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Does Limited Liability Matter?
Evidence from a Quasi-Natural Experiment

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"The **limited-liability company is one of man's greatest inventions** [...]. [The limited-liability company] encourages investment by limiting people's downside risk [...] [frees] investors from the threat of personal ruin [...].

As capital-hungry technologies such as the railroads arrived, [...] the privilege [of limited liability became] open to all comers".

- The Economist, September 2016 -

- Investors are not liable above and beyond their initial investments

    - Limited liability decreases the need to monitor managers

    - Limited liability is necessary for an organized securities market

    - Makes it possible for market prices to reflect value of the firm
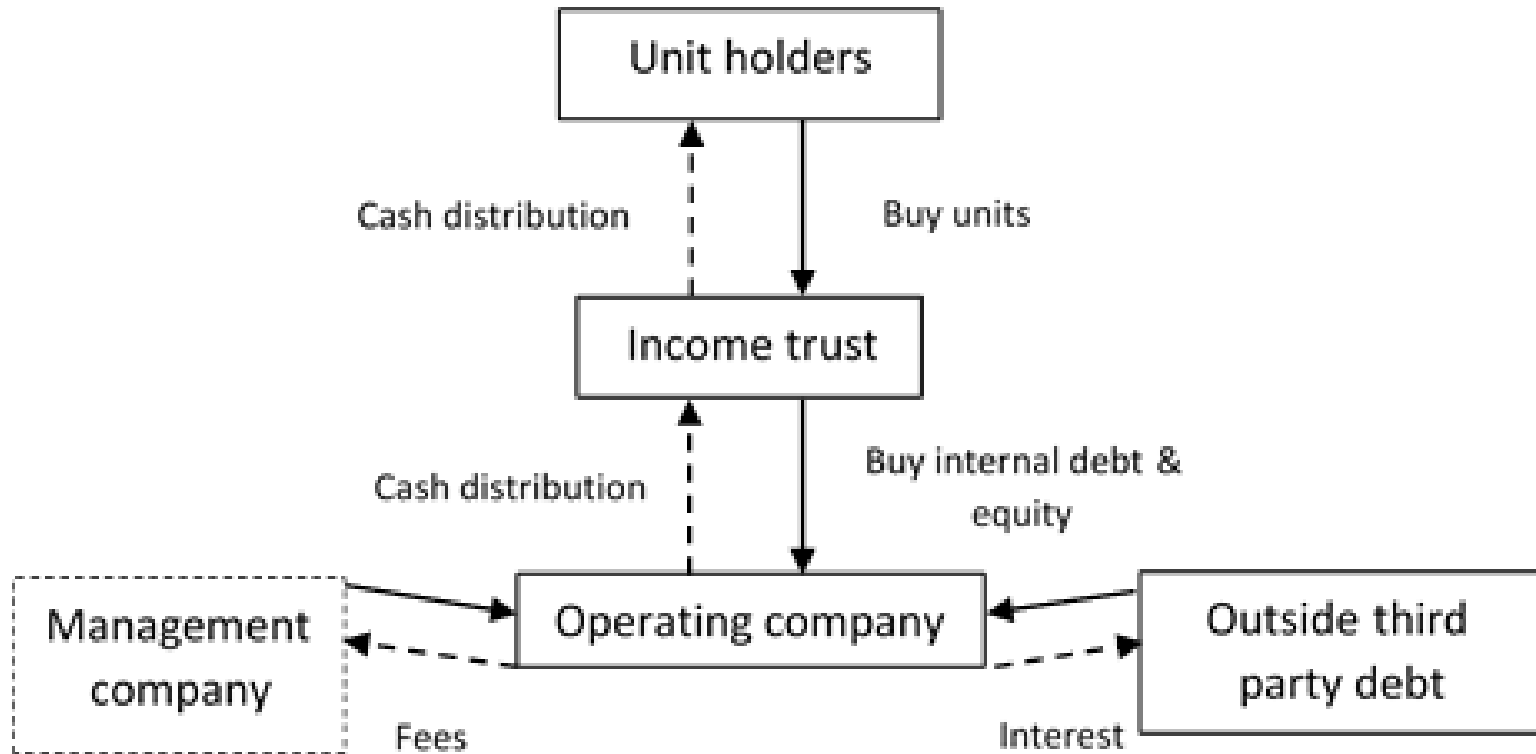
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- Does the switch from unlimited liability to limited liability affect firm policies and outcomes?
    - External financing
    - Investments
    - Profitability
    - Payouts

- Provide a clearer understanding of the effects of limited liability on firm policies and outcomes

- Limited liability leads to an increase in:
  - External financing
  - Investments
  - Profitability
  - Payouts

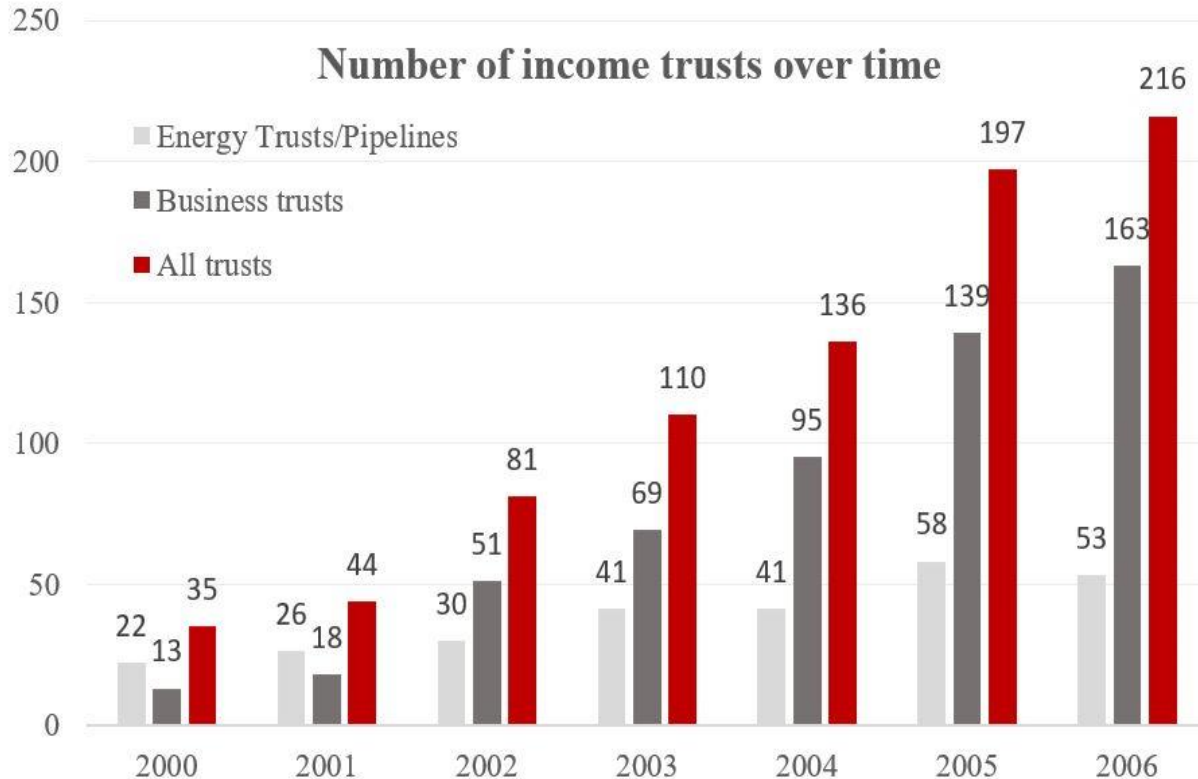- Results stronger for capital-intensive firms

- Canadian public firms known as income trusts experienced a switch from unlimited to limited liability in the mid 2000s

- Income trusts' switch to limited liability is the result of liability acts, not a choice

Income Trust Structure

Growth of Income Trusts

Number of income trusts over time

Legend:
- Energy Trusts/Pipelines
- Business trusts
- All trusts

Year	Energy Trusts/Pipelines	Business trusts	All trusts
2000	22	13	35
2001	26	18	44
2002	30	51	81
2003	41	69	110
2004	41	95	136
2005	58	139	197
2006	53	163	216

- Trust units seen as alternative to bonds during low interest rate periods
  - Stable and high dividends
- Attractive taxation (avoid double taxation)

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Province	Date	Act
Quebec	1994	
Alberta	1-Jul-04	Income Trusts Liability Act
Ontario	1-Jan-05	Trust Beneficiaries' Liability Act
Manitoba	16-Jun-05	Investment trust Unitholders' Protection Act
British Columbia	30-Mar-06	Income trust liability act
Saskatchewan	19-May-06	Income trust Liability Act

- Exploit a "quasi-natural experiment"
- Use generalized DiD method

$$Dep.\,var_{it} = \alpha + \textcolor{red}{\beta_1}\,LiabAct\_dummy_{it} + \boldsymbol{\beta X_{it-1}} + FirmFE_i + YearFE_t + \varepsilon_{it}$$
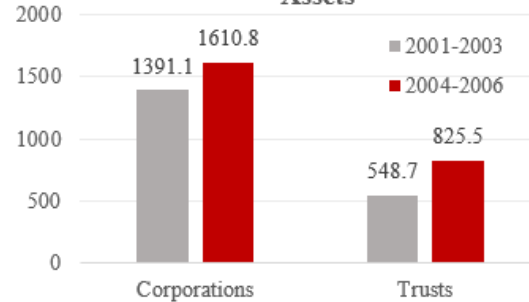
- Treatment group: trusts in provinces that already passed the liability acts
- Control group: trusts in provinces yet to pass the liability act and other listed corporations operating in the same industries

- List of income trusts: TSX documents

- Date of formation: hand-collect from SEDAR

- Accounting and market data: Compustat NA, Datastream (2000-2006)

- Liability acts enactments and effective dates: from provincial official documents and news articles
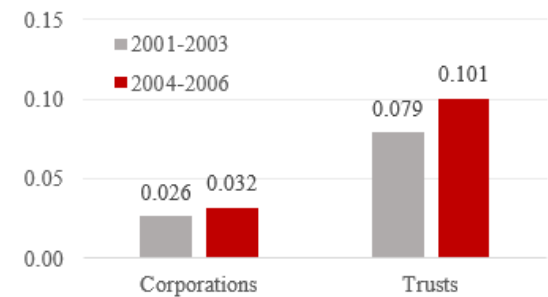
Results: Market Reaction
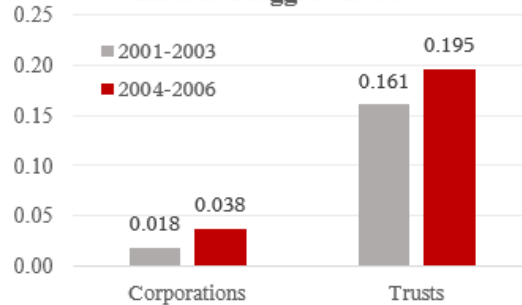
	AB Event (Mar 30, 2004)		ON Event (Dec 16, 2004)	
	(1) (-1,+1) CAR	(2) (-3,+3) CAR	(3) (-1,+1) CAR	(4) (-3,+3) CAR
AB trusts	1.11%***	-0.94%	2.14%***	2.63%***
	(2.27)	(-0.51)	(5.89)	(2.32)
AB corporations	0.58%	-1.10%	-0.06%	0.81%
	(0.95)	(-0.82)	(-0.06)	(0.42)
ON trusts	-0.26%	-1.41%	2.23%***	3.58%***
	(-0.66)	(-1.14)	(3.07)	(3.57)
ON corporations	-0.51%***	-3.00%***	0.63%	1.78%
	(-2.82)	(-4.33)	(0.93)	(1.81)

Results: External Financing

	Net Equity Issuance			Net Debt Issuance		
	All	Energy	Business	All	Energy	Business
LiabAct	0.0115	0.110*	-0.0271	0.0502**	0.0527***	0.0590**
	(0.27)	(2.61)	(-0.76)	(2.43)	(5.61)	(2.63)
Controls	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	1360	345	1015	1450	374	1076
R^2	0.536	0.574	0.580	0.402	0.540	0.380
	Net External Financing			Convertible Debt/Asset		
	All	Energy	Business	All	Energy	Business
LiabAct	0.0755	0.181***	0.0240	0.0212***	0.0128***	0.0229***
	(1.46)	(5.59)	(0.47)	(5.89)	(5.60)	(4.37)
Controls	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	1360	345	1015	1450	374	1076
R^2	0.495	0.588	0.541	0.584	0.638	0.572

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	ln(Assets)			CAPEX/lagged Assets			Acquisitions/lagged Assets		
	All	Energy	Business	All	Energy	Business	All	Energy	Business
LiabAct	0.218**	0.179**	0.165**	0.0448**	0.0507*	0.00714	0.0250	0.0595***	0.00510
	(3.16)	(2.98)	(3.22)	(2.89)	(2.66)	(0.82)	(1.39)	(11.16)	(0.21)
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1445	369	1076	1502	426	1076	1380	352	1028
R^2	0.973	0.977	0.975	0.503	0.507	0.683	0.380	0.421	0.376

Results: Profitability

	EBITDA/lagged Assets			Sales/lagged Assets			SG& A_t/$Sales_t$			COGS/Sales		
	All	Energy	Business	All	Energy	Business	All	Energy	Business	All	Energy	Business
LiabAct	-0.00336	0.0773**	-0.0114	0.141*	0.0511*	0.217	0.0292***	0.101	0.0785**	-0.648	0.00136	-0.418
	(-0.14)	(3.42)	(-0.41)	(2.28)	(2.25)	(1.83)	(3.38)	(1.23)	(2.50)	(-1.01)	(0.00)	(-1.41)
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1438	352	1086	1507	439	1068	1021	345	676	1434	387	1047
R^2	0.611	0.813	0.615	0.768	0.669	0.892	0.714	0.515	0.745	0.820	0.769	0.914

	Dividends/Sales			Dividends/lagged Assets		
	All	Energy	Business	All	Energy	Business
LiabAct	-0.0127	0.0272***	-0.0309**	0.00453	0.0231***	-0.00280
	(-1.55)	(10.30)	(-2.34)	(0.47)	(31.75)	(-0.33)
Controls	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	1417	340	1077	1430	349	1081
R^2	0.859	0.910	0.768	0.793	0.889	0.712

	Equity volatility			Cash/lagged Assets		
	All	Energy	Business	All	Energy	Business
LiabAct	0.104***	0.0653***	0.118***	0.0211	0.0699*	-0.00204
	(6.10)	(7.90)	(6.51)	(1.64)	(2.29)	(-0.22)
Controls	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	880	223	657	1442	356	1086
R^2	0.903	0.915	0.905	0.667	0.670	0.679

Robustness: Endeogeneity of enactments

	Cox Hazard Model (1)	Cox Hazard Model (2)	LPM (3)	LPM (4)
$GDP\ Growth_{t-1}$	1.054 (0.92)	1.085 (0.99)	0.0435 (1.18)	0.0436 (1.16)
$Ln(GDP\ per\ Capita)_{t-1}$	-1.010 (-0.20)	-1.403 (-0.29)	-0.106 (-0.44)	-0.106 (-0.43)
$Ln(Population)_{t-1}$	1.094 (1.59)	1.100 (1.52)	0.0433 (1.12)	0.0433 (1.12)
$Unemployment\ Rate_{t-1}$	2.021 (0.99)	1.994 (0.92)	0.0276 (0.67)	0.0277 (0.67)
$Political\ Party_{t-1}$	0.608 (0.36)	0.725 (0.45)	0.112* (1.91)	0.112* (1.90)
$Trust\ Growth_{t-1}$		0.627 (1.21)		0.000321 (0.03)
Province FE	N	N	Y	Y
Year FE	N	N	Y	Y
Observations	95	95	95	95
Pseudo R^2/ R^2	0.186	0.193	0.371	0.371

- Enactments not related to economic or political factors

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	External Financing		ln(Assets)$_t$		EBITDA$_t$/Assets$_{t-1}$		Dividends$_t$/Sales$_t$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Energy	Business	Energy	Business	Energy	Business	Energy	Business
$LiabAct\_Before(-1)$	0.0788	0.230	0.146	0.132	-0.0284	-0.0578	0.00384	-0.0217*
	(1.45)	(1.84)	(1.83)	(1.45)	(-0.89)	(-1.25)	(0.90)	(-2.01)
$LiabAct\_After(0)$	0.222**	0.137	0.178**	0.151*	0.0493**	-0.0640	-0.00994	-0.0392
	(3.30)	(1.72)	(2.85)	(2.16)	(3.20)	(-1.14)	(-2.10)	(-1.81)
$LiabAct\_After(+1)$	0.124	0.180***	0.205***	0.200*	0.0190	-0.00486	0.0415***	-0.0610**
	(1.82)	(4.70)	(5.56)	(2.14)	(0.68)	(-0.09)	(4.71)	(-3.20)
$LiabAct\_After(+2)$	0.216*	0.138	0.299***	0.0897	0.0330**	0.0525	0.0681***	-0.0162
	(2.48)	(1.32)	(4.79)	(0.89)	(3.56)	(0.79)	(27.03)	(-1.08)
Controls	Y	Y	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	325	993	347	1054	384	1131	340	1077
R^2	0.670	0.564	0.979	0.982	0.792	0.614	0.915	0.771

- No effects before the enactments

Robustness: Propensity score matching

	External Financing			ln(Assets)$_t$		
	(1)	(2)	(3)	(4)	(5)	(6)
	All	Energy	Business	All	Energy	Business
$LiabAct_t$	0.0212	0.0883*	-0.0126	0.0579	0.232*	-0.0230
	(0.38)	(8.66)	(-0.21)	(1.26)	(9.12)	(-0.64)
Controls	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	362	130	232	380	138	242
R^2	0.565	0.702	0.441	0.985	0.990	0.982
	EBITDA$_t$/Assets$_{t-1}$			Dividends$_t$/Assets$_{t-1}$		
	(7)	(8)	(9)	(10)	(11)	(12)
	All	Energy	Business	All	Energy	Business
$LiabAct$	0.0464**	0.0999**	0.0258***	0.00207	0.0241**	-0.00921*
	(3.22)	(58.42)	(4.07)	(0.30)	(14.93)	(-2.14)
Controls	Y	Y	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y	Y
Observations	376	133	243	369	126	243
R^2	0.801	0.808	0.750	0.867	0.911	0.826

- Qualitatively similar results

- Legal scholars: The risk of unlimited liability before the acts was remote

- Thus, we provide *a lower bound for the effect of limited liability on firm outcomes*

- Present a novel approach to empirically test the effects of limited liability on firm policies

- The limited liability is economically important and benefits capital-intensive firms the most.