Capital Quality, Productivity, and Financial Development: Evidence from India

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  2) study the association between capital quality and productivity.

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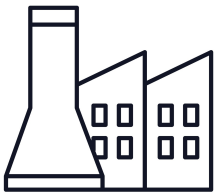
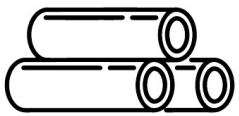
  1) Does the reduced cost of enforcing debt contracts increase investment in higher quality capital?
  2) What about productivity?

Capital Quality Measurement

lower quality



setup cost: $1 for one tonne per year capacity



product: steel pipes

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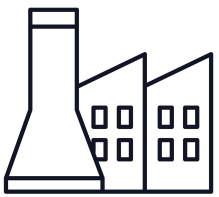
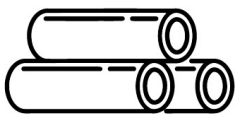


setup cost: $2 for one tonne per year capacity



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- Claim: UIC is a proxy for the quality of capital.

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  - Correlate negatively with production costs, e.g., labor cost?

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- **Capital quality is positively associated with productivity.**

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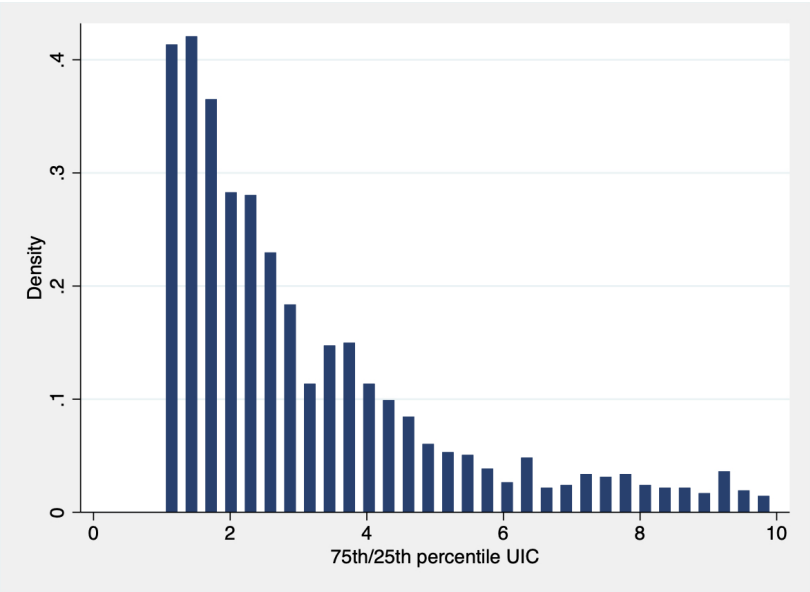
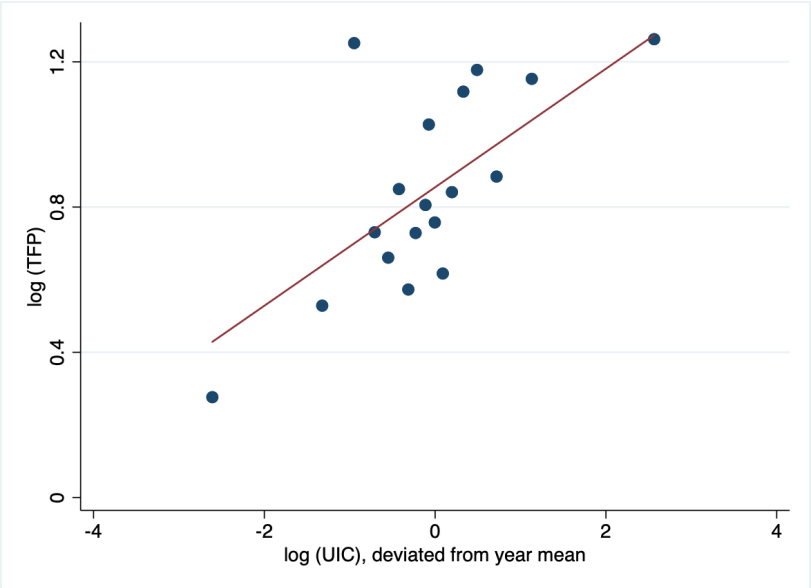
- **Reduced financial constraints increases capital quality and productivity.**

Summary with Figures I

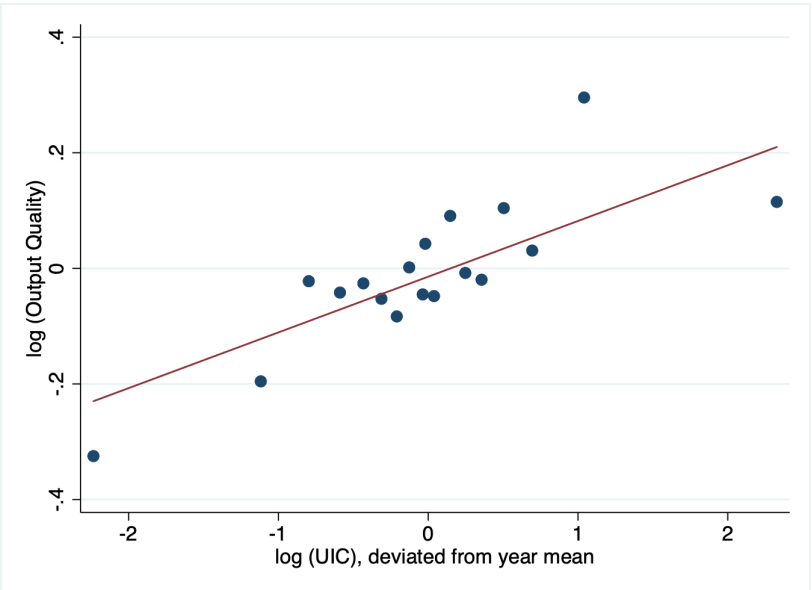


Substantial variation in UIC within product groups

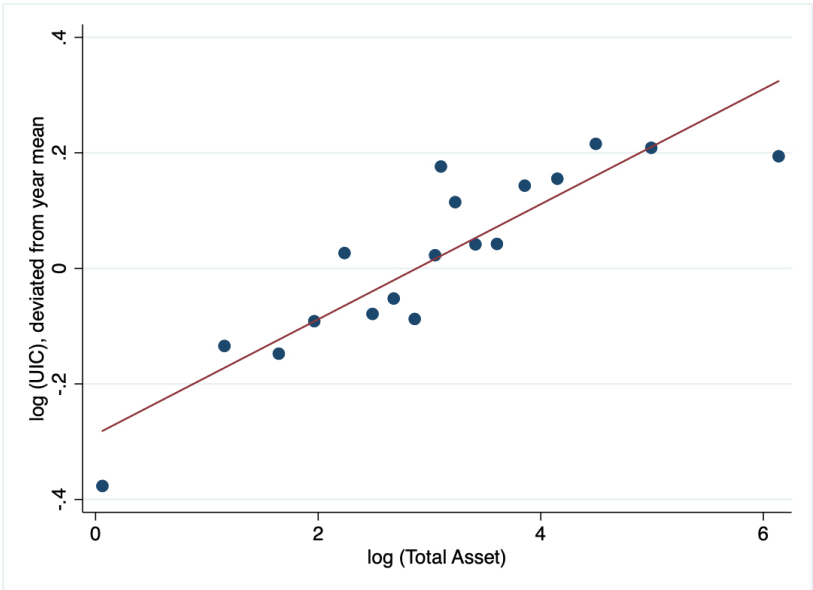


Positive correlation of UIC and TFPR

Summary with Figures II



Positive correlation of UIC and output quality



Positive correlation of UIC and firm asset (proxy for financial constraints)

Literature

- TFP, growth, and economic development
  Easterly and Levine (2001), Greenwood, Hercowitz, and Krusell (1997), Cummins and Violante (2002), Young (1995), Hsieh (2002), Hulten (1992), Jorgenson and Griliches (1967)
- Financial development and economic growth
  Rajan and Zingales (1998), Duval, Hong, and Timmer (2020), Levinea and Warusawitharanab (2021), Manaresi and Pierri (2019), Huber (2018), Syverson (2011), Verhoogen (2021), Guiso, Sapienza, and Zingales (2004), King and Levine (1993)
- Law and finance
  La Porta, et al. (1997), La Porta, et al. (1998), Visaria (2009), Gopalan, Mukherjee, Singh (2016), von Lilienfeld-Toal, Mookherjee, and Visaria (2012), Li and Ponticelli (2020), Ponticelli and Alencar (2016), Calomiris et al. (2017)
- Economic growth and product quality upgrading
  Kugler and Verhoogen (2012), Khandelwal (2009), Hottman, Redding, and Weinestein (2016), Hallak and Schott (2011), Amiti and Khandelwal (2011)

Road map

- Data
- UIC variation
- UIC correlations and interactions
- Quasi-natural experiment

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- Linked to CapEx by the firm and product identifier.

Example of a Project
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  project cost (from CapEx dataset)

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Project Cost and Balance Sheet CAPEX: Time Series Aggregates

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  balance-sheet CAPEX $= \Delta$ PPE + Dep. (from Prowess dataset)
  project cost (from CapEx dataset)

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  2) Cross-sectional comparison of project cost and balance-sheet CAPEX

Project Cost and Balance Sheet CAPEX: Time Series Aggregates
Project Cost and Balance Sheet CAPEX: Cross-Sectional Regression
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Additional Capacity from Prowess and CapEx

Variation in UIC

Is the variation in UIC large?

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Variables	Mean	Median	StD
$r_{25}^{75}(.,.)$	5.24	2.91	2.12
$r_{50}^{90}(.,.)$	4.25	2.75	2.14

Mean of $\log(r_{25}^{75}(.,.))$ is 1.57.

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Persistence

UIC and TFP Correlation

- Regression specification:

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	ln(TFPR)	ln(TFPQ)
ln(UIC)	0.119**	0.051**
	(0.048)	(0.023)
Controls	✓	✓
Product FE	✓	✓
Year FE	✓	✓
State FE	✓	✓
R^2	0.625	0.591
Observations	3851	3701

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	Revenue Channels			Cost Channels	
	ln(Price)	ln(Quality)	ln(Sales Share)	ln(Wage Bill)	ln(Material Expense)
ln(UIC)	0.099***	0.134***	0.042**	-0.064***	-0.041**
	(0.021)	(0.031)	(0.017)	(0.022)	(0.016)
Controls	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓
Product× En.type FE	×	×	×	×	×
Year FE	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓
R^2	0.967	0.963	0.916	0.371	0.386
Observations	1953	1953	1953	3851	3851

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Scope Summary Statistics

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	(0.043)	(0.021)	(0.021)	(0.031)	(0.017)
ln(UIC) × ln($scope_{R\&D}$)	0.087**	0.037*	0.073***	0.098**	0.029**
	(0.039)	(0.020)	(0.021)	(0.038)	(0.012)
Controls	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓
R^2	0.631	0.597	0.968	0.963	0.918
Observations	3851	3701	1953	1953	1953

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Scope Summary Statistics | Export | Other Performance Measures

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  1) A stylized model of financially constrained firms can explain our findings.

  2) We use one particular example of financial development: reduced enforcement cost of debt contracts.

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- The Act established DRTs that are specialized tribunals set up to expedite the resolution of debt recovery cases.

Establishment Pattern of DRTs

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- The government of India passed the Debt Recovery Tribunal (DRT) Act in 1993 to address the issue. How?
- The Act established DRTs that are specialized tribunals set up to expedite the resolution of debt recovery cases.
- The underlying law didn't change, but the enforcement did.

Establishment Pattern of DRTs

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- DRTs significantly reduced contract enforcement costs by reducing delays in debt recovery cases and increased the amount recovered.
- Staggered introduction from 1995 to 2001 in different states due to legal challenges.
- Was the introduction exogenous to state-level conditions?
- The time of establishment in different states was exogenous to average firm characteristics.

Effect of DRT on Debt, Investment, and UIC

$$\text{firm-level: } y_{fst} = \alpha_f + \alpha_t + \alpha_s + \beta \times \text{DRT}_{st} + \lambda X_{ft-1} + \varepsilon_{fst}$$

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	Debt and Investment		Project Cost Decomposition		
	ln(Total Debt)	ln(CAPEX)	ln(Project Cost)	ln(UIC)	ln(Add Capacity)
DRT	0.059***	0.041***	0.092**	0.103***	-0.011
	(0.017)	(0.013)	(0.041)	(0.017)	(0.026)
Controls	✓	✓	✓	✓	✓
Firm FE	✓	✓	×	×	×
Product FE	×	×	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓
R^2	0.819	0.874	0.702	0.832	0.827
Observations	2722	2675	3851	3851	3851

Effect of DRT on Debt, Investment, and UIC

firm-level: $y_{fst} = \alpha_f + \alpha_t + \alpha_s + \beta \times DRT_{st} + \lambda X_{ft-1} + \varepsilon_{fst}$

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	(0.017)	(0.013)	(0.041)	(0.017)	(0.026)
Controls	✓	✓	✓	✓	✓
Firm FE	✓	✓	×	×	×
Product FE	×	×	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓
R^2	0.819	0.874	0.702	0.832	0.827
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The establishment of DRTs:

Effect of DRT on Debt, Investment, and UIC

firm-level: $y_{fst} = \alpha_f + \alpha_t + \alpha_s + \beta \times DRT_{st} + \lambda X_{ft-1} + \varepsilon_{fst}$

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	Debt and Investment		Project Cost Decomposition		
	ln(Total Debt)	ln(CAPEX)	ln(Project Cost)	ln(UIC)	ln(Add Capacity)
DRT	0.059***	0.041***	0.092**	0.103***	-0.011
	(0.017)	(0.013)	(0.041)	(0.017)	(0.026)
Controls	✓	✓	✓	✓	✓
Firm FE	✓	✓	×	×	×
Product FE	×	×	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓
R^2	0.819	0.874	0.702	0.832	0.827
Observations	2722	2675	3851	3851	3851

The establishment of DRTs:

1) increased total debt by 5.9%.

Effect of DRT on Debt, Investment, and UIC

firm-level: $y_{fst} = \alpha_f + \alpha_t + \alpha_s + \beta \times DRT_{st} + \lambda X_{ft-1} + \varepsilon_{fst}$

product-level: $y_{pst} = \alpha_p + \alpha_t + \alpha_s + \beta \times DRT_{st} + \lambda X_{ft-1} + \varepsilon_{pst}$

	Debt and Investment		Project Cost Decomposition		
	ln(Total Debt)	ln(CAPEX)	ln(Project Cost)	ln(UIC)	ln(Add Capacity)
DRT	0.059***	0.041***	0.092**	0.103***	-0.011
	(0.017)	(0.013)	(0.041)	(0.017)	(0.026)
Controls	✓	✓	✓	✓	✓
Firm FE	✓	✓	×	×	×
Product FE	×	×	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓
R^2	0.819	0.874	0.702	0.832	0.827
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The establishment of DRTs:

1) increased total debt by 5.9%.
2) increased firm-level balance-sheet CAPEX by 4.1%.

Effect of DRT on Debt, Investment, and UIC

firm-level: $y_{fst} = \alpha_f + \alpha_t + \alpha_s + \beta \times DRT_{st} + \lambda X_{ft-1} + \varepsilon_{fst}$

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	Debt and Investment		Project Cost Decomposition		
	ln(Total Debt)	ln(CAPEX)	ln(Project Cost)	ln(UIC)	ln(Add Capacity)
DRT	0.059***	0.041***	0.092**	0.103***	-0.011
	(0.017)	(0.013)	(0.041)	(0.017)	(0.026)
Controls	✓	✓	✓	✓	✓
Firm FE	✓	✓	×	×	×
Product FE	×	×	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓
R^2	0.819	0.874	0.702	0.832	0.827
Observations	2722	2675	3851	3851	3851

The establishment of DRTs:

1) increased total debt by 5.9%.
2) increased firm-level balance-sheet CAPEX by 4.1%.
3) increased project cost by 9.2%.

Effect of DRT on Debt, Investment, and UIC

firm-level: $y_{fst} = \alpha_f + \alpha_t + \alpha_s + \beta \times DRT_{st} + \lambda X_{ft-1} + \varepsilon_{fst}$

product-level: $y_{pst} = \alpha_p + \alpha_t + \alpha_s + \beta \times DRT_{st} + \lambda X_{ft-1} + \varepsilon_{pst}$

	Debt and Investment		Project Cost Decomposition		
	ln(Total Debt)	ln(CAPEX)	ln(Project Cost)	ln(UIC)	ln(Add Capacity)
DRT	0.059***	0.041***	0.092**	0.103***	-0.011
	(0.017)	(0.013)	(0.041)	(0.017)	(0.026)
Controls	✓	✓	✓	✓	✓
Firm FE	✓	✓	×	×	×
Product FE	×	×	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓
R^2	0.819	0.874	0.702	0.832	0.827
Observations	2722	2675	3851	3851	3851

The establishment of DRTs:

1) increased total debt by 5.9%.
2) increased firm-level balance-sheet CAPEX by 4.1%.
3) increased project cost by 9.2%.
4) increased UIC by 10.3%.

Effect of DRT on Debt, Investment, and UIC

firm-level: $y_{fst} = \alpha_f + \alpha_t + \alpha_s + \beta \times DRT_{st} + \lambda X_{ft-1} + \varepsilon_{fst}$

product-level: $y_{pst} = \alpha_p + \alpha_t + \alpha_s + \beta \times DRT_{st} + \lambda X_{ft-1} + \varepsilon_{pst}$

	Debt and Investment		Project Cost Decomposition		
	ln(Total Debt)	ln(CAPEX)	ln(Project Cost)	ln(UIC)	ln(Add Capacity)
DRT	0.059***	0.041***	0.092**	0.103***	-0.011
	(0.017)	(0.013)	(0.041)	(0.017)	(0.026)
Controls	✓	✓	✓	✓	✓
Firm FE	✓	✓	×	×	×
Product FE	×	×	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓
R^2	0.819	0.874	0.702	0.832	0.827
Observations	2722	2675	3851	3851	3851

The establishment of DRTs:

1) increased total debt by 5.9%.
2) increased firm-level balance-sheet CAPEX by 4.1%.
3) increased project cost by 9.2%.
4) increased UIC by 10.3%.
5) decreased additional capacity by 1.1%.

Investment Pre-trend

Effect of DRT on TFP: Revenue vs Cost Channels

$$\ln(\text{TFPR}) = \underbrace{ln(\sum_{l} p_l y_l)}_{\text{Revenue}} - \underbrace{\{\alpha_k ln(K) + \alpha_l ln(L) + \alpha_m ln(M)\}}_{\text{Cost}}$$

Effect of DRT on TFP: Revenue vs Cost Channels

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	Firm TFP		Revenue Channels					Cost Channels		
	ln(TFPR)	ln(TFPQ)	ln(Price)	ln(Quality)	ln(Quantity)	ln(Sales)	ln(# Products)	ln(PPE)	ln(Wage bill)	ln(Material Expense)
DRT	0.040***	0.023**	0.028***	0.038***	0.025*	0.052**	0.016	0.038**	-0.015	-0.010
	(0.012)	(0.010)	(0.007)	(0.012)	(0.013)	(0.022)	(0.013)	(0.014)	(0.013)	(0.016)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product FE	×	×	✓	✓	✓	✓	×	×	×	×
Firm FE	✓	✓	×	×	×	×	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.556	0.537	0.912	0.873	0.917	0.923	0.739	0.714	0.757	0.775
Observations	2722	2619	1953	1953	1953	1953	2722	2722	2722	2722

Effect of DRT on TFP: Revenue vs Cost Channels

$$\ln(\text{TFPR}) = \underbrace{ln(\sum_{l} p_l y_l)}_{\text{Revenue}} - \underbrace{\{\alpha_k ln(K) + \alpha_l ln(L) + \alpha_m ln(M)\}}_{\text{Cost}}$$

	Firm TFP		Revenue Channels					Cost Channels		
	ln(TFPR)	ln(TFPQ)	ln(Price)	ln(Quality)	ln(Quantity)	ln(Sales)	ln(# Products)	ln(PPE)	ln(Wage bill)	ln(Material Expense)
DRT	0.040***	0.023**	0.028***	0.038***	0.025*	0.052**	0.016	0.038**	-0.015	-0.010
	(0.012)	(0.010)	(0.007)	(0.012)	(0.013)	(0.022)	(0.013)	(0.014)	(0.013)	(0.016)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product FE	×	×	✓	✓	✓	✓	×	×	×	×
Firm FE	✓	✓	×	×	×	×	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.556	0.537	0.912	0.873	0.917	0.923	0.739	0.714	0.757	0.775
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The establishment of DRTs:

Effect of DRT on TFP: Revenue vs Cost Channels

$$\ln(\text{TFPR}) = \underbrace{ln(\sum_{l} p_l y_l)}_{\text{Revenue}} - \underbrace{\{\alpha_k ln(K) + \alpha_l ln(L) + \alpha_m ln(M)\}}_{\text{Cost}}$$

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DRT	0.040***	0.023**	0.028***	0.038***	0.025*	0.052**	0.016	0.038**	-0.015	-0.010
	(0.012)	(0.010)	(0.007)	(0.012)	(0.013)	(0.022)	(0.013)	(0.014)	(0.013)	(0.016)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product FE	×	×	✓	✓	✓	✓	×	×	×	×
Firm FE	✓	✓	×	×	×	×	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.556	0.537	0.912	0.873	0.917	0.923	0.739	0.714	0.757	0.775
Observations	2722	2619	1953	1953	1953	1953	2722	2722	2722	2722

The establishment of DRTs:

1) increased TFPR by 4.0% and TFPQ by 2.3%.

Effect of DRT on TFP: Revenue vs Cost Channels

$$\ln(\text{TFPR}) = \underbrace{ln(\sum_{l} p_l y_l)}_{\text{Revenue}} - \underbrace{\{\alpha_k ln(K) + \alpha_l ln(L) + \alpha_m ln(M)\}}_{\text{Cost}}$$

	Firm TFP		Revenue Channels					Cost Channels		
	ln(TFPR)	ln(TFPQ)	ln(Price)	ln(Quality)	ln(Quantity)	ln(Sales)	ln(# Products)	ln(PPE)	ln(Wage bill)	ln(Material Expense)
DRT	0.040***	0.023**	0.028***	0.038***	0.025*	0.052**	0.016	0.038**	-0.015	-0.010
	(0.012)	(0.010)	(0.007)	(0.012)	(0.013)	(0.022)	(0.013)	(0.014)	(0.013)	(0.016)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product FE	×	×	✓	✓	✓	✓	×	×	×	×
Firm FE	✓	✓	×	×	×	×	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.556	0.537	0.912	0.873	0.917	0.923	0.739	0.714	0.757	0.775
Observations	2722	2619	1953	1953	1953	1953	2722	2722	2722	2722

The establishment of DRTs:

1) increased TFPR by 4.0% and TFPQ by 2.3%.
2) increased price, quality, quantity and sales by 2.8%, 3.8%, 2.5% and 5.2% respectively. No change in number of product.

Effect of DRT on TFP: Revenue vs Cost Channels

$$\ln(\text{TFPR}) = \underbrace{ln(\sum_{l} p_l y_l)}_{\text{Revenue}} - \underbrace{\{\alpha_k ln(K) + \alpha_l ln(L) + \alpha_m ln(M)\}}_{\text{Cost}}$$

	Firm TFP		Revenue Channels					Cost Channels		
	ln(TFPR)	ln(TFPQ)	ln(Price)	ln(Quality)	ln(Quantity)	ln(Sales)	ln(# Products)	ln(PPE)	ln(Wage bill)	ln(Material Expense)
DRT	0.040***	0.023**	0.028***	0.038***	0.025*	0.052**	0.016	0.038**	-0.015	-0.010
	(0.012)	(0.010)	(0.007)	(0.012)	(0.013)	(0.022)	(0.013)	(0.014)	(0.013)	(0.016)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product FE	×	×	✓	✓	✓	✓	×	×	×	×
Firm FE	✓	✓	×	×	×	×	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.556	0.537	0.912	0.873	0.917	0.923	0.739	0.714	0.757	0.775
Observations	2722	2619	1953	1953	1953	1953	2722	2722	2722	2722

The establishment of DRTs:

1) increased TFPR by 4.0% and TFPQ by 2.3%.
2) increased price, quality, quantity and sales by 2.8%, 3.8%, 2.5% and 5.2% respectively. No change in number of product.
3) increased capital stock by 3.8%. Decreased wage bill and material expenses, but not statistically significant.

Interaction with Scope for Quality Differentiation

- If high UIC capital leads to higher quality output, then we expect:

Interaction with Scope for Quality Differentiation

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- If high UIC capital leads to higher quality output, then we expect:

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	Project Cost Decomposition			Firm TFP		Revenue Channels				
	ln(UIC)	ln(Capacity)	ln(Project Cost)	ln(TFPR)	ln(TFPQ)	ln(Price)	ln(Quality)	ln(Quantity)	ln(Sales)	ln(# Products)
DRT	0.085***	-0.014	0.071**	0.030**	0.025**	0.020***	0.029**	0.034*	0.055**	0.009
	(0.023)	(0.023)	(0.034)	(0.013)	(0.011)	(0.006)	(0.011)	(0.018)	(0.024)	(0.021)
DRT × ln(scope$_{R\&D}$)	0.072**	-0.021**	0.058	0.027**	0.008	0.018**	0.027**	-0.010	0.011*	0.014
	(0.029)	(0.010)	(0.055)	(0.008)	(0.014)	(0.008)	(0.011)	(0.009)	(0.006)	(0.010)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Firm FE	×	×	×	✓	✓	×	×	×	×	✓
Product FE	✓	✓	✓	×	×	✓	✓	✓	✓	×
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.837	0.831	0.702	0.557	0.538	0.913	0.874	0.935	0.924	0.740
Observations	3851	3851	3851	2722	2619	1953	1953	1953	1953	2722

UIC, TFP, and output quality increase more in industries with higher scope for quality differentiation.

Interaction with Scope for Quality Differentiation

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	Project Cost Decomposition			Firm TFP		Revenue Channels				
	ln(UIC)	ln(Capacity)	ln(Project Cost)	ln(TFPR)	ln(TFPQ)	ln(Price)	ln(Quality)	ln(Quantity)	ln(Sales)	ln(# Products)
DRT	0.085***	-0.014	0.071**	0.030**	0.025**	0.020***	0.029**	0.034*	0.055**	0.009
	(0.023)	(0.023)	(0.034)	(0.013)	(0.011)	(0.006)	(0.011)	(0.018)	(0.024)	(0.021)
DRT × ln(scope$_{R\&D}$)	0.072**	-0.021**	0.058	0.027**	0.008	0.018**	0.027**	-0.010	0.011*	0.014
	(0.029)	(0.010)	(0.055)	(0.008)	(0.014)	(0.008)	(0.011)	(0.009)	(0.006)	(0.010)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Firm FE	×	×	×	✓	✓	×	×	×	×	✓
Product FE	✓	✓	✓	×	×	✓	✓	✓	✓	×
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.837	0.831	0.702	0.557	0.538	0.913	0.874	0.935	0.924	0.740
Observations	3851	3851	3851	2722	2619	1953	1953	1953	1953	2722

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Interactions with Another Measure of Scope

Interactions with Measures of Financial Constraints

- We expect the result to be stronger for industries and firms that are ex-ante more financially constrained.

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- Heterogeneity: firm size; industry leverage; industry Rajan-Zingales measure of external financial dependence; firm's age.

Heterogeneity	Small Firm		High Sectoral Leverage		RZ Sectoral Measure		Young Firm	
Variable	ln(UIC)	ln(TFPR)	ln(UIC)	ln(TFPR)	ln(UIC)	ln(TFPR)	ln(UIC)	ln(TFPR)
DRT	0.089***	0.031**	0.086***	0.032***	0.090***	0.027**	0.097***	0.029***
	(0.021)	(0.013)	(0.029)	(0.012)	(0.027)	(0.011)	(0.020)	(0.010)
DRT$\times H_{it}$	0.037*	0.017*	0.027*	0.013*	0.026**	0.016**	0.022	0.015
	(0.020)	(0.008)	(0.015)	(0.007)	(0.012)	(0.007)	(0.016)	(0.010)
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Product FE	✓	×	✓	×	✓	×	✓	×
Firm FE	×	✓	×	✓	×	✓	×	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.831	0.558	0.832	0.559	0.833	0.557	0.832	0.558
Observations	3694	2617	3851	2722	3851	2722	3851	2722

UIC and TFP increase more for firms that are financially constrained.

Alternative Explanations for Our Findings

- Are our findings consistent with alternative explanations?

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- Alternative I: Other TFP increasing mechanisms (increased R&D investment, employee training, and intangible investment).
- Study price, quality, and sales share for **other** products with no CapEx project (sub-sample of multi-product firms).
- Alternative II: Physical capital sellers charge higher prices from less constrained firms.
- Alternative III: UIC in treated states increases since land prices increase and not because of acquiring higher-quality capital.

Skip

Alternative Explanation I: Other TFP Increasing Mechanisms

- Recent studies find that reduced financial constraints increase TFP through increased R&D investment, employee training, and intangible investment.

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	R&D expenses		Training Expenses		Intangible Investment	
	(1)	(2)	(3)	(4)	(5)	(6)
DRT	0.005	0.002	-0.003	-0.004	0.013	0.007
	(0.135)	(0.121)	(0.107)	(0.097)	(0.044)	(0.039)
DRT $\times$ ln(scope$_{R\&D}$)		0.003		0.004		-0.003
		(0.067)		(0.122)		(0.044)
Controls	✓	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓
R^2	0.571	0.572	0.612	0.612	0.549	0.550
Observations	1837	1837	1036	1036	1789	1789

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DRT	0.005	0.002	-0.003	-0.004	0.013	0.007
	(0.135)	(0.121)	(0.107)	(0.097)	(0.044)	(0.039)
DRT $\times$ ln(scope$_{R\&D}$)		0.003		0.004		-0.003
		(0.067)		(0.122)		(0.044)
Controls	✓	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓
R^2	0.571	0.572	0.612	0.612	0.549	0.550
Observations	1837	1837	1036	1036	1789	1789

- The coefficient estimates are economically and statistically insignificant.

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- We directly test for these mechanisms in the data.

	R&D expenses		Training Expenses		Intangible Investment	
	(1)	(2)	(3)	(4)	(5)	(6)
DRT	0.005	0.002	-0.003	-0.004	0.013	0.007
	(0.135)	(0.121)	(0.107)	(0.097)	(0.044)	(0.039)
DRT $\times$ ln(scope$_{R\&D}$)		0.003		0.004		-0.003
		(0.067)		(0.122)		(0.044)
Controls	✓	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓
R^2	0.571	0.572	0.612	0.612	0.549	0.550
Observations	1837	1837	1036	1036	1789	1789

- The coefficient estimates are economically and statistically insignificant.
- Interaction with the scope for quality differentiation is not statistically or economically significant either.

DRT & Products without an Investment Project

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	ln(Output Price)		ln(Output Quality)		ln (Sales Share)	
	(1)	(2)	(3)	(4)	(5)	(6)
DRT	0.005	0.004	0.008	0.007	0.008	0.006
	(0.013)	(0.014)	(0.015)	(0.016)	(0.018)	(0.019)
DRT $\times$ ln(scope$_{R\&D}$)		0.004		0.005		0.005
		(0.011)		(0.019)		(0.017)
Controls	✓	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓
R^2	0.873	0.874	0.853	0.853	0.817	0.817
Observations	4491	4491	4491	4491	4491	4491

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		(0.011)		(0.019)		(0.017)
Controls	✓	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
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Controls	✓	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓
R^2	0.873	0.874	0.853	0.853	0.817	0.817
Observations	4491	4491	4491	4491	4491	4491

- Economically small and statistically insignificant.
- Any potential explanation for our findings should explain why these variables went up, but only for products with an investment project.

Alternative Explanation II: Market Power in Capital Supplier Market

- Can the pricing decisions of capital suppliers explain the findings?

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	ln(UIC)				
DRT	0.103***	0.091***	0.092***	0.097***	0.088***
	(0.017)	(0.021)	(0.029)	(0.032)	(0.027)
DRT× HHI_{IO}		0.061			
		(0.123)			
DRT× $HHI_{contractor}$			0.025		
			(0.073)		
DRT× $HHI_{consultant}$				0.043	
				(0.054)	
DRT× $HHI_{machinery\ suppliers}$					-0.012
					(0.097)
Controls	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓
R^2	0.832	0.833	0.832	0.833	0.833
Observations	3851	3768	3851	3851	3851

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					(0.097)
Controls	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓
R^2	0.832	0.833	0.832	0.833	0.833
Observations	3851	3768	3851	3851	3851

Capital Import

Alternative Explanation III: Projects Located in Non-Treated States

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	ln(UIC)	ln(UIC)	ln(Capacity)	ln(Capacity)	ln(Project Cost)	ln(Project Cost)
DRT	0.063**	0.056**	0.034	0.025	0.098**	0.082*
	(0.024)	(0.020)	(0.031)	(0.029)	(0.043)	(0.046)
DRT× scope		0.046**		-0.024		0.022
		(0.021)		(0.017)		(0.031)
Controls	✓	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
R^2	0.722	0.722	0.698	0.699	0.573	0.574
Observations	1013	1013	1013	1013	1013	1013

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DRT× scope		0.046**		-0.024		0.022
		(0.021)		(0.017)		(0.031)
Controls	✓	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
R^2	0.722	0.722	0.698	0.699	0.573	0.574
Observations	1013	1013	1013	1013	1013	1013

More Details

Conclusion

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- Define a novel proxy for the quality of physical capital.
- Document UIC correlations with firm outcomes, and in particular, TFP and output quality.
- Reduced costs of debt contract enforcement increase the quality of physical capital and TFP.

Backup Slides

Importance of Capital Quality

Syverson (2011) JEL:
"Capital can also vary in quality in ways not captured with standard measures. If **capital vintages differ from one another in how much technological progress they embody**, the common book-value-based capital stock measures will tend to miss variations in average capital vintages across producers ... **This seems to be an area desperate for further evidence, given its potential importance.**"
Banerjee and Duflo (2005):
"The McKinsey Global Institute's (McKinsey Global Institute (2001)) recent report on India, reports on a set of studies of the main sources of inefficiency in a range of industries in India in 1999, including apparel, dairy processing, automotive assembly, wheat milling, banking, steel, retail, etc. **In a number of these cases (dairy processing, steel, software) they explicitly say that the better firms were using more or less the global best practice technologies wherever they were economically viable.**"

Back

Importance of Capital Quality

Verhoogen (2020) JEL:
"Direct information on technologies used by manufacturing firms is also often difficult to obtain. **The World Bank is currently engaged in a series of surveys of technology use in developing countries** ... it is often unclear the extent to which one technology can be considered "better" than another. But **measures of technology use, when available, have the great advantage that they are informative even in the absence of strong functional-form assumptions.**"

Importance of Capital Quality

Solow (1960):
"... **many if not most innovations need to be embodied in new kinds of durable equipment** before they can be made effective. Improvements in technology affect output only to the extent that they are carried into practice either by net capital formation or by the replacement of old-fashioned equipment by the latest models."

Example of a Project

Example of a project: "Haldwani Dry Grinding Talc Project") undertaken by "ABC Ltd." company.

Company	Product	Product code	Announcement	Completion	Cost
ABC Ltd.	Talc	502804161600000000000	March 2008	March 2009	48.6 Million INR

State of Completion	Location	New Capacity	Unit	Type	Industry
Completed	Gujarat	7	'000 Tonnes	New Unit	Cosmetics & Detergents

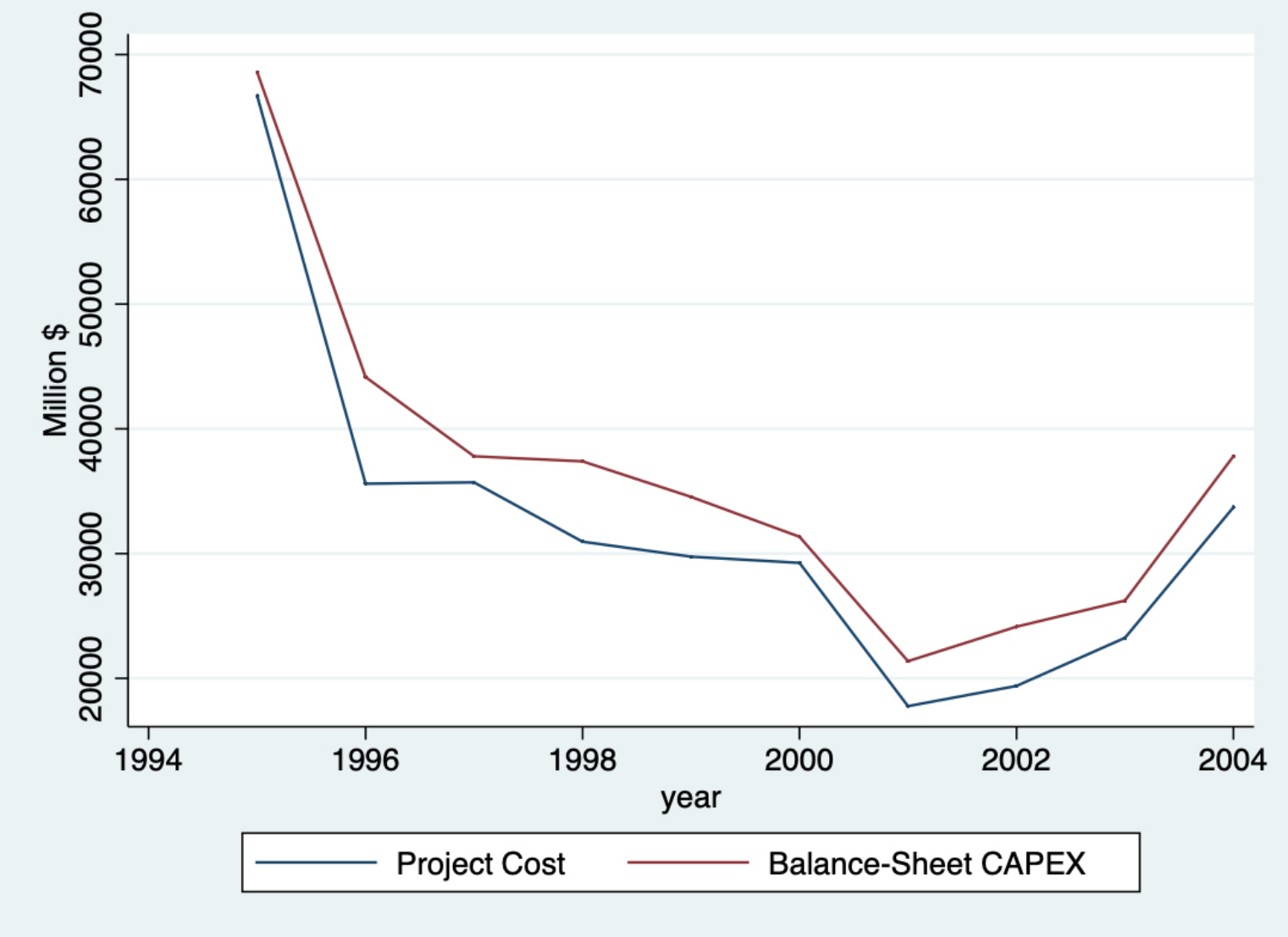
Back

Firm & Project Summary Statistics

Variables	Number	Mean	Median	SD
Panel A: Firm Summary Statistics				
Asset (Million USD)	2,722	703.1	60.62	2,661
PPE (Million USD)	2,722	276.2	20.62	1,162
Wage Bill (Million USD)	2,722	35.12	2.691	125.9
R&D (Million USD)	1,837	1.909	0.217	6.113
Training Expenditure (Million USD)	1,036	0.904	0.144	1.634
Intangible Investment (Million USD)	1,789	2.819	0.311	9.107
Panel B: Project Summary Statistics				
Project Cost (Million USD)	3,851	78.12	7.512	327.1
Duration	3,851	0.485	0.421	0.371
Sum Project Cost/Total Asset	2,722	0.171	0.132	0.184
Sum Project Cost/PPE	2,722	0.351	0.292	0.312
Sum Project Cost/Capital Expenditure	2,722	0.894	0.781	0.356
Firm	485			
Firm-Year	2,722			
Project	3,851			
Products	403			

Back

Project Cost and Balance Sheet CAPEX



Back

Project Cost and Balance-Sheet CAPEX

Cross-sectional regression of balance-sheet CAPEX on project cost:

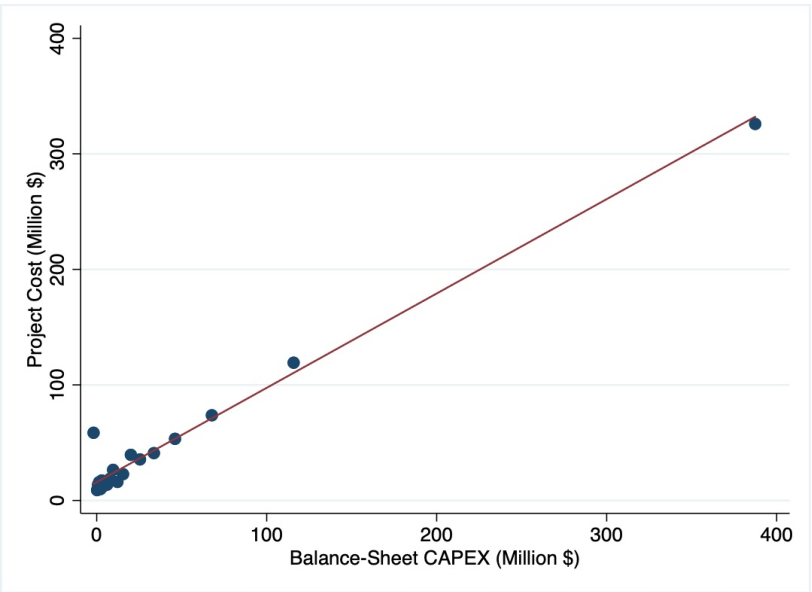
	Balance-Sheet CAPEX		
	(1)	(2)	(3)
Sum Project Cost	0.854***	0.873***	0.894***
	(0.015)	(0.014)	(0.018)
R^2	0.634	0.671	0.719
Observations	2312	2285	1563

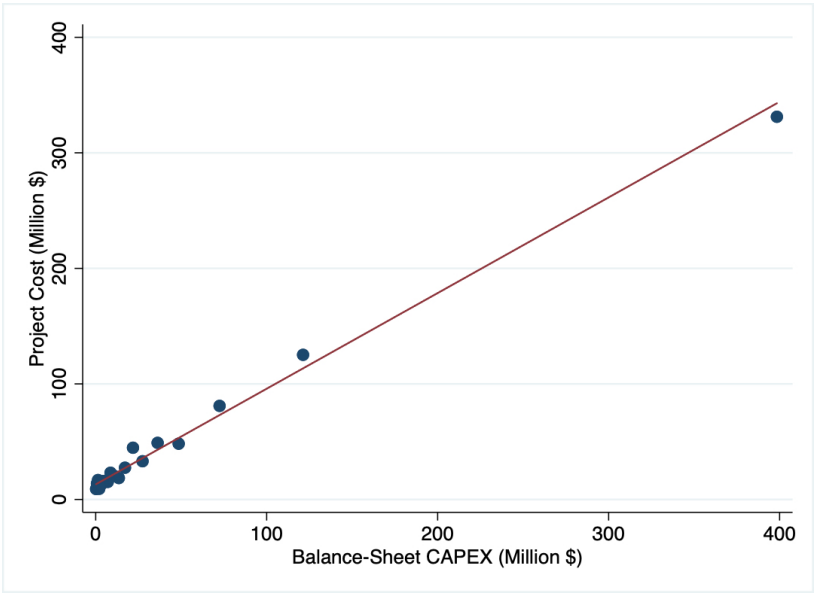
Column 2 is the sub-sample where balance-sheet CapEx is positive, and Column 3 is the sub-sample of projects with a duration of less than a year.

Back

Project Cost and Balance-Sheet CAPEX

Cross-sectional regression of balance-sheet CAPEX on project cost:





Sub-sample of firm-year observations with positive balance-sheet CapEx

Back

Additional Capacity from Prowess and CapEx

	Δ Capacity (from Prowess)
Additional Capacity (from CapEx)	1.04***
	(0.07)
Constant	-0.06
	(0.05)
R^2	0.807
Observations	978

Back

Variation in UIC (Logarithm)

Variables	Mean	Median	StD
$\ln(r_{25}^{75}(.,.))$	1.57	1.07	1.14
$\ln(r_{50}^{90}(.,.))$	1.13	1.01	1.03

Back

UIC Persistence

Back

Measurement of Total Factor Productivity

- Total Factor Productivity (TFP), ω_t, is defined as the residual of output conditional on capital and input:

$$y_t = \beta_k k_t + \beta_l l_t + \beta_m m_t + \omega_t$$

  y_t is output, k_t is capital, l_t is labor, and m_t is intermediate input (all variables are in log).
- Goal is to back out the observable part of ω_t.
- Key issue: correlation between unobservable productivity shock and input levels.
- Levinshon-Petrin (2003): with some additional assumptions on intermediate inputs (e.g. materials.) the endogeneity problem can be taken care of, and hence we can back out the TFP.

Back

Controls

Variables	Reason
$\ln(Asset)$	firm size
$\ln(PPE)$	dollar value of capital
$Wage/Sales$	differences in production function
$Wage/PPE$	differences in production function

Back

UIC & Other Performance Measures

	ln(Tobins'Q)	ln(ROE)
ln(UIC)	0.123**	0.087**
	(0.057)	(0.037)
Controls	✓	✓
Product FE	✓	✓
Year FE	✓	✓
State FE	✓	✓
R^2	0.474	0.497
Observations	2378	3822

Back

Measurement of Product Quality

Representative consumer's utility function:

$$\max_{C_f} \left(\sum_{f \in \Omega_g} (Q_f C_f)^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}} \qquad \Pi_{f \in \Omega_g} Q_f = 1$$
$$\sum_{f \in \Omega_g} P_f C_f \leq K$$

Q_f: quality of product produced by firm f
P_f: unit price of product produced by firm f
C_f: quantity of product sold by firm f
σ: elasticity of substitution

$$\ln(Q_f) = \frac{\sigma}{\sigma-1} \ln(P_f) + \frac{1}{\sigma-1} \ln\left(\frac{P_f C_f^*}{\Sigma_g P_f C_f^*}\right) + \frac{1}{\sigma-1} \ln\left(\Sigma_f P_f^{-\sigma} Q_f^{\sigma-1}\right)$$

Back

UIC & Export

	Export
ln(UIC)	0.014**
	(0.006)
Controls	✓
Product FE	✓
Year FE	✓
State FE	✓
R^2	0.454
Observations	3851

Back

UIC & Maintenance Cost

	ln(Maintenance/PPE)
ln(UIC)	- 0.019**
	(0.007)
Controls	✓
Product FE	✓
Year FE	✓
State FE	✓
R^2	0.351
Observations	3394

Back

UIC & Firm TFP: Single-Product firm

	Productivity		Cost		Durability	Foreign Market
	ln(TFPR)	ln(TFPQ)	ln(Wage Bill)	ln (Material Expense)	ln(Maintenance)	Export
ln(UIC)	0.141***	0.087**	-0.094**	-0.048**	-0.029**	0.021*
	(0.050)	(0.035)	(0.041)	(0.020)	(0.016)	(0.012)
Controls	✓	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓
R^2	0.546	0.531	0.357	0.421	0.319	0.398
Observations	1782	1722	1782	1782	1583	1782

Back

UIC & Firm TFP: New-Product Sample

	Productivity		Revenue			Cost		Durability	Foreign Market
	ln(TFPR)	ln(TFPQ)	ln(Price)	ln(Quality)	ln(Sales Share)	ln(Wage Bill)	ln(Material Expense)	ln(Maintenance)	Export
ln(UIC)	0.131*	0.053*	0.112***	0.151***	0.044*	-0.033*	-0.027*	-0.010	0.008
	(0.075)	(0.029)	(0.029)	(0.038)	(0.025)	(0.018)	(0.014)	(0.010)	(0.007)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.536	0.519	0.912	0.919	0.876	0.351	0.399	0.324	0.365
Observations	1424	1345	807	807	807	1424	1424	1271	1424

Back

UIC and Stock Market Response

- If higher UIC investments $\Rightarrow$ more profits, then,
  1) Positive correlation between UIC and the stock market return on the investment project's announcement date.
  2) More pronounced results in industries with higher scope.

	Abnormal Return			
ln(UIC)	0.0039**	0.0031	0.0054**	0.0053*
	(0.0019)	(0.0020)	(0.0026)	(0.0028)
ln(UIC)× scope		0.0112**		0.0087*
		(0.0051)		(0.0047)
ln(Capacity)			0.0027	0.0045
			(0.0026)	(0.0036)
ln(Capacity)× scope				-0.0112
				(0.0156)
Controls	✓	✓	✓	✓
Product FE	✓	✓	✓	✓
R^2	0.218	0.219	0.219	0.220
Observations	1375	1375	1375	1375

- Moving from 25th to 75th percentile of UIC is associated with:
  1) 0.85% abnormal return
  2) Value added to market cap = 415*0.0085 = 3.5 (Million$)
  3) Value added to market cap/Average project cost = 4.5%

Back

Scope for Quality Differentiation Summary Stat

- Measured for 4-digit SIC codes the U.S. FTC Line of Business Survey.

$$\text{scope} = \ln((\text{R\&D} + \text{Advertising})/\text{Sales})$$

Back

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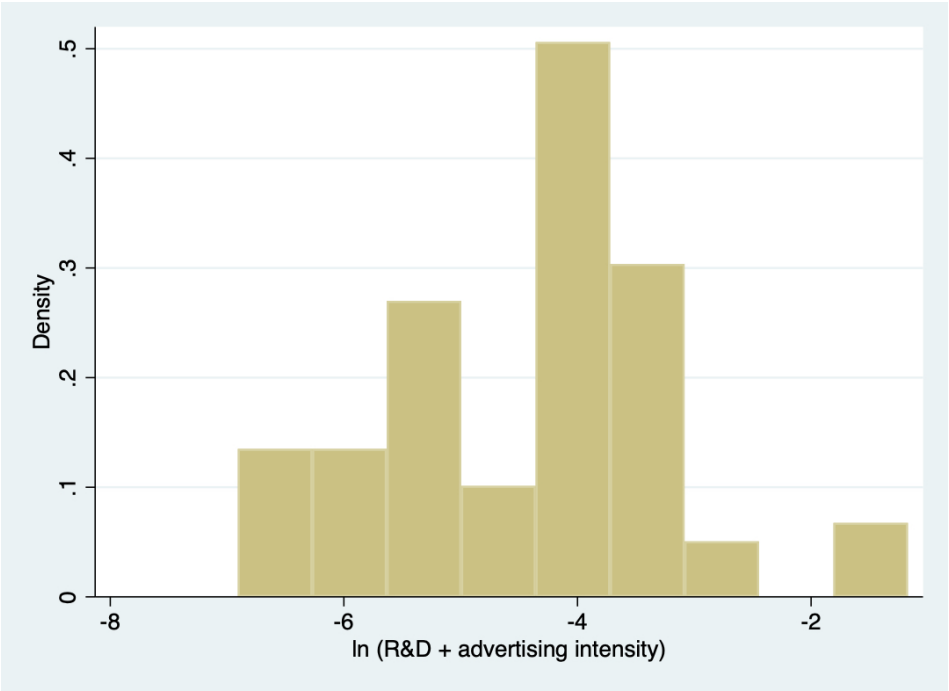


	Mean	p10	Median	p90	StD
(R&D + advertising)/Sales	0.028	0.002	0.017	0.045	0.051
log((R&D + advertising)/Sales)	-4.415	-6.212	-4.075	-3.101	1.311
Observations	91				

Back

Scope for Quality Differentiation: Export

	Export
ln(UIC)	0.010**
	(0.005)
ln(UIC) × ln($\text{scope}_{R\&D}$)	0.008*
	(0.004)
Controls	✓
Product FE	✓
Year FE	✓
State FE	✓
R^2	0.455
Observations	3851

Back

Scope for Quality Differentiation: Other Measures

	ln(Tobins'Q)	ln(ROE)
ln(UIC)	0.112*	0.079**
	(0.057)	(0.034)
ln(UIC) $\times$ ln(scope$_{R\&D}$)	0.168**	0.067*
	(0.069)	(0.035)
Controls	✓	✓
Product FE	✓	✓
Year FE	✓	✓
State FE	✓	✓
R^2	0.471	0.499
Observations	2378	3822

Back

Scope for Quality Differentiation: Quality-based Measure

	Performance measures		Revenue measures		
	ln(TFPR)	ln(TFPQ)	ln(price)	ln(quality)	ln(sales sahre)
ln(UIC)	0.112**	0.053*	0.087***	0.116***	0.034*
	(0.045)	(0.029)	(0.025)	(0.028)	(0.019)
ln(UIC) $\times ln(scope_{quality})$	0.112**	0.061*	0.067**	0.089**	0.026*
	(0.050)	(0.033)	(0.032)	(0.034)	(0.014)
Controls	✓	✓	✓	✓	✓
Product FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓
R^2	0.627	0.594	0.966	0.959	0.916
Observations	3851	3701	1953	1953	1953

Back

Theoretical Framework

$$\max_{x,u} \pi(x,u) = (p_O - c(u))x - ux$$

$$ux \leq D \quad \text{(financial constraint)}$$

c(u)
Back

Theoretical Framework

$$\max_{x,u} \pi(x,u) = (p_O - c(u))x - ux$$

$$ux \leq D \quad \text{(financial constraint)}$$

$$x = \xi q^{\sigma-1} {p_O}^{-\sigma} \text{ (CES demand function)}$$

c(u)
Back

Theoretical Framework

$$\max_{x,u} \pi(x,u) = (p_O - c(u))x - ux$$

$$ux \leq D \quad \text{(financial constraint)}$$

$$x = \xi q^{\sigma-1} {p_O}^{-\sigma} \text{ (CES demand function)}$$

$$q = u^{\beta}, \quad \beta \text{ is scope for quality differentiation}$$

Firms maximize profits, and face the following trade-offs:

c(u)
Back

Theoretical Framework

$$\max_{x,u} \pi(x,u) = (p_O - c(u))x - ux$$

$$ux \leq D \quad \text{(financial constraint)}$$

$$x = \xi q^{\sigma-1} {p_O}^{-\sigma} \text{ (CES demand function)}$$

$$q = u^{\beta}, \quad \beta \text{ is scope for quality differentiation}$$

Firms maximize profits, and face the following trade-offs:

- UIC (u) trade-off: higher UIC is more expensive but lowers cost and increases quality.

c(u)
Back

Theoretical Framework

$$\max_{x,u} \pi(x,u) = (p_O - c(u))x - ux$$

$$ux \leq D \quad \text{(financial constraint)}$$

$$x = \xi q^{\sigma-1} {p_O}^{-\sigma} \text{ (CES demand function)}$$

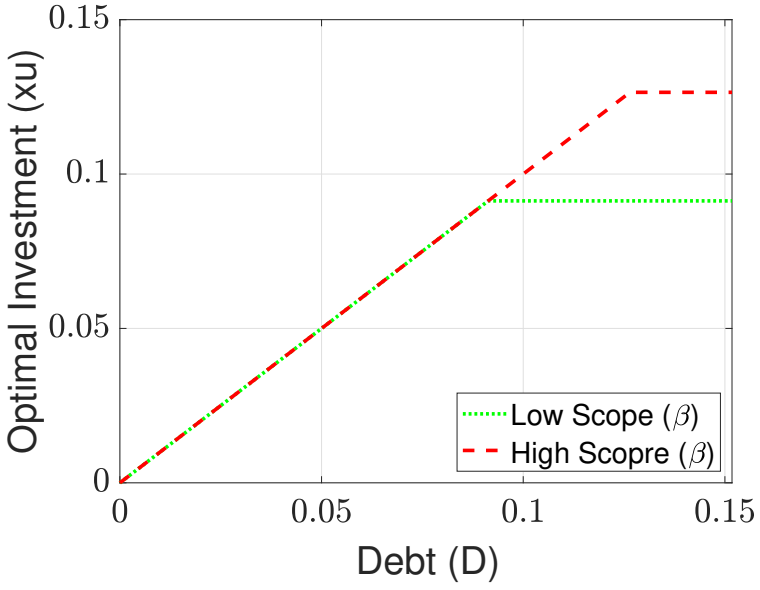
$$q = u^{\beta}, \quad \beta \text{ is scope for quality differentiation}$$

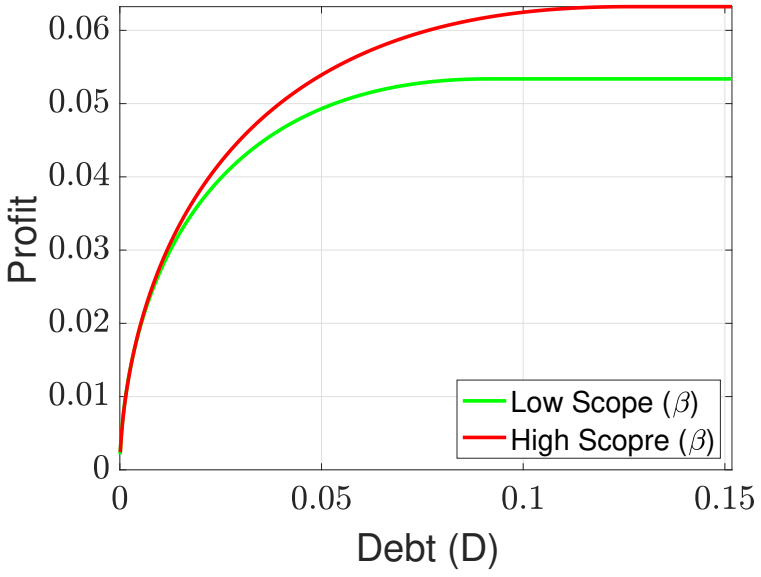
Firms maximize profits, and face the following trade-offs:

- UIC (u) trade-off: higher UIC is more expensive but lowers cost and increases quality.
- Quantity (x) trade-off: higher quantity increases profits but lowers demand.

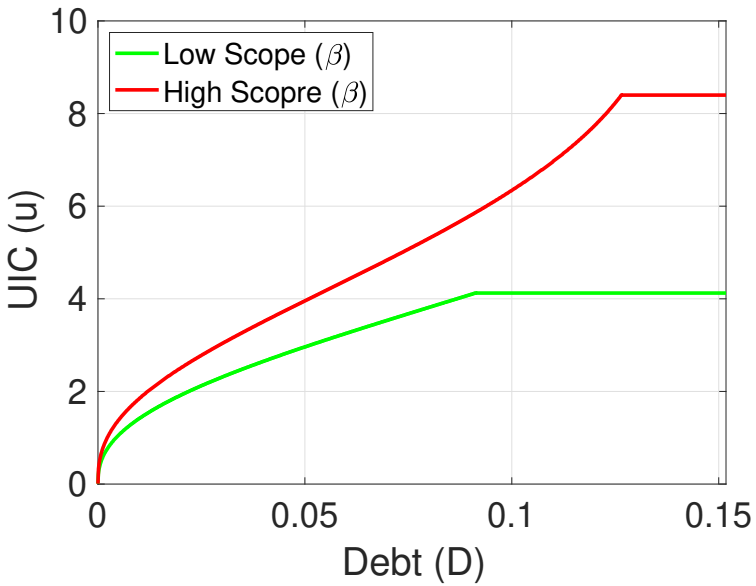
c(u)
Back

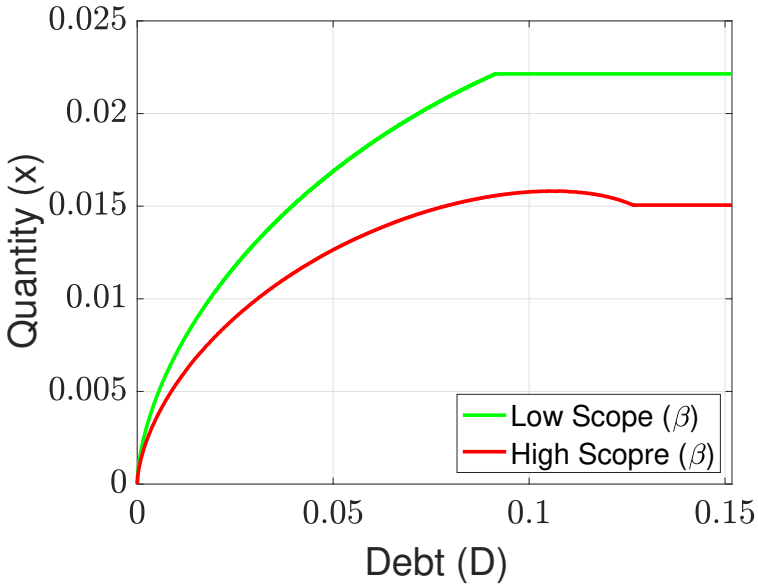
Solution: Optimal Investment and Profit



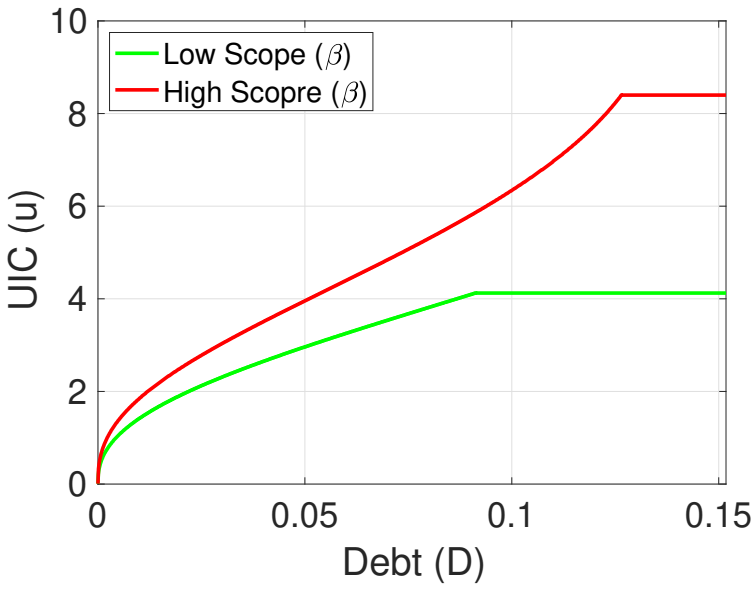


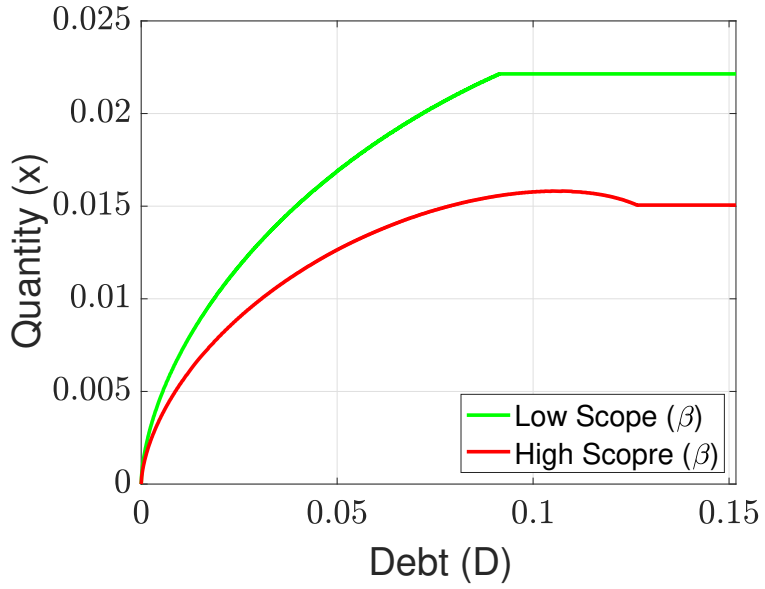
Solution: Optimal UIC and Quantity





Solution: Optimal UIC and Quantity



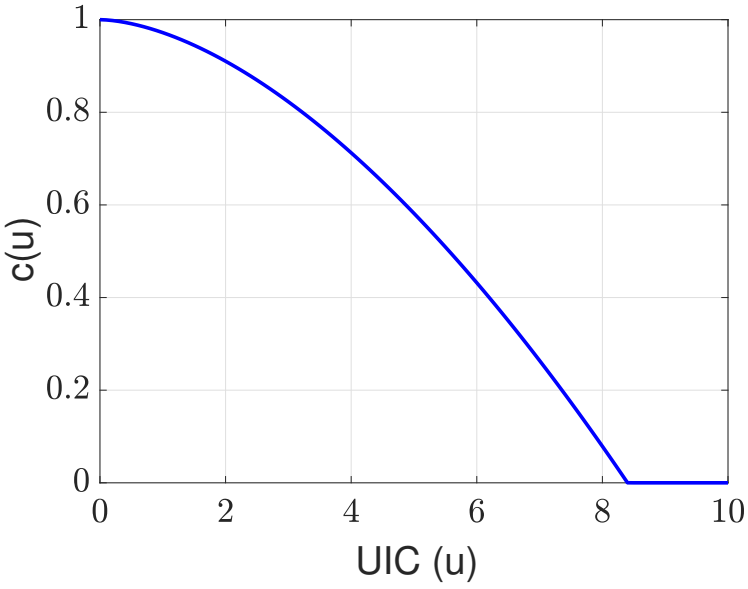


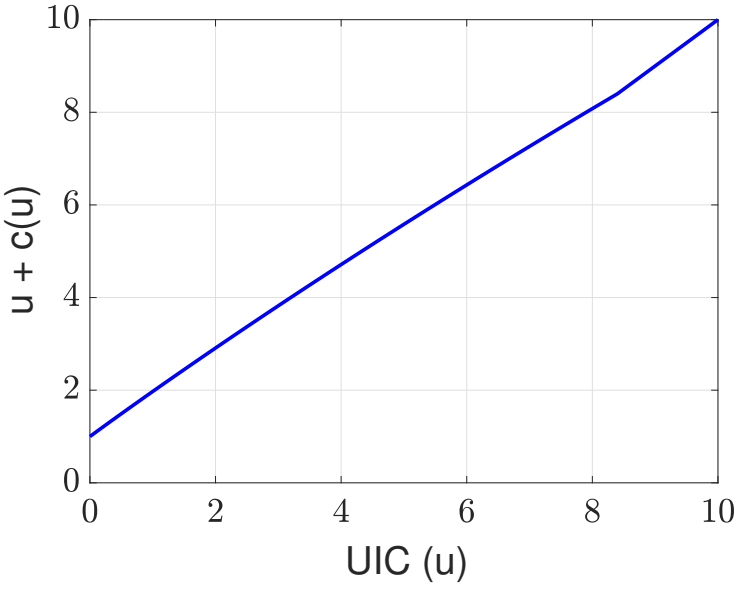
Furthermore

1) Quality is an increasing function of D.
2) Price is an increasing function of D.

Output Price and Quality

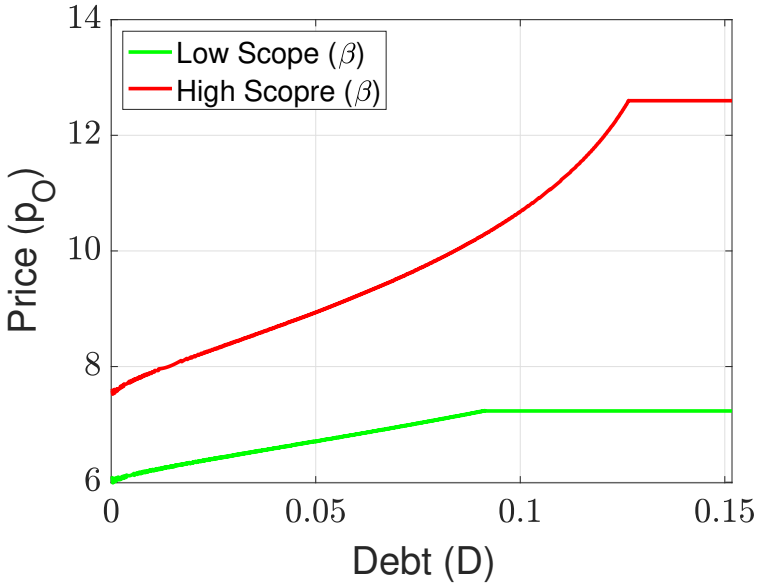
Cost Function

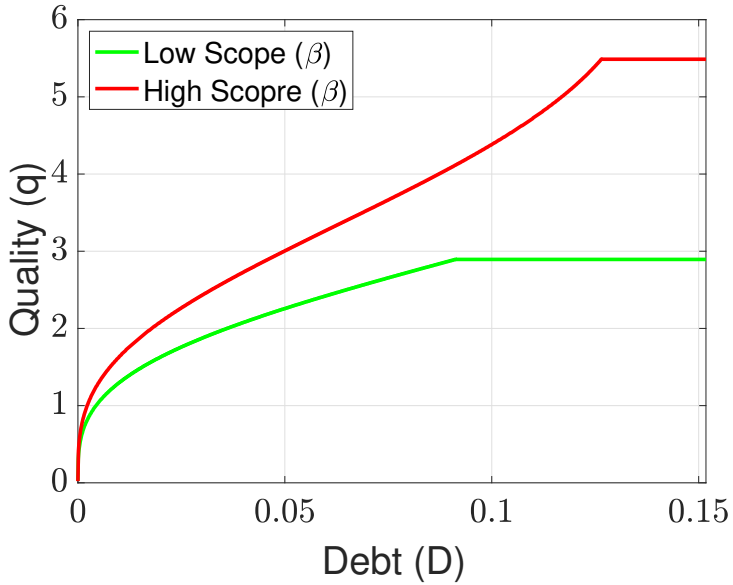




Back

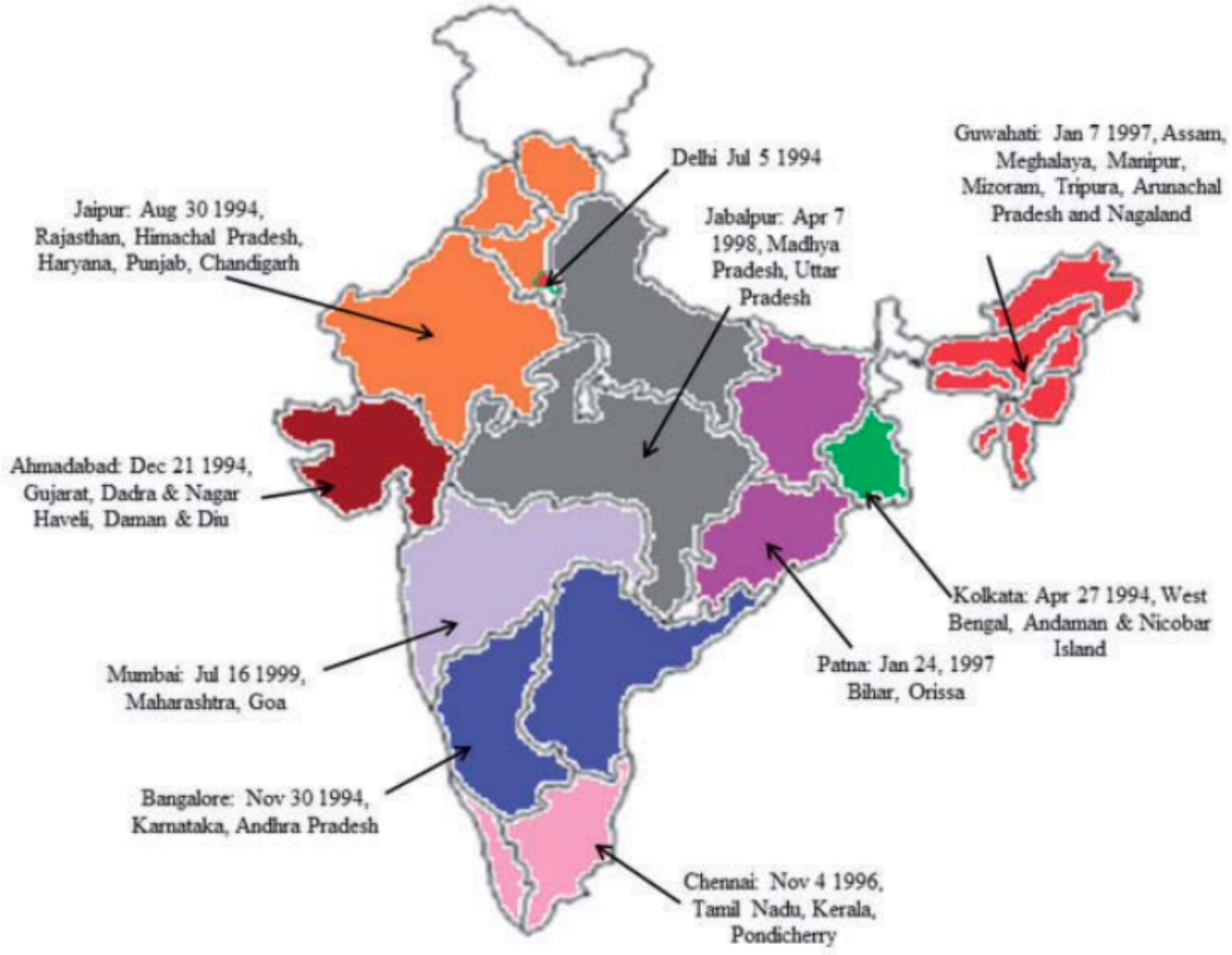
Solution: Price and Quality





Back

Establishment Pattern of DRTs



From "Do Debt Contract Enforcement Costs Affect Financing and Asset Structure?" by Gopalan, Mukherjee, and Singh

Back

Investment

	All Firms			Firms with Project			
	ln(CAPEX)	ln(CAPEX)$\times 1_{CapEx}$	ln(CAPEX)$\times 1^{c}_{CapEx}$	ln(Total Debt)	ln(CAPEX)	ln(Sum Project Costs)	ln(Project Cost)
DRT	0.049**	0.040***	0.010	0.059***	0.041***	0.048**	0.092**
	(0.021)	(0.011)	(0.023)	(0.017)	(0.013)	(0.021)	(0.041)
Controls	✓	✓	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	✓	✓	✓	×
Product FE	×	×	×	×	×	×	✓
Year FE	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓
R^2	0.873	0.875	0.853	0.819	0.874	0.812	0.693
Observations	19876	19876	19876	2312	2285	2312	3851

Back

Pre-Trend for the Effects of DRT

	ln(Total Debt)	ln(CAPEX)	ln(TFP)	ln(Project Cost)	ln(UIC)	ln(price)	ln(quality)
$Before^{-1}$	0.003	0.009	0.006	0.021	-0.028	0.005	0.006
	(0.010)	(0.024)	(0.021)	(0.051)	(0.074)	0.017	0.023
$Before^{0}$	0.031**	0.037**	0.020**	0.101**	0.107***	0.029***	0.023*
	(0.012)	(0.014)	(0.008)	(0.045)	(0.024)	(0.008)	(0.012)
$After^{+1}$	0.071***	0.049***	0.027***	0.081**	0.091**	0.016*	0.031***
	(0.021)	(0.015)	(0.009)	(0.034)	(0.038)	(0.009)	(0.011)
Controls	✓	✓	✓	✓	✓	✓	✓
Firm FE	✓	✓	✓	×	×	×	×
Year FE	✓	✓	✓	✓	✓	✓	✓
Product FE	×	×	×	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓
R^2	0.818	0.801	0.525	0.671	0.830	0.895	0.901
Observations	2312	2312	2312	3851	3851	3851	3851

We find no evidence of pre-trend for total debt, CAPEX, TFP, Project Cost, UIC, price and quality for treated and non-treated states.

Back

Interaction with Scope for Quality Differentiation

	Project Cost Decomposition			Revenue measures				Performance measure	
	ln(UIC)	ln(Capacity)	ln(Project Cost)	ln(Price)	ln(Quality)	ln(Quantity)	ln(Sales)	ln(TFPR)	ln(TFPQ)
DRT	0.069***	0.013	0.082**	0.018***	0.026**	0.027*	0.045*	0.031**	0.024*
	(0.023)	(0.046)	(0.039)	(0.006)	(0.010)	(0.014)	(0.024)	(0.014)	(0.013)
DRT× ln($scope_{quality}$)	0.093*	-0.032*	0.061	0.027**	0.038***	-0.009	0.014*	0.039**	-0.002
	(0.049)	(0.017)	(0.079)	(0.011)	(0.012)	(0.019)	(0.008)	(0.015)	(0.012)
Controls	✓	✓	✓	✓	✓	✓	✓	✓	✓
Firm FE	×	×	×	×	×	×	×	✓	✓
Product FE	✓	✓	✓	✓	✓	✓	✓	×	×
Year FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
State FE	✓	✓	✓	✓	✓	✓	✓	✓	✓
R^2	0.835	0.833	0.706	0.915	0.879	0.937	0.926	0.559	0.539
Observations	3851	3851	3851	1953	1953	1953	1953	2722	2619

Back

Capital Import

	Import of Physical-Capital	ln(Share of Physical-Capital Imported)
ln(UIC)	0.013**	0.029**
	(0.005)	(0.014)
Controls	✓	✓
Product FE	✓	✓
Year FE	✓	✓
State FE	✓	✓
R^2	0.431	0.671
Observations	3851	2231

Back

Capital Quality vs. the Alternative

preferred explanation	company headquarter	project location: treated	project location: not treated
	treated	yes	yes
	not treated	no	no

alternative explanation	company headquarter	project location: treated	project location: not treated
	treated	yes	no
	not treated	yes	no

Back

More Summary Statistics

Variable	Observations	Mean	Median	StD
ln(TFP)	2312	0.92	0.91	0.81
ln(ROE)	2312	-2.54	-2.33	1.04
ln(Tobins'Q)	1498	0.43	0.37	0.13
MarketCap (Million$)	1498	415	29	1890