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Measuring family planning supply chain performance in developing countries

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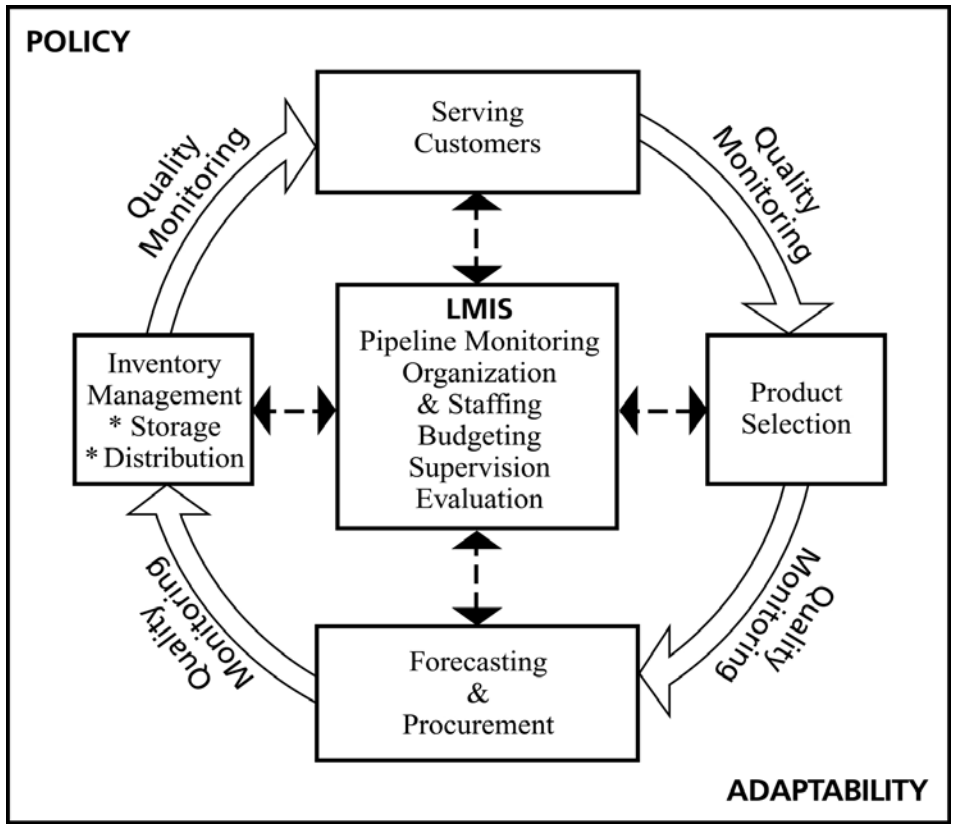
FROM THE AMERICAN PEOPLE

INTRODUCTION

- Commodity availability at SDPs essential for successful FP programs
- To improve and strength supply chain, performance must be effectively measured
- Logistics Indicator Assessment Tool (LSAT) developed and used by USAID | DELIVER PROJECT to measure performance
- Study Question:

  Is the Logistics Indicator Assessment Tool (LSAT) an effective measure of logistic system performance?

FAMILY PLANNING LOGISTICS



LOGISTICS SYSTEM ASSESSMENT TOOL (LSAT)

- Eleven functional aspects of FP logistics systems measured by the tool:
  1. Organization and staffing
  2. Logistics Management Information System (LMIS)
  3. Product selection
  4. Forecasting
  5. Procurement
  6. Inventory control
  7. Warehousing
  8. Distribution
  9. Organizational support
  10. Product use
  11. Financing

- In-depth interviews with key informants; each component scored

METHODOLOGY

- LSAT data from 12 countries available
- Observed item scores for each component averaged
- 11 summary scores available to construct the LSAT Index; (used 8)
- Product use, organization and staffing, and organizational support components eliminated
- Eight logistics systems component scores are aggregated to construct the LSAT Index
- LSAT Index is assessed for:
  - Reliability using item analysis
  - Content validity on face value
  - Construct validity using factor analysis
  - Predictive validity using simple correlation

RESULTS: Summary statistics of LSAT component scores

	N	Mean	SD	Min	Max
1. LMIS	18	68.4	24.7	0.0	100.0
2. Product selection	9	66.2	22.0	20.0	100.0
3. Forecasting	18	61.6	28.9	0.0	100.0
4. Procurement	18	74.6	28.6	0.0	100.0
5. Inventory control	18	63.1	21.5	18.2	91.7
6. Warehous. and storage	17	79.2	17.9	32.0	100.0
7. Transp. and distribution	17	53.5	31.5	0.0	100.0
8. Finance	16	61.1	26.2	12.5	100.0

RESULTS: RELIABILITY

- Extent to which the score remains consistent over repeated assessment of the same FP program under identical conditions
- Assessed from a single administration using *split-half* and *internal consistency*
- Split-half – two indices formed; correlation observed
- Internal consistency for reliability – Cronbach's alpha (<0.70 unsatisfactory; >0.80 good; >0.90 excellent)

Item analysis of the LSAT Index consisting eight items

Item	N	Sign	Alpha
1. LMIS	12	+	0.77
2. Product selection	8	+	0.79
3. Forecasting	12	+	0.66
4. Procurement	12	+	0.67
5. Inventory control	12	+	0.80
6. Warehousing and storage	12	+	0.75
7. Transportation and distribution	12	+	0.73
8. Finance	11	–	0.83
Index			0.79

RESULTS: CONTENT & CONSTRUCT VALIDITY

- Content validity is the theoretical appropriateness of the items to belong to a particular index
- The extent to which the items of the index measures a single attribute or construct (family planning logistics system performance)
- Using factor analysis: statistical technique to identify latent or unobserved attributes or factors and assess the correlation of the items with the factors

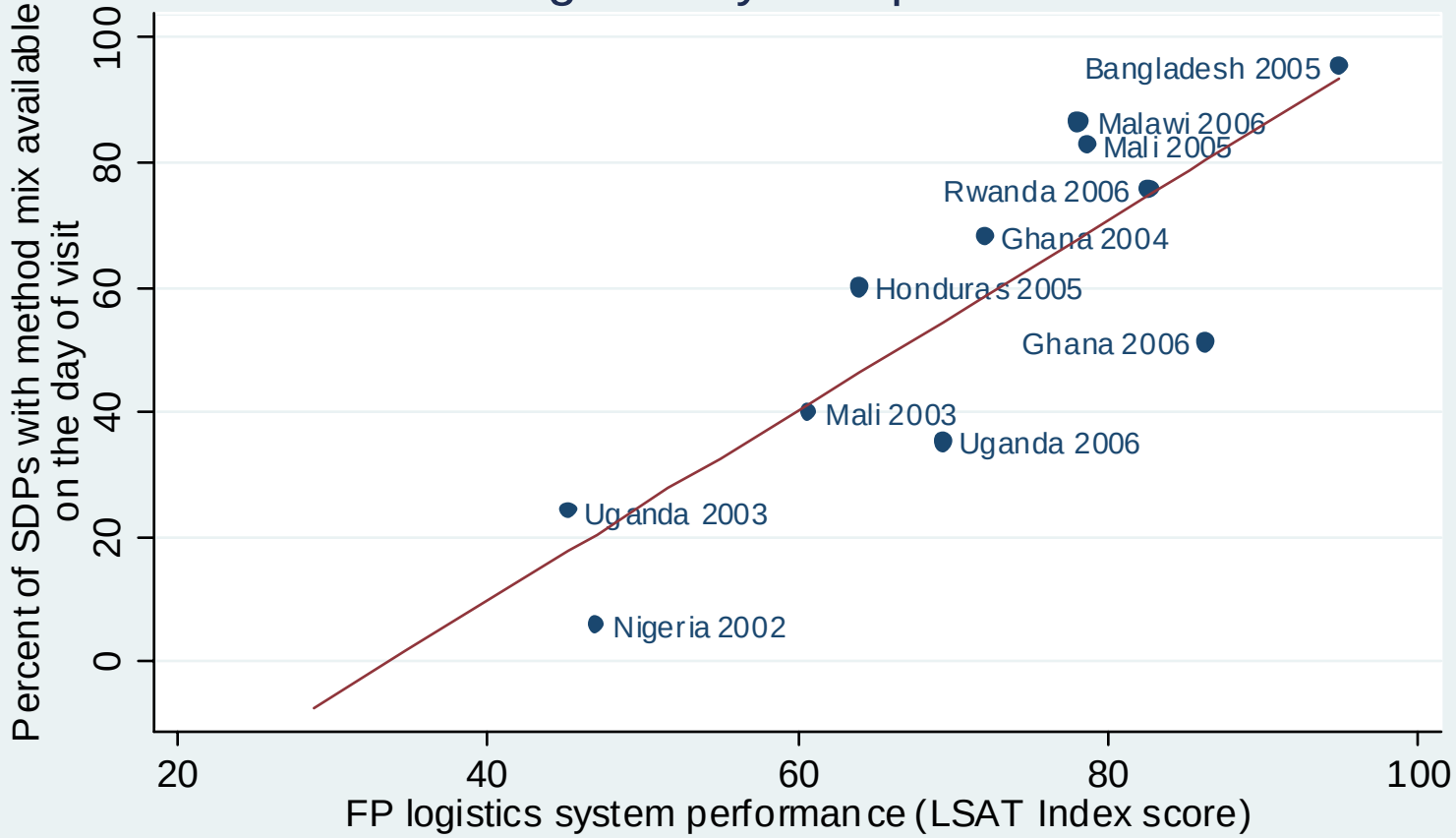
Correlation of the items (factor loadings) with each of the factors identified using principal-factor method

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Uniqueness
1. LMIS	0.476	-0.787	0.370	0.061	-0.089	0.015	0.005
2. Product selection	0.802	0.348	-0.211	0.159	-0.405	-0.010	0.002
3. Forecasting	0.973	-0.093	0.174	-0.049	-0.049	-0.077	0.005
4. Procurement	0.985	-0.022	-0.087	0.114	-0.054	0.071	<0.001
5. Inventory control	0.214	0.552	0.710	0.051	0.079	0.015	0.136
6. Warehousing	0.816	0.029	-0.210	0.267	0.459	-0.012	0.007
7. Transportation	0.806	0.082	-0.088	-0.558	0.096	0.016	0.015

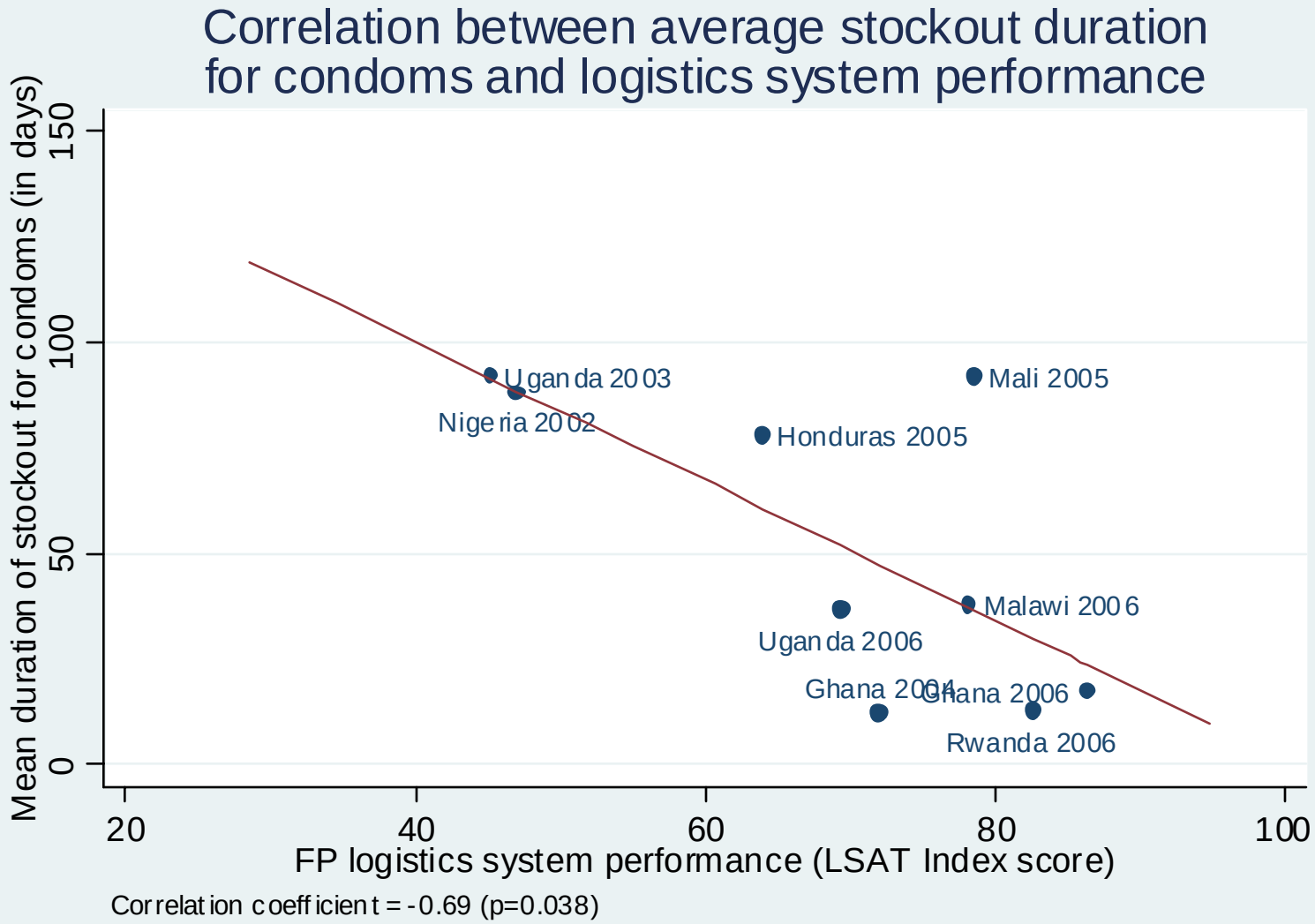
RESULTS: PREDICTIVE VALIDITY

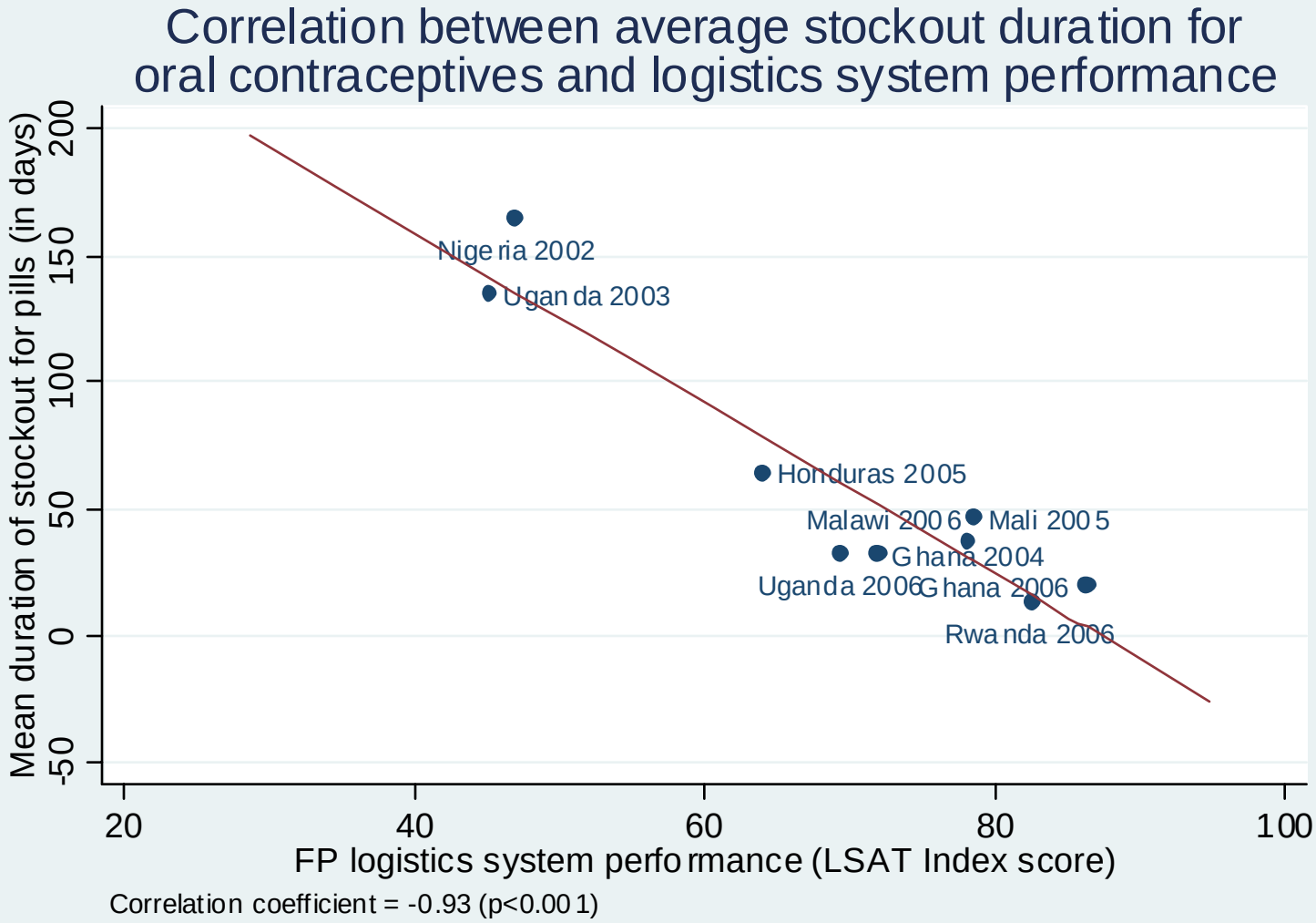
- Correlation between LSAT Index and contraceptive availability at SDPs assessed
- Contraceptive availability obtained from facility surveys (sample size of facility surveys varied from 65 to 200)
- Indicators for contraceptive prevalence:
  - Availability of contraceptive method mix
  - The average duration of stockouts of contraceptives during past 6 months

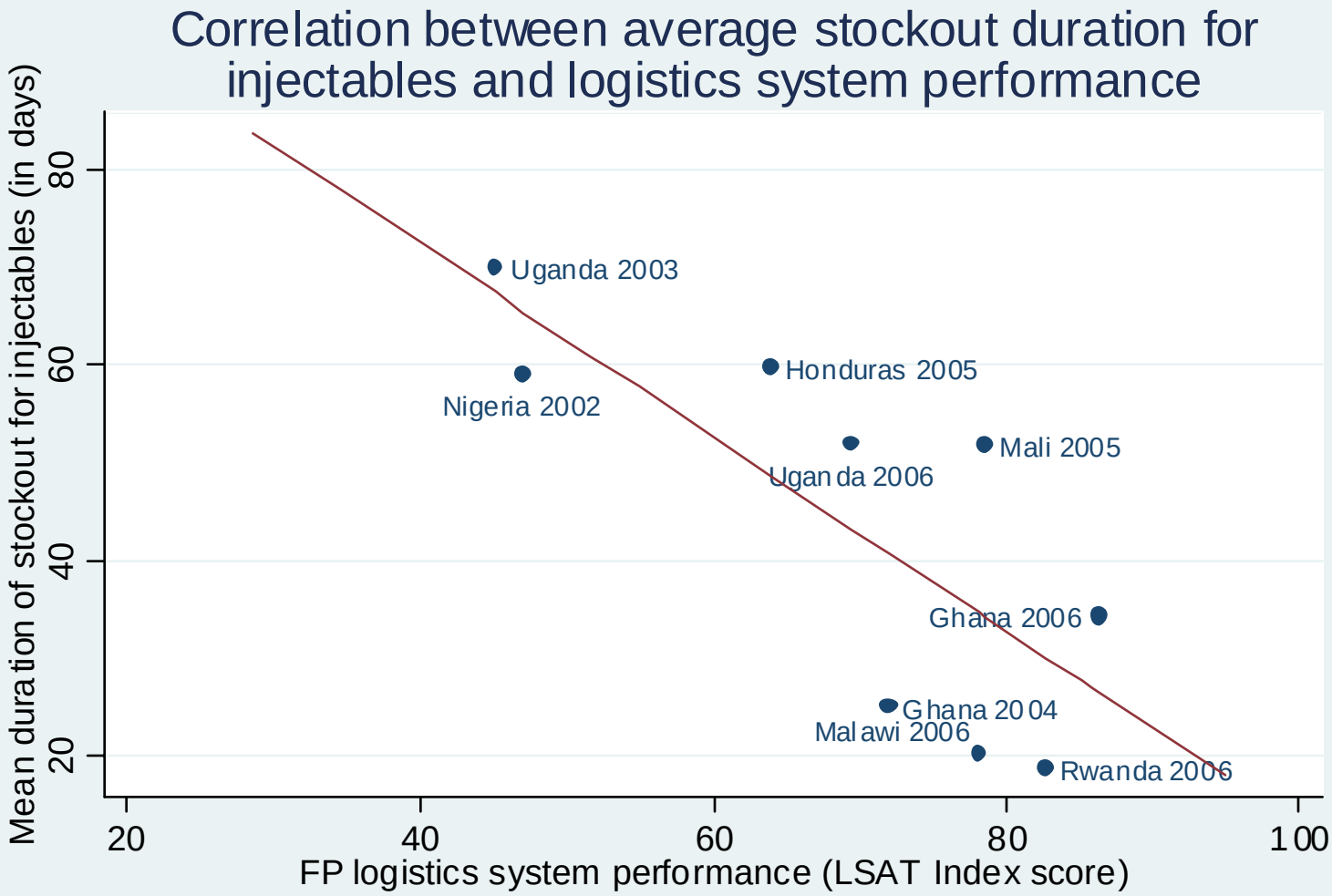
Correlation between availability of method mix and logistics system performance

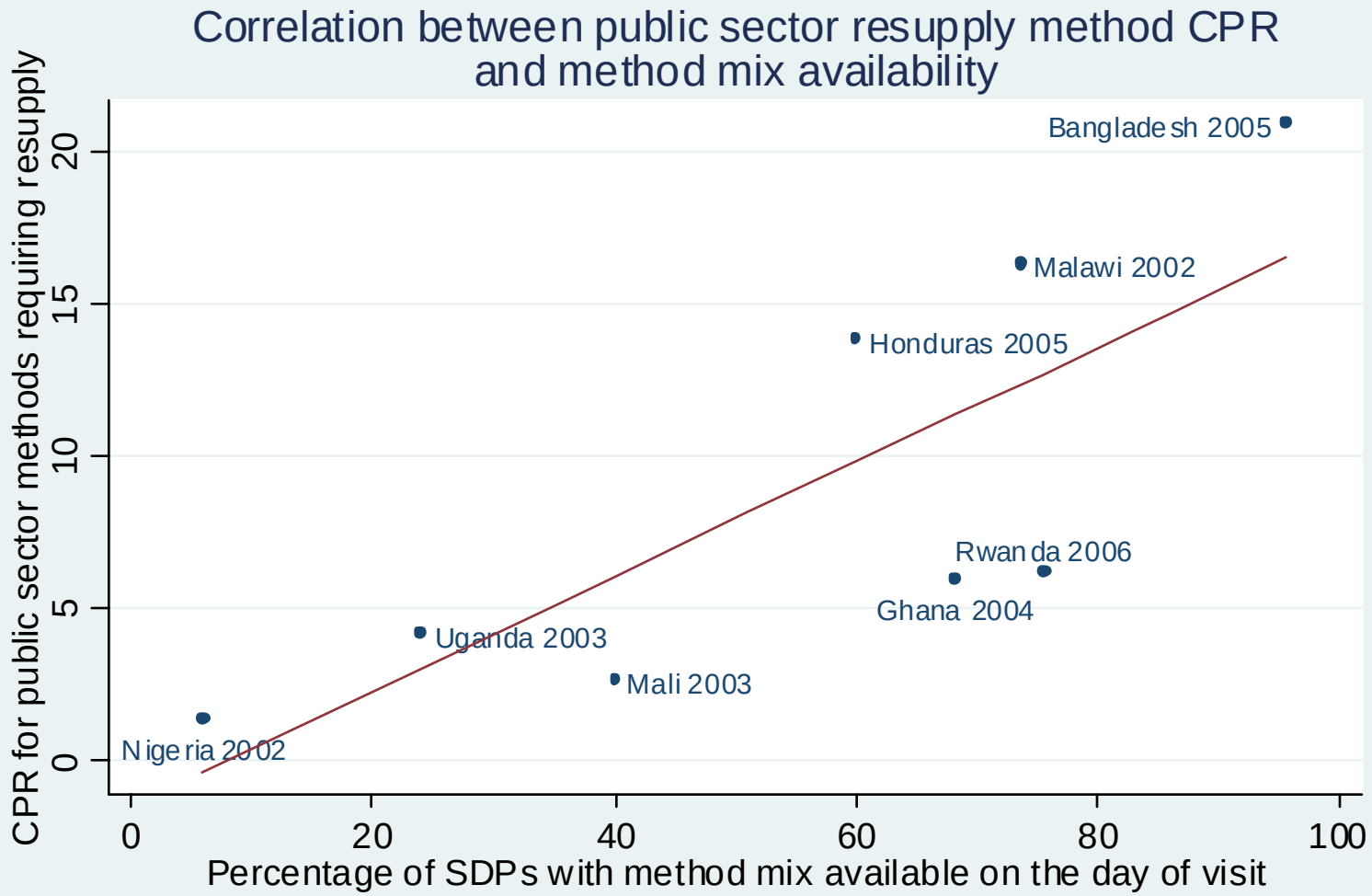


Correlation coefficient = 0.84 (p=0.001)
Source: Karim et al. 2007









CONCLUSIONS

- Seven items constructing the LSAT Index are valid and reliable
- Individual item scores are useful to identify the strengths and weakness within the supply chain
- LSAT Index appropriately predicts the performance of family planning logistics systems
- A strong relationship exists between product availability and CPR
- FP use increases as the performance of the health logistics system and product availability improves
- It is not likely that improving family planning logistics systems alone will ensure increases in contraceptive use unless the demand for contraceptives is created by other means; nevertheless, investing in logistics systems can be one of the most effective interventions to improve the success of family planning