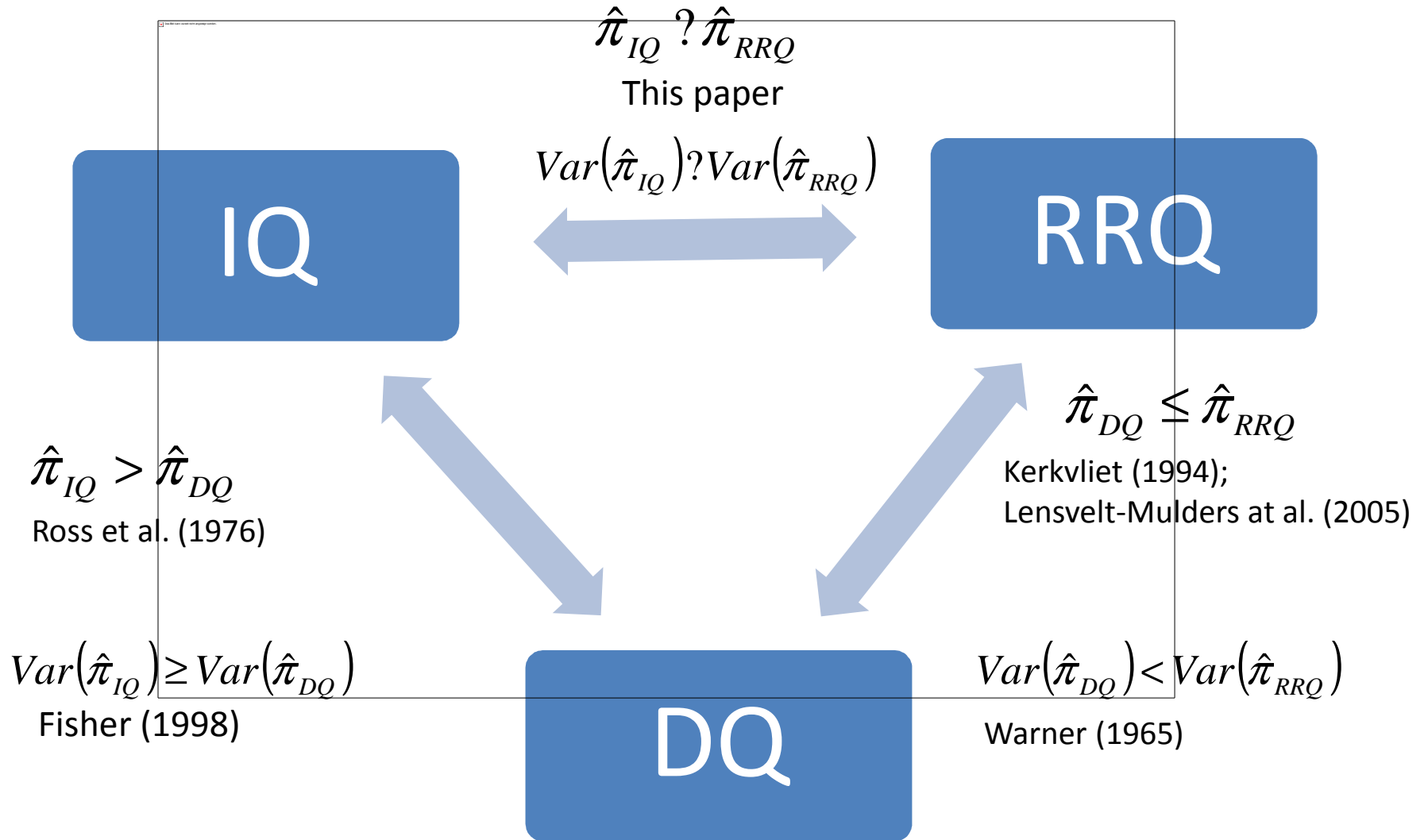


# A Comparison Of Randomised Response And Indirect Methods In Measuring Corruption And Tax Evasion

- Different methods have been used to get reliable data on potentially sensitive topics such as corruption and tax evasion:
  - Direct Questioning (DQ)
    - E.g. “Has your company made an informal payment to a public official in the last 12 months?”
  - Indirect Questioning (IQ)
    - E.g. “Would a company like yours make informal payments to public officials?”
  - Randomised Response Questioning (RRQ)
    - “Flip a fair coin. Have you paid a bribe in the past year or flipped a heads?”
    - An estimate of the percentage of people who bribe can be made from the procedure
    - This estimate can be compared to estimates from direct questioning and indirect questioning to see which method fares best in getting information about bribery and sensitive topics
- This investigation seeks to test RRQ against IQ

# Literature



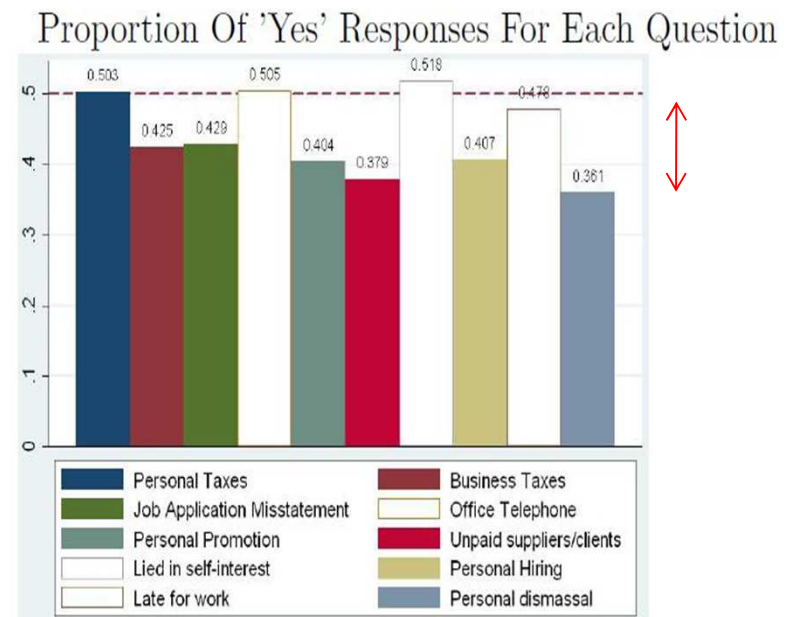
# Data

- Nigerian Firms
- All 36 States and 1 Federal Capital Territory
- Manufacturing, Retail, “Rest Of Universe”
- Survey On Business Environment
- 7 Sensitive RR questions; 3 less sensitive RR questions
- 5 potentially sensitive indirect questions

# Randomised Response Questions

1. Have you ever paid less in **personal taxes** than you should have under the law?
2. Have you ever paid less in **business taxes** than you should have under the law?
3. Have you ever made a **misstatement** on a job application?
4. Have you ever used the office telephone for personal businesses?
5. Have you ever **inappropriately promoted an employee for personal reasons**?
6. Have you ever **deliberately not given your suppliers or clients what was due to them**?
7. Have you ever lied in your self-interest?
8. Have you ever **inappropriately hired a staff member for personal reasons**?
9. Have you ever been purposely late for work?
10. Have you ever **unfairly dismissed an employee for personal reasons**?

# Underreporting Within Randomised Response Design



- If
  - 1 - Nobody was guilty of the act in question; and
  - 2 - Everybody responded honestly, then
- (Approx.) 50% would be the lower bound percentage of Yeses (image on the right) and;
- The distribution of yeses would be symmetrical (image on the left)
- An observed percentage of Yeses below 50%, and an asymmetry in the distribution of yeses, indicates potential underreporting (reticence)

# Results - RRQ

- RRQ Estimates Of Guilt

Table 1: Observed Responses and Estimated Percentage Of Transgressions

Question	Observations (%)		Estimates (%)		95% Confidence Intervals <sup>28</sup>		Lower Bound Estimate Of Reticence(%) <sup>29</sup>	Upper Bound Estimate Of Reticence(%) <sup>30</sup>
	"Yes"	"No"	"Yes"	"No"				
1 <b>Have you ever paid less in personal taxes than you should have under the law?</b>	50.3	49.7	0.6	99.4	0.5994	0.6006	0	49.7
2 <b>Have you ever paid less in business taxes than you should have under the law?</b>	42.5	57.5	0	100.0	-0.0006	0.0006	15	57.5
3 <b>Have you ever made a misstatement on a job application?</b>	42.9	57.1	0	100.0	-0.0006	0.0006	14.2	57.1
4 Have you ever used the office phone for personal businesses?	50.5	49.5	1.0	99.0	0.9994	1.0006	0	49.5
5 <b>Have you ever inappropriately promoted an employee for personal reasons?</b>	40.4	59.6	0	100.0	-0.0006	0.0006	19.2	59.6
6 <b>Have you ever deliberately not given your suppliers or clients what was due them?</b>	37.9	62.1	0	100.0	-0.0006	0.0006	24.2	62.1
7 Have you ever lied in your self interest?	51.8	48.2	3.6	96.4	3.5994	3.6006	0	48.2
8 <b>Have you ever inappropriately hired a staff member for personal reasons?</b>	40.7	59.3	0	100.0	-0.0006	0.0006	18.6	59.3
9 Have you ever been purposely late for work?	47.8	52.2	0	100.0	-0.0006	0.0006	4.4	52.2
10 <b>Have you ever unfairly dismissed an employee for personal reasons?</b>	36.1	63.9	0	100.0	-0.0006	0.0005	27.8	63.9

Number of Observations:3,200. Questions in bold highlight the relatively more sensitive questions

# Results - RRQ

Maximum Likelihood Estimates For Reticence

b	r	$P(Y_i = 1)$
0	16.9%	0.416
0.25	33.5%	0.416
0.5	44.6	0.416
0.75	52.5%	0.416
1	58.4%	0.416

Maximum Likelihood Estimates For Guilt

r	b	$P(Y_i = 1)$
0	-16.9%	0.416
0.1294	-4.4%	0.416
0.395	37.4%	0.416
0.5	66.3%	0.416

# Indirect Questions

1. To what extent do you agree or disagree with the following statements? (strongly disagree; tend to disagree; tend to agree; strongly agree)
  1. It is common for establishments in this line of business to have to pay informal payments/gifts to get things done with regard to customs, taxes, licenses, regulations, etc.
  2. Establishments in this line of business know in advance about how much this informal payment/gift is to get things done.
2. We've heard that establishments are sometimes required to make gifts or informal payments to public officials to get things done with regard to customs, taxes, licenses, regulations, services etc. **On average, what percentage of total annual sales, or estimated annual value, do establishments like this one pay in informal payments/gifts to public officials** for this purpose?
3. When establishments like this one do business with the government, what percentage of the contract value would typically be paid in informal payments/gifts to secure the contract?
4. **What percentage of total annual sales would you estimate a typical establishment in your sector of activity reports for tax purposes?**
5. **What percentage of the total workforce would you estimate the typical establishment in your line of business declares for tax purposes?**



# Results - IQ

Table 2: Results From Indirect Questions With Categorical Responses

To what extent do you agree or disagree with the following statements?			
	It is common for establishments in this line of business to have to pay informal payments/gifts to get things done with regard to customs, taxes, licenses, regulations, etc.	Establishments in this line of business know in advance about how much this informal payment/gift is to get things done.	(Firms who answered "strongly agree/tend to agree" to question 1) Establishments in this line of business know in advance about how much this informal payment/gift is to get things done.
Strongly agree	8%	7%	13%
Tend to agree	30%	27%	54%
Tend to disagree	38%	38%	21%
Strongly disagree	24%	28%	12%
N	3199	3198	1215

Table 3: Indirect Questions Concerning Bribe Payments And Hidden Sales/Workforce

	Bribe For General Government Services	Bribe For Government Contracts	Unreported Sales	Unreported Workforce
Yes	53%	57%	71%	68%
No	47%	43%	29%	32%

# Reticence, Bribery & Tax Evasion

Number of yeses	Proportion Of Firms Admitting to Bribery	Proportion Of Firms Admitting to Tax Evasion
0 (Reticent)	.61	.86
1	.44	.81
2	.49	.83
3	.50	.78
4	.54	.79
5	.59	.81
6	.57	.85
7	.57	.82

# Conclusions

If  $\hat{\pi}$  = estimate of the prevalence of the sensitive act then  $\hat{\pi}_{IQ} > \hat{\pi}_{RRQ}$

- Indirect Questioning is strictly preferred to Randomised Response Questioning under the “More Is Better” Assumption
- Some respondents must be guilty of at least some of the acts, or lying about their status, or both.
- If all interviewees were innocent (No guilt) reticence must be at least 16.9%
- Using method of Azfar & Murrell (2009) both reticence and guilt must be approximately 40%.
- Estimate of reticence is sensitive to the definition/measure used
- Some evidence showing the predictability of final answer based on answers to previous RRQs

# Possible Extensions

- Experiment Analysis