

An Analytical Insight into the Future Growth of Women's Cricket through the Women's Premier League (WPL)

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I. INTRODUCTION

Cricket has been the heart and soul for the Indian subcontinent for as long as we can remember. The likes of Virat Kohli, MS Dhoni and Rohit Sharma are known in every household. In the period of women empowerment, this sport has not failed to impress. With over 100 women international teams in the field of cricket, it seems that this sport is scaling new heights. In fact, just a few months ago, the Board of Control for Cricket in India (BCCI) announced an equal pay grade for the men and women's international team. This has been a big step in the history of sport and is a definite indication to the bright future for women's cricket, especially in the cricket loving nation of India.

The Indian Premier League (IPL) has not only generated whopping amounts of revenue over its fifteen years but has also produced some of the greatest talents such as Jasprit Bumrah and Hardik Pandya who have made the nation proud at the highest levels. Following the footsteps of the IPL, the BCCI launched the first ever edition of the Women's Premier League in 2023 consisting of five fierce teams which proved to be a huge success. With foreign superstars such as Ellyse Perry, Hayley Matthews and Alyssa Healy gracing the crowd with their presence and flawless technique, the stadiums were bound to be sold out. While the Royal Challengers Bangalore (RCB) fans showed their love for another Number 18 in the form of Smriti Mandhana, Delhi Capitals' Jemimah Rodrigues became a fan favorite. New names were uncovered as Shreyanka Patil, Saika

Ishaque, Issy Wong, Parshavi Chopra and many more started their journey of going onwards and upwards. Over this period of 22 matches, the teams locked horns in mouth watering encounters as the Mumbai Indians franchise were eventually crowned the champions. As Viacom18 invested a massive INR 951 crore for the viewership rights for the next 5 years of the WPL, it is certain that this platform is ready to take off. With a league so big, there are several factors that would determine the fruitfulness of its future. This analytical research paper uses the power of statistics, audience polling and a comparison to the growth of the IPL in order to understand what could potentially be the outcome of this competition in the next 5 years on the different people in focus.

II. HYPOTHESIS TESTING

In this section we will explore how the audience responded to the first season of the Women's Premier League. For each of the five simple Likert Scale based questions that the 200 people who form a part of our stratified sample of age have answered, a 90% confidence interval will be used to test the null hypothesis of at least 65% of the representative population being likely or highly likely to support the progress of the WPL. The following are the questions and the calculations made to either fail to reject or reject the null hypothesis:

Calculations & Conclusion (Question 1):



Test Statistic (Z - Score):

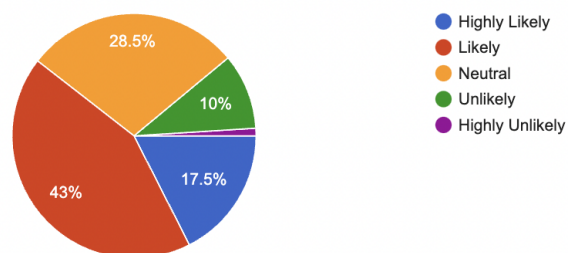
$$Z = \frac{\rho - \rho_0}{\sqrt{\frac{\rho_0(1-\rho_0)}{n}}}$$
$$Z = \frac{\frac{75+68}{200} - \frac{130}{200}}{\sqrt{\frac{\frac{130}{200}(1-\frac{130}{200})}{200}}}$$
$$= 1.927$$

The 'p' value calculated for this test statistic is 0.97301 which means that this left-tailed hypothesis test has **failed to reject the null hypothesis.**

Calculations & Conclusion (Question 2):

How likely are you to purchase merchandise or team merchandise related to the WPL?

200 responses



Test Statistic (Z - Score):

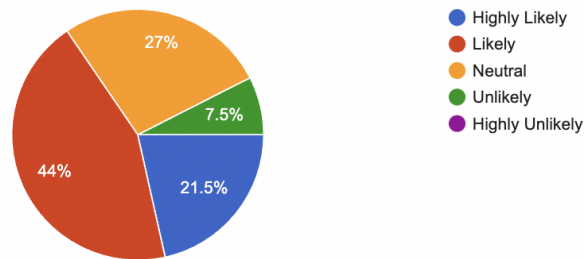
$$Z = \frac{\rho - \rho_0}{\sqrt{\frac{\rho_0(1-\rho_0)}{n}}}$$
$$Z = \frac{\frac{86+35}{200} - \frac{130}{200}}{\sqrt{\frac{\frac{130}{200}(1-\frac{130}{200})}{200}}}$$
$$= -1.334$$

The 'p' value calculated for this test statistic is 0.09110 which means that this left-tailed hypothesis test has **rejected the null hypothesis.**

Calculations & Conclusion (Question 3):

How likely is it that you are going to attend future WPL matches?

200 responses



Test Statistic (Z - Score):

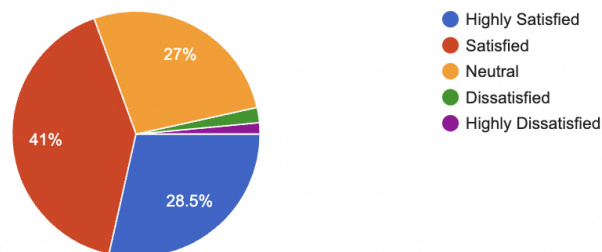
$$Z = \frac{\rho - \rho_0}{\sqrt{\frac{\rho_0(1-\rho_0)}{n}}}$$
$$Z = \frac{\frac{88+43}{200} - \frac{130}{200}}{\sqrt{\frac{\frac{130}{200}(1-\frac{130}{200})}{200}}}$$
$$= 0.148$$

The 'p' value calculated for this test statistic is 0.55883 which means that this left-tailed hypothesis test has **failed to reject the null hypothesis.**

Calculations & Conclusion (Question 4):

How satisfied were you with the overall experience and challenge of the WPL?

200 responses



Test Statistic (Z - Score):

$$Z = \frac{\rho - \rho_0}{\sqrt{\frac{\rho_0(1-\rho_0)}{n}}}$$

$$Z = \frac{\frac{82+57}{200} - \frac{130}{200}}{\sqrt{\frac{\frac{130}{200}(1-\frac{130}{200})}{200}}}$$

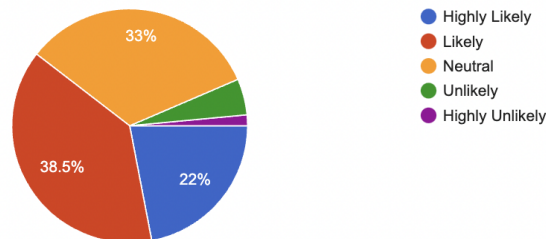
$$= 1.334$$

The 'p' value calculated for this test statistic is 0.908898 which means that this left-tailed hypothesis test has **failed to reject the null hypothesis.**

Calculations & Conclusion (Question 5):

How likely are you to follow news and updates about the WPL through social media or other online platforms?

200 responses



Test Statistic (Z - Score):

$$Z = \frac{\rho - \rho_0}{\sqrt{\frac{\rho_0(1-\rho_0)}{n}}}$$

$$Z = \frac{\frac{77+44}{200} - \frac{130}{200}}{\sqrt{\frac{\frac{130}{200}(1-\frac{130}{200})}{200}}}$$

$$= -1.334$$

The 'p' value calculated for this test statistic is 0.09110 which means that this left-tailed hypothesis test has **rejected the null hypothesis.**

III. IDENTIFYING LINEAR TRENDS & PREDICTING PLAYER SALARIES

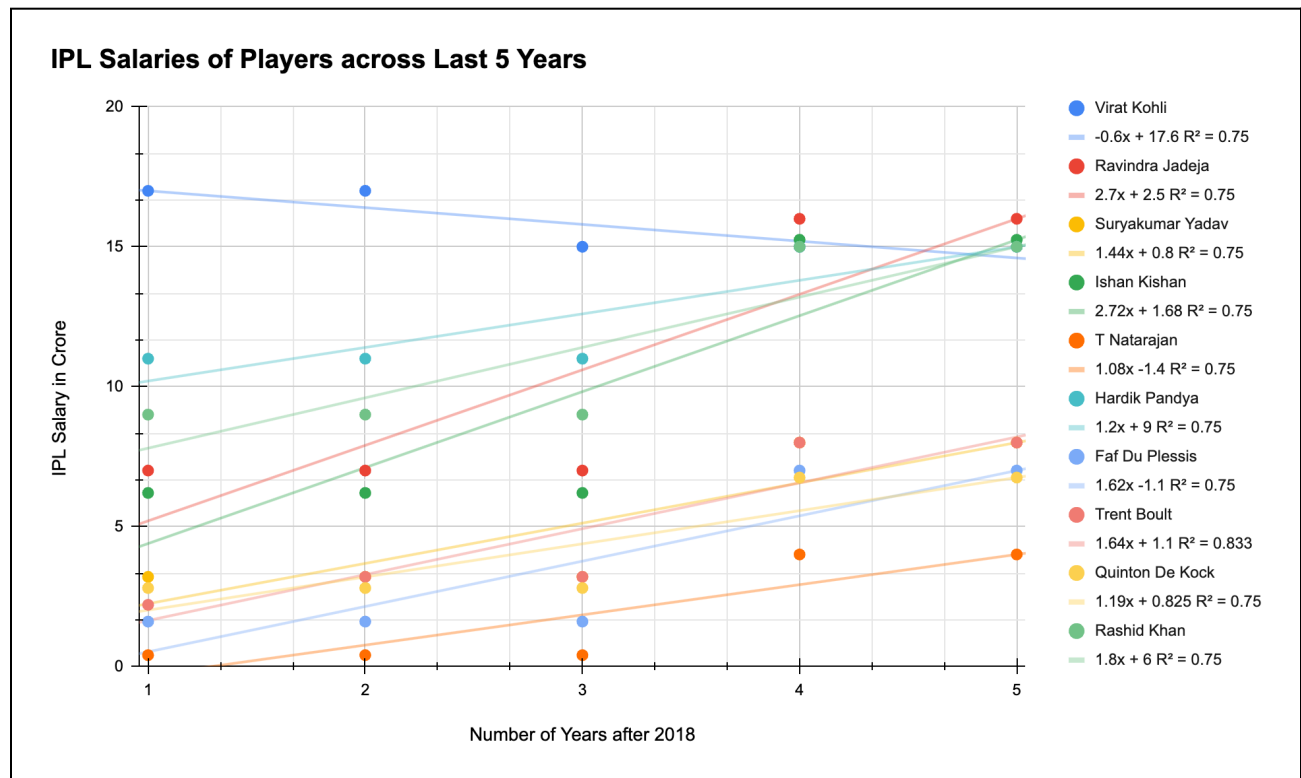
The following table consists of the salary of 10 IPL players in the last 5 years:

Sr No.	Player Name	IPL 2019	IPL 2020	IPL 2021	IPL 2022	IPL 2023
1	Virat Kohli	17 Cr	17 Cr	15 Cr	15 Cr	15 Cr
2	Ravindra Jadeja	7 Cr	7 Cr	7 Cr	16 Cr	16 Cr
3	Suryakumar Yadav	3.2 Cr	3.2 Cr	3.2 Cr	8 Cr	8 Cr
4	Ishan Kishan	6.2 Cr	6.2 Cr	6.2 Cr	15.25 Cr	15.25 Cr
5	T Natarajan	0.4 Cr	0.4 Cr	0.4 Cr	4 Cr	4 Cr
6	Hardik Pandya	11 Cr	11 Cr	11 Cr	15 Cr	15 Cr
7	Faf Du Plessis	1.6 Cr	1.6 Cr	1.6 Cr	7 Cr	7 Cr
8	Trent Boult	2.2 Cr	3.2 Cr	3.2 Cr	8 Cr	8 Cr
9	Quinton De Kock	2.8 Cr	2.8 Cr	2.8 Cr	6.75 Cr	6.75 Cr
10	Rashid Khan	9 Cr	9 Cr	9 Cr	15 Cr	15 Cr

The following table consists of the salary of 10 WPL Players in 2023 with each serial number corresponding to a serial number of an IPL player with a similar background, performance and ability to grow:

Sr No.	Player Name	WPL 2023	Sr No.	Player Name	WPL 2023
1	Smriti Mandhana	3.4 Cr	6	Harmanpreet Kaur	1.8 Cr
2	Deepti Sharma	2.6 Cr	7	Alyssa Healy	0.7 Cr
3	Shafali Verma	2 Cr	8	Ellyse Perry	1.7 Cr
4	Richa Ghosh	1.9 Cr	9	Sophie Ecclestone	1.8 Cr
5	Saika Ishaque	0.1 Cr	10	Nat Sciver-Brunt	3.2 Cr

After plotting the data from the first table trying to identify the individual trajectory of each of the 10 different type of players that have been chosen, this is the scatterplot we obtain with best fit lines & their equations:



Through the data that has been collected above, on the basis of assumption and ignoring external factors such as injuries or retention, we can use statistical analysis to predict the future salaries of the WPL players. This prediction is solely based on the growth of the league, if it mimics that of the IPL & the value of the players increasing based on the growth. It is also important to incorporate and assume that the factor of league income and player value is going to increase by approximately a total of 20% every year. The following table is the predicted salaries of the 10 players by WPL 2028 after the statistical analysis:

Sr No.	Player Name	WPL 2024	WPL 2025	WPL 2026	WPL 2027	WPL 2028
1	Smriti Mandhana	3.4 Cr	4.08 Cr	4.90 Cr	5.88 Cr	7.05 Cr
2	Deepti Sharma	2.6 Cr	3.12 Cr	3.74 Cr	4.48 Cr	5.38 Cr
3	Shafali Verma	2 Cr	2.40 Cr	2.88 Cr	3.45 Cr	4.14 Cr
4	Richa Ghosh	1.9 Cr	2.28 Cr	2.74 Cr	3.29 Cr	3.95 Cr
5	Saika Ishaque	0.1 Cr	0.12 Cr	0.14 Cr	0.16 Cr	0.19 Cr
6	Harmanpreet Kaur	1.8 Cr	2.16 Cr	2.59 Cr	3.10 Cr	3.72 Cr
7	Alyssa Healy	0.7 Cr	0.84 Cr	1.01 Cr	1.21 Cr	1.45 Cr
8	Ellyse Perry	1.7 Cr	2.04 Cr	2.45 Cr	2.94 Cr	3.52 Cr
9	Sophie Ecclestone	1.8 Cr	2.16 Cr	2.59 Cr	3.10 Cr	3.72 Cr
10	Nat Sciver-Brunt	3.2 Cr	3.84 Cr	4.61 Cr	5.53 Cr	6.63 Cr

IV. LIMITATIONS TO THE STATISTICAL ANALYSIS

While a statistical analysis helps predict certain figures that are extremely important to understand the future of the game, it is ultimately still an educated guess based on assumptions. Through the extrapolation and interpolation of data, we are able to identify certain trends in the IPL which are presumed to be seen in the WPL as well. However, it is extremely rare that WPL follows the exact same trajectory that was seen in the IPL. Like every other investigation, this data report has its limitations which is why the figures that are seen above are just a rough estimate of how this league can evolve in the next few years. The following are the possible factors that have not been considered or have been assumed for conducting this investigation:

1. The 200 people that were the sample for the hypothesis testing are not representative of the entire population as the sample consisted of people only from India and did not take into account the overseas

2. The capabilities of each of the IPL players and the platform they had to grow would not be exactly the same for the WPL players which is why it is not completely correct to predict the trajectory of a WPL player based on the trend of a similar type of player in the IPL
3. The IPL has been assessed over the last 5 years for which some of the main players' salaries has plateaued which does not give a proper estimate of the trajectory of their career
4. The league income and player value for the WPL has been presumed to increase by an average of 20% every year which is again based on the IPL where there have been high increments but also downfalls
5. Factors such as international representation, retentions, additional number of teams, injuries, opting out of the league and retirement have not been considered for these WPL players while calculating what their future earnings from the WPL can look like (eg. Saika Ishaque could soon play for India which would make her a part of the capped category potentially increasing her WPL earnings)

V. CONCLUDING ON THE FUTURE GROWTH OF WOMEN'S CRICKET

While the limitations of this study are present, the results give us a fair idea of the bright future of this league as the response is very positive. The majority of the representative population expressed support for the progress of the WPL, as evidenced by the results of the hypothesis testing. Specifically, in Questions 1, 3, and 4, where the null hypothesis was not rejected, more than 65% of the participants indicated a likelihood or high likelihood of supporting the league's progress. Even in Question 2 & 4, the 'p' value calculated was 0.09 making it just fall into the rejection region indicating that the purchasing of team merchandise and social media following will still take a few more years.

Moreover, the predicted future salaries of WPL players, based on the analysis of IPL player salaries provide further insight into the potential growth of the WPL. If the WPL were to follow a trajectory similar to that of the IPL, the salaries of WPL players are projected to increase steadily over the years which is extremely beneficial for women's cricket in general. Players

like Smriti Mandhana, Deepti Sharma, and Shafali Verma exhibit consistent growth in their salaries, aligning with their performance and potential. Also, Richa Ghosh and Nat Sciver-Brunt show promising upward trends, reflecting the importance of this league for young talent and foreign talent. It alludes to the league's potential to attract significant investment, enhance player value, and create lucrative opportunities for talented female athletes.

As the WPL continues to evolve and establish its own unique identity, further research and data collection will be essential. A comprehensive understanding of the league's growth potential requires continuous monitoring of audience sentiment, player performance, and market dynamics. Factors like international representation, team expansions, and individual player choices can significantly influence future earnings and should be considered in future research. In conclusion, while considering the limitations, the positive response from the audience and the projected growth of salaries for WPL players, with continued development and strategic planning, the WPL has the potential to become the IPL of women's cricket.
