Impact of Iran's 4200 Toman Exchange Rate Policy on Iranian Industry

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Abstract

This report evaluates the impact of Iran's 4200 Toman exchange rate policy on industrial activities, with a focus on key sectors such as manufacturing. The report uses the Difference-in-Differences (DiD) method to compare pre- and post-policy outcomes for treatment and control industries, analyzing data on workshop worker numbers, sales value, and export value using time series data. Initially, the results are presented in the form of charts and graphs. The findings indicate that the policy slightly increases the number of male workers in workshops, but has no effect on the number of female workers, sales value, or direct exports of these workshops.

Institutional Background

The 4,200 Toman exchange rate for one US dollar was one of the decisions made by the government of President Hassan Rouhani in the spring of 1397 (2018). The goal of this policy was to support vulnerable groups and control the prices of essential goods, animal feed, medicine, and medical equipment. Over the following years, due to the restriction of Iran's foreign currency resources, the list of items eligible for this preferential exchange rate gradually shrank. From Ordibehesht 1397 (May 2018) to Mehr 1400 (October 2021), nearly 46 billion dollars of Iran's foreign currency resources were allocated to this preferential exchange rate and provided to exporters. The goods have been divided into three groups based on their importance and the government's priorities for providing subsidized foreign currency:

- The first group consists of essential goods, which are crucial for the basic needs of the population and are directly linked to public welfare. These goods include wheat, oil, rice, animal feed, and legumes.

  To see the list of these goods, click here.

- The second group of goods, which includes raw materials, intermediate goods, and capital goods, are provided with foreign currency through the export of petrochemicals, steel, and minerals, as well as the NIMA system.

  These goods include production raw materials, machinery, and more, and their foreign currency is supplied at the rate of 4200 Toman per US dollar.

  To see the list of these goods, click here.

- The third group of goods, which are assigned foreign currency based on the government's decision, consists of consumer goods. The foreign currency for these goods is sourced from exports of goods that are not required to submit their foreign currency to the NIMA system. These goods are funded at the rate of 4200 Toman per US dollar, plus the export declaration price.

  To see the list of these goods, click here.

Summary Statistic

I used time series data from workshops between 2002 and 2010 to assess the effect of the 4200 Toman exchange rate on workshops. For my analysis, I limited the data to the years 2016 to 2020. The summary statistics for six industries, which were affected by the 4200 rial exchange rate, are presented in this section. These six industries will later be used as the treatment group in the effect analysis. The summary statistics include the number of workers over time, information about workers in the workshops of each industry, as well as data on sales value, production value, and capital accumulation for each establishment over time. Given the high inflation in Iran in recent years, the variables "sales value", "capital accumulation", and "products value" have been adjusted for inflation. The inflation data has also been taken from the Central Bank of Iran's website.

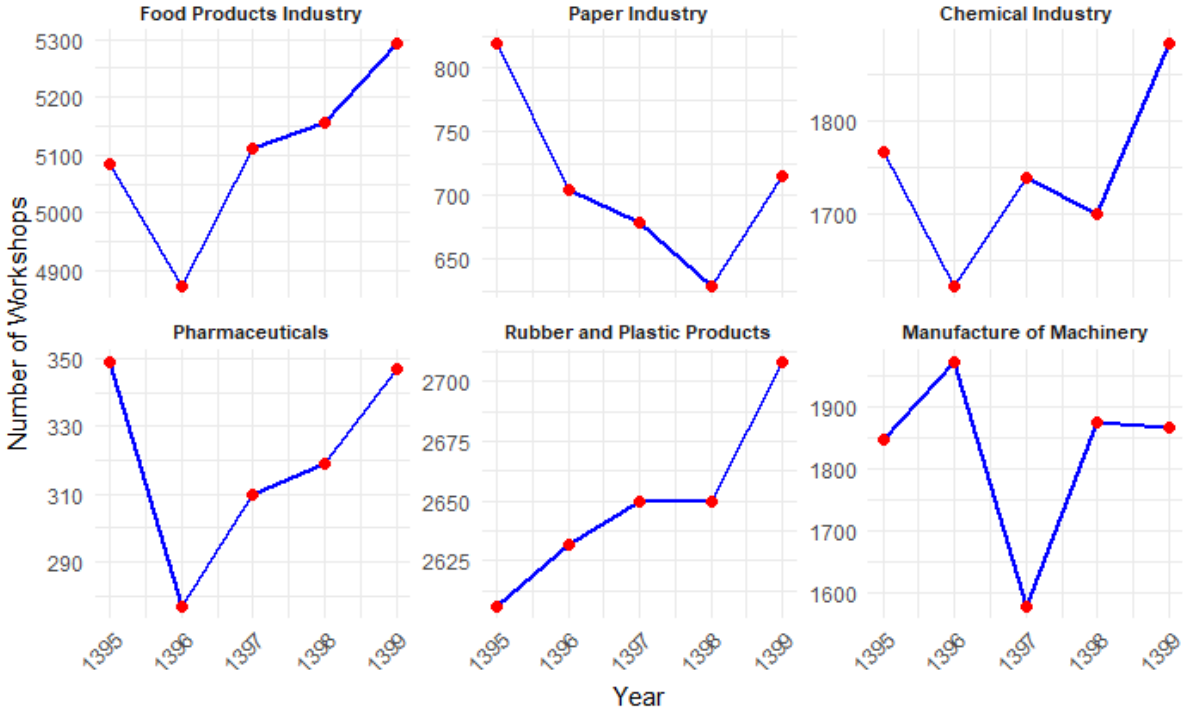


Figure 1: Number of Workshops Over Time by Industry

Figure 2: Number of Employees Receiving Wages by Gender and Industry Over Years

Figure 3: Number of Employees Not Receiving Wages by Gender and Industry Over Years

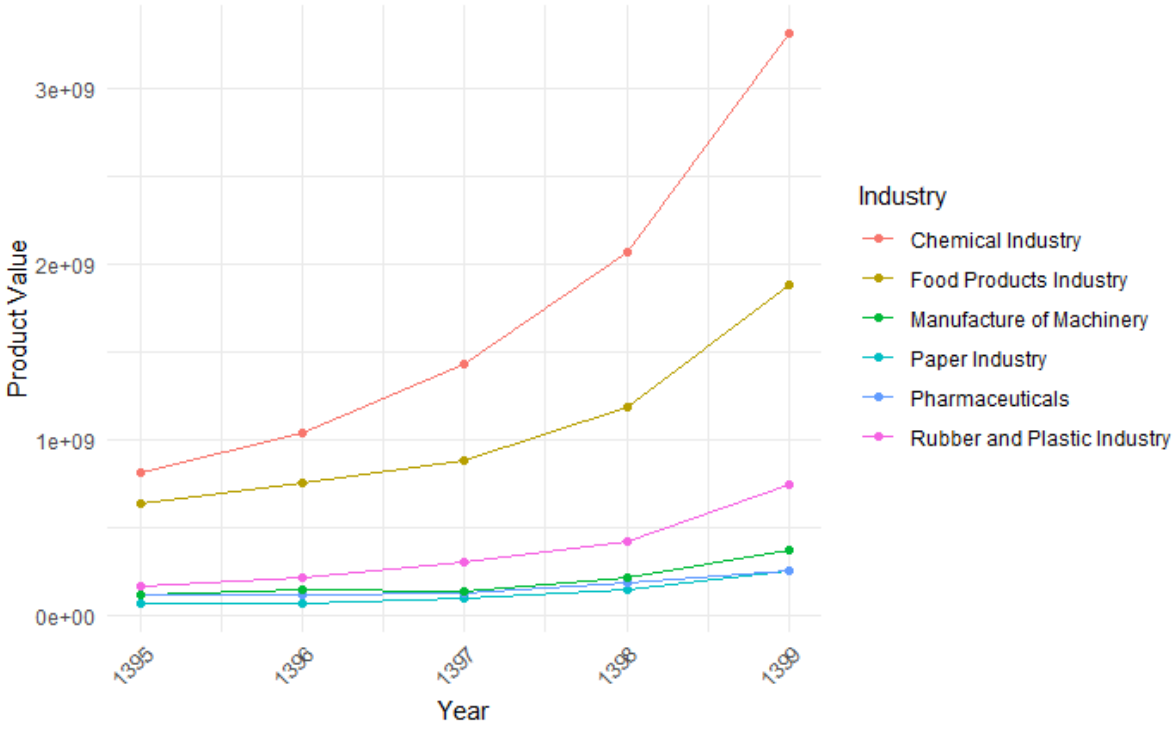


Figure 4: Adjusted Product Value by Industry and Year

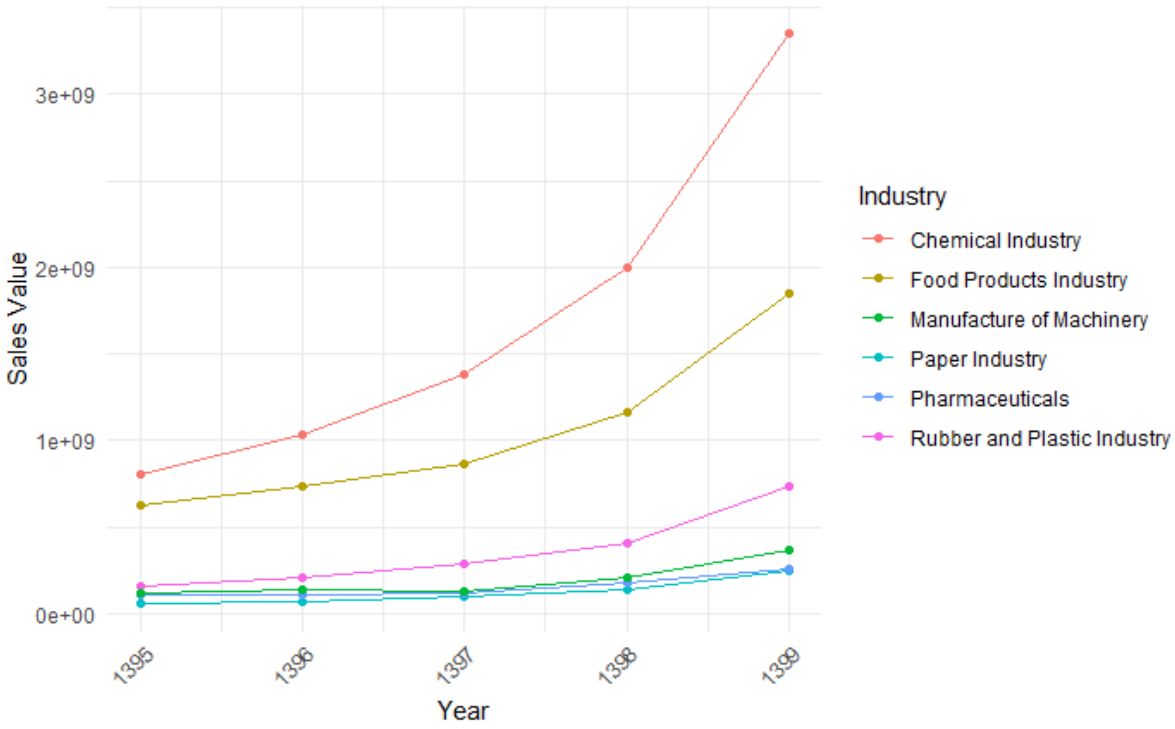


Figure 5: Adjusted Sales Value by Industry and Year

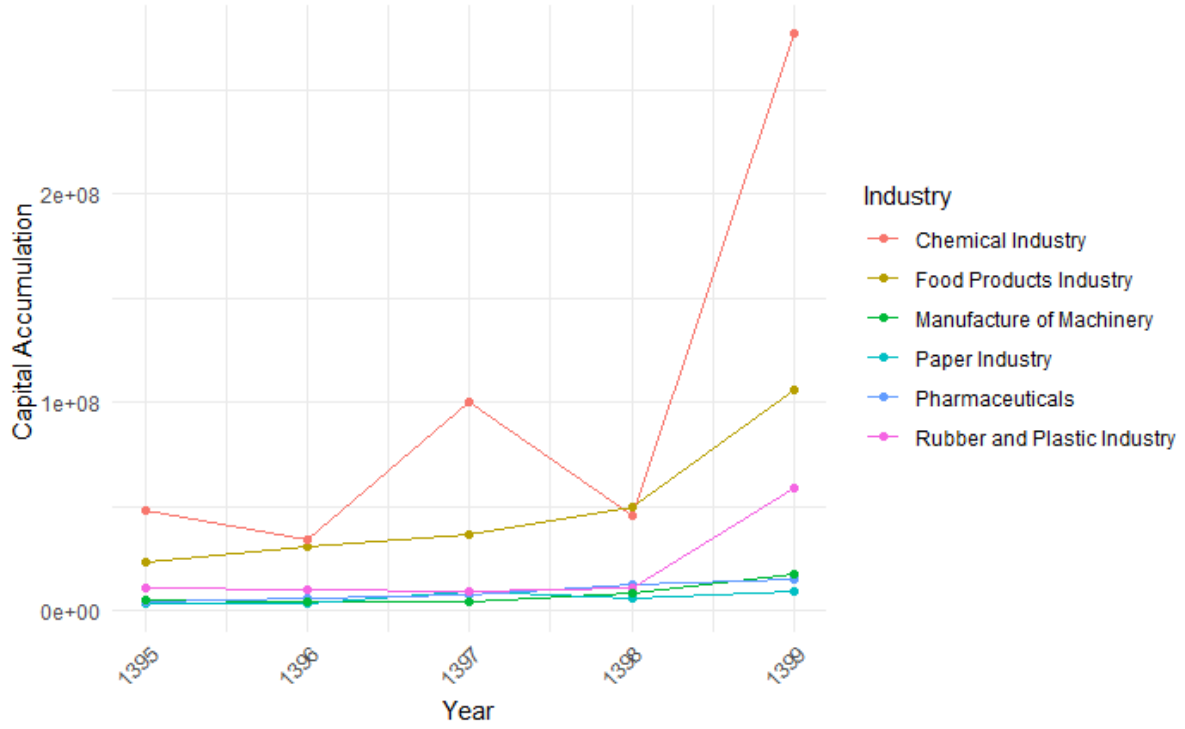


Figure 6: Adjusted Capital Accumulation by Industry and Year

Effect of *4200 Exchange Rate*

Identification & methodology

The primary analytical method used is Difference-in-Differences (DiD). The DiD approach compares the change in outcomes for treated and control groups before and after the policy intervention. I used the industries of *"Paper and Paper Products Manufacturing"*, *"Plastic Products Manufacturing"*, *"Food Products Manufacturing"*, *"Pharmaceutical and Chemical Products Manufacturing"*, and *"Machinery and Equipment Manufacturing (not elsewhere classified)"* as the treatment group. Additionally, I used the industries of *"Beverage Manufacturing"*, *"Tobacco Products Manufacturing"*, *"Textile Manufacturing"*, *"Leather and Related Products Manufacturing"*, *"Furniture Manufacturing"*, *"Other Manufacturing (not elsewhere classified)"*, and *"Repair and Installation of Machinery and Equipment"* as the control group. The treatment group received the 4200 Toman exchange rate, while the control group did not. Due to the limited data availability, I have used the variables "number of workers," "number of female workers," "sales value," and "direct export value" to assess the effect. Given the high inflation in Iran in recent years, the variables "sales value" and "direct export value" have been adjusted for inflation. Because my dependent variables exhibits large variation, I use the logarithmic form of the variable.

The model is specified as follows:

$$y_{it} = \alpha_i + \gamma_t + \beta_0 treatment_i + \beta_1 Post_t + \beta_3 (treatment_i \times Post_t) + \epsilon_{it} \quad (1)$$

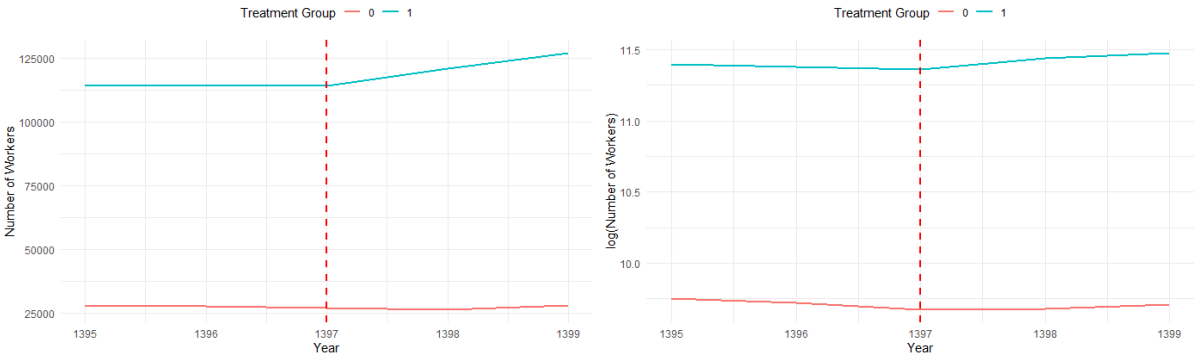
Where:

- y_{it} represents the outcome variables (Number of Workers, Number of Female Workers, Sales Value, Direct Export Value)
- γ_t represents year fixed effects
- α_i represents industry fixed effects
- Post is a dummy variable indicating the post-policy period
- Treatment is a dummy variable for the industries affected by the policy
- ϵ_{it} is the error term

Results

Number of Workers

First, I examine the impact of the 4,200 exchange rate policy on the number of workers in workshops. In panel (a) of Figure 7, I use the number of workers, and in panel (b), I use the logarithmic form of the number of workers. We observe that before the policy in 2018, parallel trends exist between the treatment and control groups, confirming the validity of using the difference-in-differences method. After the cutoff year, we see only a slight change in the number of workers in workshops.



Panel (a) Panel (b)

Figure 7: Parallel Trends for Number of Workers

After confirming the parallel trends assumption, I run Regression (1) for the number of workers, and the results are presented in Table 1. The coefficient of the interaction term (treatment × post) is 0.087, which is statistically significant at the 10% level. This indicates that, after the 4200 exchange rate policy, the treatment group experienced an 8.7% increase in the number of workers in workshops relative to the control group, compared to the pre-policy period.

Table 1: Effect of 4200 Exchange Rate on Number of Workers

	Dependent variable:
	log(Number OF Workers)
treatment	4.027^{***}
	(0.071)
post	-0.025
	(0.046)
treatment × post	0.087^{*}
	(0.052)
Observations	65
R^2	0.995
Adjusted R^2	0.993
Residual Std. Error	0.101 (df = 47)
F Statistic	536.326^{***} (df = 17; 47)
Note:	*p<0.1; **p<0.05; ***p<0.01

Now, we examine the impact on female workers. In Figure 8, the parallel trends for women are shown. As seen in the graph, before the policy, the trends for the two groups were parallel, confirming the validity of using the difference-in-differences method. After the cutoff year, there is no noticeable change in the trend for the treatment group compared to the control group, which further supports the use of the difference-in-differences approach. After confirming the parallel trends assumption, I present the results of Regression (1) for the number of female workers in firms in Table 2.As shown in the table, the 4200 exchange rate policy does not have a significant effect on the number of female workers. Based on the results from Table 1, we can conclude that the increase in the number of workers in firms is mainly driven by the increase in the number of male workers.

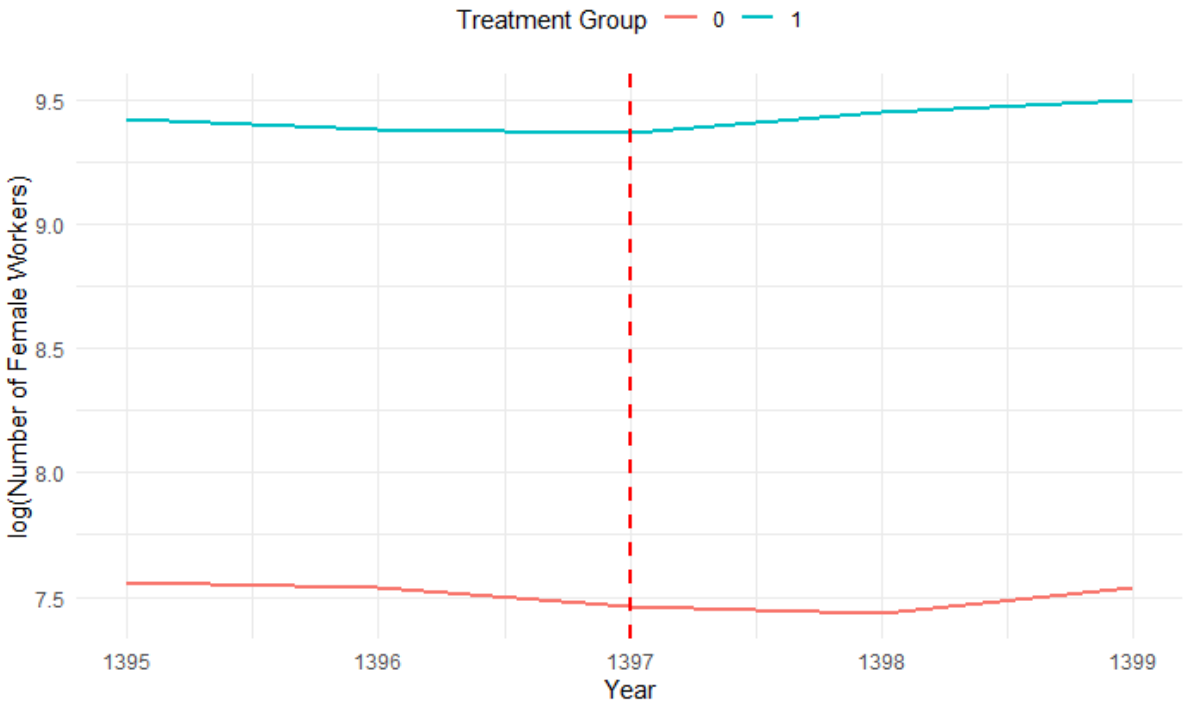


Figure 8: Parallel Trends for Number of Female Workers

Table 2: Effect of 4200 Exchange Rate on Number of Female Workers

	Dependent variable:
	log(Number OF Female Workers)
treatment	5.449^{***}
	(0.114)
post	-0.026
	(0.074)
treatment $\times$ post	0.106
	(0.082)
Observations	65
R^2	0.991
Adjusted R^2	0.988
Residual Std. Error	0.162 (df = 47)
F Statistic	301.437^{***} (df = 17; 47)
Note:	*p<0.1; **p<0.05; ***p<0.01

Sales Value

In this subsection, I examine the effect of the 4200 exchange rate policy on the *adjusted sales value* of workshops. In Figure 9, I present the parallel trends for the logarithmic form of workshops sales. As shown in the figure, before the cutoff year, both the treatment and control groups exhibit parallel trends, which supports the validity of using the difference-in-differences method. After the cutoff year, no change in the sales trend for the treatment group relative to the control group is observed.

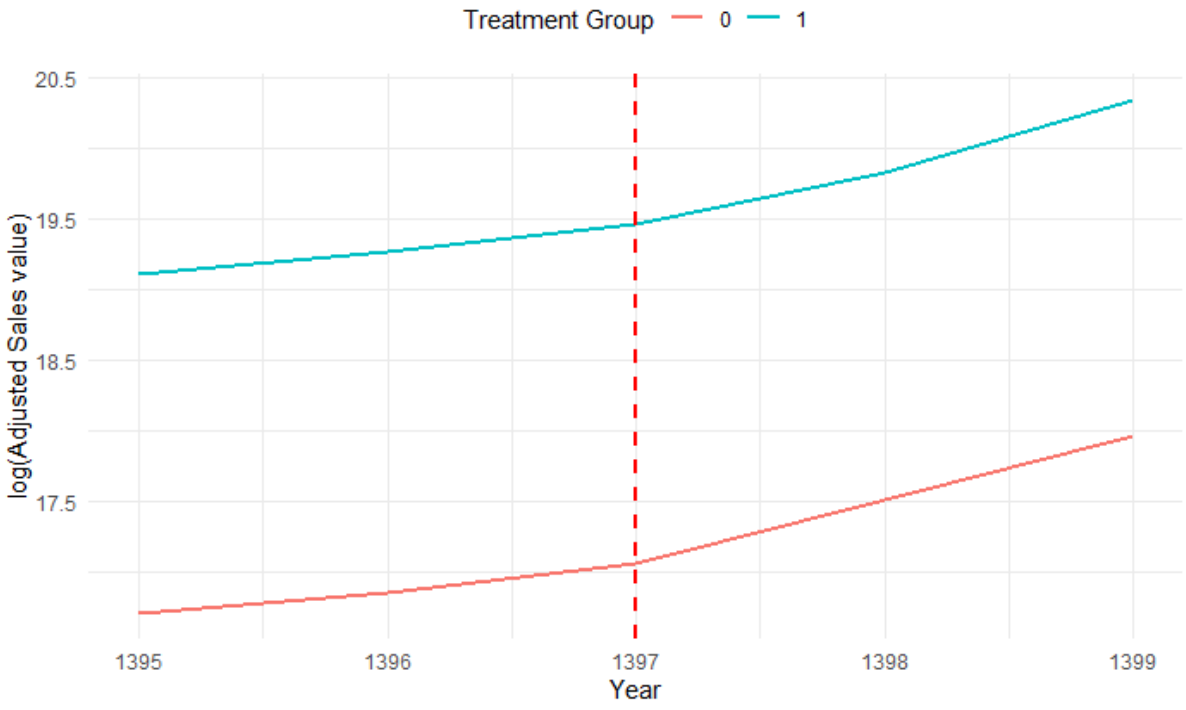


Figure 9: Parallel Trends for Adjusted Sales Value

After confirming the parallel trends assumption, I ran regression (1) for the logarithmic form of the adjusted sales value of workshops, and the results are reported in Table 3. As shown in the table, the coefficient is negative but not statistically significant, indicating that the 4200 exchange rate policy has had no effect on the sales value of workshops.

Table 3: Effect of 4200 Exchange Rate on Sales Value

	Dependent variable:
	log(Adjusted Sales Value)
treatment	5.005^{***}
	(0.119)
post	1.267^{***}
	(0.077)
treatment:post	-0.039
	(0.086)
Observations	65
R^2	0.992
Adjusted R^2	0.989
Residual Std. Error	0.169 (df = 47)
F Statistic	339.585^{***} (df = 17; 47)
Note:	*p<0.1; **p<0.05; ***p<0.01

Direct Export Value

Finally, I examine the impact of the policy on the adjusted direct export value of workshops. In Figure 10, I plot the trends for the treatment and control groups. As shown, before the cutoff year, the two trends are parallel, confirming the validity of using the difference-in-differences method. After the cutoff year, no change in the trend for the treatment group relative to the control group is observed.

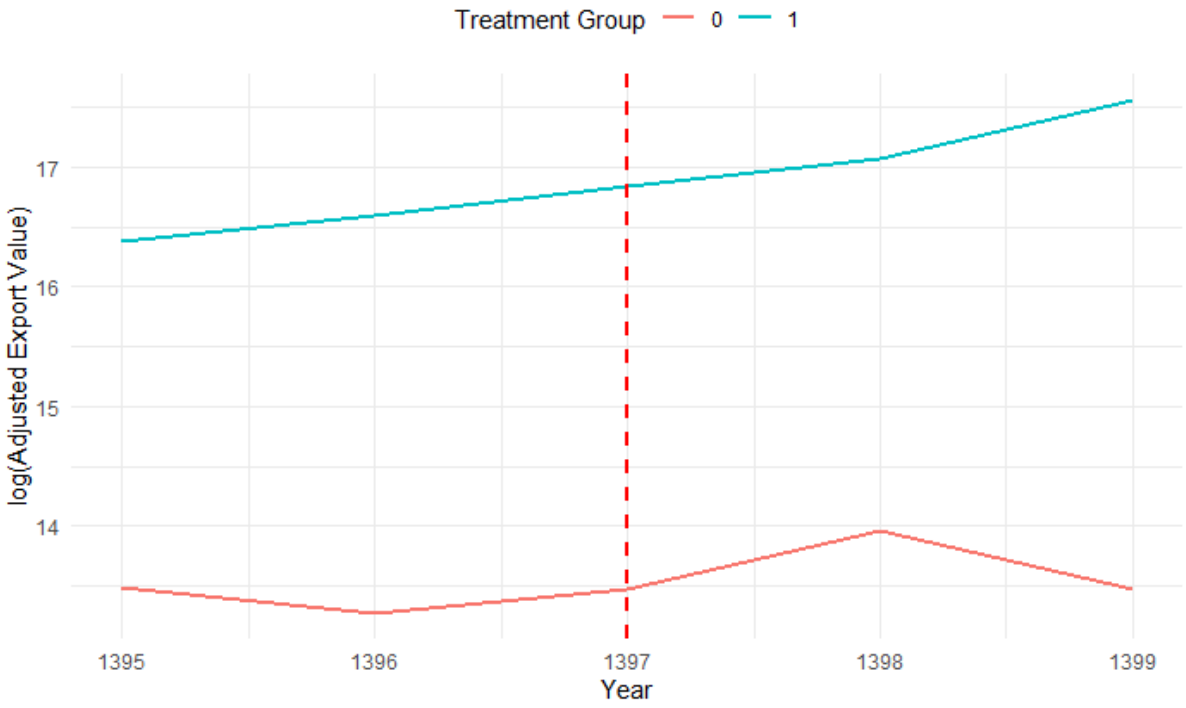


Figure 10: Parallel Trends for Adjusted Direct Export Value

After confirming the parallel trends assumption, I ran Regression (1) for the logarithm of adjusted direct export value, and the results are presented in Table 4. As observed, there is no significant effect, indicating that the 4200 exchange rate policy has had no impact on the direct export value of the workshops.

Table 4: Effect of 4200 Exchange Rate on Direct Export Value

	Dependent variable:
	log(Adjusted Export Value)
treatment	5.650^{***}
	(0.480)
post	0.342
	(0.312)
treatment:post	0.415
	(0.347)
Observations	65
R^2	0.947
Adjusted R^2	0.927
Residual Std. Error	0.683 (df = 47)
F Statistic	49.097^{***} (df = 17; 47)
Note:	*p<0.1; **p<0.05; ***p<0.01

Conclusion

The 4200 rial exchange rate policy had a limited impact on the industrial sector, particularly regarding gender-based employment and export outcomes. While this policy led to a slight increase in the number of male workers in workshops, it had no effect on the number of female workers, sales value, or direct export value of these workshops. This suggests that although the policy may have influenced certain aspects of labor demand, its impact on the macroeconomy, particularly on female labor force participation and export performance, has been minimal.