

GARMENT INDUSTRY: ASSESSING THE PRODUCTIVITY OF DIFFERENT DEPARTMENTS

By Sinha Binte Babul

Introduction

The garment industry is a huge contributor to the world economy. The industry requires a lot of manpower as well as labor to meet the global demand for garment products. There are a lot of processes involved in making a garment product and each of these processes are painstaking and very manual. Besides taking care of the details, it is integral that the productivity of the departments involved in each of the processes are assessed well enough to be an all rounded productive industry. Productivity will save time for the input and would generate more output, therefore, the industry can continue to expand its profit and invest on improving its infrastructure. The garment industry departments mainly consist of Sewing and Finishing department to facilitate the completion of garment production.

In this project, I decided to analyze the variation in difference between each department's actual productivity and targeted productivity.

Research Question

What are the factors that impact the productivity in the Sewing and Finishing departments from the garment industry?

Method

Data: A dataset that includes important attributes of the garment manufacturing process and the productivity of the employees has been used for this project. The dataset was collected from Kaggle.com

References

- S.S. Jadhav, G.S.Sharma, A.M. Daberao, S.S.Gulhane, Improving Productivity of Garment Industry with Time Study, International Journal on Textile Engineering and Processes ISSN 2395-3578 Vol. 3, Issue October 2017
- Saima Akter, Farasat Raiyan Yasmin, Md. Ariful Ferdous, Implementation of kaizen for continuous improvement of productivity in garment industry in Bangladesh, American Academic & Scholarly Research Journal Vol 7, No. 3, May 2015
- Alam, Mohammad Nurul; Hassan, Md Mahmudul; Bowyer, Dorothea; and Reaz, Md, The Effects of Wages and Welfare Facilities on Employee Productivity: Mediating Role of Employee Work Motivation, Australasian Accounting, Business and Finance Journal, 14(4), 2020, 38-60. doi:10.14453/aabfj.v14i4.4

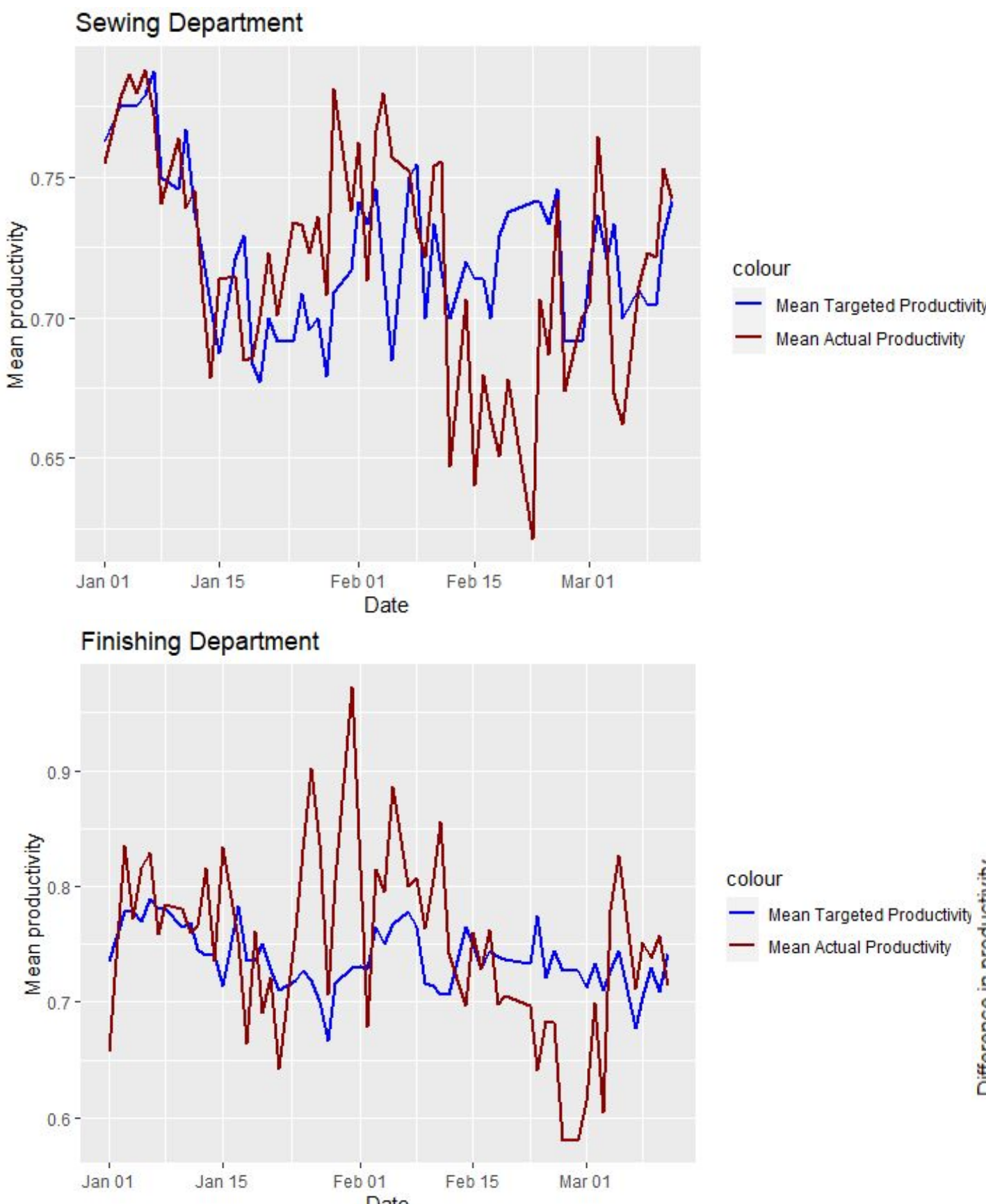


Figure: The Mean Actual and Targeted Productivity of Sewing and Finishing department throughout the study time

The line graphs show that there are noticeable differences between actual and targeted productivity of Sewing and Finishing departments.

Variables and Statistical Test:

The difference in productivity is calculated as follows:

$$\text{Difference} = \text{actual productivity} - \text{targeted productivity}$$

Multiple Linear Regression is performed twice: once for the sewing department and next for the finishing department. The test used the calculated differences as the response variable and eight explanatory variables which are: Quarter (a month was divided into four quarters), Department, Number of Workers, Number of Style Change, Standard Minute Value (smv), Work in Progress (wip), Over Time, Financial Incentive.

Then, all of these parameters have been used to fit a full model and the backward selection method has been used to eliminate variables that had p value > 0.001.

Results

Multiple significant relationships were found between difference in productivity and

- 1) Sewing department: ($p < 0.001$, $F = 218.8$ on 3 and 687 DF, Adjusted R-squared: 0.4864)
- 2) Finishing department: ($p < 0.001$, $F = 22.94$ on 3 and 502 DF, Adjusted R-squared: 0.1153)

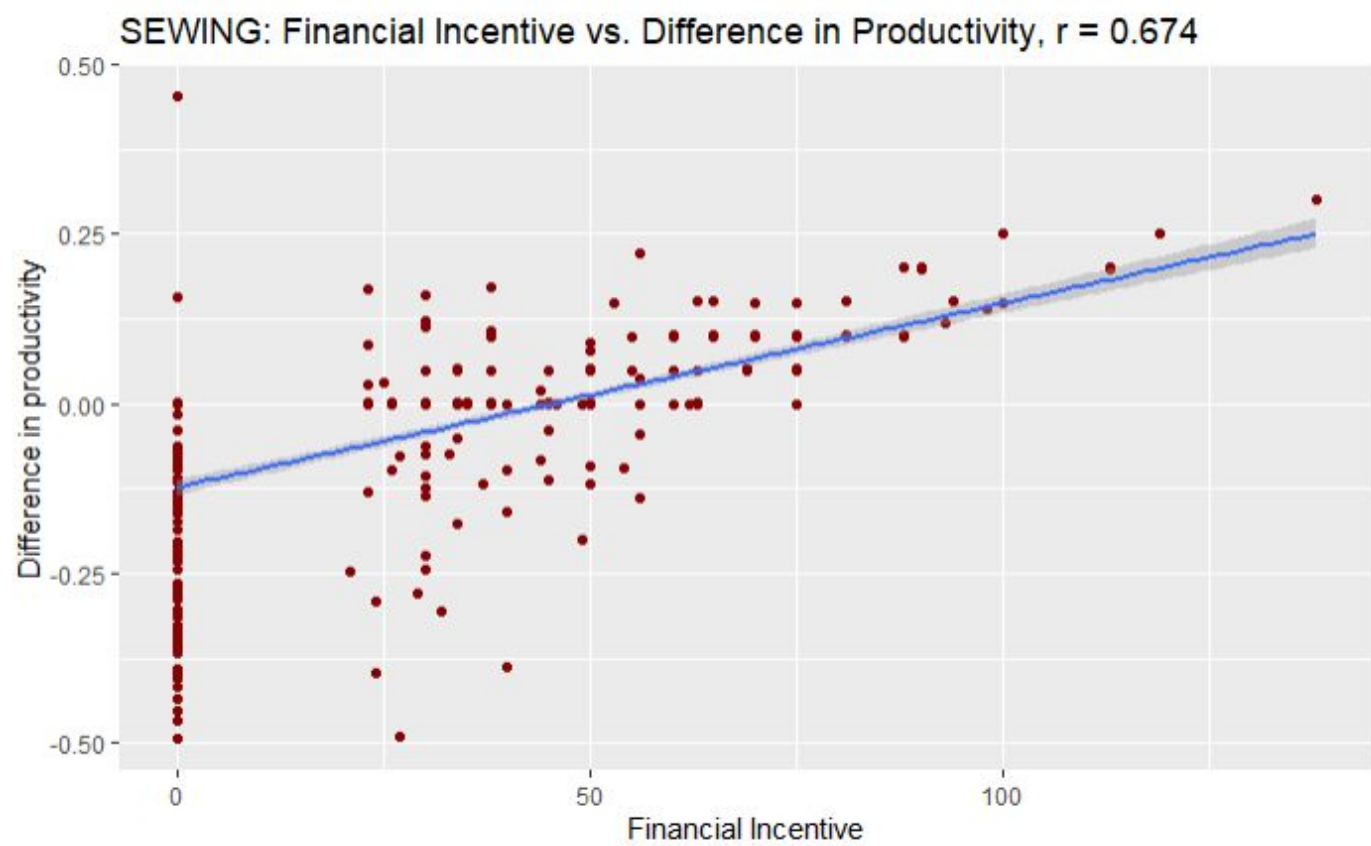
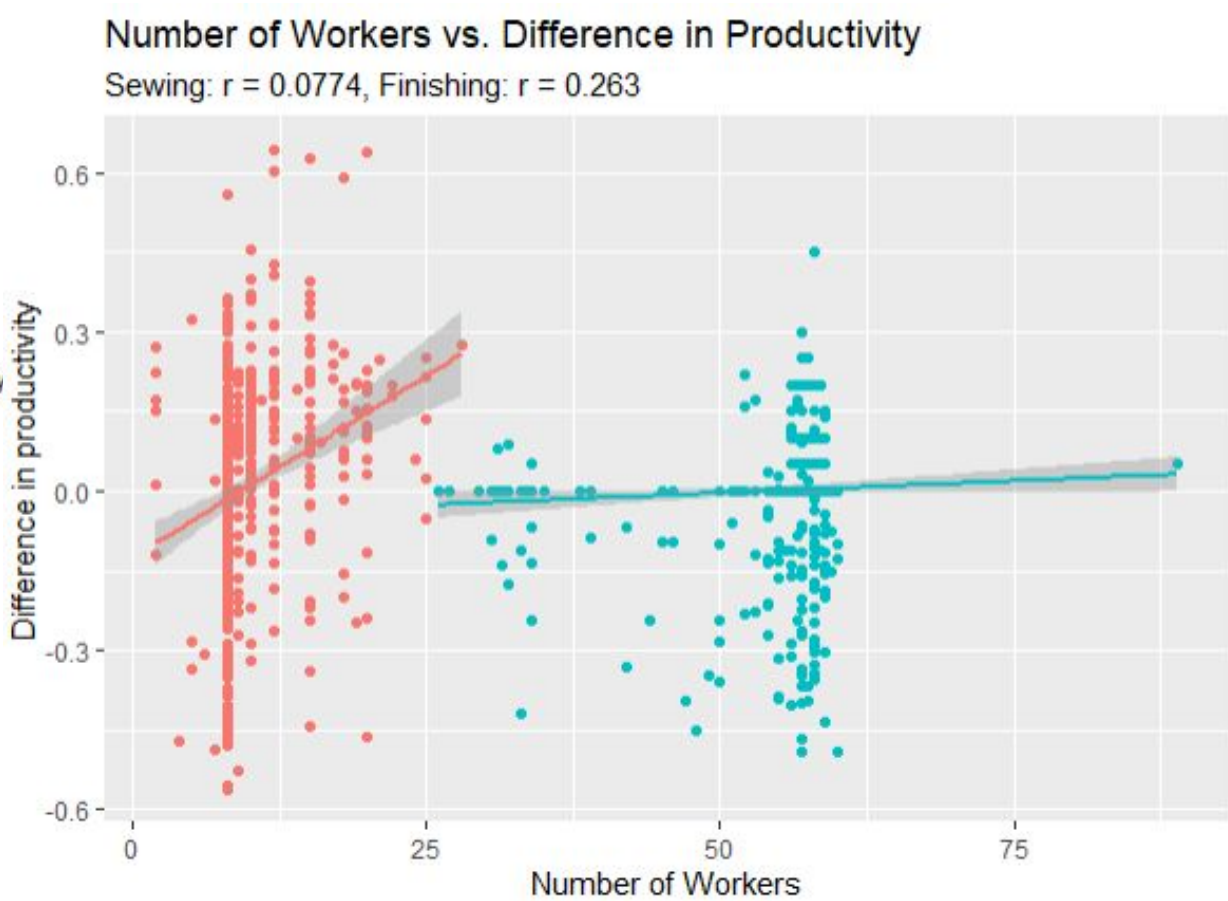
The predicted linear models:

Sewing:

$$\text{Difference} = \{-74.4 - 3.61(\text{smv}) + 2.5(\text{incentive}) + 1.85(\text{no_of_workers})\} 10^{(-3)}$$

Finishing:

$$\text{Difference} = \{-34360 + 6083(\text{smv}) - 2.363(\text{over_time}) + 1841(\text{no_of_workers})\} 10^{(-5)}$$



Conclusion:

- Increasing the Number of Workers in a team helps to increase the productivity in both departments.
- Increasing the allocated time for a work increases productivity in finishing department but decreases productivity in sewing department.
- In finishing department, the more extra amount of time a team works, the higher the productivity.
- In sewing department, increasing the financial incentive motivates higher productivity from teams.

For **sewing** department, the financial '**incentive**', the allocated work time '**smv**' and the **number of workers** all have statistically significant effect on the difference between productivities. Roughly **49%** of the variability in difference is accounted for by a multiple linear model with these four variables (R2 Adj = 0.4973).

For **finishing** department, the '**overtime**' worked by employees, the allocated work time '**smv**' and the **number of workers** statistically significant effect on the difference between productivities. Roughly **11.5%** of the variability in difference is accounted for by a multiple linear model with these three variables (R2 Adj = 0.1153).

