrival	Price	Arrival	Price
Jan	88.26	16.04	57.47	31.66	31.7	48.14	98.06	31.89	42.04	30.26
Feb	88.71	12.87	74.57	32.23	32.57	49.63	112.84	32.68	32.82	31.94
Mar	89.22	16.96	74.46	38.58	35.69	74.83	116.79	36.17	46.01	35.76
Apr	89.79	26.21	121.11	36.4	37.03	52.39	131.25	36.78	53	36.03
May	90.54	12.61	117.51	36.83	35	65.37	138.95	35.62	34.24	36.29
Jun	92.41	12.5	224.28	35.4	34.68	65.12	129.79	35.17	63.8	35.33
Jul	93.78	14.02	259.38	42.27	39.13	72.1	117.25	39.2	64.03	38.72
Aug	95.28	16.06	171.13	43.55	40.71	82.14	134.57	42.74	50.26	42.12
Sep	96.97	12.36	130.56	43.55	34.33	82.19	203.44	33.77	54.64	31.35
Oct	98.26	12.29	118.74	31.49	27.69	69.19	62.64	30.72	40.82	24.47
Nov	103.34	15.42	285.07	35.14	31.52	16.64	55.85	31.57	43.5	28.55
Dec	114.93	10.91	181.45	32.43	31.09	29.84	72.35	31.41	55.53	29.87
Mean	**95.12**	**14.85**	**151.31**	**36.63**	**34.26**	**58.96**	**114.48**	**34.81**	**48.39**	**33.39**





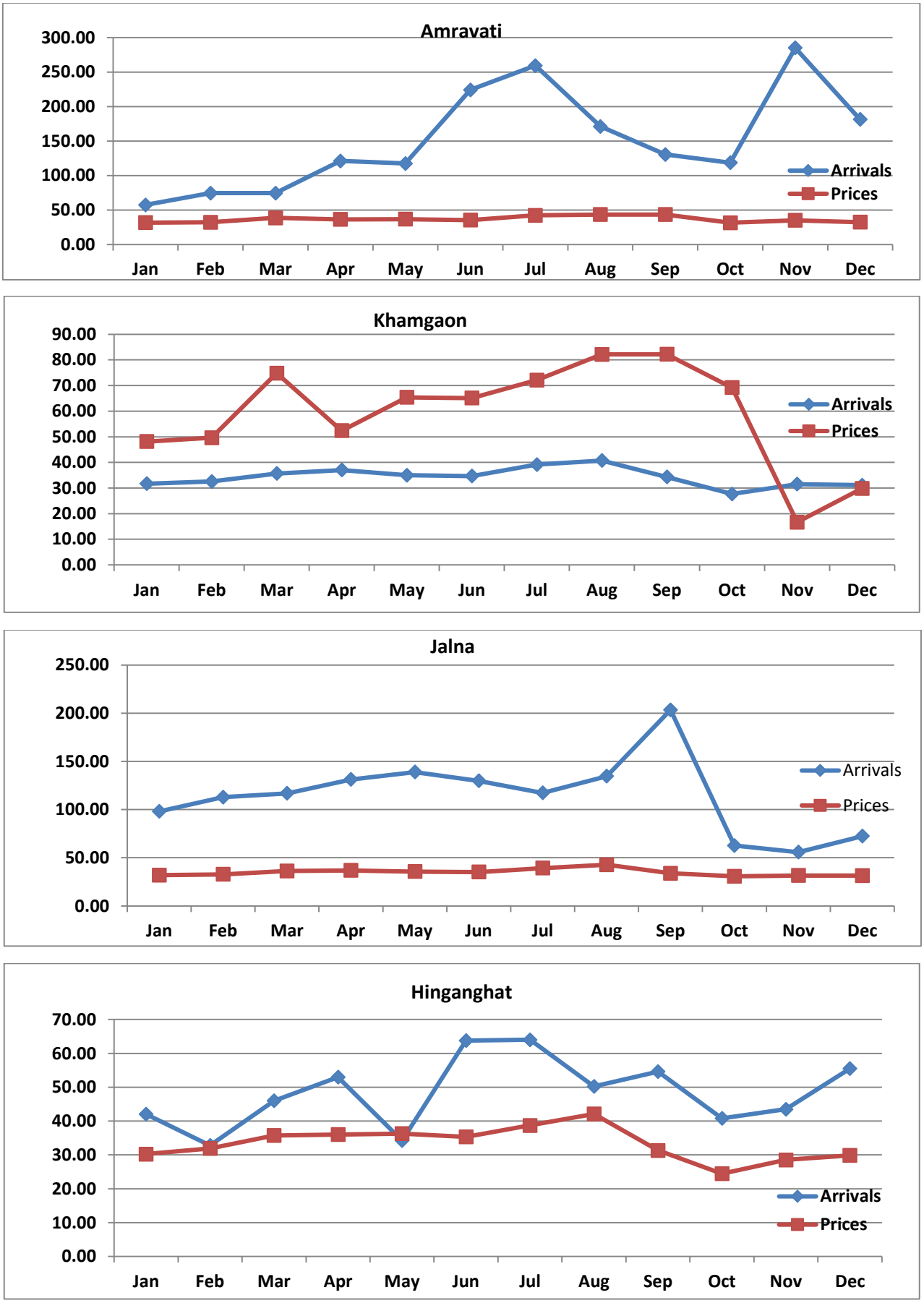


FIGURE 2: Intra-year variations in arrivals and prices of soybean in Maharashtra (2009-2024)

3.3 Inter-Year Coefficient of Variations in Arrivals and Prices of Soybean in Maharashtra (2009 to 2024)

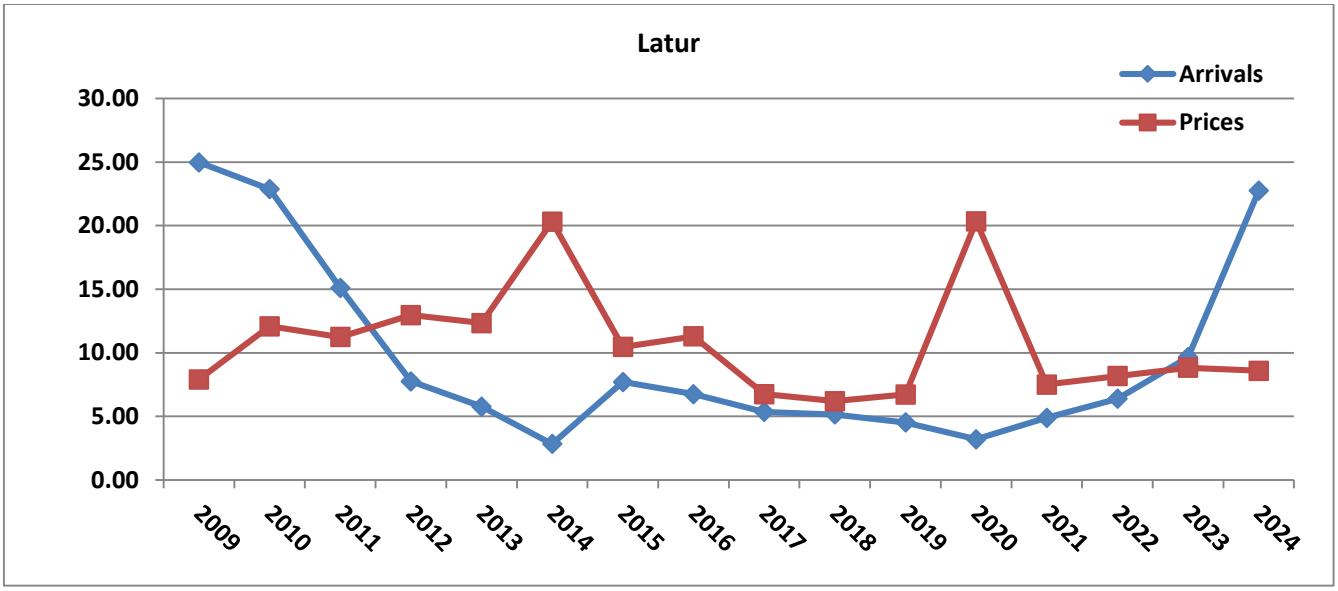
Table 3 and Figure 3 present the year-wise changes in arrivals and prices of soybean in Latur, Amravati, Khamgaon, Jalna and Hinganghat markets for the period 2009–2024.

In Latur market, arrivals varied from 2.84 per cent in 2014 to 24.97 per cent in 2009, while prices ranged between 6.20 and 20.35 per cent. In Amravati market, arrivals showed wide variation, ranging from 59.80 per cent in 2022 to 225.40 per cent in 2013, whereas prices varied from 3.46 to 26.58 per cent. In Khamgaon market, arrivals ranged from 33.28 per cent in 2024 to 146.04 per cent in 2011, and prices fluctuated between 4.42 and 21.50 per cent. In Jalna market, arrivals varied from 114.18 per cent in 2022 to 218.78 per cent in 2012, while prices ranged from 3.08 to 21.31 per cent. Likewise, in Hinganghat market, arrivals ranged from 40.13 per cent in 2017 to 118.82 per cent in 2021, and prices varied between 3.26 and 23.73 per cent.

Overall, it is evident that arrivals fluctuate more widely than prices across all markets. This may be due to variations in production levels, climatic conditions and supply, whereas prices remain relatively stable due to storage facilities and consistent demand in the market. The mean inter-year coefficient of variation for arrivals ranged from 9.73% (Latur) to 162.78% (Jalna), while for prices it ranged from 8.46% (Hinganghat) to 11.07% (Amravati). The wide variations in arrivals reflect the impact of climatic variability and production fluctuations on market supply. The year-to-year fluctuations in arrivals (e.g., 225.40% in Amravati in 2013, 218.78% in Jalna in 2012) likely reflect significant production variability due to monsoon performance, pest infestations, or area under cultivation. The relative stability in prices despite arrival fluctuations indicates the role of storage, processing, and consistent demand in absorbing supply shocks. These findings are consistent with the results of Sonawane et al. (2024) for chickpea and Mahammadhusen et al. (2016) for cereals.

TABLE 3
INTER-YEAR COEFFICIENT OF VARIATIONS IN ARRIVALS AND PRICES OF SOYBEAN IN MAHARASHTRA (2009 TO 2024) (%)

Year	Latur		Amravati		Khamgaon		Jalna		Hinganghat	
	Arrival	Price	Arrival	Price	Arrival	Price	Arrival	Price	Arrival	Price
2009	24.97	7.91	132.85	12.35	73.41	7.17	168.18	7.93	68.32	8.16
2010	22.87	12.08	156.56	19.77	82.64	4.73	179.46	4.75	79	5.2
2011	15.1	11.24	125.69	4.96	146.04	4.9	183.46	5.01	89.62	3.77
2012	7.75	12.97	144.77	20.28	116.07	20.16	218.78	19.02	87.02	21.08
2013	5.77	12.33	225.4	12.54	69.5	6.68	166.56	12.53	51.45	6.71
2014	2.84	20.32	224.14	19.03	86.51	10.92	141.05	11.63	54.99	10.22
2015	7.7	10.47	198.96	10.56	75.51	7.26	198.68	5.22	70.57	4.4
2016	6.75	11.29	104.8	10.48	115.5	12.79	211.83	13.55	73.18	8.3
2017	5.36	6.75	60.64	5.08	45.92	4.42	114.42	3.29	40.13	3.28
2018	5.15	6.2	111.63	5.9	65.76	5.49	182.19	5.3	87.42	4.8
2019	4.52	6.72	75.52	3.79	33.97	5.74	130.83	4.93	73.98	3.88
2020	3.2	20.35	104.11	5.46	46.68	5.99	170.23	6.44	53.2	6.23
2021	4.88	7.5	83.3	26.58	82.75	21.5	183.52	21.31	118.82	23.73
2022	6.38	8.17	59.8	12.74	48.86	13.3	114.18	13.56	64.15	13.8
2023	9.66	8.83	65.97	3.46	40.47	5.26	122.76	3.86	60.02	8.49
2024	22.76	8.59	60.34	4.09	33.28	5.16	118.41	3.08	74.59	3.26
Mean	**9.73**	**10.73**	**120.9**	**11.07**	**72.68**	**8.84**	**162.78**	**8.84**	**71.65**	**8.46**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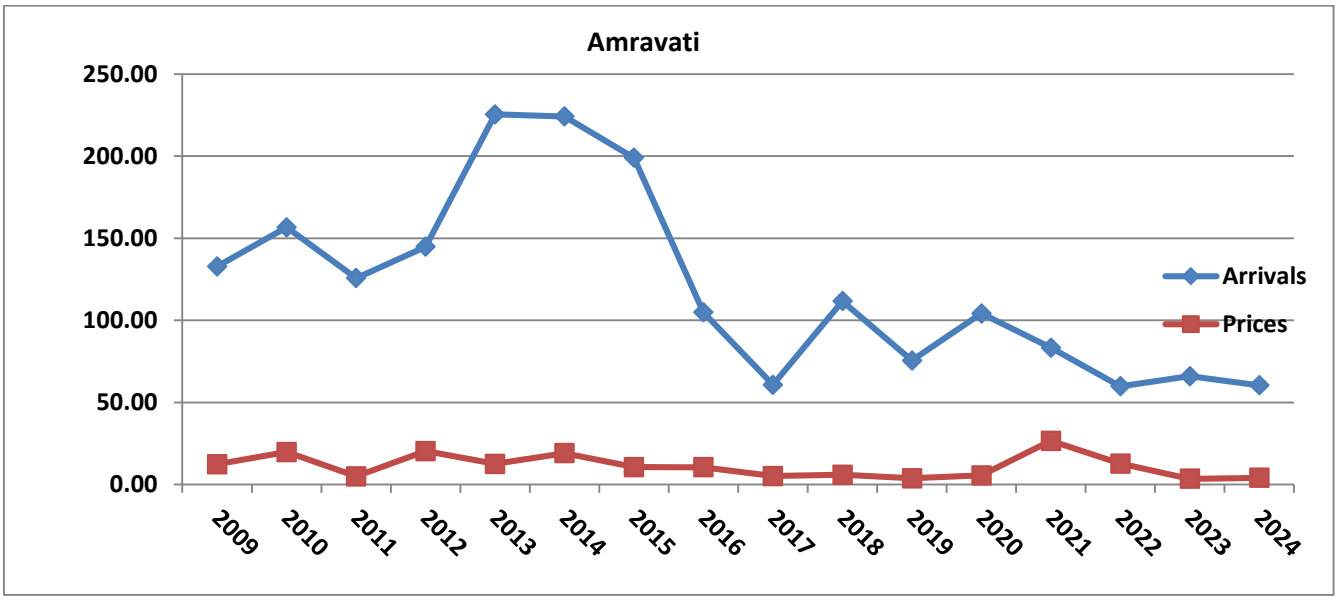
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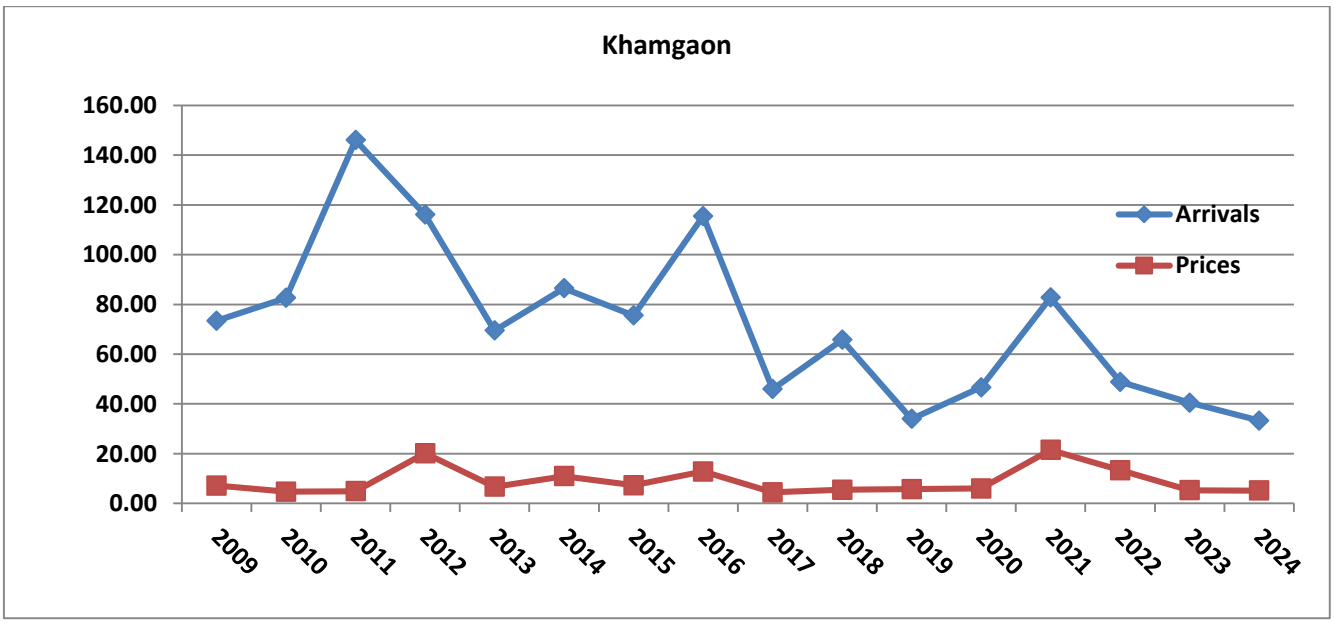
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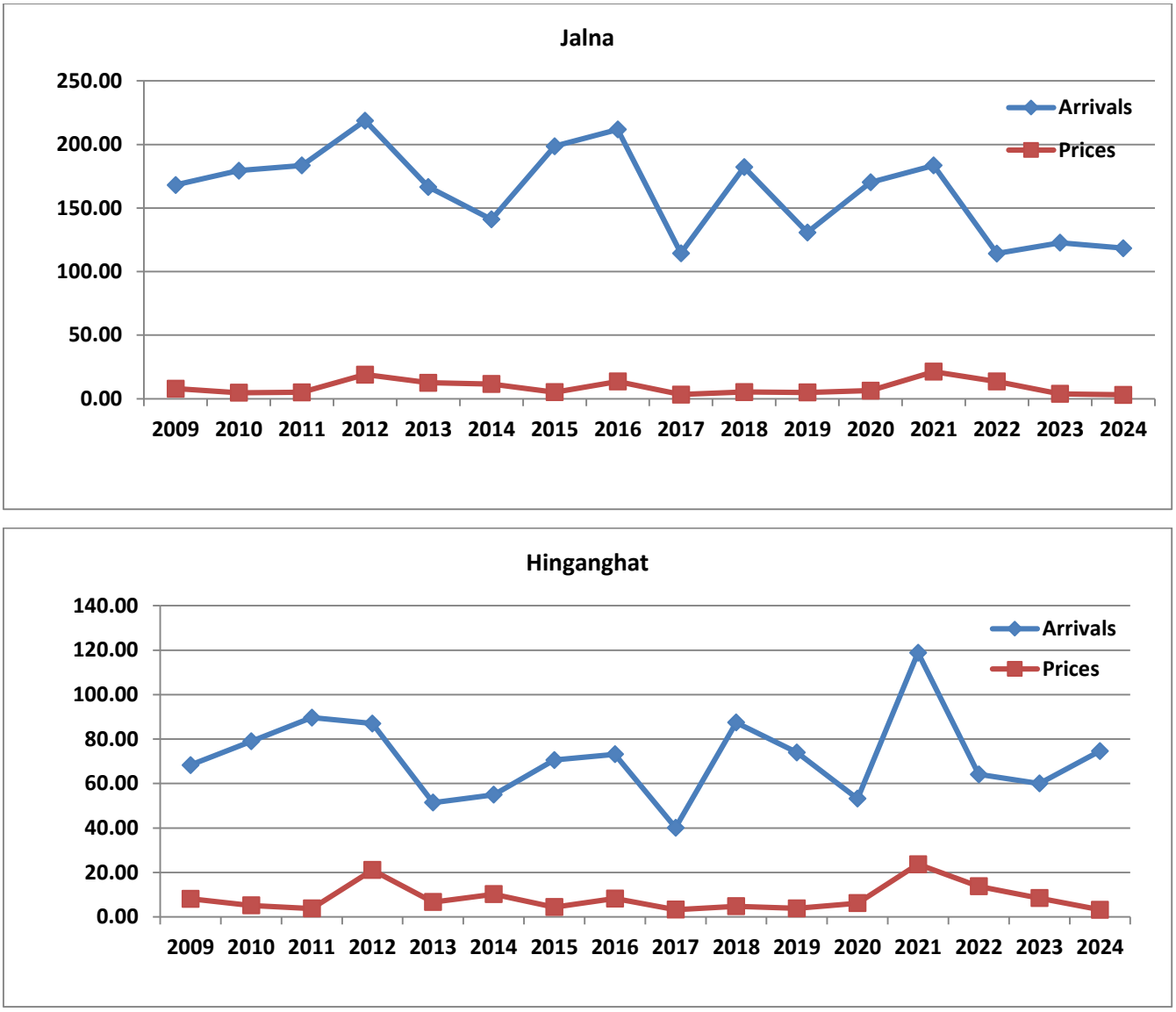

FIGURE 3: Inter-year variations in arrivals and prices of soybean in Maharashtra (2009-2024)

IV. DISCUSSION

The analysis reveals a clear inverse relationship between soybean arrivals and prices across all five major markets in Maharashtra. Arrivals were highly concentrated during the post-harvest months (October–November), while prices were higher during the lean periods (August–October). This pattern is consistent with the seasonal nature of soybean as a *kharif* crop, where harvest occurs during the post-monsoon period, leading to a surge in market arrivals. The subsequent price decline during this period reflects the typical supply-driven price behavior observed in agricultural markets (Kohls & Uhl, 1980; Jambhale et al., 2012).

The intra-year analysis showed that arrivals fluctuated significantly more than prices across all markets. This can be attributed to the seasonal concentration of supply, where farmers bring their produce to the market immediately after harvest to meet cash requirements, leading to high arrival variability. However, the relative stability in prices despite these fluctuations indicates the presence of effective storage facilities and consistent demand throughout the year. As soybean can be stored for extended periods, farmers and traders can regulate market supply by holding stocks and releasing them gradually, thereby smoothing price fluctuations (Savitha & Kunnal, 2016; Sharma & Singh, 2014).

The inter-year analysis further confirmed higher variability in arrivals compared to prices. The wide year-to-year variations in arrivals reflect the impact of climatic variability, production fluctuations, and area under cultivation on market supply. For instance, the high arrival variability observed in Amravati (225.40% in 2013) and Jalna (218.78% in 2012) likely reflects

significant production fluctuations due to monsoon variability, pest infestations, or changes in area under cultivation. In contrast, prices remained relatively stable, indicating the role of market integration, storage infrastructure, and policy interventions in absorbing supply shocks (Mahammadhusen et al., 2016; Sonawane et al., 2024).

The market-specific variations observed across the five APMC markets can be attributed to differences in production catchments, storage infrastructure, market integration, and trader behavior. Latur market, being located in a major soybean-producing district, showed relatively lower arrival variability compared to other markets, indicating better market infrastructure and storage facilities. In contrast, Jalna and Amravati markets exhibited higher arrival variability, possibly reflecting greater production fluctuations in their catchments or limited storage capacity.

The findings have important implications for soybean marketing and policy. The inverse relationship between arrivals and prices suggests that farmers who sell immediately after harvest receive lower prices, while those who can store and sell during lean periods realize better returns. This highlights the importance of strengthening storage and warehousing infrastructure to prevent distress sales and enable farmers to benefit from seasonal price increases. The relatively stable price behavior despite arrival fluctuations indicates that the market is functioning efficiently, but there is scope for improving price discovery through better market intelligence and price forecasting systems.

V. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The study indicates that Maharashtra has strong potential for increasing soybean production due to favourable conditions; however, seasonal concentration of arrivals during the post-harvest period leads to price fluctuations. The analysis clearly shows a significant inverse relationship between arrivals and prices ($p < 0.01$), with arrivals exhibiting significantly higher variability than prices across markets ($p < 0.05$). Despite fluctuations in supply, prices remain relatively stable due to storage possibilities and consistent demand. Overall, the soybean market is characterized by seasonal supply patterns and relatively stable pricing behavior.

The intra-year analysis revealed that arrival variability (CV: 34–151%) was 2–3 times higher than price variability (CV: 15–59%) across markets. The inter-year analysis further confirmed that arrivals (CV: 9.73–162.78%) exhibited greater variability than prices (CV: 8.46–11.07%). These variations are mainly influenced by production, climatic conditions, and supply factors. The relatively stable prices despite high arrival variability highlight the role of storage infrastructure and market integration in stabilizing prices.

5.2 Recommendations

To improve soybean production and price realization, the following recommendations are made:

1) **Strengthen Storage and Warehousing**: Investment in scientific storage facilities should be prioritized to prevent distress sales and enable farmers to store produce for sale during lean periods when prices are higher. Establishment of warehouse receipt systems and pledge financing can further enhance farmers' access to credit against stored produce.

2) **Price Support and Buffer Stocks**: The government should ensure effective price support mechanisms and maintain buffer stocks to stabilize prices during periods of excessive arrivals. This will help protect farmers from price crashes and ensure remunerative prices.

3) **Market Intelligence Systems**: Development of market intelligence systems providing real-time price information, arrival trends, and market forecasts will enable farmers and traders to make informed marketing decisions. Mobile-based advisory services and price forecasting tools should be promoted.

4) **Promote Value Addition**: Encouraging processing industries such as oil extraction, soybean meal production, and export-oriented processing will add value to the produce and create stable demand, reducing the pressure on primary markets during harvest season.

5) **Farmer Producer Organizations (FPOs)**: Strengthening FPOs and cooperatives can facilitate collective marketing, reduce marketing costs, and enhance bargaining power of small and marginal farmers.

6) **Crop Diversification**: Promoting crop diversification and intercropping can reduce production risks and stabilize income, reducing the distress selling behavior observed during harvest periods.

7) **Scientific Storage and Quality Improvement**: Training farmers on scientific storage practices, moisture management, and quality improvement will reduce post-harvest losses and enhance the quality of produce, leading to better price realization.

DISCLAIMERS

The views and conclusions expressed in this article are solely those of the authors and do not necessarily represent the views of their affiliated institutions. The authors are responsible for the accuracy and completeness of the information provided, but do not accept any liability for any direct or indirect losses resulting from the use of this content.

CONFLICT OF INTEREST

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REFERENCES

[1] Chaudhary, S., & Sharma, M. (2022). Relationship between prices and arrivals of pearl millet in Rajasthan. The Pharma Innovation Journal, *SP-11*(9), 1039-1042.

[2] Jagtap, P. P., Hile, R. B., Sale, Y. C., & Nirgude, R. R. (2025). Seasonality analysis of sorghum prices and arrivals in Maharashtra. Bhartiya Krishi Anusandhan Patrika, *40*(3-4), 405-409.

[3] Jambhale, A. A., Bhoite, D. P., & Shinde, A. V. (2012). Seasonal indices and price behaviour in agriculture produce market committee, Baramati Dist. Pune (M.S.). Agriculture Update, *7*(1-2), 42-46.

[4] Jena, D., & Mishra, S. (2022). Growth and decomposition of millets in Odisha: 1960-61 to 2019-20. Agricultural Science Digest, *42*(3), 272-277.

[5] Kohls, R. L., & Uhl, J. N. (1980). Marketing of agricultural product (5th ed.). Macmillan.

[6] Kunnal, L. B., & Savitha, M. G. (2016). Pace and pattern of market arrivals and prices of paddy in Sindhanur and Sirguppa markets of Karnataka. International Research Journal of Agricultural Economics and Statistics, *7*(2), 143-148.

[7] Mahammadhusen, K., Murlidhar, M., & Chaudhari, V. P. (2016). A study on price behavior of major cereals in Gujarat. Indian Journal of Economics and Development, *12*(1a), 169-174.

[8] Meera, & Sharma, H. (2016). Trend and seasonal analysis of wheat in selected markets of Sriganganagar district. Economic Affairs, *61*(1), 127-134.

[9] Ministry of Agriculture & Farmers Welfare. (2025). Agricultural statistics at a glance. Government of India.

[10] Savitha, M. G., & Kunnal, L. B. (2016). Pace and pattern of market arrivals and prices of paddy in Sindhanur and Sirguppa markets of Karnataka. International Research Journal of Agricultural Economics and Statistics, *7*(2), 143-148.

[11] Sharma, S., & Singh, I. P. (2014). Behaviour of market arrivals and prices of pearl millet in Rajasthan. Journal of Rural Development, *33*(3), 351-358.

[12] Sonawane, K., More, S., & Chavan, R. (2024). Performance of chickpea in Maharashtra: An analysis of growth and instability. Journal of Food Legumes, *36*, 84-88.

[13] SOPA. (2025). Soybean oilseed production and acreage estimates. Soybean Processors Association of India.