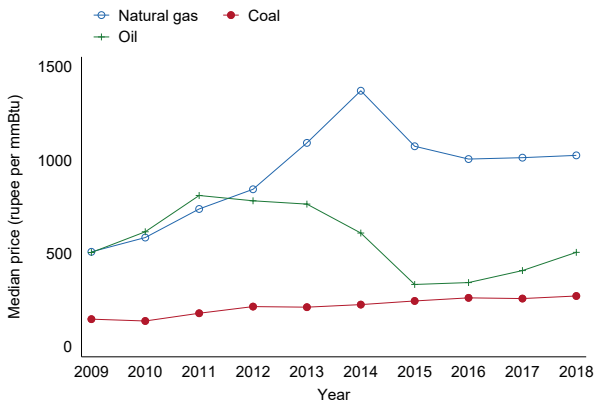
GHG Emissions (ASI)

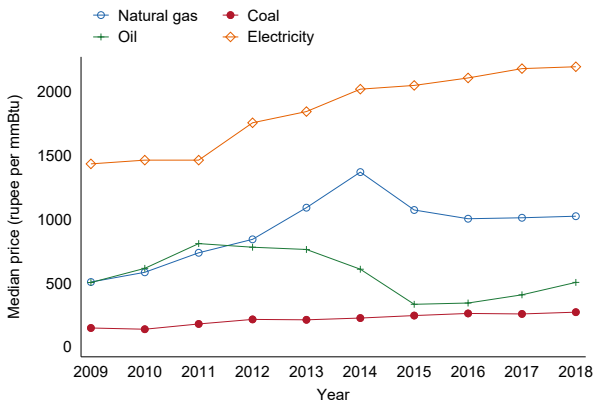
1 Fuel and Energy Prices

Figure 1: IPO and Profitability

(a) Fuel Prices



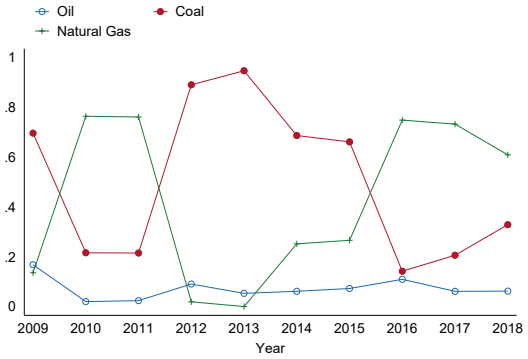
(b) Energy Prices



2 Aggregate Shares

Figure 2: Spending Shares

(a) Fuels



(b) Energy

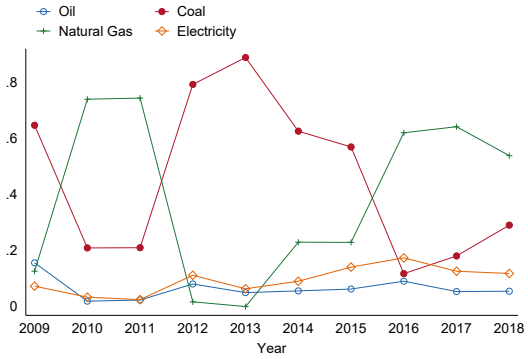
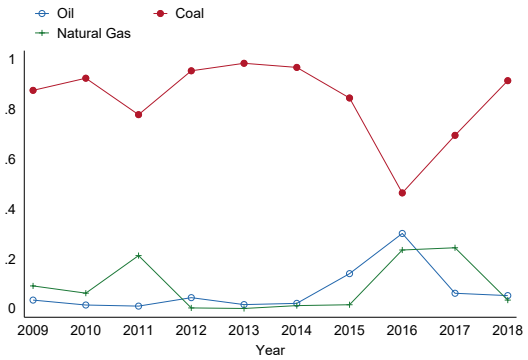
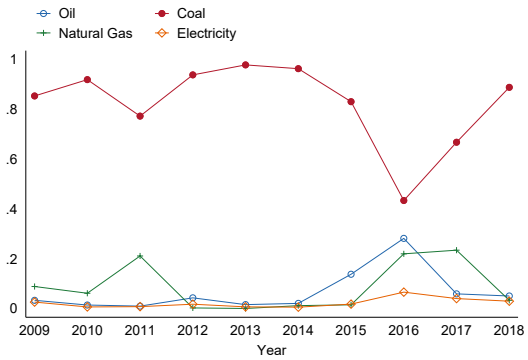


Figure 3: Quantity Shares (mmbtu)

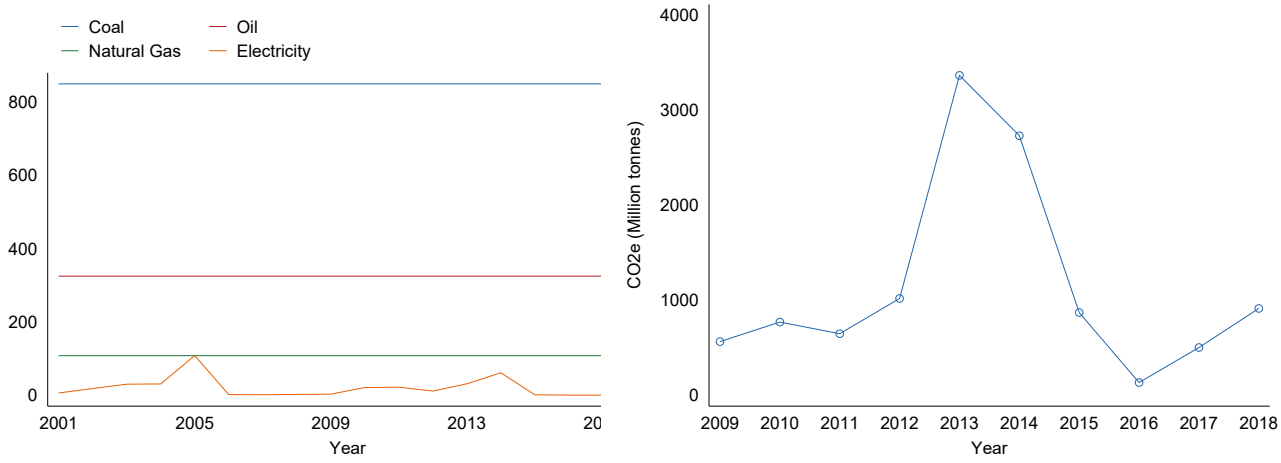
(a) Fuels



(b) Energy



3 GHG emissions



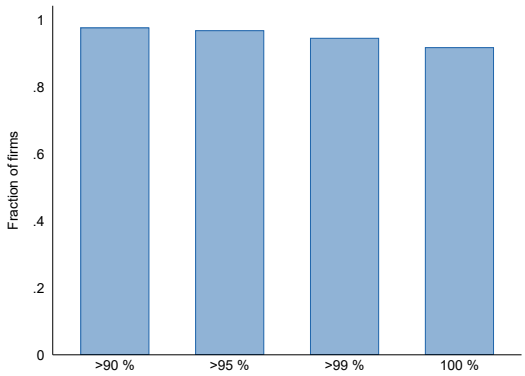
(a) One mmbtu in kg CO2e by energy source

(b) Aggregate GHG emissions

4 Evidence on mixing

Figure 5: Quantity Shares (mmbtu)

(a) Single fuel consumption above given threshold



(b) Mixing and Single fuel consumption

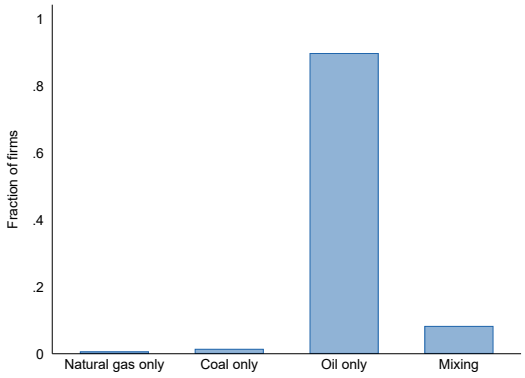


Table 1: Effect of producing multiple outputs on fuel mixing

	(1) No controls	(2) Industry dummies	(3) Extra controls
Multiple Outputs	0.0215***	0.0231***	-0.00354***
	(28.26)	(29.36)	(-3.74)
Observations	823838	812261	618644

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

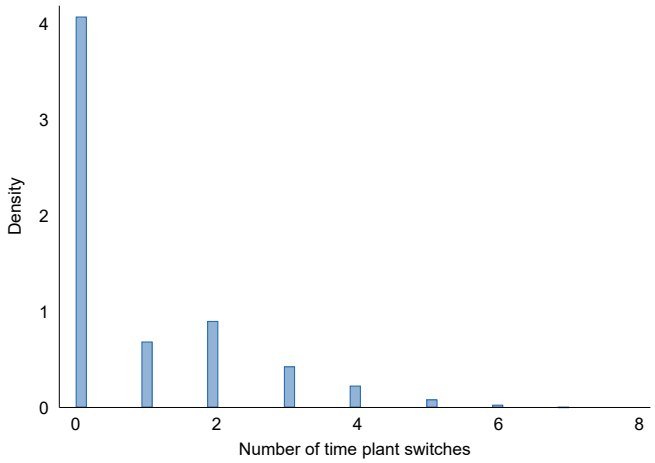


Figure 6: Distribution of switching within plants (Balanced panel)

5 Evidence on Fuel Switching (Balanced panel)

Table 2: Proportion of unique firms who switch between fuels

	Firms who never swith	Firms who switch	Total
Number	2,174	1,451	3,625
Fraction	0.60	0.40	1

Table 3: Proportion of unique firms in each switching categories (not mutually exclusive)

	Never switch	Single to Single	Single to Mix	Mix to single	Mix to Mix	Number of Firms
Number	2,174	82	1,169	1,100	219	3,625
Fraction	0.60	0.02	0.32	0.30	0.06	N/A

Single to Mix (Row)/Mix to Single (Column)	No	Yes	Total
No	2297	159	2456
Yes	228	941	1169
Total	2525	1100	3625

5.1 One way switching

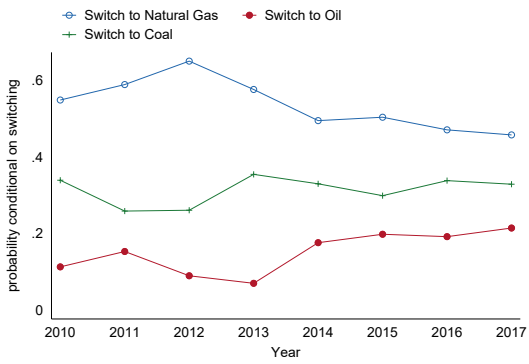
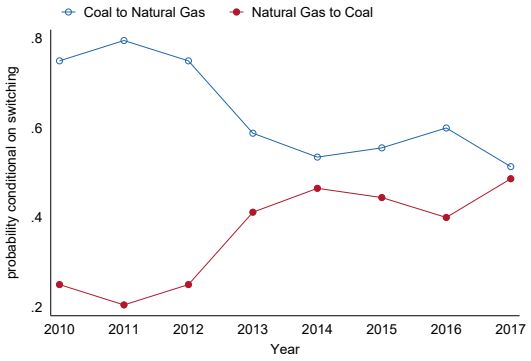


Figure 7: Proportion of switching across fuels

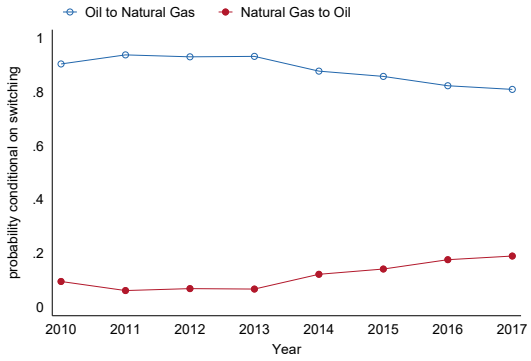
5.2 Twoway switching and switching consistency

Figure 8: Quantity Shares (mmbtu)

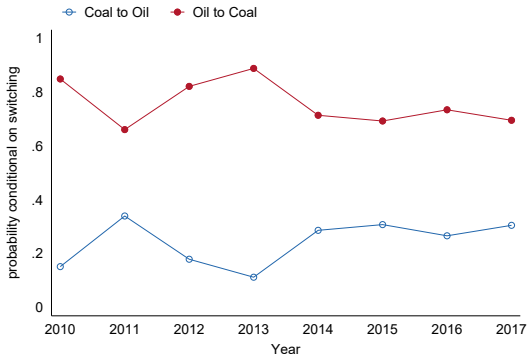
(a) Coal and Natural Gas



(b) Oil and Natural Gas



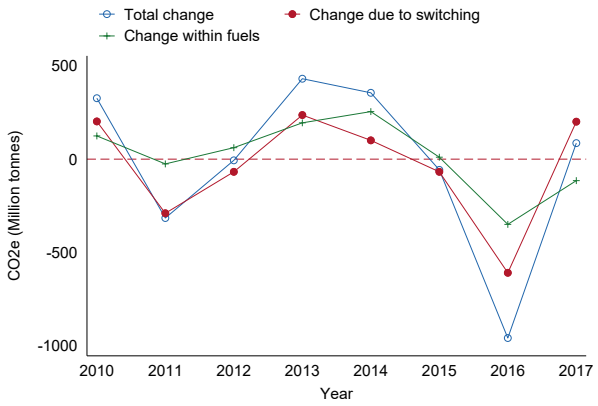
(c) Coal and Oil



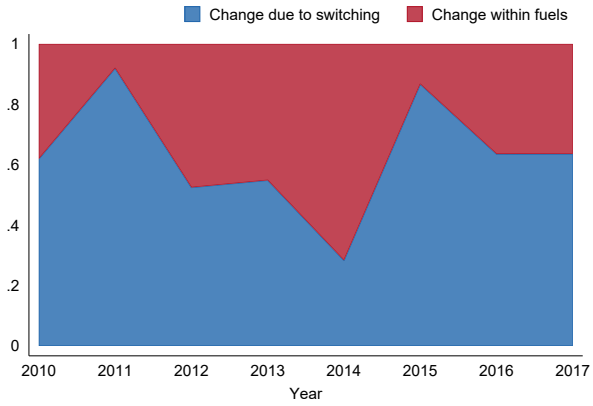
5.3 Decomposition of GHG emissions

Figure 9: Fuel switching and change in aggregate GHG emissions

(a) Decomposition between within and across



(b) Fraction due to within and across fuels



5.4 Relationship between fuel switching and Observables

5.4.1 Gross output and switching next period

Table 4: Relationship between Gross output and plants who switch at next period

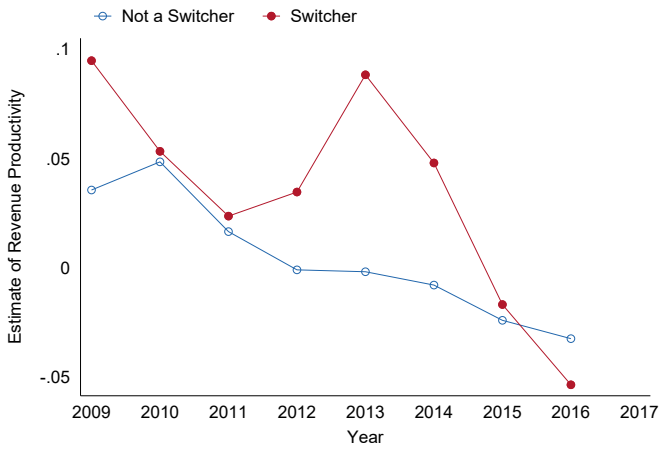
	(1) Switching Dummy		(2) Switching Categories	
Capital Spending	0.0928***	(0.000)	0.0929***	(0.000)
Intermediate Spending	0.561***	(0.000)	0.561***	(0.000)
Labor Spending	0.291***	(0.000)	0.291***	(0.000)
Energy Spending	0.0414***	(0.000)	0.0418***	(0.000)
Not Switching	0	(.)	0	(.)
Switching	0.0300*	(0.014)	-0.0524	(0.401)
Single to Mixing			0.0471**	(0.007)
Mixing to Single			0.0375*	(0.038)
Mixing to Mixing			-0.0719+	(0.071)
Constant	1.516***	(0.000)	1.515***	(0.000)
Observations	26526		26526	

p-values in parentheses

Capital, labor, intermediates and energy are in logs

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 10: Average revenue productivity and switching in the next period



5.4.2 Gross output and switcihing at least once

Table 5: Relationship between Gross output and plants who switch at least once

	(1)	
Capital Spending	0.0926***	(0.000)
Intermediate Spending	0.568***	(0.000)
Labor Spending	0.288***	(0.000)
Energy Spending	0.0359***	(0.000)
Not a switcher	0	(.)
Switcher	0.0145+	(0.067)
Constant	1.501***	(0.000)
Observations	29828	

p-values in parentheses

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 11: Average revenue productivity of switchers vs non-switchers

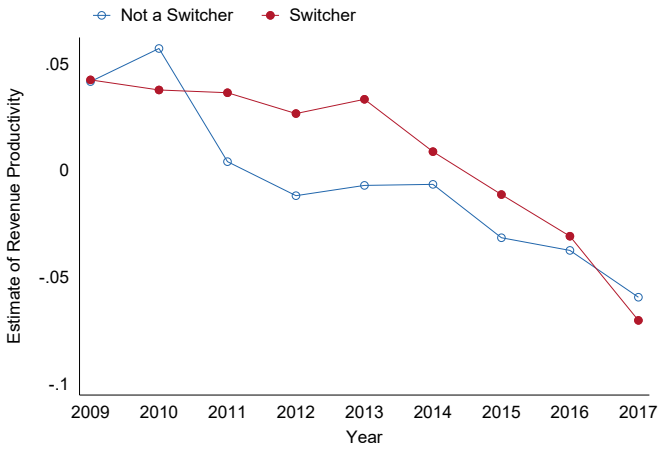


Table 6: Marginal effects, probability of switching (next period)

	(1)	(2)	(3)
	Next period	Next period	Next period
Leverage (Debt to Assets)	0.00601**	0.00540**	0.00375+
	(2.98)	(2.66)	(1.79)
Cash	0.00138	0.00154	0.00125
	(1.40)	(1.55)	(1.25)
Estimate of revenue productivity (OLS)	0.00970**	0.00942**	-0.000174
	(3.15)	(3.07)	(-0.05)
Labor Spending	0.00102	0.00218	0.00145
	(0.42)	(0.89)	(0.53)
Energy Spending	0.0205***	0.0204***	0.0179***
	(11.64)	(11.55)	(8.96)
Intermediate Spending	0.0000331	-0.000123	-0.00218
	(0.02)	(-0.07)	(-1.09)
Capital Spending	-0.00540**	-0.00588**	-0.00121
	(-2.80)	(-3.04)	(-0.57)
Age	-0.00258	-0.00204	0.000736
	(-1.14)	(-0.90)	(0.31)
Price of Oil		0.0169**	0.0168**
		(2.70)	(2.70)
Price of Natural Gas		-0.00624	-0.000984
		(-1.32)	(-0.21)
Price of Coal		-0.00656	-0.00853
		(-1.05)	(-1.38)
industry dummies	No	No	Yes
Observations	26171	26171	25921

t statistics in parentheses

All independent variables are in logs

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7: Marginal effects, probability of switching (same period)

	(1)	(2)	(3)
	Same period	Same period	Same period
Leverage (Debt to Assets)	0.00388*	0.00309+	0.00164
	(2.16)	(1.72)	(0.89)
Cash	0.00284**	0.00255**	0.00233**
	(3.23)	(2.91)	(2.63)
Estimate of revenue productivity (OLS)	0.00485+	0.00473+	-0.00368
	(1.83)	(1.78)	(-1.30)
Labor Spending	0.00577**	0.00486*	0.00561*
	(2.65)	(2.21)	(2.27)
Energy Spending	0.0177***	0.0178***	0.0151***
	(11.25)	(11.34)	(8.57)
Intermediate Spending	-0.00126	-0.000917	-0.00236
	(-0.80)	(-0.58)	(-1.32)
Capital Spending	-0.00566**	-0.00500**	-0.00144
	(-3.29)	(-2.89)	(-0.77)
Age	0.000451	0.0000967	0.00290
	(0.21)	(0.05)	(1.32)
Price of Oil		0.0182**	0.0184***
		(3.28)	(3.33)
Price of Natural Gas		0.00636	0.0114**
		(1.46)	(2.67)
Price of Coal		0.0364***	0.0322***
		(6.20)	(5.58)
industry dummies	No	No	Yes
Observations	29420	29420	29082

t statistics in parentheses

All independent variables are in logs

$^{+}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$