Do Exporters Perform Better? Evidence from Manufacturing Plants in Iran

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Incentives

- The export markets are usually known to be more competitive
- Exporting plants need to upgrade their performance in order to survive
- Is there such a pattern among Iranian manufacturing plants?

Exports and Performance

- The causality between exporting and performance is two sided:

  1- Better performed (more productive) firms select into exporting
  - i.e. they can pay fixed costs to enter foreign markets, they can set lower prices
  - Melitz, 2003
  - Bernard and Jensen, 1995 & 1999

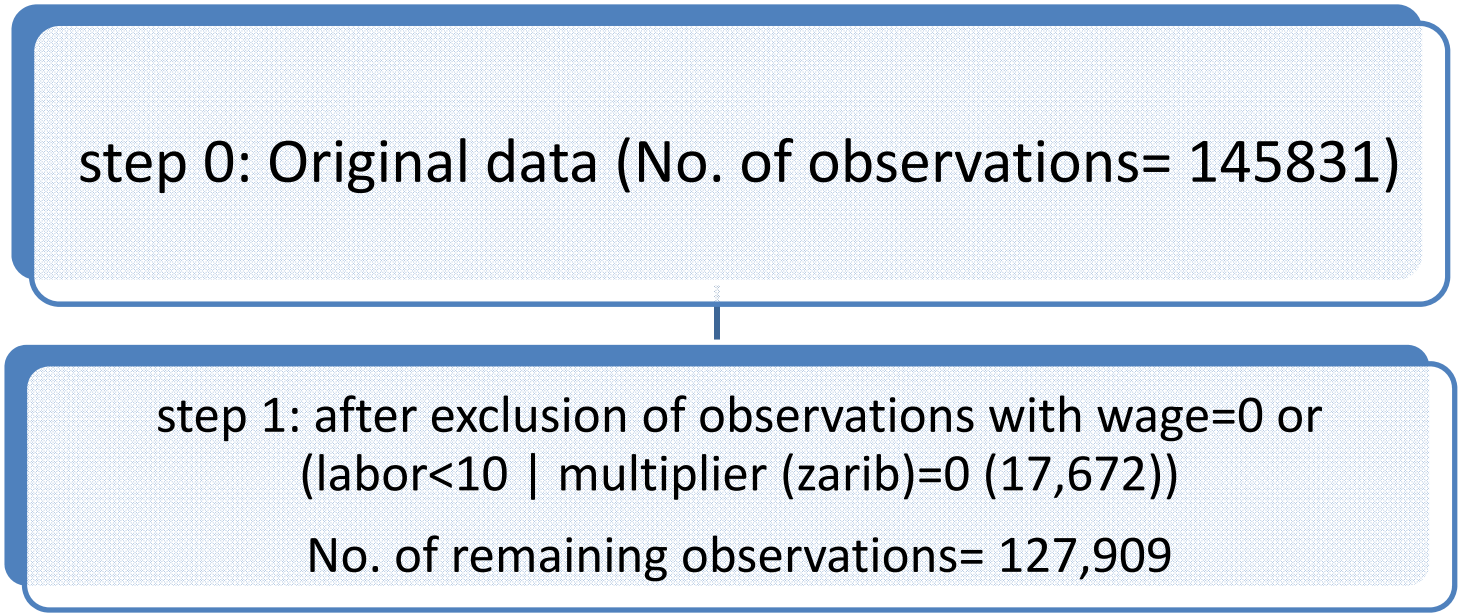
  2- Exporting yields in better performance (higher productivity)
  - By inducing more competitive environments, learning, etc.
  - Van Biesebroeck, 2005
  - Grima et al, 2004

This study…

- Question:
  - Are exporters induced to perform better?
- Issue:
  - Identify selection into export from learning hypothesis
- Dataset:
  - Panel dataset of manufacturing plants in Iran, 2003-2011

Dataset

- *Iran's Manufacturing Plants Data Bank*
- Provided by Iran Statistics Center



Estimation Procedure

- What we ***wish*** to estimate:
  - $\mathrm{ATT} = \mathrm{E}\{\mathrm{y}^{1}_{\mathrm{i,t}} - \mathrm{y}^{0}_{\mathrm{i,t}} | \mathrm{export}_{\mathrm{i,t}} = 1\} =$
    $\mathrm{E}\{\mathrm{y}^{1}_{\mathrm{i,t}} | \mathrm{export}_{\mathrm{i,t}} = 1\} - \mathrm{E}\{\mathrm{y}^{0}_{\mathrm{i,t}} | \mathrm{export}_{\mathrm{i,t}} = 1\}$

- What we estimate in OLS:
  - $\mathrm{E}\{\mathrm{y}^{1}_{\mathrm{i,t}} | \mathrm{export}_{\mathrm{i,t}} = 1\} - \mathrm{E}\{\mathrm{y}^{0}_{\mathrm{i,t}} | \mathrm{export}_{\mathrm{i,t}} = 0\}$
  - $Performance_t = \alpha_1 export_t + \alpha_2 X_t + error_t$
  - We implicitly assume that there is no <u>*baseline bias*</u> between the two groups

Estimation Procedure (continue)

- To remove the baseline bias, we follow Rosenbaum and Rubin (1983) and do the followings:
  - Estimate probability of being an exporter, using observables (via a *logit* model)
  - Exclude observations in (control)treated group with no counterpart in the (treated)control group
  - Run WLS, with less weights to exporters with higher probability of exporting, and less weights to domestic sellers with low probability of non-exporting

Data trimming process

step 2: exclusion of exiters (15192), always exporters (2988), year=1382(14889), sale=0|. (6829), energy=0 (33)

No. of remaining observations= 87894

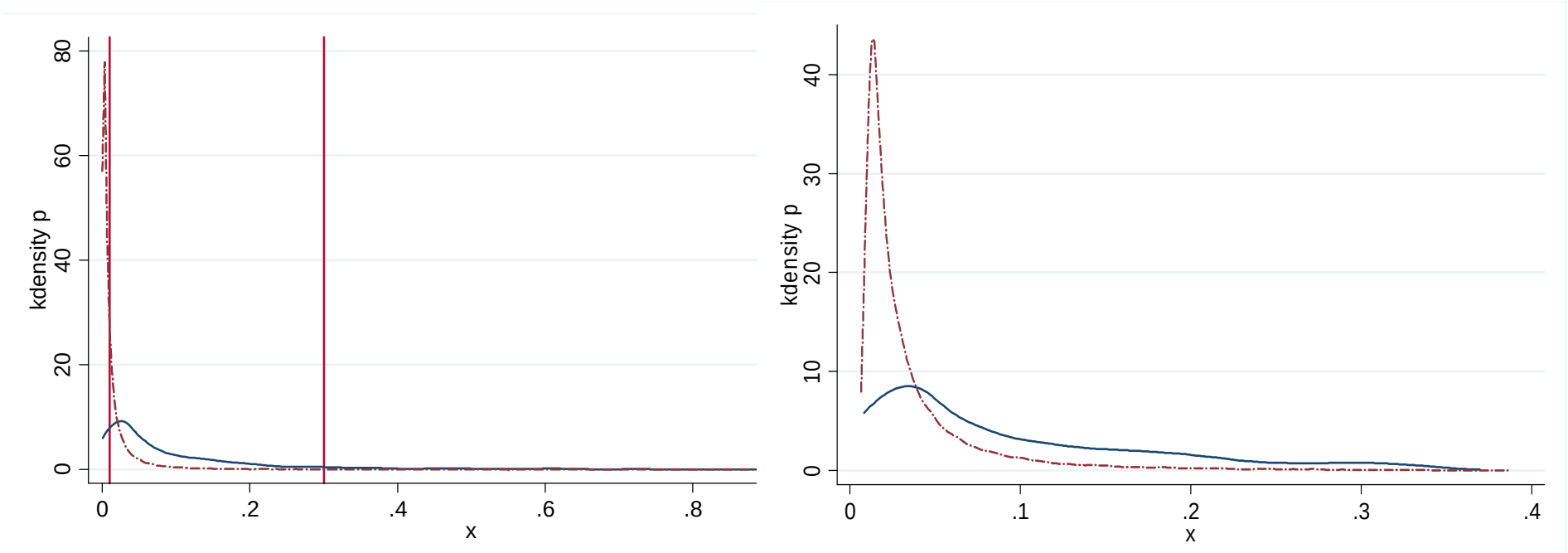
step 3: Trimming (1st round), drop if p<0.01 | p>0.3, also these 2-dgt ISICs dropped b/c no exporters:

No of observations= 30126

step 4: Triming (2nd round)

No. of observations= 28,172

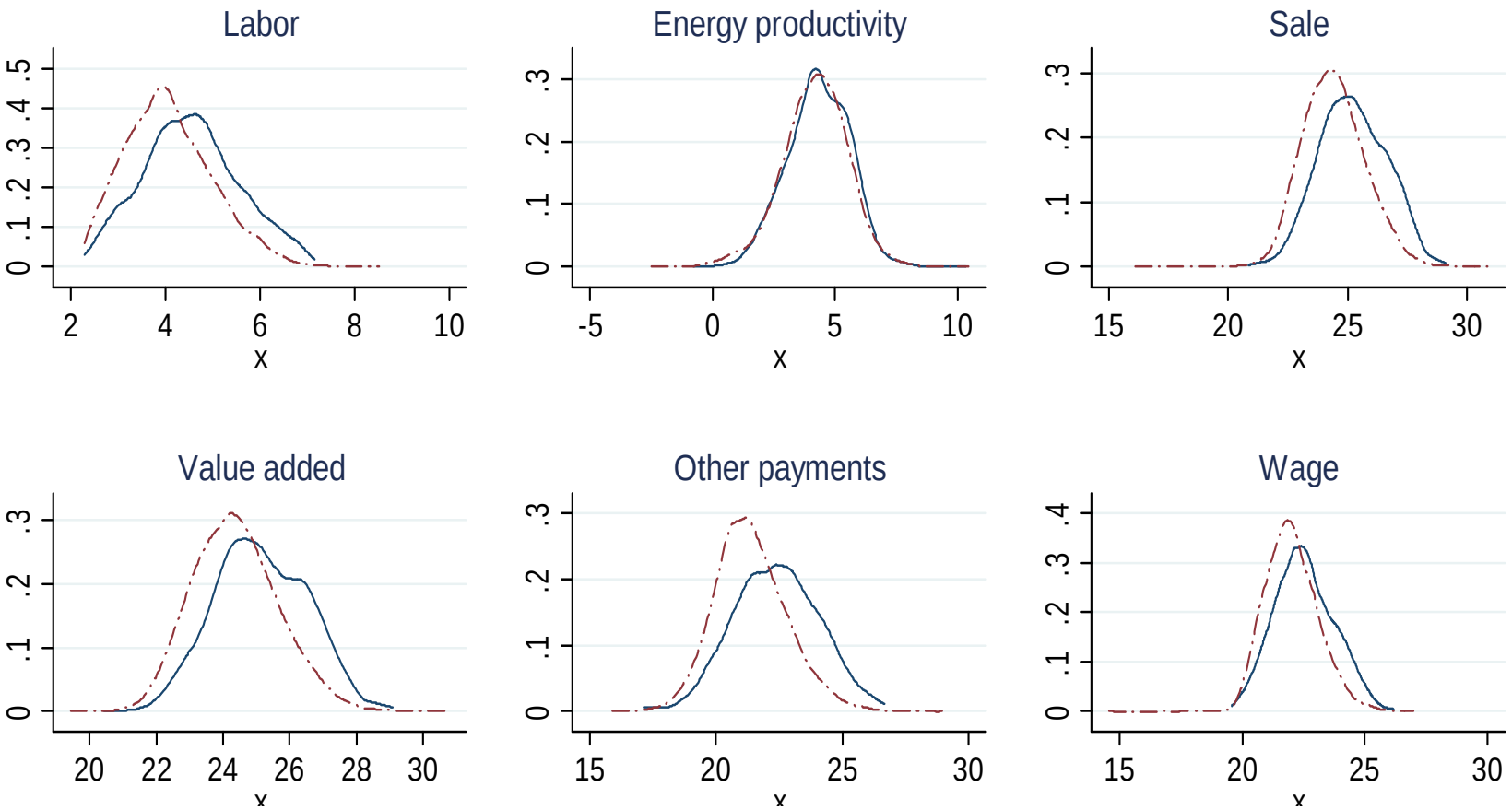
Kernel Densities of Probability of Exporting/non-exporting



Exporters: ———

Non-exporters: - - - - -

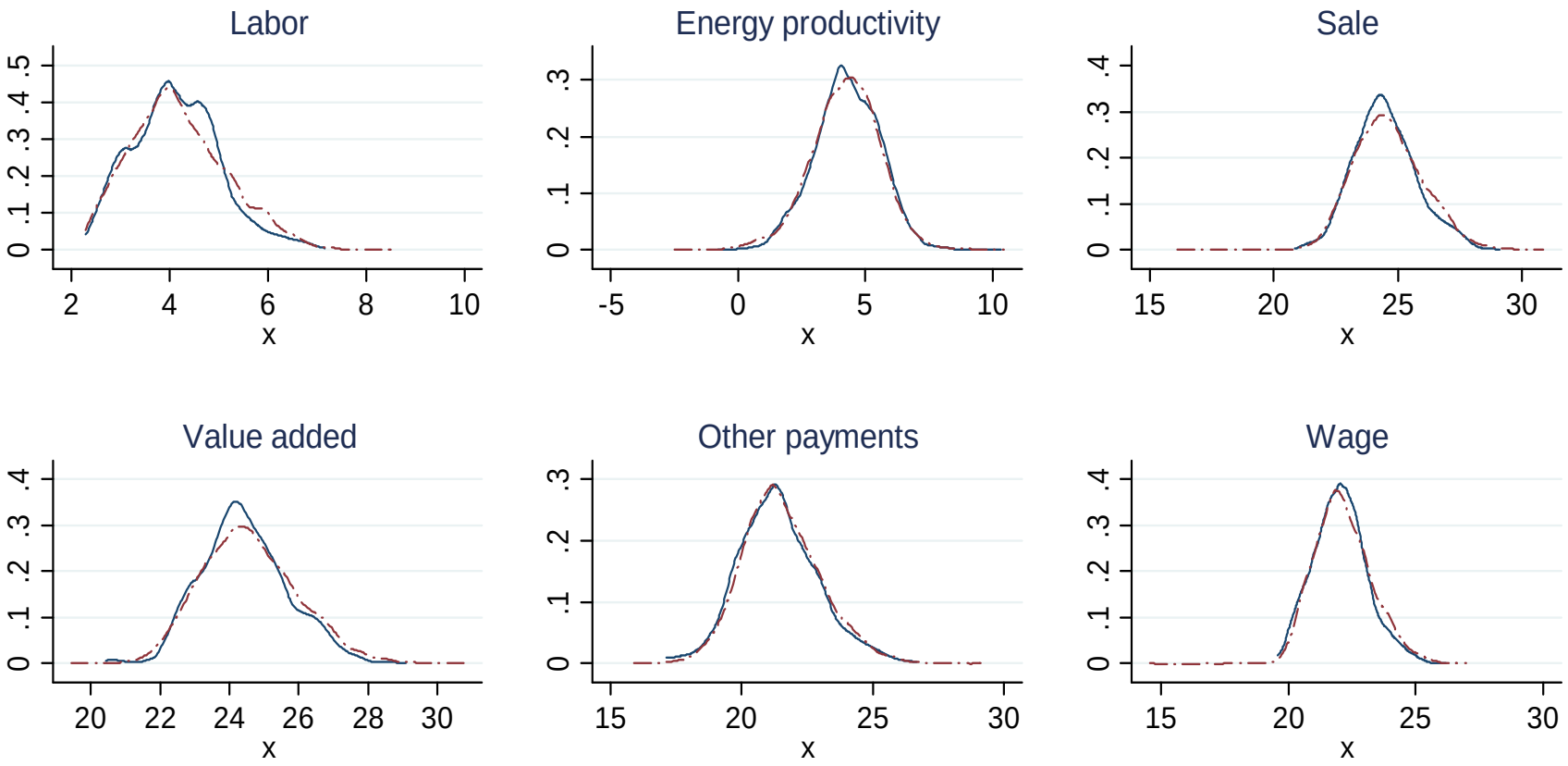
Distribution of Variables without Weighting



Exporters: ——

Non-exporters: - - - - -

Distribution of Variables *After* Weighting



Mean Difference Between the two Groups

	No Weighting		Weighted	
	Difference	t-stat	**Difference**	**t-stat**
Sale	-0.95	-40.2790	-0.1045	-4.8521
Value added	-0.93	-40.4220	-0.0914	-4.3188
External material	-0.076	-9.6021	-0.0068	-0.9083
Labor	-0.55	-32.3323	-0.0659	-4.3844
Energy productivity	-0.23	-11.0268	-0.1245	-5.8777
Wage	-0.61	-31.4486	-0.0398	-2.2530
Other payments	-0.88	-32.9750	-0.0198	-0.7815
Dummy for North border	0.014152	2.2913	-0.01483	-2.2638
Dummy for South border	-0.00584	-2.3960	0.00106	0.5167

Results

Dependent var↓	OLS- No Weighting	Weighted Least Squares	# of Observations
Log(real value added)	0.387***	0.173***	28,172
	(14.64)	(5.193)	
Log(energy productivity)	0.387***	0.173***	28,172
	(14.64)	(5.193)	
Log (real Wage)	0.0233**	-0.00327	28,172
	(2.414)	(-0.254)	

Model:

$$Performance_t = \alpha_1 export_t + \alpha_2 X_t + error_t$$

Results

Dependent var.s→ Explanatory var.s↓	Weighted Fixed Effect Estimator (weights= inverse P-Scores)		
	Log(real Value added)	Log(Energy productivity)	Log(real Total payments) †
Export status	-0.0372	-0.0780	0.0618
	(-0.640)	(-0.925)	(1.491)
Observations	28,172	28,172	28,172
Number of firms	9,785	9,785	9,785
R-squared	0.235	0.095	0.286

Controls: Labor, management, fuel consumption, year, plants' FE,

Dependent var.s→ / Explanatory var.s↓	Distributed Lags Model (Weighted Fixed Effect Estimator)		
	Log(real Value added)	Log(Energy productivity)	Log(real Total payments) †
Dummy for 1st year exporters	-0.0471	-0.107	0.0533
	(-0.778)	(-1.189)	(1.261)
Dummy for 2nd year exporters	-0.0400	-0.0743	0.0921*
	(-0.557)	(-0.722)	(1.715)
Dummy for ≥3rd year exporters	-0.0929	-0.212*	0.0954
	(-1.077)	(-1.871)	(1.434)
R-squared	0.236	0.098	0.287

Controls: Labor, management, fuel consumption, year, plants' FE,

Robustness Analysis

	Dependent var: Log(real Total payments) Weighted by PScores			
Dummy for 1st year exporters	0.0533	0.0544	0.0536	0.0564
	(1.261)	(1.280)	(1.248)	(1.309)
Dummy for 2nd year exporters	0.0921*	0.0920*	0.0901*	0.0929*
	(1.715)	(1.712)	(1.665)	(1.710)
Dummy for ≥3rd year exporters	0.0954	0.0958	0.0954	0.0950
	(1.434)	(1.435)	(1.427)	(1.419)
Skilled /labor		0.0327	0.0338	0.0325
		(0.349)	(0.359)	(0.352)
Men/labor			-0.112	-0.132
			(-0.435)	(-0.516)
Literate /labor				-0.298
				(-0.915)
Dummy for Year	YES	YES	YES	YES
Plants' FE	YES	YES	YES	YES
Observations	28,172	28,172	28,172	28,172
Number of firms	9,785	9,785	9,785	9,785
R-squared	0.286	0.287	0.288	0.287

Robustness Analysis

(time *t-1* vars are used in the Logit model)

Dependent var.s→ / Explanatory var.s↓	Weighted by P-Score		
	Log(real Value added)	Log(Energy productivity)	Log(real Total payments) †
Export status	0.0936	-0.0119	0.154***
	(1.626)	(-0.149)	(3.681)
Observations	24,898	24,898	24,898
Number of firms	6,511	6,511	6,511
R-squared	0.225	0.077	0.312

Conclusion

- Learning from exporting among Iranian manufacturing plants:
  - No significant learning in terms of added value
  - No learning in terms of energy productivity (insignificant but robust)
  - Better payments (labor productivity) following entry into exporting (significant and robust)