Winners and Losers in Industrial Policy 2.0 : An Evaluation of the impacts of the Tunisian Industrial Upgrading Program

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Overview

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Motivation

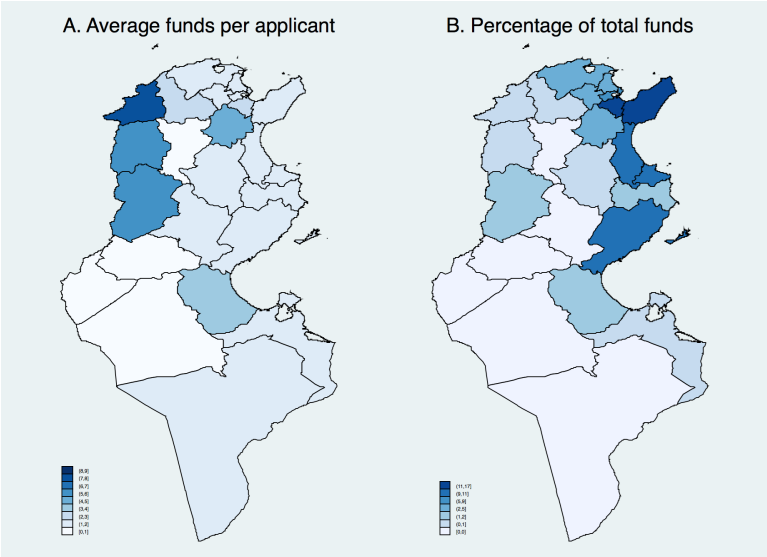
- Over the past 2-3 decades increasing openness to trade and focus on increasing competitiveness to meet these demands
- Industrial policies are unpopular : **market distortions**, **political capture** and its misguided **focus on sectors.**
- But continued focus on industrial development and the success of Asian countries has brought such policies back to the limelight.
  - Who gains from IPs ? What is it's impact on jobs and wages? And implicitly, what does this say about its purpose ?

Literature Review

- The literature tells us that the impacts of firm subsidies on productivity are almost always negative or non-significant.
  - Negative or no impact on firms (Criscuolo, 2019; Cerqua, 2014)
  - If there are positive impacts they are :
    - 2-4 yrs after (Bernini, 2017)
    - only for on small firms (Criscuolo, 2019)
  - But the state also uses IP to guarantee its clients a non-competitive environment (Cammett 2007, Murphy 2006 and Rijkers 2017 in Tunisia; and Rougier 2016 in Egypt).

Description: The Industrial Upgrading Program (PMN)

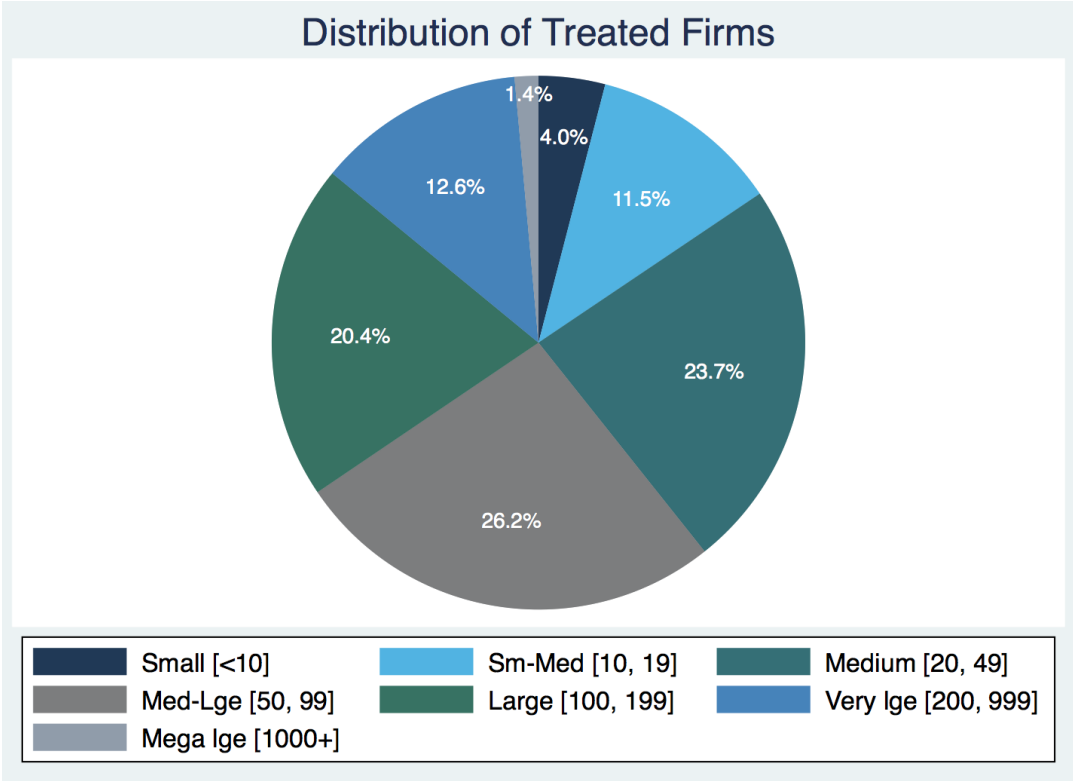
- The Industrial Upgrading Program (PMN) was implemented after the Free Trade Agreement with the EU with the following goals:
  - competitiveness,
  - exports,
  - innovation and
  - labor market outcomes.



Source: Office of the Industrial Upgrading Program

Allocation of IUP funds

- More than 5K grants in the last 20 years equivalent to 1.26 Billion Tunisian Dinars (500 Million US$).
- 2/3 of the amount were spent on material purchases and the rest on immaterial acquisitions.
- Focused on large firms : 60% of recipient firms had over 50 workers



How were funds allocated?

- The COPIL - a board of multi-stakeholders – and the bureau of the IUP decided on who received benefits.
- These were closed door sessions, with low-oversight $\rightarrow$ It quickly became well known that members of the inner circle of the regime benefited from this.
- But overall there was support from business and civil society. International donors were positive about it. $\rightarrow$ largely perceived as beneficial for Tunisian firms and employment.

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Data Description

1. National firm-level enterprise registry (*Répertoire nationale des entreprises*) from 2000 to 2016.
   - A sample of firms with at least 6 employees
   - Approximately 125,000 obs in an unbalanced panel of 7,000 firms.
   - Firm-level data on exports from national export agency from 2005-2010.
2. PMN survey by ITCEQ (*Institut tunisien de la compétitivité et des études quantitatives*)
3. Treatment data from database online and in consultation with research institute in Tunisia.

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Approach

- **Approach**
  - A (double) weighted propensity score matching method to create control groups, with assignment based on fuzzy matching technique.
  - Combined with a re-weighted panel differences-in-differences (Card, 1990; Hirano, Imbens, and Ridder, 2003).

Econometric Specification

$$
\begin{aligned}
y_{i,t} = \quad & \beta_0 + \beta_1 \mathit{Treated} * \mathit{After}_{i,t} + \beta_2 \textstyle\sum_{t+n}^{n=3} \mathit{After}_{i,t} + \\
& \beta_3 \mathit{TreatmentGroup}_i + \beta_4 \mathit{Anticipation}_{i,t-1} + \\
& \beta_5 \textstyle\sum_{t}^{n} \mathit{Treated} * \mathit{After} * \mathit{Year}_{i,t} + \\
& \beta_6 X'_{i,t}\gamma + \tau_t + \lambda_i + \zeta_i + \epsilon_i
\end{aligned} \tag{1}
$$

- $y_{i,t}$: log of employment, log of average wages per worker and the log of net job creation.
- β_1 : main treatment variable of interest
- β_2 : time-specific treatment effects (1-3 years)
- β_3 : treatment group assignment
- β_4 : anticipation effect of the program (one year prior)
- β_5 : year-specific treatment effect
- β_6 : controls (age, age-squared, size, distance to ports and lagged and growth components)
- year (τ_t), regional (λ_i), and sector (ζ_i) fixed effects

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Small but significant increase in wages

Table: Impact of the IUP on Average Wages.

	OLS Panel Fixed Effects Models			*Reg. Adj. Models*	
Log of Ave. Wages	(1)	(2)	(3)	(4) PSM	(5) IPW
Treatment	-0.003	0.007	0.013**	-0.070***	**0.023****
	[-0.447]	[1.208]	[2.081]	[-5.134]	[2.249]
1-year after	0.004	0.018***	0.021***		-0.006
	[0.579]	[3.621]	[3.646]		[-0.486]
2-years after	0.007	0.020***	0.020***		-0.012
	[1.118]	[3.625]	[3.249]		[-1.133]
3-years after	0.003	0.019***	0.017***		-0.008
	[0.430]	[3.126]	[2.605]		[-0.672]
Anticipation	0.030***	0.011**	0.022***		-0.008
	[4.654]	[2.052]	[3.687]		[-0.637]
Treat*Year	No	No	Yes	No	Yes
Full Controls	No	Yes	Yes	Yes	Yes
Observations	327,234	195,501	195,501	69,077	69,077
R-squared	0.347	0.458	0.458	0.0004	0.693

Wages growth mostly in smaller firms

Table: Impact of the IUP on Average Wages, by size.

Log of Wages	(1) Small [5, 9]	(2) Sm-Med [10, 19]	(3) Medium [20, 49]	(4) Med-Lge [50, 99]	(5) Large [100, 199]	(6) Very lge [200, 999]
Treatment	-0.004	0.015	0.091***	0.049***	0.019	0.059***
	[-0.082]	[0.528]	[4.594]	[3.256]	[0.918]	[3.985]
1-year after	0.177***	-0.0003	0.050*	-0.021	-0.063***	-0.019
	[4.735]	[-0.009]	[1.759]	[-1.319]	[-3.048]	[-1.065]
2-years after	0.219	-0.090**	0.030	-0.031*	-0.048**	-0.031
	[0.861]	[-2.294]	[1.240]	[-1.944]	[-2.353]	[-1.568]
3-years after	-0.134	0.119**	0.045**	-0.015	-0.036	-0.009
	[-1.578]	[2.116]	[2.047]	[-0.900]	[-1.503]	[-0.504]
Anticipation	-0.024	-0.043	-0.002	-0.066***	-0.005	-0.030
	[-0.302]	[-1.333]	[-0.085]	[-4.196]	[-0.190]	[-1.566]
Observations	31,203	12,108	11,314	6,496	4,344	3,354
R-squared	0.783	0.771	0.768	0.745	0.647	0.795
Method	IPW	IPW	IPW	IPW	IPW	IPW

No impact on overall employment

Table: Impact of the IUP on Employment.

	OLS Panel Fixed Effects Models			*Reg. Adj. Models*	
Log of Employment	(1)	(2)	(3)	(4) PSM	(5) IPW
Treatment	0.260***	0.016***	0.011*	1.545***	**0.001**
	[19.282]	[2.745]	[1.658]	[52.40]	[0.162]
1-year after	0.133***	0.021***	0.015**		0.005
	[10.221]	[3.804]	[2.411]		[0.612]
2-years after	0.093***	0.020***	0.017***		0.001
	[6.996]	[3.507]	[2.792]		[0.115]
3-years after	0.099***	0.013*	0.014**		0.012
	[6.177]	[1.940]	[2.010]		[1.166]
Anticipation	0.169***	0.009	0.003		-0.016
	[12.415]	[1.570]	[0.433]		[-1.549]
Treat*Year	No	No	Yes	No	Yes
Full Controls	No	Yes	Yes	Yes	Yes
Observations	328,536	195,501	195,501	69,077	69,077
R-squared	0.010	0.606	0.606	0.038	0.949

But employment does increase in smaller firms.

Table: Impact of the IUP on Employment, by size.

Log of Employment	(1) Small [5, 9]	(2) Sm-Med [10, 19]	(3) Medium [20, 49]	(4) Med-Lge [50, 99]	(5) Large [100, 199]	(6) Very lge [200, 999]
Treatment	0.518***	-0.031	0.010	-0.005	0.019*	-0.082***
	[12.203]	[-1.577]	[0.689]	[-0.502]	[1.712]	[-3.981]
1-year after	0.135	0.076*	0.047**	0.033**	-0.013	-0.047**
	[1.465]	[1.910]	[2.225]	[2.481]	[-1.064]	[-2.298]
2-years after	0.127*	0.110**	0.012	0.012	0.014	0.003
	[1.719]	[2.530]	[0.456]	[0.868]	[1.037]	[0.116]
3-years after	-0.095	-0.064	0.097***	0.002	0.037**	-0.023
	[-0.846]	[-1.620]	[3.506]	[0.098]	[2.426]	[-0.794]
Anticipation	0.173***	0.013	0.023	-0.025**	0.014	-0.074***
	[3.039]	[0.398]	[1.108]	[-2.008]	[0.936]	[-3.013]
Observations	31,203	12,108	11,314	6,496	4,344	3,354
R-squared	0.269	0.103	0.149	0.135	0.131	0.362

Conclusions

- The findings suggest that the IUP did have positive outcomes for labor (employment and wages) – but mostly for smaller firms.
- When program recipients are large firms, subsidies from the program do not clearly benefit labor $\rightarrow$ capital-owners do not transfer gains to workers.
- When subsidies are distributed to small-sized firms, more gains go to labor.
- Additionally, treated firms' there is evidence of export specialization, but this is not clearly linked with higher volumes as dominant post-treatment business strategy $\rightarrow$ unclear export outcomes. Go to Details

Main Take Away

- From an efficiency argument, the findings suggest that the IUP in Tunisia is being used as a political tool– it does not find evidence to reject the arguments of Murphy and Cammett.
- The way it is implemented and its impacts suggest that it's political purpose is more likely to control and bolster support through clientellism.
- **If the purpose is to support labor, IPs could be better focused on supporting small firms rather than larger firms.**

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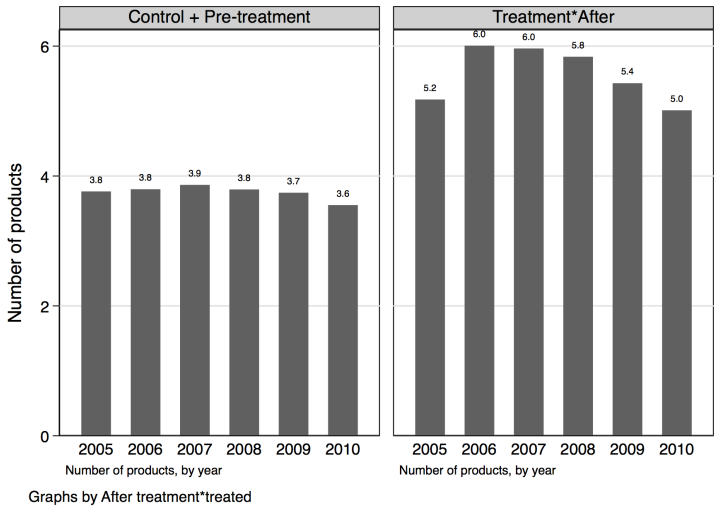
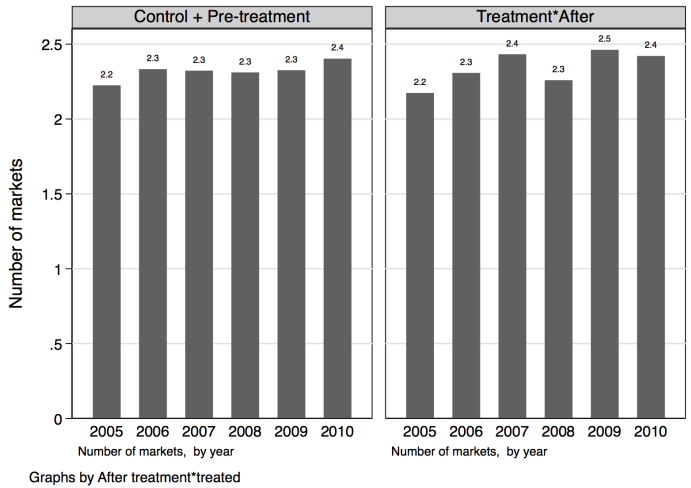
Annex : Results on Export diversification or Concentration

- Further non-parametric analysis also demonstrates that after treatment, treated firms exported higher number of different products, but not markets.

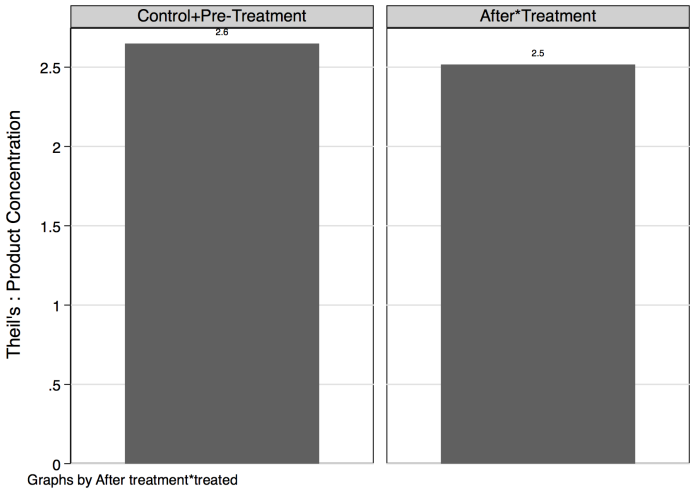




return to conclusions

Annex : Results on Export diversification or Concentration

- Using the Theil Index, there is an increase in concentration (decrease in diversification) in the value of products exported but not markets.



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