

Improving Management with Individualized and Group-Based Consulting

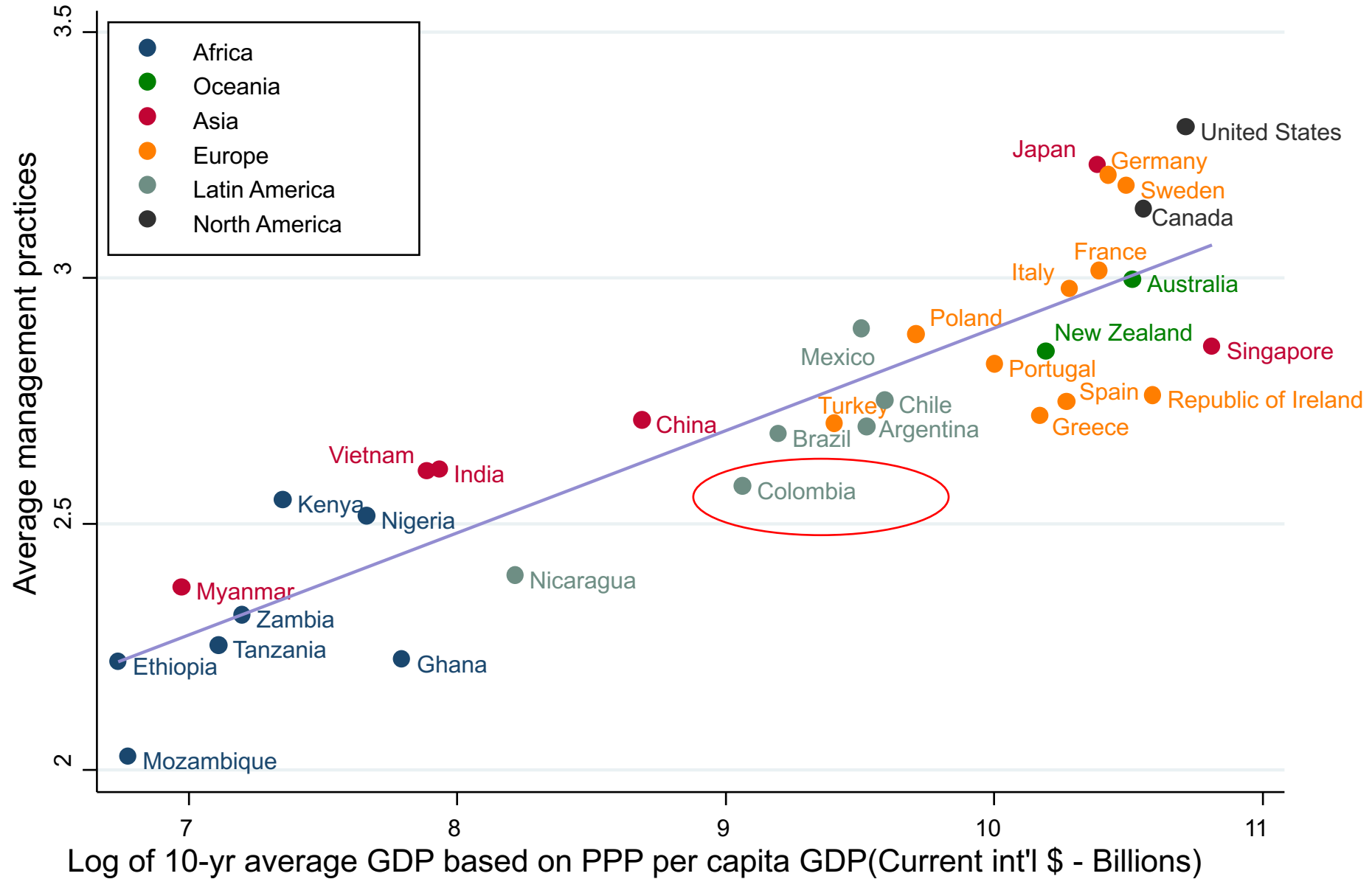
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	CENTRO NACIONAL DE PRODUCTIVIDAD		F-GP-01
	MEDICION DE PRODUCTIVIDAD CUALITATIVA		VERSION: 00 FECHA: 01/03/2011 PAGINA: 1 de 2
PROYECTO			
ETAPA	1	CARACTERIZACIÓN Y MEDICION BASICA DE LA PRODUCTIVIDAD DE LA EMPRESA	
FICHA	3	MEDICION CUALITATIVA	
EMPRESA			
No Existe	En Construcción	Formalizado	Implementado
< 20%	20% -40%	41% - 60%	61% - 85%
			Operando Bajo Control
			>85%

GESTIÓN HUMANA		CALIFICACION
1	Objetivos estratégicos apalancados por los talentos de las personas	0%
2	Modelo General de Gestión Humana por Competencias	0%
3	Estructura organizacional actual	0%
4	Programa de desarrollo de las capacidades del talento humano(Plan Carrera) y desarrollo del potencial de las personas y programas de polivalencia	0%
5	Medición y Mejoramiento de clima organizacional para tener un clima de bienestar, salud y seguridad de las personas	0%
6	Programa integral de Responsabilidad Social al interior de la empresa donde se propenda por el crecimiento del individuo, enriquezca el aprendizaje y el respeto por las diferencias en ideas, culturas y sexos	0%
7	Fomento de la cultura organizacional de comunicación abierta, alto desempeño en el trabajo y alto compromiso de las personas	0%



Management practices in Colombia low by global standards, even conditional on income.



Motivation

- Recent studies have shown causality from management improvement to productivity.
- Bloom et al. (2013; 2018) – proof of concept that intensive individualized consulting can improve management and productivity
 - But 17 firms, cost \$75,000 (discount price) per firm
 - Broader literature on whether promising researcher pilot studies can scale-up (Banerjee et al, 2017; Bold et al, 2018).
- Our questions:
 - Can we improve management quality in Colombia?
 - Can we do it much cheaper so scalable?

Summary of key results

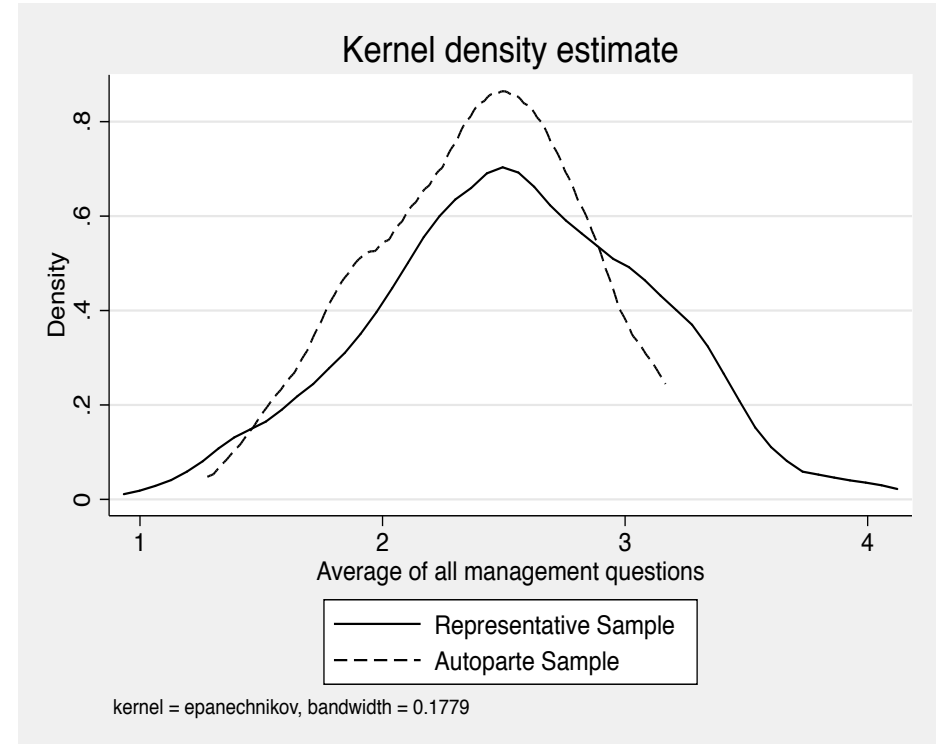
- Can management be improved in Colombian manufacturing?
 - Yes, improvements of 8-10 percentage points; broad-based with improvements in wide range of practices.
 - But this improvement only 1/3 of that seen in India.
- Is there a more-cost effective way of doing so than individualized consulting?
 - Group-based intervention delivers similar magnitude improvement in management to individual approach at one-third the cost
 - Group-based intervention appears to have grown treated firms – 6 to 7 worker (10-12%) increase in employment, use more energy, sell more than individual treatment group.
- However, neither treatment significantly improves productivity, but can't rule out improvements of 5-6% that would get from extrapolating from India case.

Outline

- Choice of sector and sample + industry context
- Details of the interventions:
 - Individual consulting treatment
 - Group consulting treatment
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- Impact on management practices
- Impact on firm outcomes
- Discussion

Choice of sector and sample

- Government wanted:
 - production in multiple locations, sufficient numbers of firms,
 - Some potential for growth,
 - Can extrapolate to other industrial sectors
- Auto-parts sector
 - Largely second-tier suppliers to large car manufacturers
 - Produces parts like fenders, glass, plastic parts, paints etc. sold to assemblers that supply national and international car manufacturers
 - Looks similar to Colombian manufacturing in terms of WMS management.



Examples of products

Appendix 2: Examples of Products Manufactured



Air Filters



Glass Panels



Rubber parts



Metal parts



Plastic parts



Tires



Injection molding/cushioning



GPS tracking services

Note:

- Much more heterogeneous in terms of product mix/production technology than is case for Indian textiles.
- Firms largely competing with imports (imports averaged 68% of total sales in sector pre-intervention).

The Experimental Sample

- Public announcement of program in April 2012, and firms also informed through car manufacturers – firms told program would offer assistance in improving production practices to improve profitability and productivity.
- Offered for free, firms need to commit time and effort
- 218 firms applied – screened on size and products to give sample of 159 firms.
- Mean (median) firm in business for 24 years
- Firms had mean size of 59 and median of 40 employees, 10-90 range was from 13 to 119 workers
- Mean sales U\$2.7 million in 2013, 10-90 range \$280K-6.3million
- 60% export at least once in 2013-16, but only 20% do in given month.
- Almost all single plant firms

Much room for improvement

- Mean WMS score: 2.38/5
- Lack of a culture of measurement



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The Implementer

- Centro Nacional de Productividad (CNP)
 - Colombian non-profit
 - Originally funded and supported by Japanese technical cooperation who trained them in implementing Lean, Six-Sigma, etc.
 - 15 years of experience helping more than 4,000 Colombian companies
 - Consultants used in project all had minimum of 8 years experience







Diagnostic phase (all three groups)

- Analyze 141 management practices in 5 areas (June-Oct 2013):
 - production,
 - logistics,
 - human resources,
 - finance,
 - marketing & sales.
- Team of 6 consultants
 - 5 specialists in each specific area analyzed and one team leader coordinating the process.
 - Diagnostic phase lasts 2 full-time weeks.
- Firm gets a report on managerial practices for each one of these areas and key performance indicators associated with each one of the areas, along with suggested priority areas for improvement

Cost approx: US\$3,500 per firm.

Anexo K Management Practices

- 35 sub-indices
- Scale of 1 (don't exist) to 5 (operating under control)
- E.g. Operations 2:
 - Definition and management of the most important operational processes from order to delivery of final product
 - 2.1. All processes have a description
 - 2.2 The plant has a lay out that allows for Flow of materials
 - 2.3 The plant has a high level of 5S
 - 2.4 bottlenecks to capacity identified and Managed in the plant
 - 2.5 machine operators have standards and necessary work instructions

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No Existe	En Construcción	Formalizado	Implementado		Operando Bajo Control
1	2	3	4		5
2	Definición y manejo de los procesos más importantes de la operación desde el pedido, hasta la entrega del producto final que permitan lograr la estrategia (Estándares, Políticas , Roles, 5'S, Layout, y Procesos Establecidos)				
2.1	Todos los Procesos tienen la descripción del proceso				
2.2	La planta tiene un Lay Out que permite el flujo de material				
2.3	La planta tiene un alto nivel de 5S				
2.4	Esta identificado y se gestiona el Cuello de botella en la capacidad de la planta				
2.5	Lo operarios tienen los estándares, especificaciones e Instructivos de trabajo necesarios				
3	Método formal para Medir y Gestionar la Eficiencia de la planta (Desperdicios, Horas Hombre/ Capacidad del servicio, eficiencia de máquina) y su impacto en los costos				
3.1	Se miden y se gestionan los indicadores clave de desempeño de planta (OEE, Desperdicios, Defectos, Lead Time, otros)				
3.2	El gerente de planta y su siguiente nivel reconocen los problemas e identifican oportunidades permanentemente				
3.3	Se llevan a cabo programas de mejoramiento aplicando herramientas de gestión de planta				
3.4	Se tiene la cultura de Hechos y Datos para demostrar las mejoras de los procesos.				

Individual Treatment

- Six months – April-Nov 2014
- Team of five consultants: logistics, human resources, finance, marketing and sales and production + leader.
- Emphasis
 - Teaching firms how to measure and monitor KPIs
 - Provide firms with the set of tools to better understand how firm is performing.
 - Little direct implementation from the consultants
- Once per month: team meets with the whole firm's management to discuss improvements
- Total consultant time: 500 hours = 100 hours training + 100 4-hour sessions of individual consulting

COST: US\$29,000 per firm receiving treatment



Group Treatment

- Six months (Sept 2015-May 2016, with Christmas break)
- Groups:
 - 3 to 8 firms in a region so that members are not direct competitors
 - Instead are producing complementary products with similar management problems
- Key ideas:
 - Have firms learn from one another's experiences
 - Lower costs- bring firms together in hotel rooms

NOSOTROS NOS COMPROMETEMOS DE CORAZON , CON DECISION Y VALENTIA A SUPERAR NUESTROS MIEDOS Y DESCONFIANZAS INICIALES, PARA AVANZAR Y PARTICIPAR ACTIVAMENTE , COMPROMETIDOS, EN EL PROCESO DE CREACION, CONSOLIDACION Y PROYECCION DE REDES EMPRESARIALES ASOCIATIVAS.

SOMOS CONSCIENTES DE QUE ESTA DECISION REPRESENTA BENEFICIOS, RIESGOS Y ESPERANZAS DE UN FUTURO MEJOR PARA NOSOTROS, NUESTRAS EMPRESAS, NUESTRAS FAMILIAS Y EL PAIS.

FIRMAMOS EN CONSTANCIA DE NUESTRA CONVICCION Y DECISION

We commit ourselves with heart, with determination and courage to overcome our initial fears and distrust, to advance and participate actively, committed, in the process of creation, consolidation and projection of associative business networks. We are aware that this decision represents benefits, risks and hopes for a better future for us, our companies, our families and the country.



- In any given week, a group would discuss two areas, having one or two meetings focusing on a single area (max. 4 meetings/week).
- Only management with responsibilities over the area being discussed would participate in the meetings.
- Monthly meeting with highest level of firm, takes place at plant.

COST: \$10,500 per firm receiving treatment (i.e. one-third of the cost of the individual treatment)

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Take-up, data, attrition

- **Take-up rates:**

- Individual: 86.8% (46/53 started and completed)
- Group: 75.4% (40/53) started, 36 (67.9%) completed.
- Baseline characteristics of those who complete not statistically different from those who don't.

- **Data sources:**

- Management score- measured in firms, during diagnostic, during treatment, and in 2014/15 for C and I, in 2015/16 for G.
- KPIs from firms, measured during visits
- Linking firms to admin data sources – PILA, Exports.

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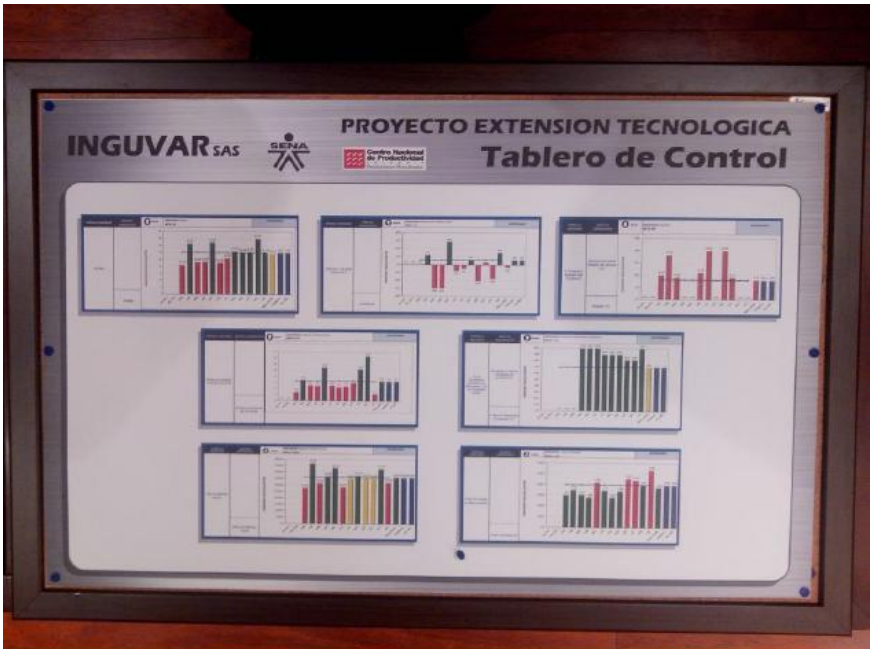
Improvements in Management



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DESPUES



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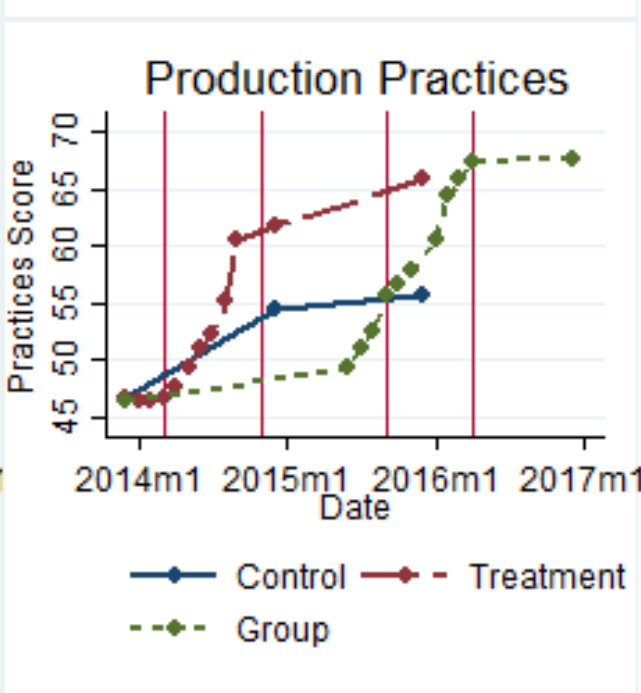
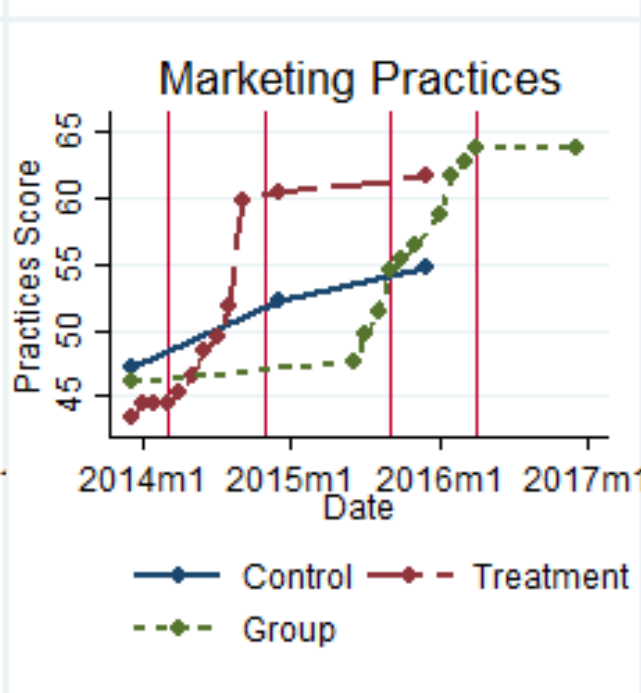
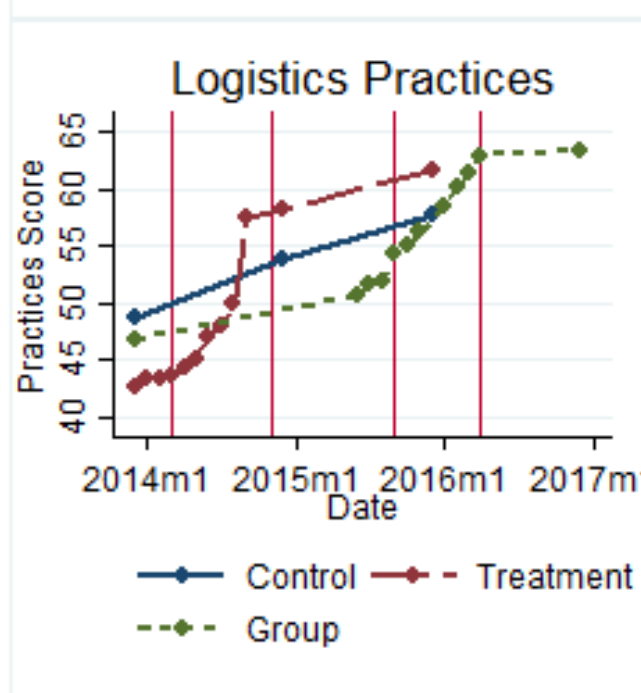
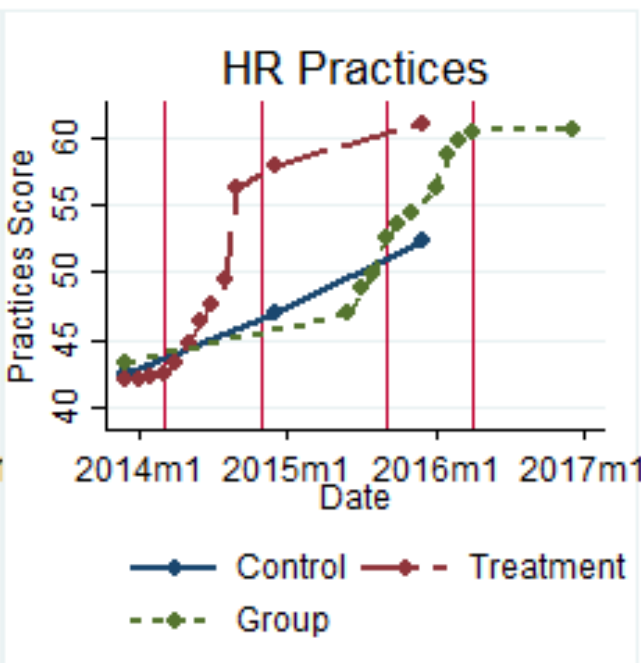
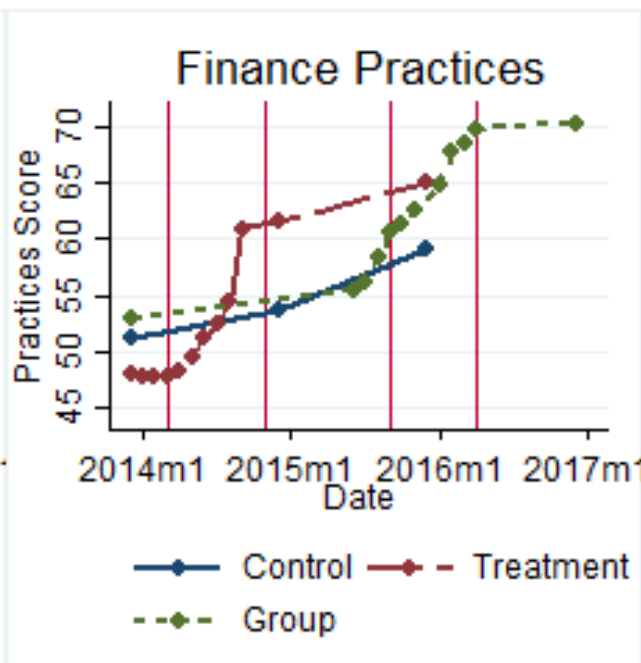
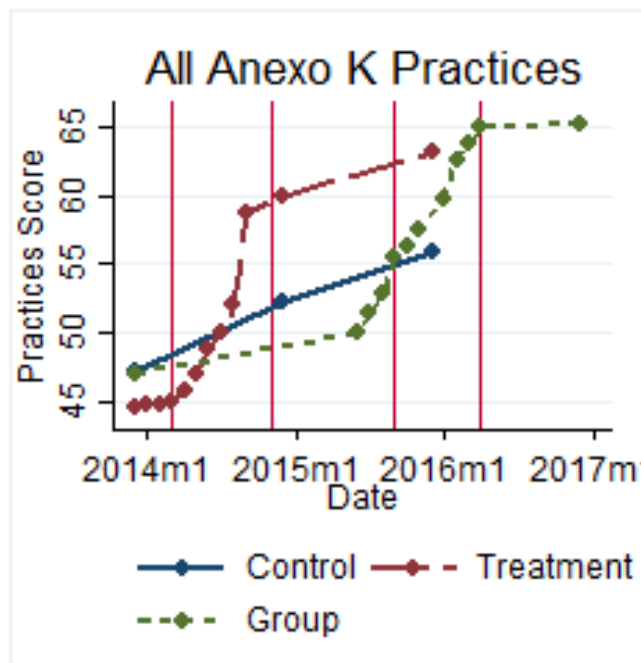
DESPUES



ANALISIS:



Improvements in Management



Improvement
across the
distribution

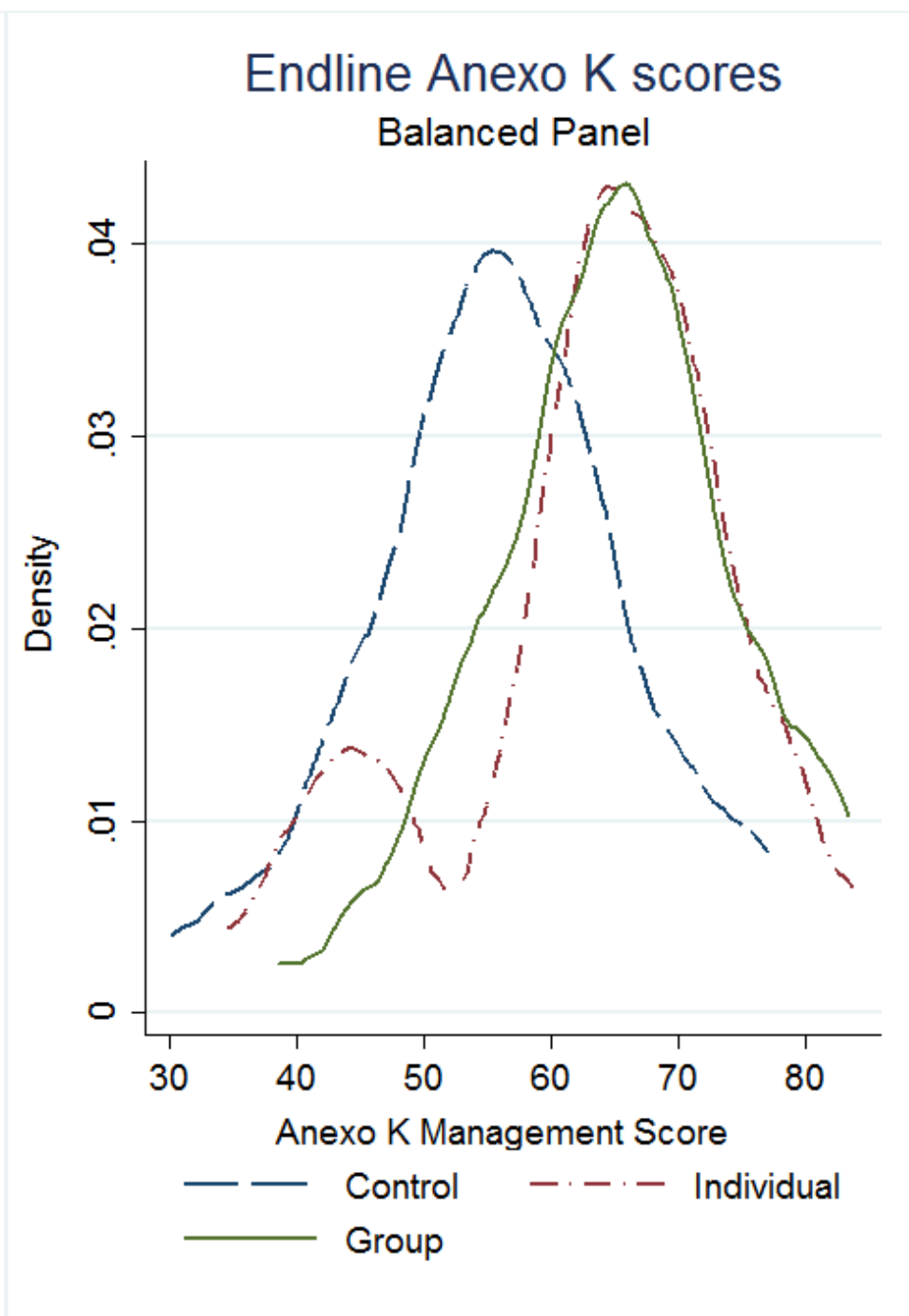
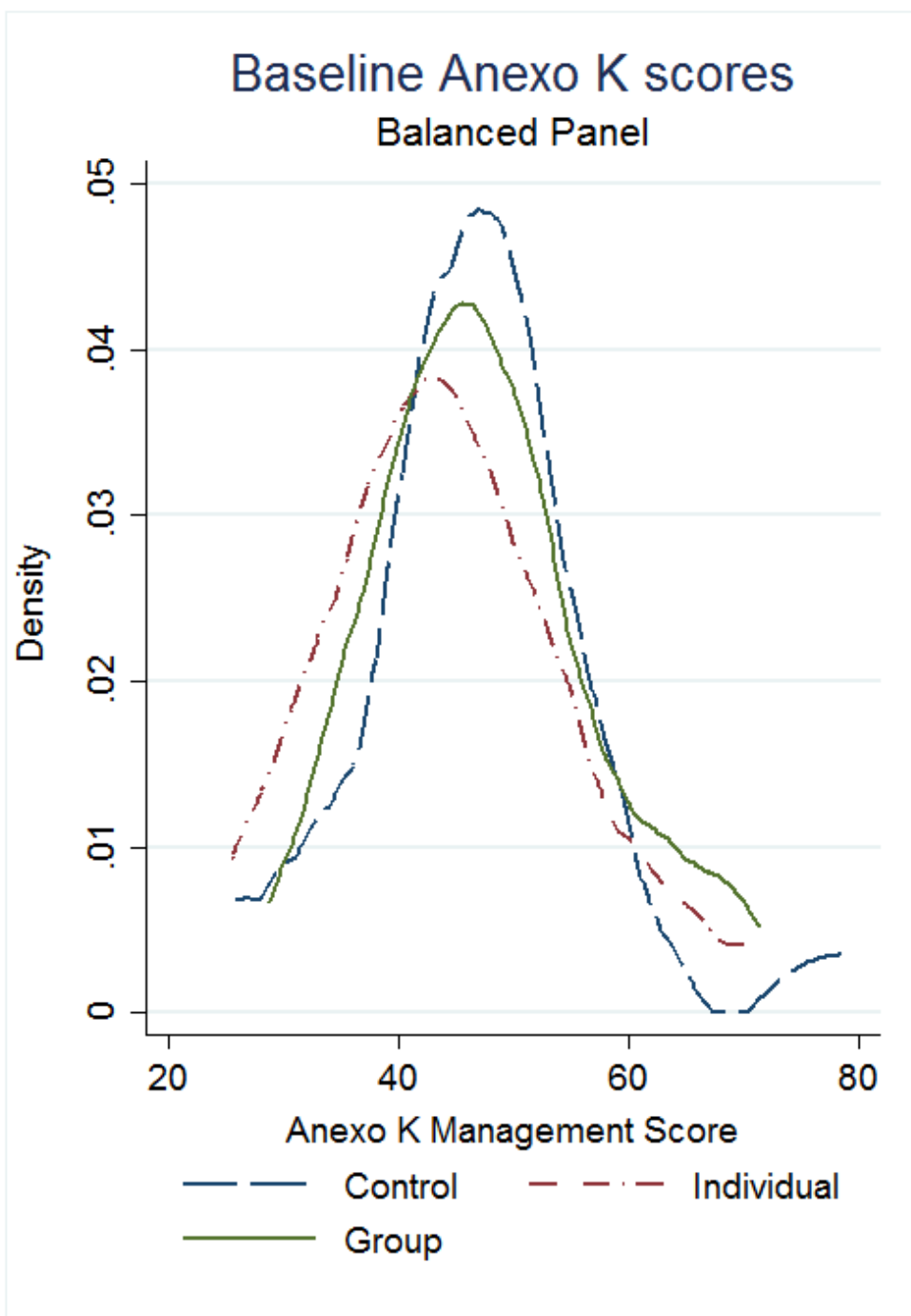
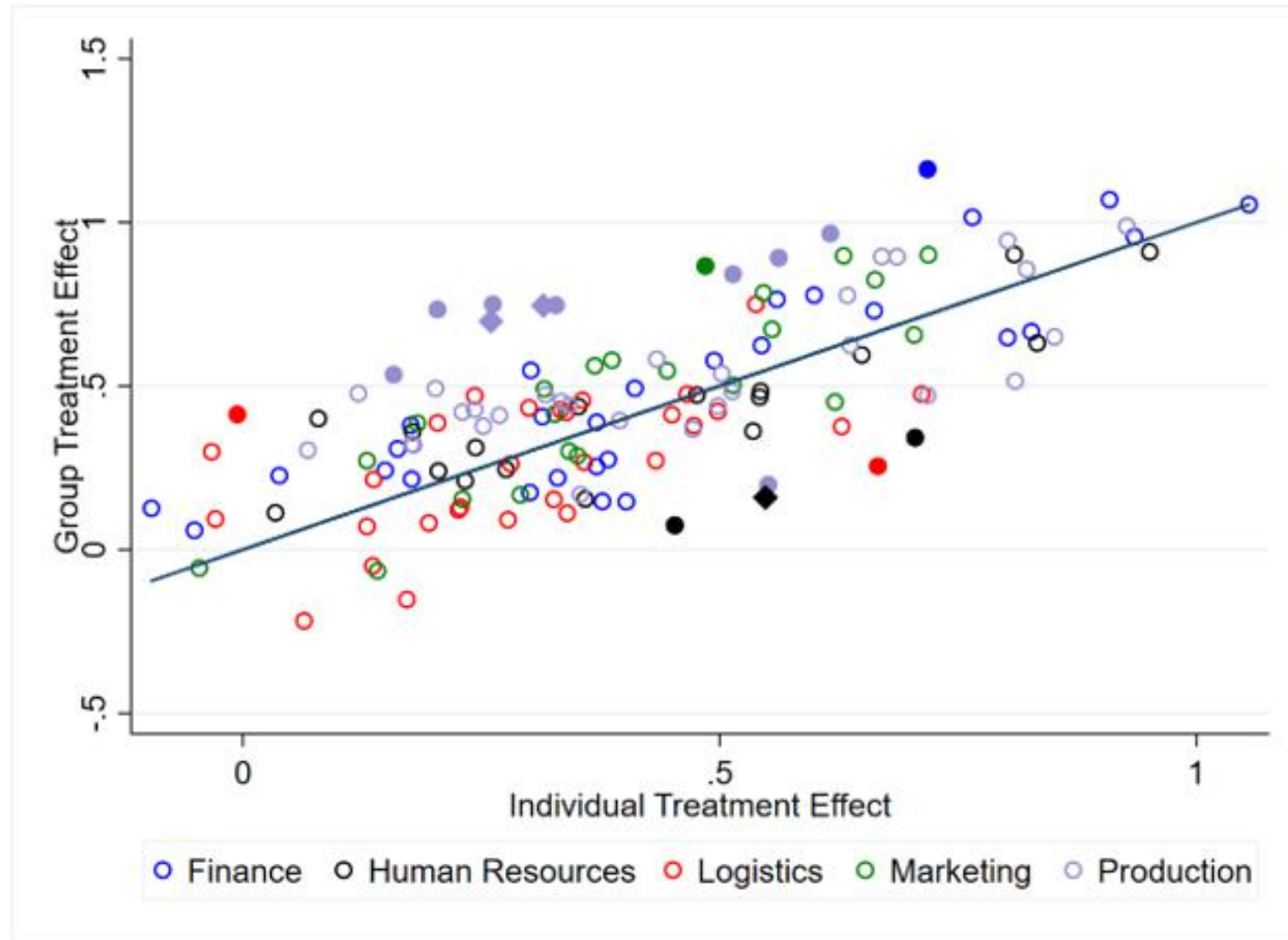


Table 2: Impact on Management Practices

	Overall Score	Finance Practices	HR Practices	Logistics Practices	Marketing Practices	Production Practices
Panel A: Unbalanced Panel						
Individual Treatment*During Intervention	9.703*** (1.370)	9.644*** (1.852)	10.793*** (1.822)	8.708*** (1.603)	10.637*** (2.280)	5.696*** (1.806)
Individual Treatment*Post Intervention	9.620*** (1.830)	9.712*** (2.413)	8.974*** (2.508)	8.585*** (2.457)	9.451*** (2.466)	8.488*** (1.993)
Group Treatment*During Intervention	11.971*** (1.660)	13.841*** (2.057)	12.249*** (2.078)	9.327*** (2.047)	11.899*** (2.599)	11.798*** (1.993)
Group Treatment*Post Intervention	8.544*** (1.894)	9.820*** (2.306)	7.156*** (2.655)	5.860** (2.539)	9.046*** (2.637)	10.694*** (2.048)
Sample Size	225	226	226	225	226	225
P-value: Individual=Group During	0.145	0.027	0.451	0.753	0.568	0.002
P-value: Individual=Group Post	0.533	0.958	0.365	0.235	0.864	0.315
Control Mean	55.98	59.18	52.39	57.75	54.80	55.79
Control SD	10.79	13.79	11.25	14.33	12.58	11.19

By way of comparison: Bloom et al. (2013) have 26 percentage point increase in practices;
 Business training programs typically have 5 percentage point increase (McKenzie and Woodruff, 2016).

Figure 3: The Individual and Group Treatments Improved Specific Practices to a Similar Extent



Broad improvement in practices – significant improvements in 66% of sub-indices (individual), 57% (group)

Largest changes seen in:

- Defining strategic goals and objectives
- Setting up master budgets
- Monitoring KPIs

Smallest changes seen in HR and logistics practices.

Group has stronger impact on production practices related to preventative maintenance.

Notes: Empty circles denotes that difference between the two treatments is not statistically significant at the 5% level; Solid circles indicate that difference between the two treatments is statistically significant at the 5% level; Solid diamonds indicate that difference is statistically significant at the 1% level. Correlation between group treatment effect and individual treatment effect is 0.71. 45 degree line shown.

How does the group change practices?

- Motivated by two possibilities:
 - 1) *Coordinated experimentation and learning*, where group members try to improve same practice together, so can share experiences and motivate one another.
 - 2) *Existing knowledge transfer* – learn from those already doing a practice well to begin with.

$$\Delta Practice_{j,i,g} = \alpha + \beta \overline{\Delta Practice_{j,-i,g}} + \lambda \max_{-i,g} Baseline Practice_{j,-i,g} + \epsilon_{j,i,g}$$

Table 4: Correlation of Practice Changes Within Groups

Dependent Variable: Change in Practice between Baseline and Endline

	(1)	(2)	(3)
Mean Change in Practice for other Group Members	0.100*		0.104**
	(0.050)		(0.049)
Maximum Baseline Level of Practice for Other Group Membe		0.001	0.014
		(0.021)	(0.019)
Sample Size (Firms*Practices)	5069	5210	5069
Mean Change in Practices	0.168	0.171	0.168

Notes:

Regression uses the stacked panel of 141 practices for firms in the group treatment.

Robust standard errors in parentheses, clustered at the firm level. *, **, and *** denote significance at the 10, 5, and 1 percent levels respectively.

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Impact on Employment

Table 5: Impact on Employment

	Firm Data		PILA Data				
	Jan 2013-Dec 2017		Jan 2013-Dec 2017				
	Level	I.H.S.	Firm Survival	Conditional Level	Conditional I.H.S.	Unconditional Level	Unconditional I.H.S.
Individual Treatment*During Intervention	-3.012 (2.912)	-0.018 (0.040)		-1.987 (2.339)	-0.058* (0.035)	-1.048 (2.279)	0.001 (0.045)
Individual Treatment*Post Intervention	-2.150 (3.741)	0.040 (0.052)	0.019 (0.049)	1.222 (4.253)	0.027 (0.066)	2.563 (4.103)	0.113 (0.094)
Group Treatment*During Intervention	3.837* (2.268)	0.101** (0.039)		4.685 (3.053)	0.097* (0.050)	3.081 (3.386)	0.081 (0.094)
Group Treatment*Post Intervention	5.874** (2.848)	0.121** (0.049)	0.019 (0.049)	6.806* (3.746)	0.164** (0.068)	4.044 (4.199)	0.087 (0.133)

Weaker/absent impacts on energy, sales, productivity

Cost-benefit

- Group cost \$10,500/firm; individual \$28,950/firm
- Group does at least as well, if not better, so dominates on cost-benefit basis.
- Does it pay for itself?
 - Lots of uncertainty, but
 - Baseline profit margin is 11%, gain in sales \$26,500-\$29,900/month – suggests profit gain of \$3,000/month => pays for itself in 4 months.
 - If sales impact one std. error below point estimate (84% of treatment effects this large), profit impact \$750/month, pays for itself in 14 months.

Why might group treatment do better than individual?

Possibility 1: Didn't. Small sample sizes coupled with firm heterogeneity prevent us detecting individual treatment effects.

- can only weakly reject equality of treatment effects of two interventions on some specifications in levels of employment and sales, but not when looking at logs.

Possibility 2: Group either provides a way for improvements to last longer, or offers other benefits beyond management improvements.

- One year later, groups don't formally meet, but 54% still communicate occasionally with other group members. Say main value is seeing other firms facing similar problems and seeing how others solved them.
- Only four firms said group useful for helping find supplier or customer = > suggests main channel not direct business relationships.

Conclusions

- Bloom et al. (2013) provided proof-of-concept that poor management could be improved.
- Moving from pilot demonstration to scalable program requires lowering cost of delivery and testing whether can operate within constraints of government bureaucracy – common for impacts of social programs to be smaller when delivered by governments at scale (Rossi, 1987, Vivaldi)
- Both individual and group treatments did improve management 8-10 p.p., with this resulting in increase in firm size under group model.
- New group approach seems promising for scaling.

Lessons

- Good management also matters for managing a management improvement project. Several challenges here:
 - Delays in contracts which challenged data collection and delayed implementation
 - Contracting only single organization to implement may have resulted in hold-up problems, removed performance incentives from competition among consultants.

=> Importance of governments paying attention to quality of their own management when attempting to scale.