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Do Community-Managed Schools Facilitate Social Capital Accumulation?

Evidence from COGES Project in Burkina-Faso

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Background

- Achieving universal primary education (MDG #2)
  - A variety of policy instruments proposed on both supply and demand sides (deworming, information sharing, free school lunch, free school uniform, and CCT)
  - School-Based Management (SBM) as the key to deliver effective education services (Barrera-Osorio, Fasih, and Patrinos, 2009)
  - Estimated policy effects of SBM still mixed:
    - Proponents: Barrera-Osorio et al. (2009), Gertler et al. (2006, 2007), Blimbo and Evans (2011), Bruns, Filmer, and Patrinos (2011), Pradhan et al. (2011), Duflo, Dupas, and Kremer (2012)
    - Opponents: Banerjee et al. (2010) De Laat, Kremer, and Vermeersch (2008) , Pradhan et al. (2011),
- Sustainability of voluntary provision of local public goods
  - A number of interventions such as local cost-sharing and verbal commitment intervention are all ineffective (Kremer and Miguel, 2007 "illusion of sustainability")
  - Formation of user committees by donors effective?

Goals

- Formal evaluation of a SBM program in Burkina Faso, "COGES"
  - A hybrid method of artefactual field experiments and RCT
- Explore the channels at least partially
  - By utilizing panel data
- Examine fiscal sustainability of SBM
  - In theory, SBM can enable local cost recovery
  - By using artefactual field experiments

Novelties

- A hybrid evaluation method of AFE and RCT (NFE)
- The first RCT-based evaluation of SBM itself (not sub-components of SBM)

S.D. Levitt, J.A. List / European Economic Review 53 (2009) 1–18

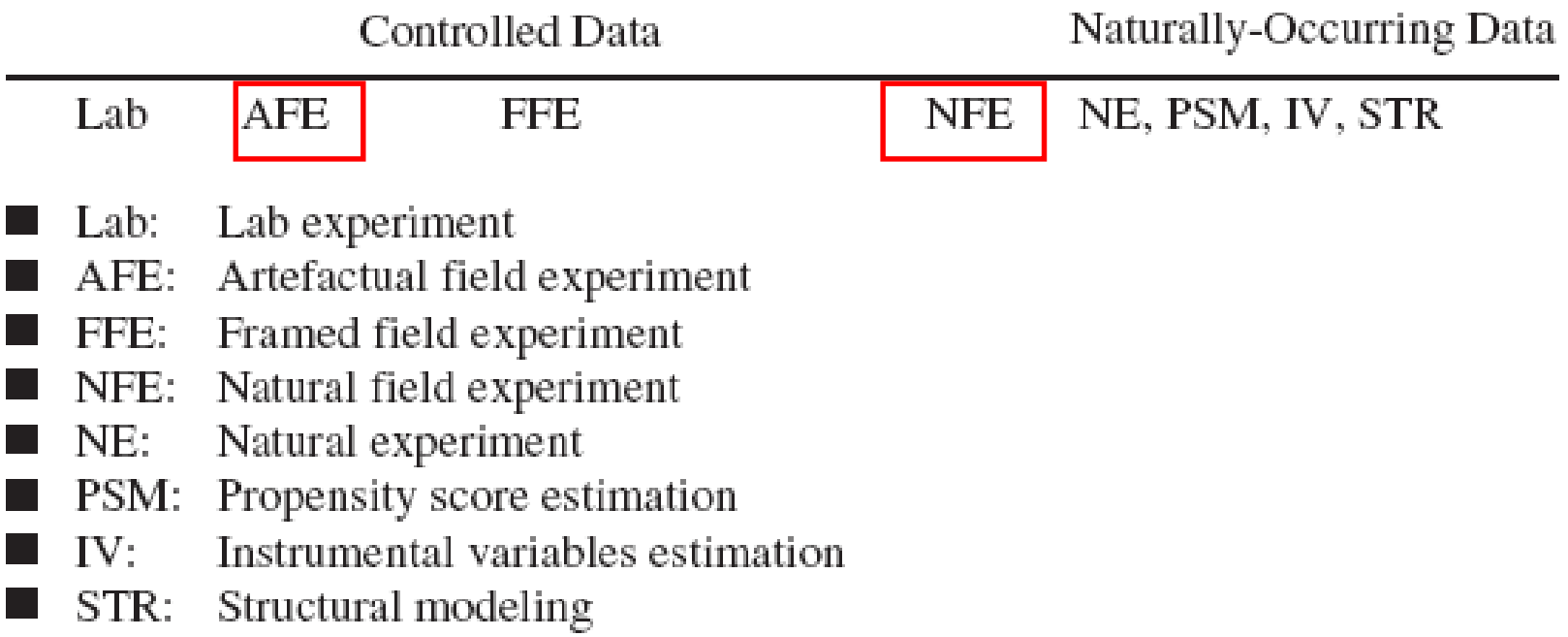


Fig. 1. A field experiment bridge.

Presentation Outline

- COGES project in Burkina Faso
- Evaluation Strategy
- Data and empirical results
- Remarks and future tasks

COGES as a new innovation to improve education

- COGES (Comites de Gestion dans des Ecoles Primaires):

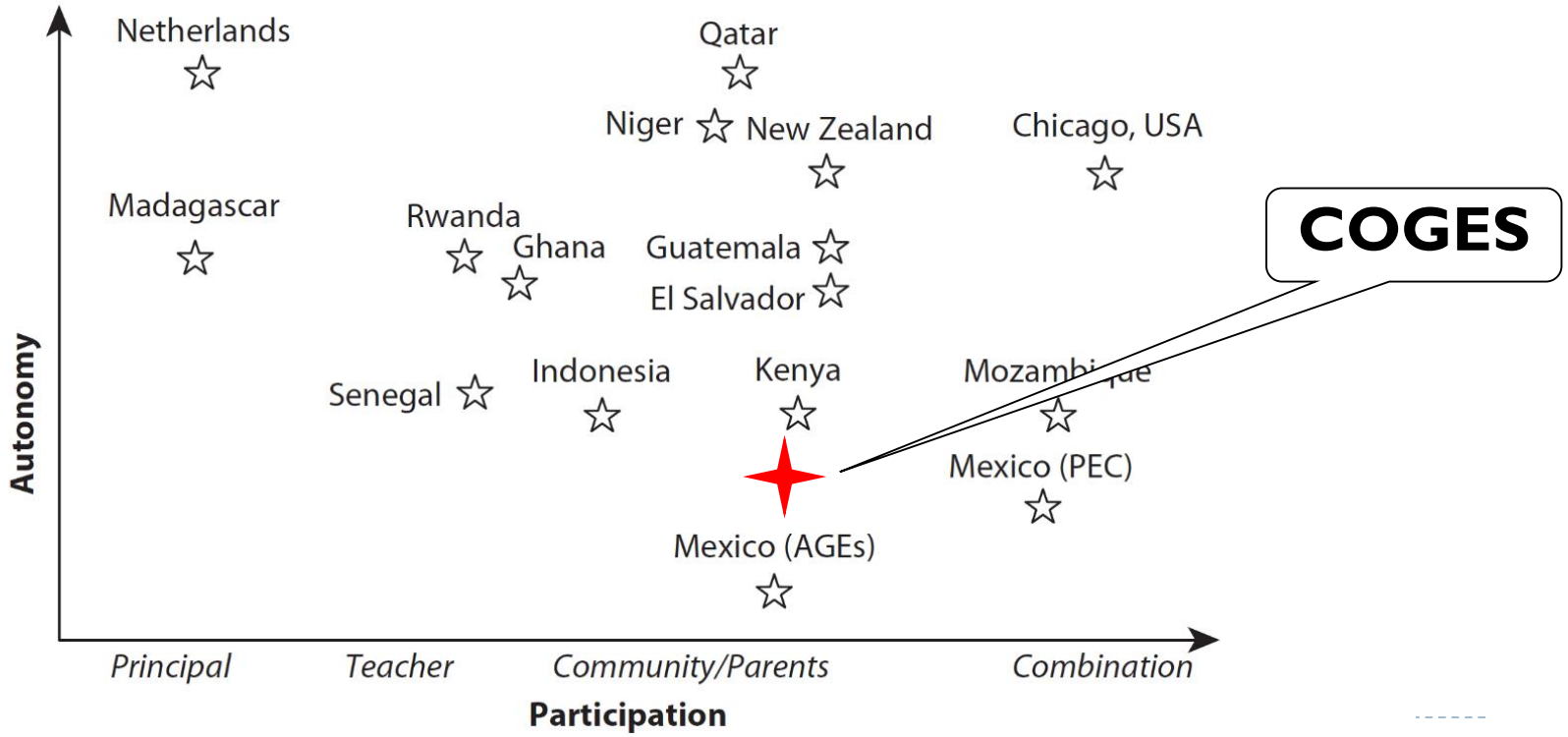
- Purposes:
  - To improve child education, health, and nutrition and to empower parents and community (to accumulate social capital)

- Ingredients:
  - Decisions are delegated to a school management committee (a director, teachers, and elected members by community voting)
  - Training provided by the gov't w/ help of JICA
  - Activity plans constructed by COGES
    - School lunch programs
    - Improvements in toilets
    - Better knowledge about diseases

School-Based Management (SBM)

- COGES is a replication of EDUCO in El Salvador and a "weak form" SBM

Figure 1.2 The Autonomy-Participation Nexus, Selected Countries



Source: Barrera-Osorio, Fasih, and Patrinos (2009) *Decentralized Decision-Making in Schools*, The World Bank

COGES as a new innovation to improve education

- Timeline under COGES:

1) Election training (one day, to the school principal) to select a school management committee (a director, teachers, and community members)
2) With all village residents, elections by secret voting (two community-wide meetings)

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3) Activity training (2.5 days) for COGES members on fiscal management, activity plans, monitoring
4) Design of activity plans

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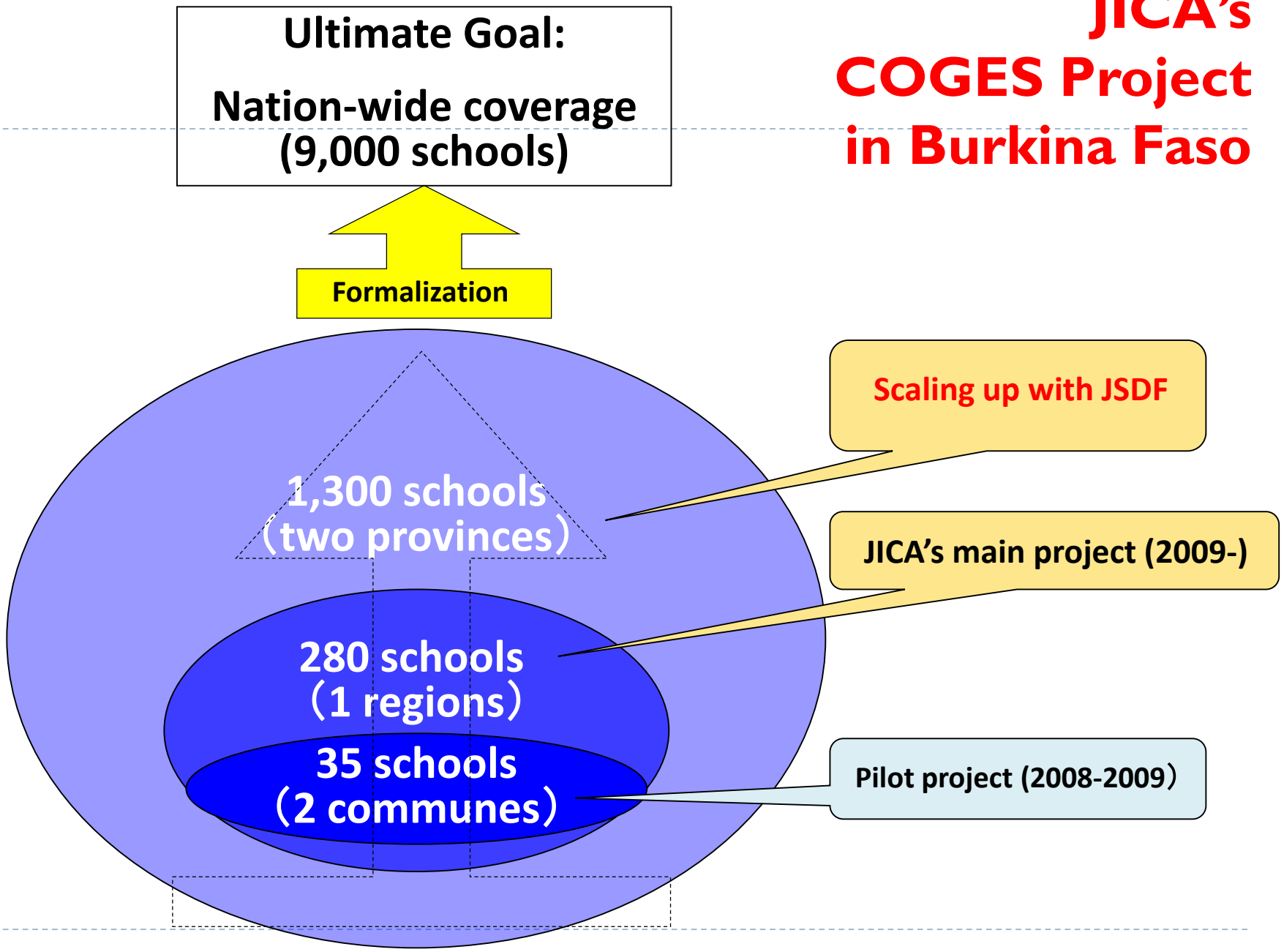
5) Implementation of school activities
6) Collective monitoring

JICA's COGES Project in Burkina Faso



Burkina Faso

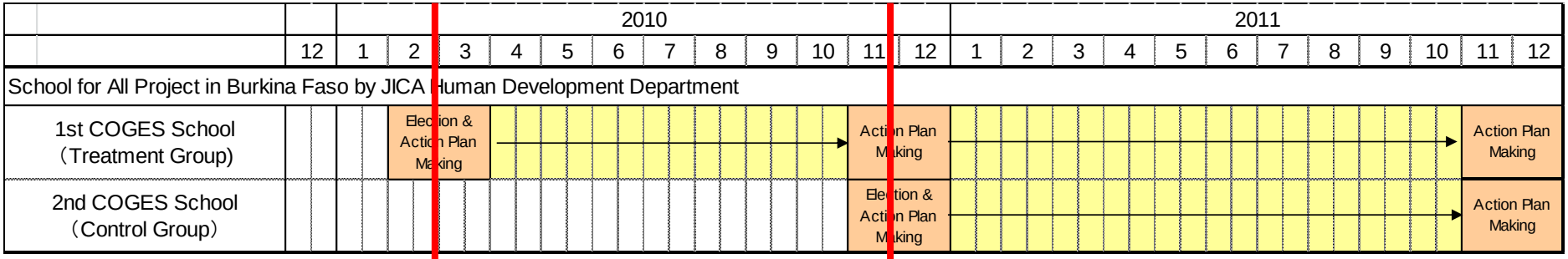
Map No. 4230 UNITED NATIONS
November 2004

Department of Peacekeeping Operations
Cartographic Section

JICA Research Institute's Evaluation Project

- Pilot Phase (November 2008-June 2009):
  - Survey and experiments in Oct & Nov 2009 and Nov 2010
  - 7 COGES schools after one year of COGES implementation
  - 5 non-COGES schools

- Main Phase (November 2009-):
  - RCT roll-in interventions, survey, and experiments in Feb & Nov 2010
  - 140 COGES schools started in Feb 2010
  - 139 Non-COGES schools started COGES in Nov 2010



1st experiment

2nd experiment

Evaluation Strategy

- Impact of COGES (*D*) on Outcome (*Y*)
  - Treatment *D*=1[COGES]
    - Pilot phase: Retrospective
    - Main phase: Randomized Roll-in
  - Outcomes *Y*:
    - Social capital (voluntary contribution to public goods)
    - Cognitive and non-cognitive achievements
    - Health and anthropometric outcomes

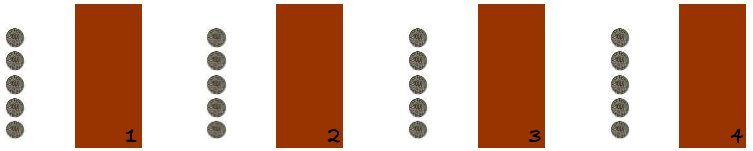
- Methods:
  - Pilot phase: IV and PSM (Sawada and Ishii, 2011)
  - Main phase (RCT): OLS and IV (non-compliance)

Public Goods Experiment to Quantify the Level of Social Capital

- Public goods game:
  - Standard lab experiments (Levitt and Fehr, 2004)
  - Voluntary cooperation among people
  - One of the measures of social capital (Anderson et al., 2004)
  - Multi-person PD game

- Participants secretly choose how many of their initial endowments (5 coins of 100FCFA) to put into the public pot.
  - Each participant keeps the tokens they do not contribute plus an even split of doubled amount of the total tokens in the common pot

- Each experiments are played by a group of 4 persons (within and between design):
  - Father group (4 fathers)
  - Mother group (4 mothers)
  - Mixed parent group (2 fathers and 2 mothers)
  - Mixed parent-teacher group (1 director, 1 teacher, 1 father, and 1 mother)
  - COGES members (only for COGES schools)



Public Goods Experiment to Quantify the Level of Social Capital

$$\pi_i = (E - Y_i) + \frac{\rho}{N}\sum_{i=1}^{N} Y_i$$

- Values:
  - E = 500 FCFA
  - ρ = 2
  - N = 4
- $\partial\pi_i/\partial Y_i = -1 + (\rho/N) < 0$ when $1 < \rho < N$.
- Nash equilibrium: $Y_i = 0$ for all i, so π_i , i.e., discrepancy of actual decision from the NE, is one of measures of SC.

Subject Size of the Public Goods Experiment

- Public goods experiments: 4 participants as a unit of experiment.
- Pilot Phase
  - In total, we conducted 62 groups of experiments and the total number of participants are 248 (136 "pilot" COGES; 112 Non-COGES) in pilot phase
- Main Phase
  - First experiment was conducted for 84 schools (41 COGES; 43 Non-COGES) in Feb 2010. Among these, second experiment was conducted for 42 schools (20 COGES; 22 Non-COGES) in Nov 2010.
  - # of participants are 1708 in Feb 2010, and 840 in Nov 2010 in total.

	Oct- Nov 2009 (Retrospective)	Feb 2010 (RCT)	Nov 2010 (RCT)
COGES (Treatment)	136 (7 schools)	920 (41 schools)	400 (21 schools)
Non-COGES (Control)	112 (5 schools)	788 (40 schools)	440 (21 schools)

Pilot Phase

- Pilot Phase (Nov 2008-June 2009):
- Evaluation data and experiments in Oct & Nov 2009 and Nov 2010

	Oct- Nov 2009 (Retrospective)	Feb 2010 (RCT)	Nov 2010 (RCT)
COGES (Treatment)	136 (7 schools)	920 (41 schools)	400 (21 schools)
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IV Estimates

- IV: proportion of number of teachers to number of students, proportion of number of girls to number of boys, number of classes, number of teachers, and number of females

	(I)	(II)	(III)	(IV)
Estimation method	IV	IV	IV	IV
Dep.var.	Contribution	Contribution	Contribution	Contribution
Controls	YES	YES	YES	YES
COGES†	0.613***	0.729***	0.206**	0.252***
	[0.168]	[0.237]	[0.0918]	[0.0469]
membertype2		-0.503		-0.268
		[0.353]		[0.256]
membertype3		0.212		0.183
		[0.175]		[0.179]
membertype4		0.534		0.571
		[0.560]		[0.564]
membertype5		1.361***		1.422***
		[0.448]		[0.479]
dictatorgame			0.448***	0.414***
Constant	2.998***	2.406***	1.958***	1.503***
	[0.441]	[0.485]	[0.214]	[0.330]
F Stat. for 1st stage instruments which use COGES as Dep.var.	2.89*	2.19*	8.82***	53.42***
Anderson and Rubin Wald test F	26.71***	58.17***	3.53**	8.67***
Anderson and Rubin Wald test Chi	125.73***	278.67***	16.77**	41.90***
Sargan	0.704	1.962	0.862	1.233
Observations	248	248	248	248
Adjusted R-squared	0.256	0.309	0.376	0.414

20.3% = 0.61/3

14.4% = 0.45/3.1

17 Cluster-adjusted robust standard errors reported in parentheses. *** denotes significance at the 1% level; ** at the 5% level, * at the 10% level

PSM

- PS individual level covariates: Years of education and its squared variables, age of the participant and its squared variables

- PS school level covariates: Number of teachers at each school.

33.3% = 1.0/3.0

Estimated ATT by PSM

	One to one matching	Caliper matching	Kernel matching
ATT	1.02	1.02	0.805
t value	2.36	2.36	3.58

Main Phase

- Main RCT Phase (Nov 2009-):
- Evaluation data and experiments in (Feb and) Nov 2010

	Oct- Nov 2009 (Retrospective)	Feb 2010 (RCT)	Nov 2010 (RCT)
COGES (Treatment)	136 (7 schools)	920 (41 schools)	400 (21 schools)
Non-COGES (Control)	112 (5 schools)	788 (40 schools)	440 (21 schools)

COGES as a new innovation to improve education

- Timeline under COGES:

1) Election training (one day, to the school principal) to select a school management committee (a director, teachers, and community members)
2) With all village residents, elections by secret voting (two community-wide meetings)

Public goods game

3) Activity training (2.5 days) for COGES members on fiscal management, activity plans, monitoring
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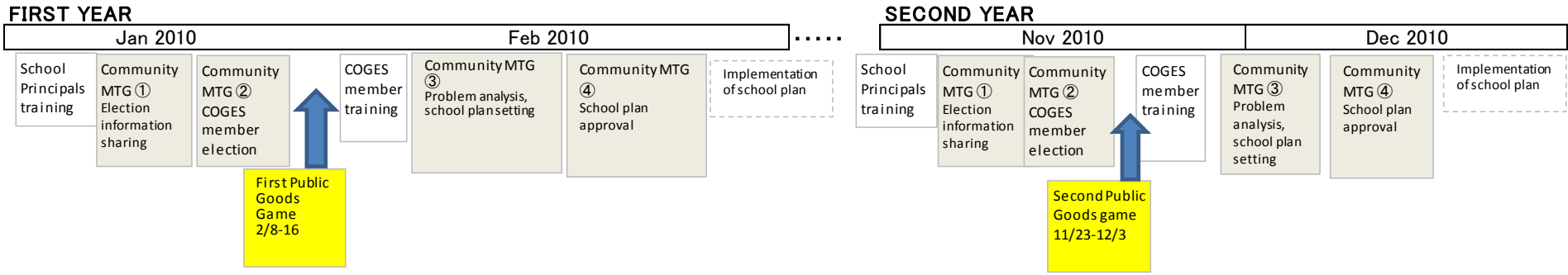
6) Collective monitoring

Sequence of Events



	Before (first year)	After (second year)
1st round COGES	a1b	a1a
2nd round COGES	a2b	a2a

- Total effect = election effect + implementation effect:
  - (before) election effect: a1b-a2b
  - (after) implementation effect: a1a-a2a
- Dif-in-Dif effect: (a1a-a1b) - (a2a-a2b) = implementation effect - election effect

Public Goods Experiment to Quantify the Level of Social Capital

- Each experiments are played by a group of 4 persons:
  - 1) Father group (4 fathers)
  - 2) Mother group (4 mothers)
  - 3) Mixed parent group (2 fathers and 2 mothers)
  - 4) Mixed parent-teacher group (1 director, 1 teacher, 1 father, and 1 mother)
  - 5) COGES members

COGES "election" effects
using the "before" data

	Method	IV	IV	IV
	Strata FE	YES	YES	YES
	Control	NO	YES	YES
VARIABLES				
COGES (treat8)		40.60**	29.49*	32.75**
		(16.40)	(15.76)	(13.35)
Group 2			3.230	2.130
			(27.26)	(24.68)
Group 3			3.063	-3.716
			(19.01)	(16.95)
Group 4			59.39**	37.79*
			(24.36)	(20.63)
Group 5			75.03**	56.24**
			(29.65)	(27.26)
Dictator game				49.15***
				(4.965)
Constant		277.8***	245.5***	121.8***
		(22.68)	(33.33)	(34.22)
Kleibergen-Paap rk Wald F statistic		313.915***	259.438***	264.116***
Observations		716	702	698
R-squared		0.111	0.192	0.341

14.7% = 41/278

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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1 director
1 teacher
1 father
1 mother

Robust standard errors in parentheses
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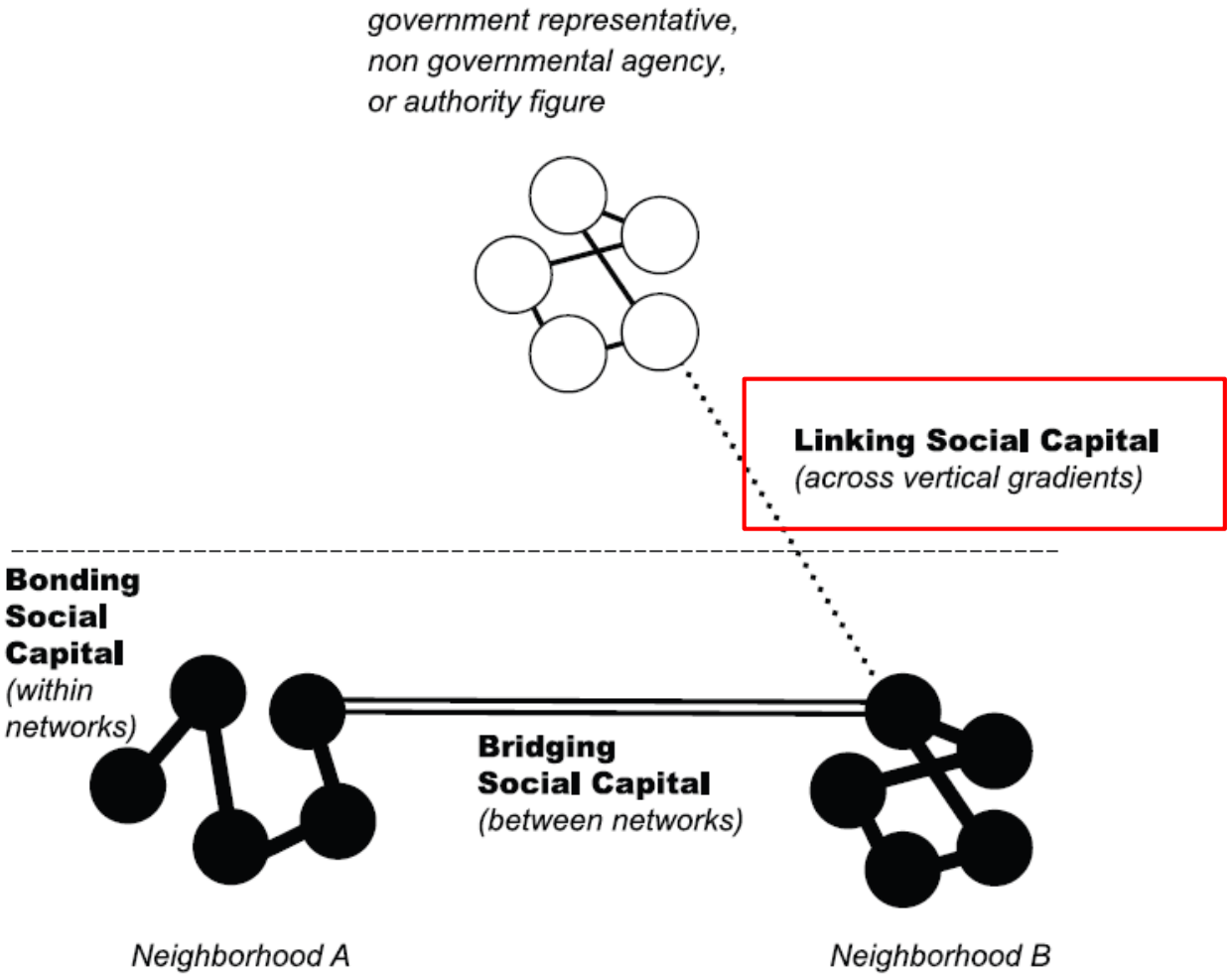
Three types of social capital



Source) Daniel P. Aldrich, "Networks of Resilience: How Social Capital Assist Post Disaster Recovery."

COGES "Implementation" effects using the "after" data

	Method	IV	IV	IV
	Strata FE	YES	YES	YES
	Control	NO	YES	YES
VARIABLES				
COGES (treat8)		33.85**	34.87**	26.95**
		(16.00)	(15.70)	(13.13)
Group 2			15.32	3.115
			(27.37)	(23.87)
Group 3			13.73	3.270
			(24.29)	(21.09)
Group 4			31.01	22.98
			(23.94)	(21.64)
Group 5			28.13	22.89
			(22.04)	(19.71)
Dictator game				45.91***
				(4.085)
Constant		359.0***	362.2***	227.2***
		(20.87)	(35.09)	(35.72)
Kleibergen-Paap rk Wald F statistic		873.587***	852.789***	857.063***
Observations		828	820	819
R-squared		0.057	0.080	0.243

9.4% = 33.9/359

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Remarks

- Remarks
  - COGES project increased SC:
    - The amount of voluntary contribution to public goods increases by 20.3%-33.3% in the pilot phase and by 24.1% (election effect=14.7% & implementation effect=9.4%) in the main phase.
    - Community management project seems to enable local cost recovery, leading to fiscal sustainability potentially.
  - Empowerment of linking SC
- Future Tasks:
  - Robustness checking by real-world decisions
    - Tontine (ROSCAs) and actual contributions to schools
  - Other outcomes
- External validity: JICA has been supporting COGES in West Africa (Niger, 2004-; Senegal, 2007-; Mali, 2008-; Burkina Faso, 2008-)