Impact of Accord & Alliance Led Compliance Measures on RMG Firm Performances in Bangladesh

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Collapse of Rana Plaza:
Deadly Incident in Garment Industry

- Collapse of Rana Plaza had been the deadliest incident revealing the underlying failure of ensuring safety in workplace. On April 24 2013, the world trembled with the horrible devastation when a concrete building known as "Rana Plaza" cracked, buckled and ultimately collapsed atop the garment workers inside its factories leaving over 1100 people dead and 2400 injured. Rana Plaza was an eight storied commercial building near Dhaka, the capital of Bangladesh housing around five clothing factories in addition to a bank, apartments and a few shops.

- The International Labour Organisation (ILO) calls on the government of Bangladesh to demand liability from manufacturers and distributors. Clothing brands and their international clients pledge to take responsibility for improving working, health and safety conditions and allow independent inspections of workplaces. ACCORD and ALLIANCE were formed with the exigency of establishing safety and security in the garment factories of Bangladesh
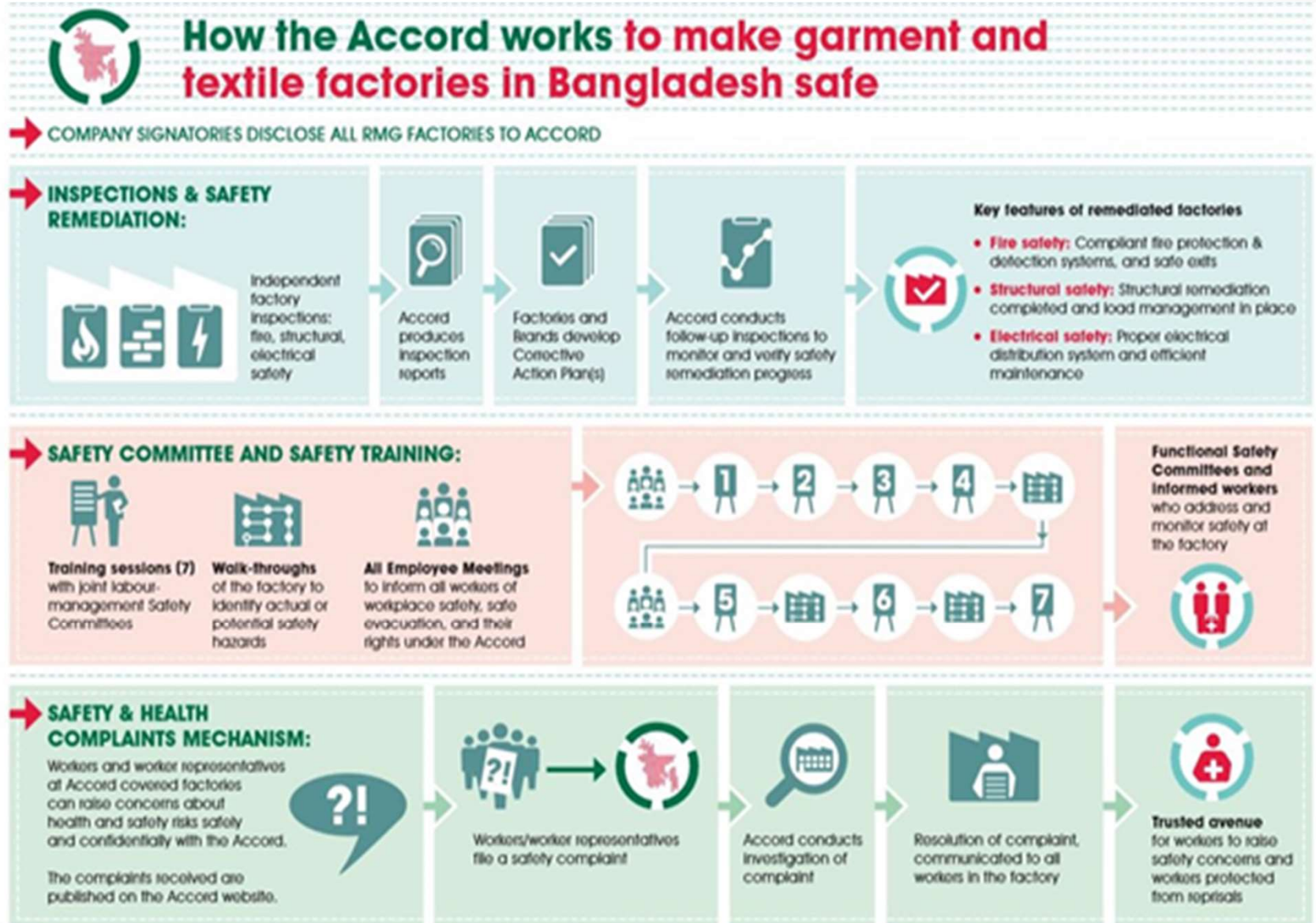
Aftermath of Rana Plaza:
ACCORD, ALLIANCE and National Initiatives

- The Accord and the Alliance are the two coalitions which were established with a five-year timeline for improving factory safety in Bangladesh.

- The Accord consists of European brands whereas the Alliance made up of mostly American fashion brands.

- Both had five-year deadlines that expired in 2018. The groups have made a great deal of progress, fixing well over 80% of the issues they had originally identified.

- The Accord has created a three-year extension to continue the remediation work, and to allow its oversight to transition smoothly to a body set up by Bangladesh's government to carry on the work of remediating factories, called the Remediation Coordination Cell (RCC). The Alliance's tenure in Bangladesh ended in 2018.

- Remediation Coordination Cell (RCC) is a unit that has been set up by the Department of Inspection for Factories and Establishments (DIFE) together with other industry regulators to manage the remediation work of RMG factories which were inspected under the National Initiative.
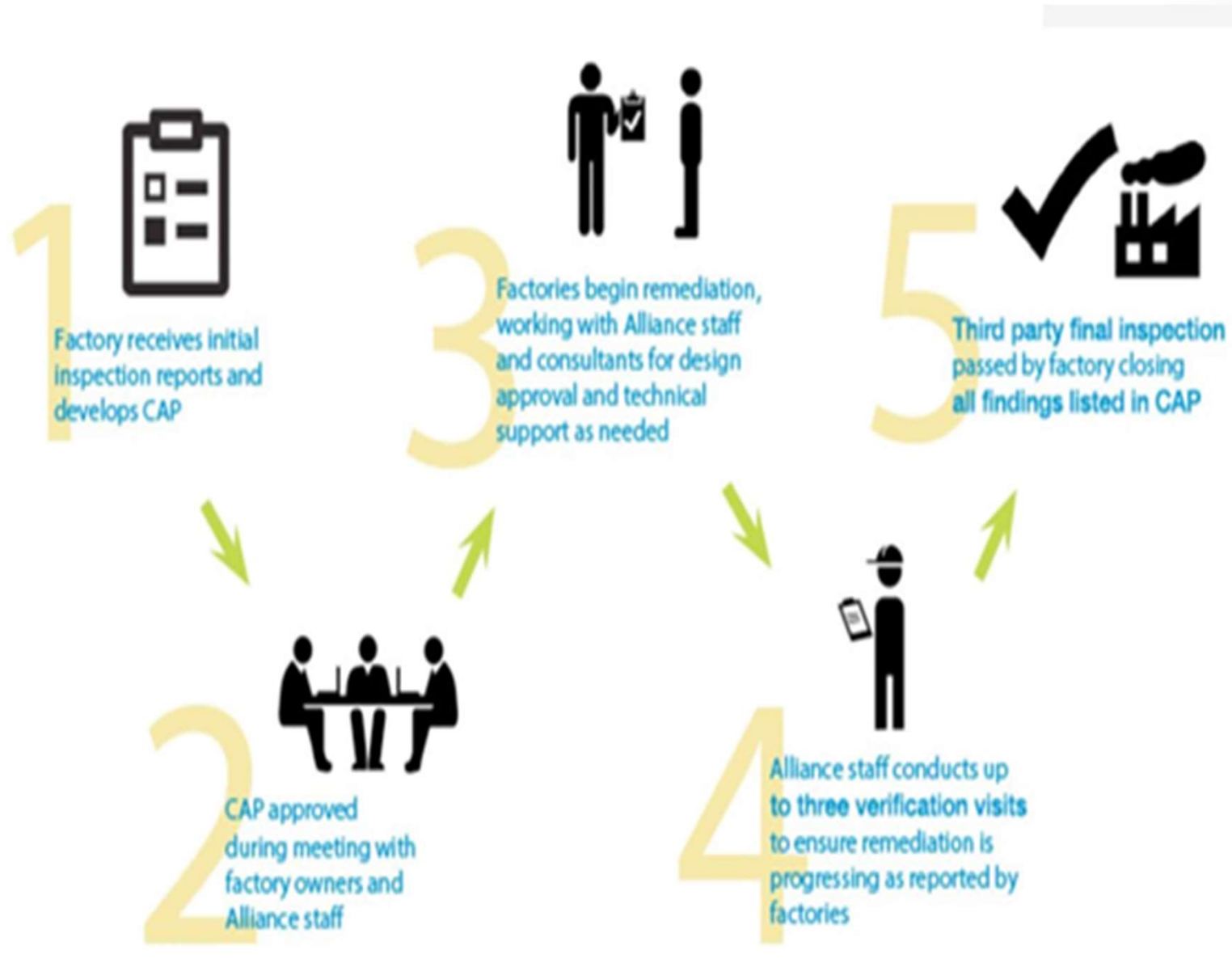
How Did Accord & Alliance Work?

- Company signatories were supposed to disclose all their RMG supplier factories in Bangladesh.

- All factories covered by the Accord received initial inspections and periodic follow-up inspections to monitor and verify remedial measures. Engineers inspected more than 2000 RMG factories in 2013 where they identified more than 150,000 safety hazards (The Bangladesh Accord, 2013).

- After each factory had been inspected for *fire, electrical and structural safety*, the inspection reports were shared with factory owners, the responsible Accord signatory companies and worker representatives.

- The factory owner and the company signatories were tasked to develop a Corrective Action Plan (CAP) that detailed what remedial actions would be taken with a clear timeline and a financial plan.

- The Accord had a team of case handlers who provided support in the CAP development and implementation, and worked closely with the Accord engineers to provide any necessary technical guidance.

- The Accord engineers were involved in monitoring progress and verifying implementation of CAPs through follow-up inspections.

- The Accord trained joint labour-management Safety Committees at Accord-covered factories and conducted programs to inform all the workers in the factory about essential workplace safety.

- Vision of the Alliance was more or less similar to ACCORD's ; if a factory had been shared with the Accord, the Alliance did not duplicate inspections already completed by the Accord, but instead accepted and use the Accord inspection reports and Corrective Action Plan (CAP) to track factory progress. If, however, the Alliance became aware that highest or high priority items had not been addressed in an Accord-led shared factory, the Alliance would discuss the issue with the Accord. The Alliance performed a Final Verification Visit (FVV) on all shared factories that had reached CAP closure under the remediation efforts of the Accord.

How did Accord work to ensure safety?

How did Alliance work to ensure safety?

1 Factory receives initial inspection reports and develops CAP

2 CAP approved during meeting with factory owners and Alliance staff

3 Factories begin remediation, working with Alliance staff and consultants for design approval and technical support as needed

4 Alliance staff conducts up to three verification visits to ensure remediation is progressing as reported by factories

5 Third party final inspection passed by factory closing all findings listed in CAP

Objectives and Research Questions

❑ **Primary Objectives:**

- To examine the impact of compliance measures on productivity and performances (in terms of labour productivity and market access) of RMG firms in Bangladesh.
- To explore the and Performance of Treatment firms considering the extent of Compliance: if higher remediation leads to enhanced productivity among compliant firms or not.
- To assess the perception of employees regarding the impact of compliance measures on the safety status at workplace.

❑ **Key Research Questions:**

➢ **Did the Accord-Alliance compliant RMG firms perform better compared to non-compliant firms?**

➢ *Among the compliance firms, did the firms with higher number of remediation gain more?*

➢ *Did the Workers feel safe after the compliance measures were taken?*

Literature Review

- There is debate as whether or not introducing improvements in workplace safety can actually increase measurable economic benefits in terms of improved performance of workers.

- According Lamm (2207), "while there are a growing number of studies indicating the benefits of providing a healthy and safe working environment, the evidence is still tenuous and difficult to quantify. In particular, it is not known if the benefits are short-term or long-term.

- Also, while there is evidence that occupational injuries and illnesses impact on productivity losses, it is not clear whether or not reducing injuries and illnesses will automatically influence productivity gains. Literature suggests, getting employers, particularly those operating in the small business sector, to link health and safety measures with tangible increases in productivity and profits could be difficult".

- There are also few references that make the connection between OHS and the sociology and organisation of work and productivity. A few studies relating to environmental regulation compliance found that such compliance measures reduced firm productivity (Denison, 1979; Gray, 1987; Hitchens et al. (2005) show that smaller firms are constrained to adopt environmental standards.

Literature Review (cont...)

- However, some studies also find that environmental regulation costs improve firm performance. Masakure et al. (2009) finds a positive relationship between exports and ISO9000 standard certification.

- Umoh & Torbira (2013) found significant relationship between employer's compliance to safety rule and man hour put in by employees in the production process.

- The effect of compliance standard measures on firms productivity yet to be assessed in the context of Bangladesh.

- Bakht and Hossain (2016) finds that smaller factories,(less than 500 workers) and factories located in Dhaka district have been found to be less complaint, and so greater attention with regard to monitoring and follow up should be directed towards these factories. Nearly 50% of the factory buildings are shared with similar type of factories and about 15% factory buildings are shared with other offices and businesses, which render it difficult to maintain fully the safety standards.

Data and Variables

- Total 322 firms located in Dhaka, Gazipur, Narayanganj and Chittagong were surveyed in 2019.

- Treatment group : 179 firms were participated in the compliance initiatives of any of the three entities: Accord, Alliance or National Initiatives.

- Control Group: 143 firms similar to the treatment group ex-ante but have never been members of Accord, Alliance or National Initiatives.

- Compliance measures have been categorized in three different indicators: (i) Building Safety Measures (Building Construction, Means of Exit, etc.); (ii) Fire Safety Measures (Resistance against Fire and Protection from Fire) and (iii) Electrical Safety Measures.

- The firms of treatment groups reported all the actions and measures suggested by the compliance entities. However, the firms belonging to the control groups were also asked to report any safety measures undertaken through their own initiatives.

Data and Variables (cont...)

Distribution of Sample of Treatment Firms across Compliance Association

	No. of firms	%
Accord	69	38.55
Alliance	11	6.15
National Initiative	59	32.96
Accord and Alliance	34	18.99
Accord and National Initiative	5	2.79
Alliance and National Initiative	1	0.56

Distribution of sample firms across size
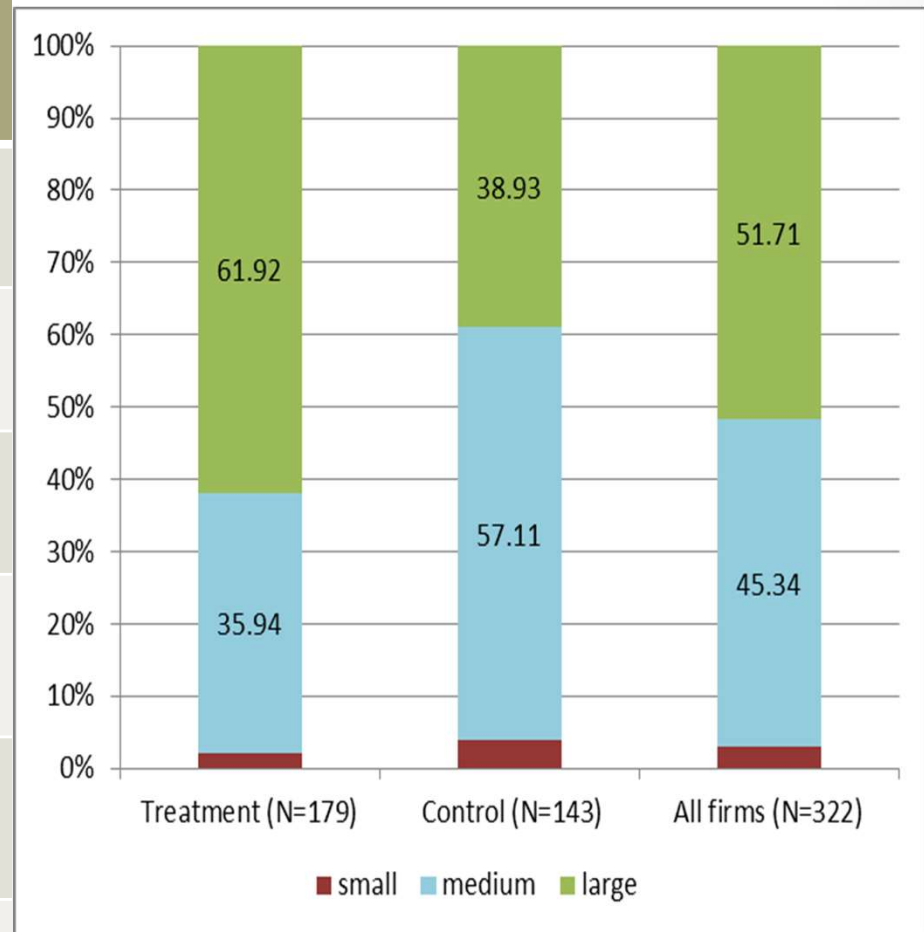
Basic Attributes of Sample Firms

Category	Treatment	Control	Total
Ownership type (%)			
Single Ownership	54.75	52.45	53.73
Joint Ownership	16.76	18.88	17.7
Limited Company	28.49	28.67	28.57
Firm type (%)			
Domestic	83.24	95.1	88.51
Foreign	10.61	3.5	7.45
Jointly Domestic & Foreign	6.15	1.4	4.04
Building ownership type (%)			
Rental	54.75	70.63	61.8
Owned	45.25	29.37	38.2
Total number of firms	179	143	322

Estimation Strategy

❑ **Research Question 1: Performance of Compliant vs Non-Compliant Firms**

➢ ***Diff-in-Diff Estimates*** : Three outcome variables for treatment & control firms

(i) labour productivity (ii) Profit rate (reported) (iii) extent of market access (number of countries & numbers of companies the firms export their product to and number of products exported)

➢ ***Treatment Heterogeneity***: Diff-in-Diff Estimates with interactions

We also explored if the impacts of compliance are heterogeneous across different firm characteristics such as firm size, spending on remediation measures, capital-labour ratio and life of factory building.

❑ **Research Question 2: performance of treatments firms**

Using OLS and fixed effect panel estimates , we examined the performance of treatments firms considering the extent of remediation measures (number of CAPS remained unadressed).

❑ **Research Question 3: Workers' Perception on Workplace Safety**

Using Logit Model with workers' perception of risk about building, fire and electrical safety. . Perception was expressed as binary variables which assume the value of 1 if workers perceive some risks and 0 if there is no risk. We run both Logit and OLS to estimate the impact.

Estimation Strategy (Cont..)

Diff-in-Estimation:

$Y_{it} = \beta_0 + \beta_1$ *Post treatment year$_t$*$+ \beta_2$ *Treatment$_i$*$+ \beta_3$ *Treatment*Post year $_{it}$* $+Controls_{it} +\mu_{it}$

- ➤ **Y_{it}** : outcome indicator for firm *i* in period *t*, *t* includes the period, 2013-2018.
- ➤ ***Post treatment year*** : dummy variable ; 1 if the year corresponds to the year after intervention.
- ➤ ***Treatment*** : dummy variable which is 1 if the firm received the compliance
- ➤ **β_3 :** captures the treatment effect – the impact of compliance on the outcome variables.
- OLS to estimate the models; standard errors are clustered at the firm level.
- **Control variables** : firm size, capital-labour ratio, location of the firms, whether the firm produces Knit or Woven products or both, types of ownership, and age of the factory.

Defining Two Counterfactuals:

- All the treatment firms in our sample received (addressed the first CAP) in 2014.
- Though firms were supposed to address all CAPs by a definite time, all firms could not do so and the efforts continued up to 2017.
- Considering 2013 as the pre-intervention year; two different counterfactuals were taken into account: Counterfactual 1 and Counterfactual 2.
- ***Counterfactual 1*** : 2014 to 2018 as post-intervention years (to capture the immediate as well as lagged impacts of remedial procedures)
- ***Counterfactual 2 :*** 2018 as only post-intervention year instead

Impact of Compliance on Workers' Productivity : DiD Estimates

Dependent variable: log of output per worker				
	Counterfactual 1		Counterfactual 2	
Post treatment year	-0.001	-0.001*	-0.002	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Treatment	-0.010***	0.000	-0.010***	0.000
	(0.003)	(0.002)	(0.003)	(0.002)
Treatment x Post year	0.000	0.002**	-0.000	0.003**
	(0.001)	(0.001)	(0.002)	(0.001)
Log of firm size		-0.032***		-0.033***
		(0.003)		(0.003)
Log of capital-labor ratio		-0.000		-0.000
		(0.001)		(0.001)
Observations	1,899	1,893	641	639
R-squared	0.031	0.733	0.032	0.721

Note: The year 2013 is defined as pre-intervention period. Five years in total (from 2014 to 2018) are considered as post-intervention periods under counterfactual 1. The year 2018 is considered as the only post-intervention period under counterfactual 2. Locations of the factory and whether the factory produces knit or woven are also controlled in columns 2 and 4. Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Impact of Compliance on Profit Rate (reported) : DiD Estimates

(Dependent variable: profit rate)				
	Counterfactual 1		Counterfactual 2	
Post treatment year	-3.844	-3.841	-4.617	-4.668
	(4.833)	(4.855)	(4.754)	(4.836)
Treatment	-3.278	-3.438	-3.278	-3.054
	(4.764)	(4.462)	(4.772)	(3.819)
Treatment x Post year	3.610	3.516	4.964	4.830
	(4.840)	(4.854)	(4.771)	(4.800)
Log of firm size		2.145***		2.451***
		(0.440)		(0.639)
Log of capital-labor ratio		0.009		-0.774
		(0.377)		(0.894)
Observations	1,857	1,848	625	622
R-squared	0.002	0.016	0.004	0.023

Note: The year 2013 is defined as pre-intervention period. Five years in total (from 2014 to 2018) are considered as post-intervention periods under counterfactual 1. The year 2018 is considered as the only post-intervention period under counterfactual 2. Locations of the factory and whether the factory produces knit or woven are also controlled in columns 2 and 4. Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Heterogeneity of Impact of Compliance on Labor Productivity

Dependent variable: log of output per worker

	(1)	(2)	(3)	(4)
Post x Treatment x Log of firm size	0.011*			
	(0.006)			
Post x Treatment x Log of capital-labor ratio		0.001		
		(0.001)		
Post x Treatment x Dhaka			-0.002	
			(0.003)	
Post x Treatment x Woven				-0.001
				(0.003)
Post treatment year	-0.001*	-0.001	-0.001*	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)
Treatment	0.002	0.000	-0.000	0.000
	(0.001)	(0.002)	(0.002)	(0.002)
Treatment x Post year	-0.069*	0.002**	0.004	0.003
	(0.037)	(0.001)	(0.003)	(0.003)
Observations	1,893	1,893	1,893	1,893

Heterogeneity of Impact of Compliance on Profit

Dependent variable: profit rate				
	(1)	(2)	(3)	(4)
Post x Treatment x Log of firm size	-1.393*			
	(0.830)			
Post x Treatment x Log of capital-labor ratio		0.278		
		(0.754)		
Post x Treatment x Dhaka			1.624	
			(1.453)	
Post x Treatment x Woven				1.466
				(2.537)
Post treatment year	-3.851	-3.836	-3.835	-3.842
	(4.858)	(4.845)	(4.854)	(4.857)
Treatment	-3.677	-3.424	-3.294	-3.418
	(4.524)	(4.431)	(4.398)	(4.443)
Treatment x Post year	12.562	3.661	2.398	2.336
	(8.357)	(5.197)	(4.518)	(4.248)
Observations	1,848	1,848	1,848	1,848

Note: The DID corresponds to counterfactual 1 where five years in total (from 2014 to 2018) are considered as post-intervention periods and 2013 is considered as pre-intervention period. Locations of the factory and whether the factory produces knit or woven are also controlled. Robust standard errors in   parentheses
*** p<0.01, ** p<0.05, * p<0.1

Impact of Compliance on Market Access

Dependent variable(s): number of countries exported to, number of companies exported to, number of products exported

	(1)	(2)	(3)	(4)	(5)	(6)
	Counterfactual 1			Counterfactual 2		
	No of countries exported to	No of companies exported to	No of products exported	No of countries exported to	No of companies exported to	No of products exported
Post treatment year	0.074	-0.001	-0.325	0.220**	0.084	-0.308
	(0.052)	(0.051)	(0.308)	(0.090)	(0.063)	(0.307)
Treatment	1.136***	1.836***	0.657	1.126***	1.824***	0.671
	(0.275)	(0.415)	(0.452)	(0.274)	(0.416)	(0.436)
Treatment x Post year	-0.157	0.002	0.391	-0.037	0.106	0.419
	(0.113)	(0.156)	(0.311)	(0.137)	(0.238)	(0.310)
Log of firm size	0.513***	0.808***	0.214	0.545***	0.741**	0.324**
	(0.166)	(0.311)	(0.178)	(0.181)	(0.326)	(0.162)
Log of capital-labor ratio	0.171	-0.078	0.265*	0.120	-0.142	0.199
	(0.105)	(0.146)	(0.155)	(0.123)	(0.151)	(0.177)
Observations	1,598	1,580	1,602	536	530	539

Note: The year 2013 is defined as pre-intervention period. Five years in total (from 2014 to 2018) are considered as post-intervention periods under counterfactual 1. The year 2018 is considered as the only post-intervention period under counterfactual 2. Locations of the factory and whether the factory produces knit or woven are also controlled. Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Findings from Result:

Impacts of Compliance on Labour Productivity, Profit & Market Access

- Impacts of compliance on labour productivity is positive & significant: *Labour productivity increase when firms invest on compliances measures !*
- Impacts of compliance on *profit are not significant*.
- Impacts of compliance on *market access are not significant*

- **When Heterogeneity of impacts are considered:**

➢ Heterogeneity of impact of compliance on labor productivity exists across firm size :

 The larger is the firm size; the higher is the difference-in-difference of labour productivity of   treatment firms compared to control firms. In other words,, as the firm size increases; the difference of labour productivity of treatment firms in pre-intervention and post-intervention period in comparison with control firms becomes larger.

➢ But , in case of profit rate, no significant impact was found even after controlling the **Heterogeneity of impacts.**

Extent of Compliance and Performance of Treatment firms :

Did the firms addressing higher number of remediation gain more?

Extent of Compliance and Performance of Treatment firms

- The "number of Corrective Action Plan(CAP) [imposed by Accord-Alliance addressed"] varies across each of the four years from 2014 to 2017.

- Around 96% of treatment firms spent on CAP [received last intervention] in 2017. Hence, there is not much difference among the treatment firms in terms of duration of treatment.

- The firms were inspected every year and the inspection authority determined the firms' performance in terms of *"number of CAP remained unaddressed"*.

- Instead of considering how long the treatment firms have received intervention, we considered *"number of CAP remained unaddressed"* as one of determining factors of the performance of the firms.

- The higher is the "number of CAP remained unaddressed; the lower will be the performance of the firm (as expected).

- We used both OLS and fixed effect panel technique using time dummies of two periods: 2013 and 2018 (1 if year is 2018 and 0 if 2013).

Extent of Compliance and Performance of Treatment firms

Dependent variable: Log of output per worker & Profit rate

Dependent variable	OLS		Panel : Fixed Effect	
	(1) Log of output per worker	(2) Profit rate	(3) Log of output per worker	(4) Profit rate (%)
Post treatment year	-0.000	-0.205	-0.000	-0.205
	(0.001)	(0.803)	(0.001)	(0.691)
No of CAP unaddressed	-0.000**	-0.013	-0.000***	-0.013
	(0.000)	(0.012)	(0.000)	(0.016)
Log of firm size	-0.031***	3.823***	-0.031***	3.823**
	(0.004)	(1.422)	(0.002)	(1.779)
Log of capital-labor ratio	0.001	0.223	0.001**	0.223
	(0.001)	(0.593)	(0.001)	(0.697)
	-0.004***	-4.103***	-0.004	-4.103
Ratio of remediation costs to total costs	(0.002)	(1.193)	(0.004)	(4.075)
	(0.002)	(1.197)	(0.004)	(4.135)
Observations	355	341	355	341

Note: Post treatment year takes value 0 if the year is 2018 and 0 if it is 2013. Types of compliance (if the firm was inspected by ACCORD or Alliance or National Initiatives); locations of the factory and whether the factory produces knit or woven are also controlled. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Higher is the "number of CAP remained unaddressed"; lower will be labour productivity

Impact on workers' perceptions of building, fire and electrical safety :

Did the Workers feel safe after the compliance measures were taken?

Perception of Workers about Building, Fire and Electrical Risks

Dependent Variable: Workers' Perception on Building, Fire and Electric risk

	(1)	(2)	(3)	(4)	(5)	(6)
		OLS			Logit	
Dependent Variable	Building Risk	Fire Risk	Electric Risk	Building Risk	Fire Risk	Electric Risk
Post treatment year	0.083	-0.000	-0.001	0.405	0.104	-0.046
	(0.053)	(0.157)	(0.051)	(0.273)	(0.935)	(0.350)
Treatment	-0.149***	-0.316***	-0.458***	-0.944***	-1.494**	-2.182***
	(0.022)	(0.090)	(0.034)	(0.102)	(0.582)	(0.235)
Treatment x Post year	-0.092***	0.101	0.030	-0.510***	0.320	0.174
	(0.035)	(0.105)	(0.046)	(0.164)	(0.629)	(0.295)
Observations	5,001	390	1,720	4,983	390	1,720

Note: Dependent variable takes value 1 if workers perceive some risks and 0 if there is no risk. Post treatment year takes value 0 if the year is 2018 and 0 if 2013. Firm size, Cap-labour ratio, locations of the factory & if the factory produces knit or woven are also controlled. Robust standard errors in parentheses *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Workers of the compliant firms perceive that the building risks are lower in the factories they work compared to the workers of the non-compliant firms

Conclusions

- A positive effect of compliance on real variables (labour productivity & profit) and market access was expected , results suggest an significant impact only on labour productivity .

- Firms which addressed higher numbe rof remediation measures perfored better in terms of increased labour productivity.

- ***Workers of the compliant firms feel more safe at their factories to the workers of the non-compliant firms.***

- The compliant RMG firms might enjoy benefits of productivity enhancement in the future if they maintain the standard level of compliance .

- Since the study was done soon after implementation of compliance standards, it is unlikely to gauge the impact of safety compliance on firm performances. A several rounds of survey over time might help understand definitive impact of compliance standards on firm performances and profitability.

Thank You !