Consumption Taxes and Corporate Income Taxes:

Evidence from Place-Based VAT

Jules Ducept

EU Tax Observatory, Paris-Saclay

Evangelos Koumanakos

Hellenic Open University

Panayiotis Nicolaides

EU Tax Observatory, Paris School of Economics

November, 2024

Motivation

Motivation

In theory (and in experts' perceptions) VAT is efficient and non-distortionary

Yet, we have evidence of real effects (price asymmetry) and lack of others

In this paper, we analyse **corporate responses to a large VAT increase**

Findings:

1. **Inverse relationship between VAT rates and declared profits**
2. **Cross-tax-base effects in CIT**
3. **Indications that these are driven by tax evasion effects rather than real effects**

Empirical VAT literature is very slim

Mostly focused on incidence:

- Pass-through depends on elasticities/competition (Genakos and Pagliero, 2022)
- Pass-through is asymmetric on increase/decrease (Kosonen 2015; Benzarti et al., 2018; Benzarti and Carloni, 2019; Benzarti et al., 2020; Benzarti et al. 2024)

No empirical evidence on how VAT affects corporate responses, choices and CIT

(VAT %-changes usually small, sector-specific, difficult for counterfactual)

Institutional Background

Institutional Background

We can compare corporate responses to a VAT change due to the existence of **place-based VAT rates** in Greece

Preferential VAT rate in some Aegean islands: 33% (8 p.p.) lower rate

To raise tax revenue, Troika (IMF, EC, ECB) asked for repeal in summer 2015

Repeal in October 2015 in 6 large touristic islands:

Santorini, Mykonos, Naxos, Skiathos, Rhodes, Paros

We use Ionian islands as control (similar activity, always at mainland rate):

Kefalonia, Zante, Lefkada, Meganisi, Corfu, Paxoi and Kythira


VAT Increase
VAT Constant

Treatment - Control Groups

In October 2015, corporations experienced a large VAT rate increase:

VAT Rate	% before	% after
Main	16	24
Reduced	9	13
Super-reduced	4	6.5

Products/services **sold** to treatment islands increase by the same percentage.

Corporations in treatment islands faced an increase in **both** inputs and outputs.

We compare corporate responses against those in islands not part of the reform

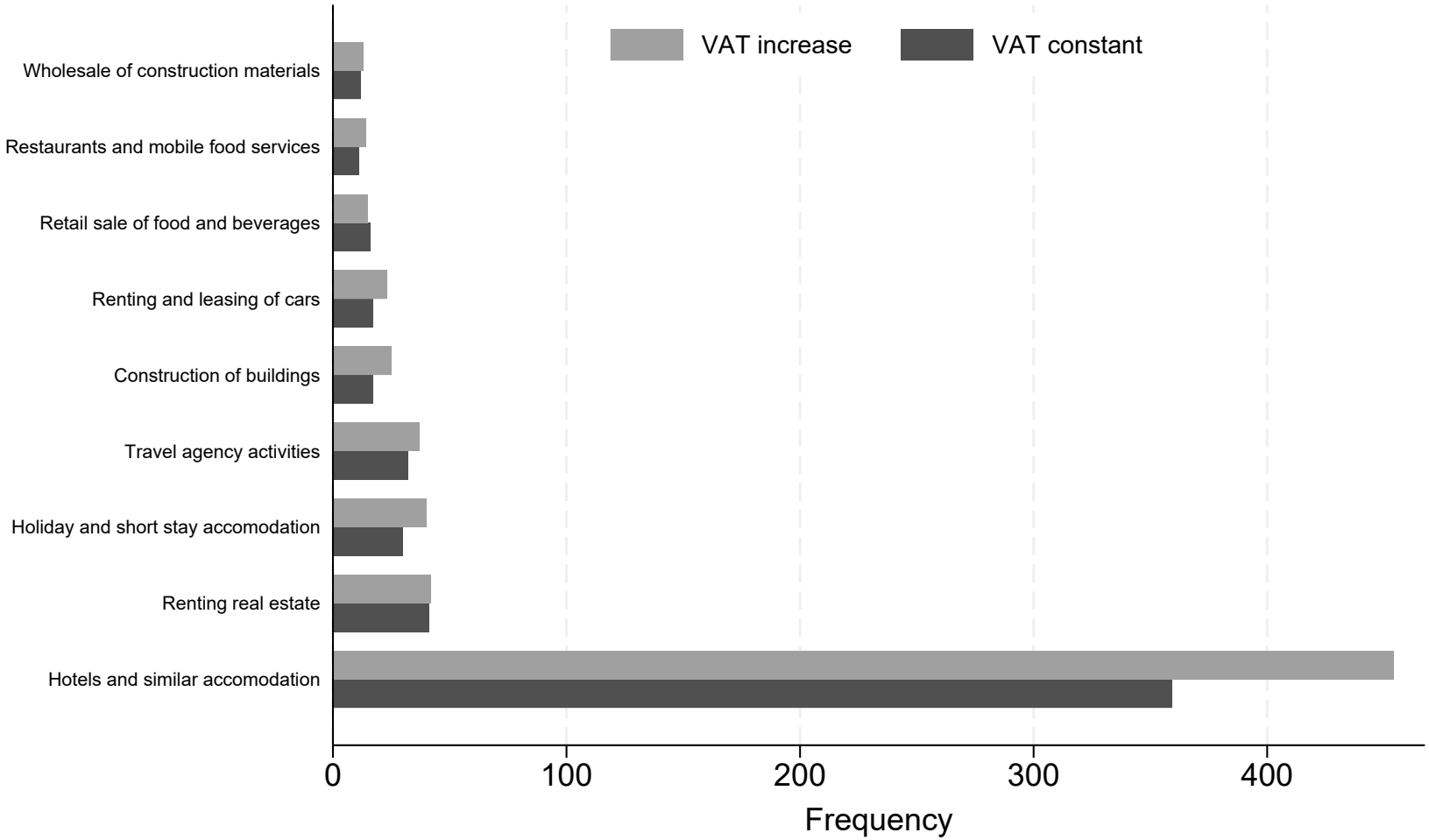
Data

1. Corporate tax filings in Greece
    - Reported profits, losses, revenue, and taxes
    - Annual observations from 2011 to 2018
2. Postcodes of corporations using Tax ID matching in Orbis & ICAP
    - 1,042 corporations in control group, 1,152 in treatment group
    - Balanced panel over 8 years: 12,798 observations
3. Aggregate VAT revenue by island tax office
    - Monthly VAT tax return information
4. Time-varying control variables
    - Monthly number of hotel accommodation nights per island
    - Monthly hotel capacity booked

Sample Statistics

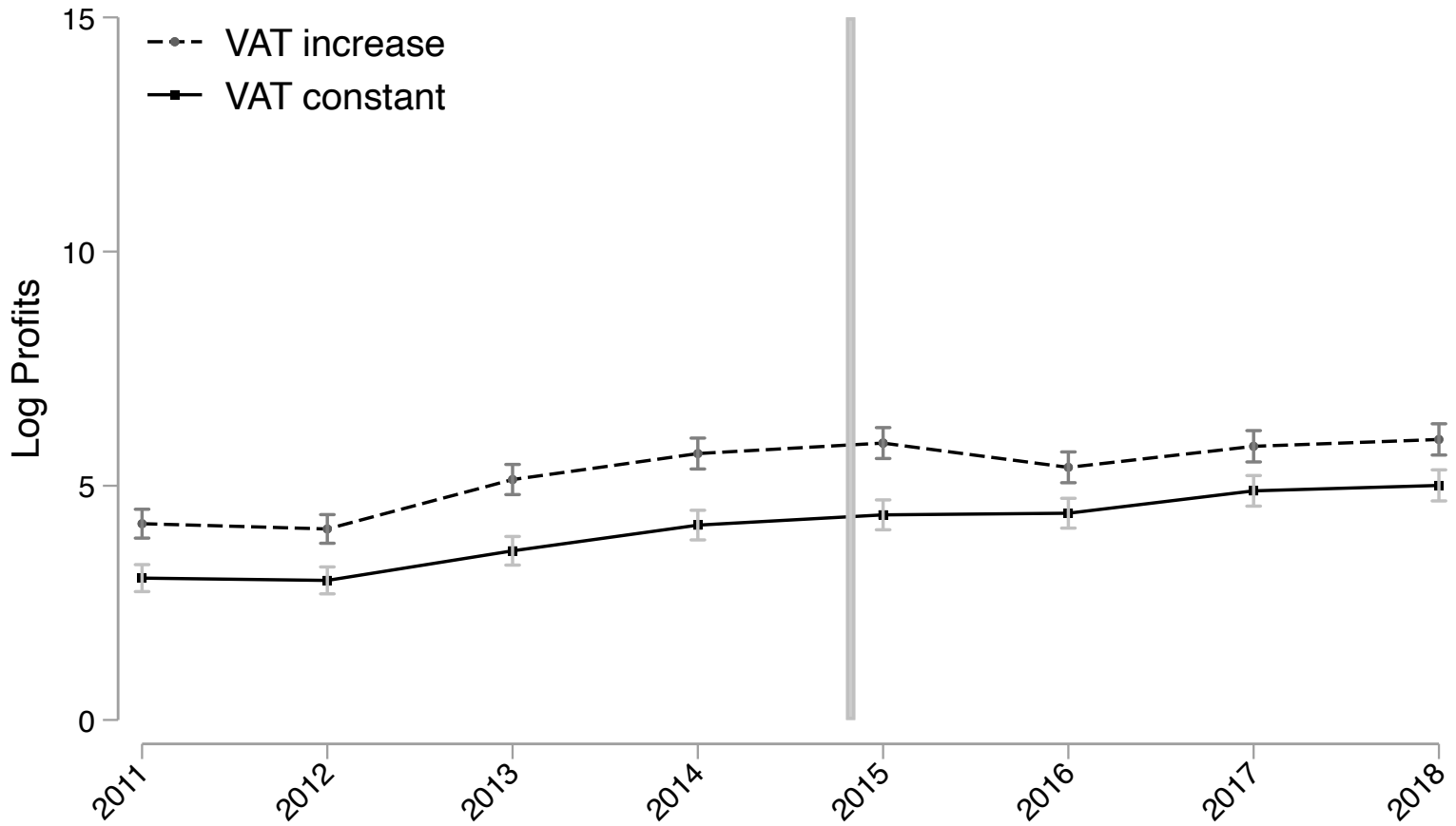
	VAT Constant Islands				VAT Increase Islands			
	Gross Revenues	Taxable Profits	Losses	CIT	Gross Revenues	Taxable Profits	Losses	CIT
Mean	971,780	74,441	114,697	21,588	1,726,187	166,564	182,837	48,213
Median	192,022	0	0	0	370,420	3,189	0	924
Sample	1,042	1,042	1,042	1,042	1,152	1,152	1,152	1,152

Corporate Activity

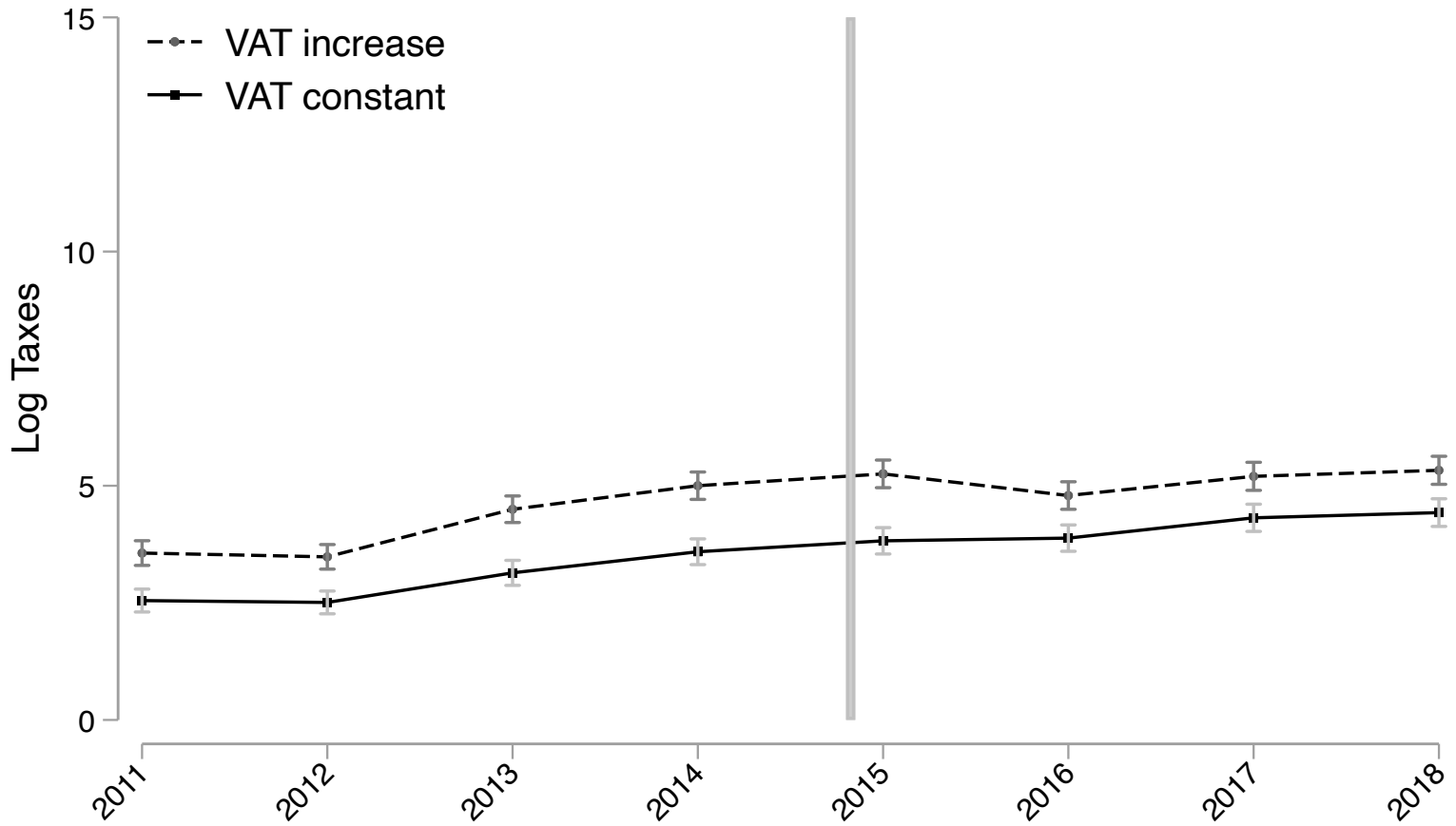


Inverse Relationship of VAT to (a) Corporate Profits and (b) CIT

Unconditional Differences in Profits



Unconditional Differences in CIT



Specification

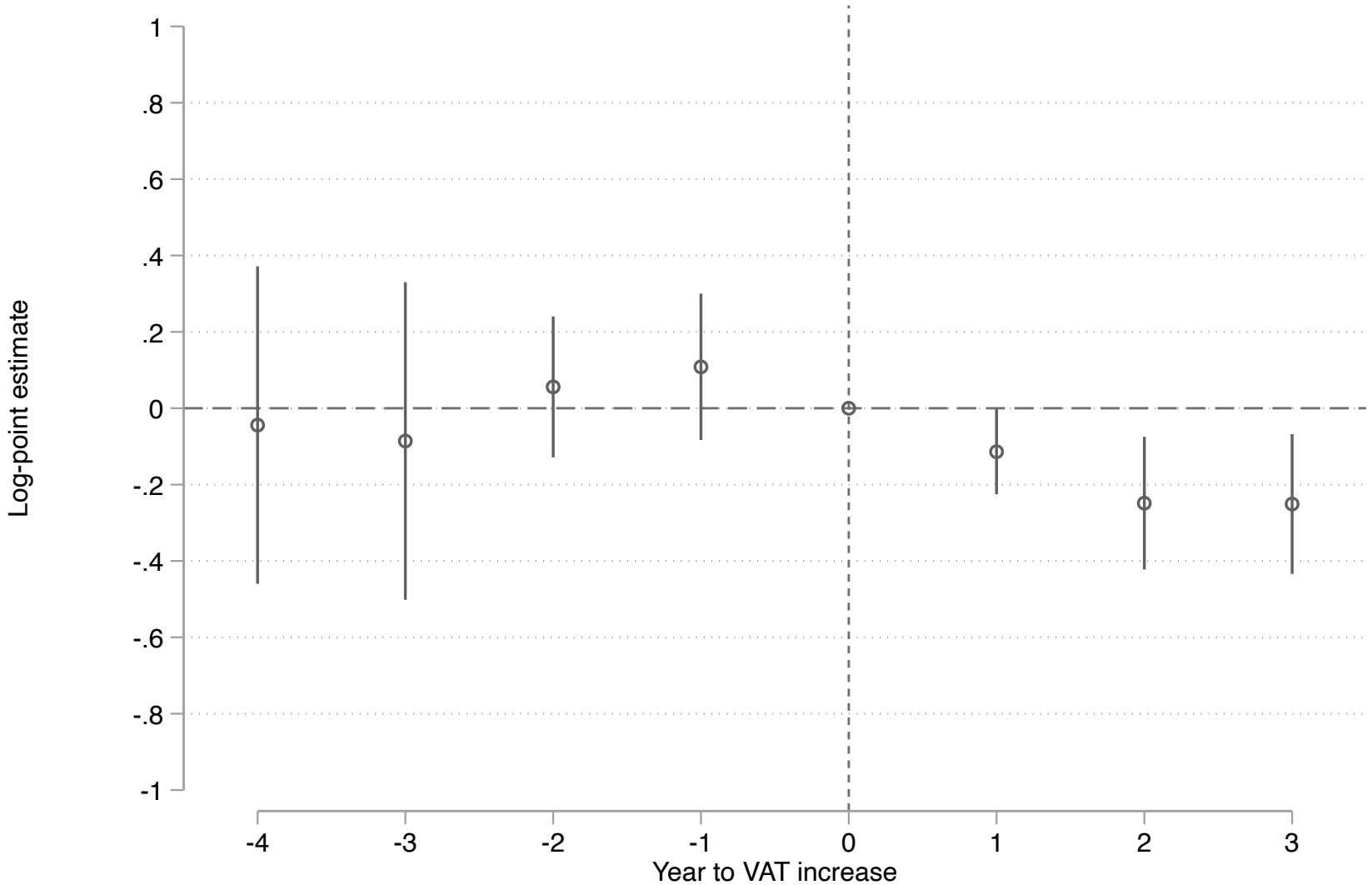
Investigate responses by comparing before and after VAT change:

- Corporations located in islands of VAT change (treatment)
- Corporations located in islands with no VAT change (control)

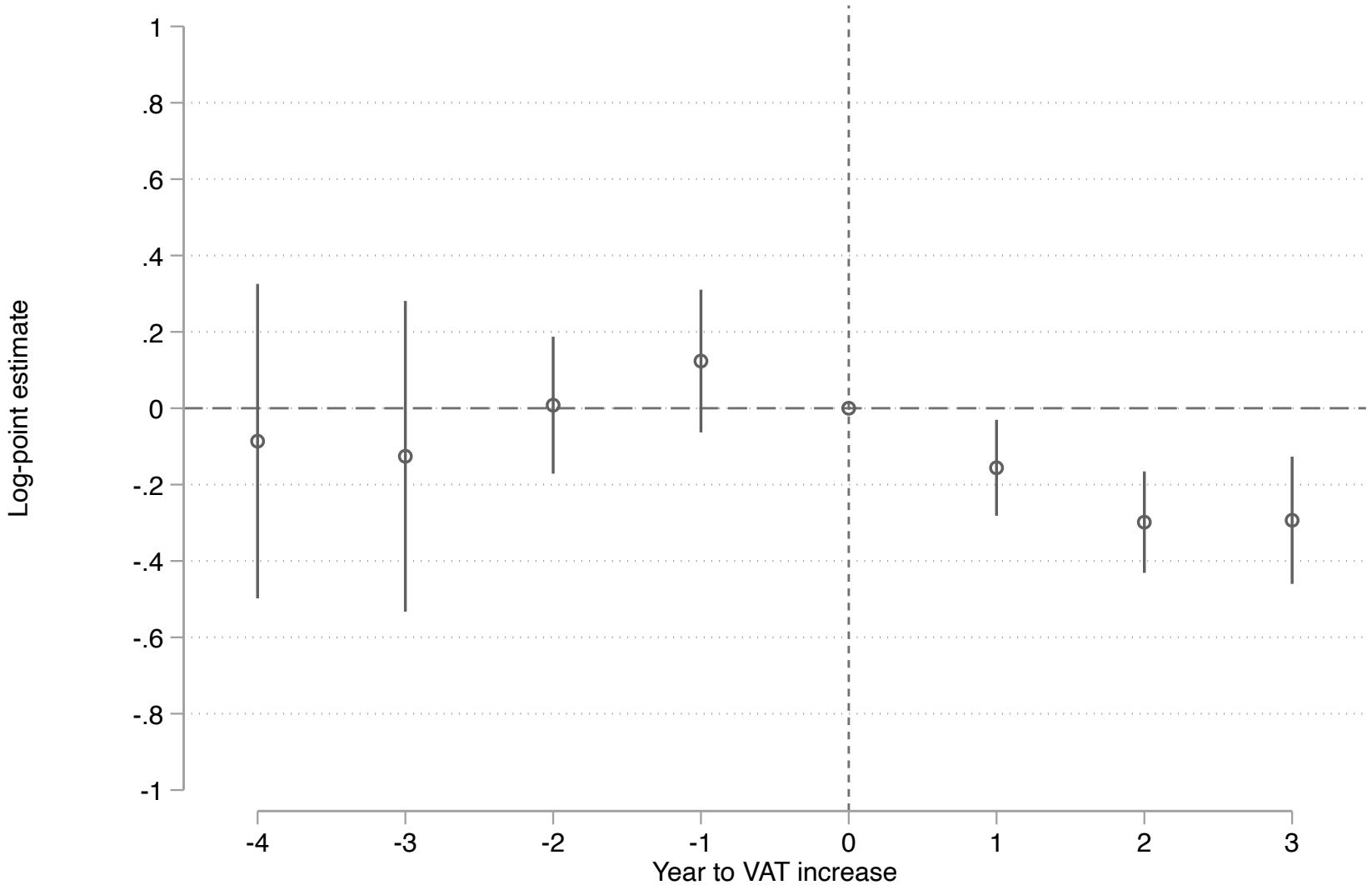
Specification:

$$\underbrace{Y_{i,z,t}}_{\text{Outcome variable}} = \alpha + \overbrace{\beta Post_t \times VAT_{i,z}}^{\text{VAT increase indicator}} + \underbrace{X_{i,t}}_{\substack{\text{Time-varying} \\ \text{corporate variables}}} + \overbrace{W_{z,t}}^{\substack{\text{Time-varying} \\ \text{island variables}}} + \delta_i + \lambda_z + \zeta_t + \epsilon_{i,z,t}$$

Profits (PPML with controls & FEs)

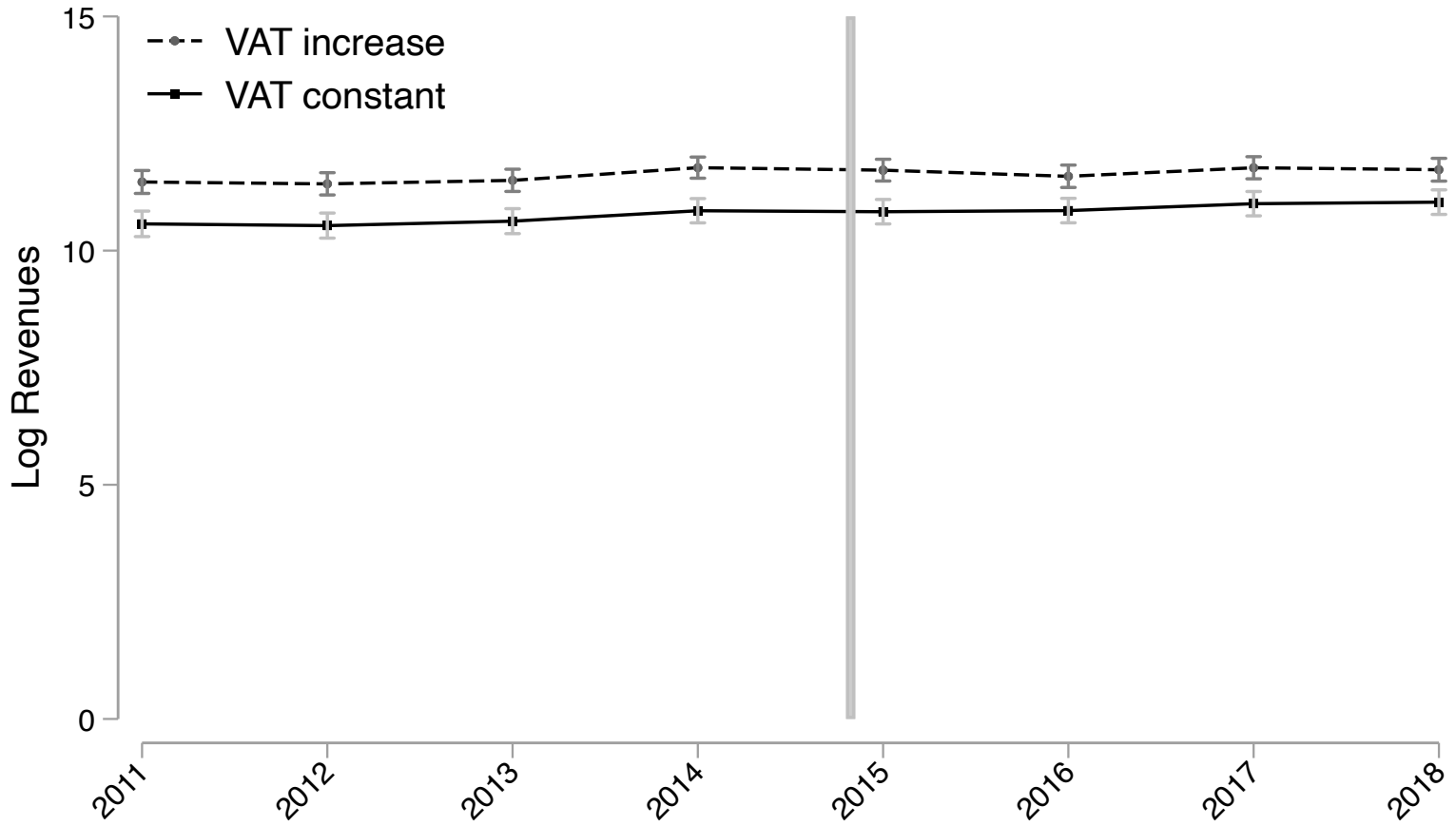


Corporate Income Taxes (PPML with controls & FEs)

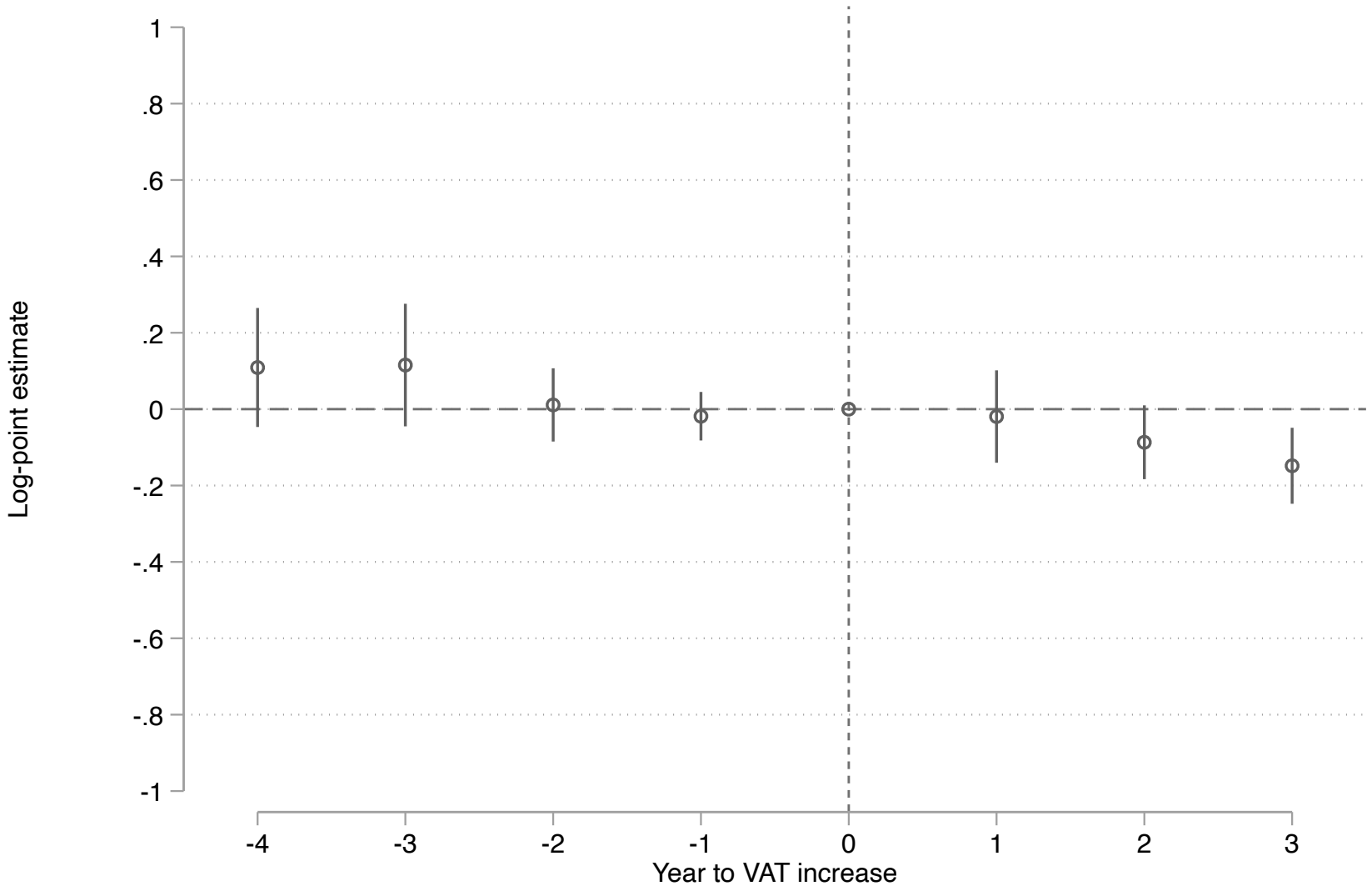


Corporate Responses in Revenues, Costs, Losses, Employment

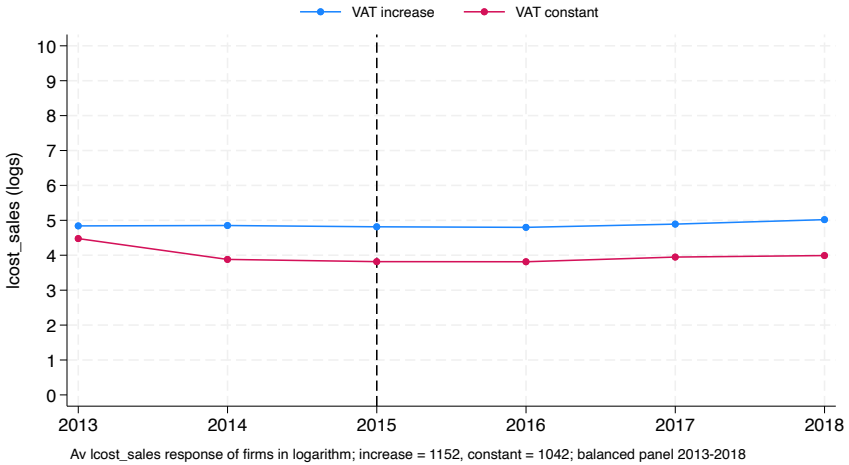
Unconditional Differences in Revenue



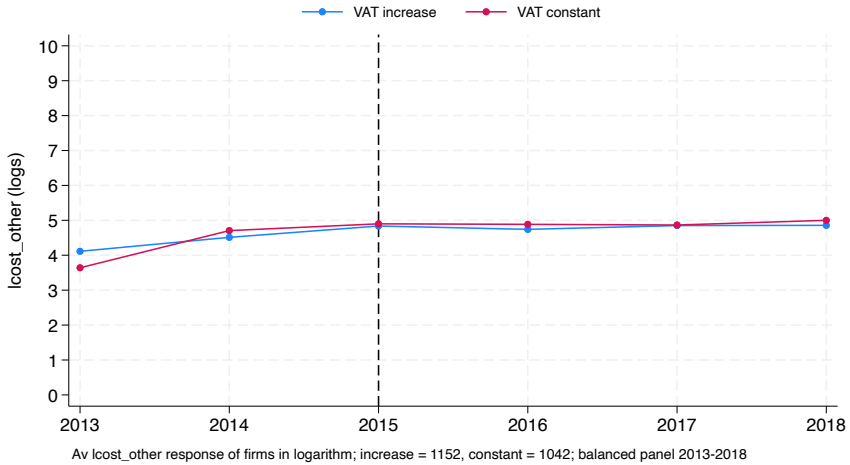
Revenues (PPML with controls & FEs)



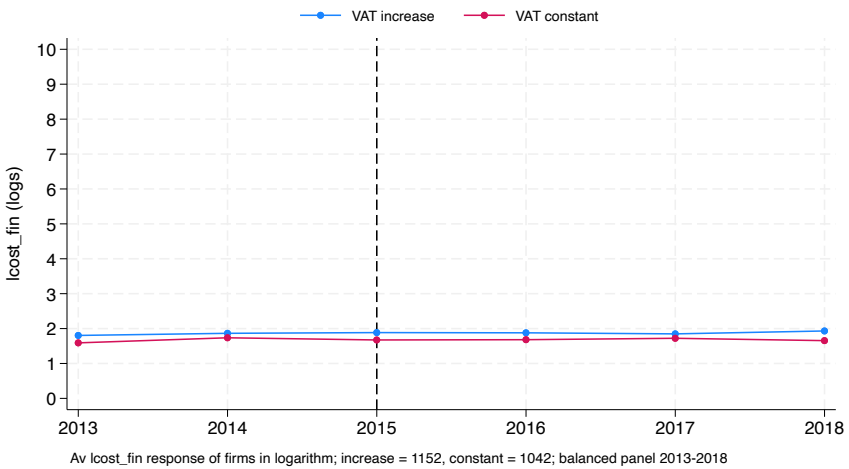
Unconditional Differences in Costs



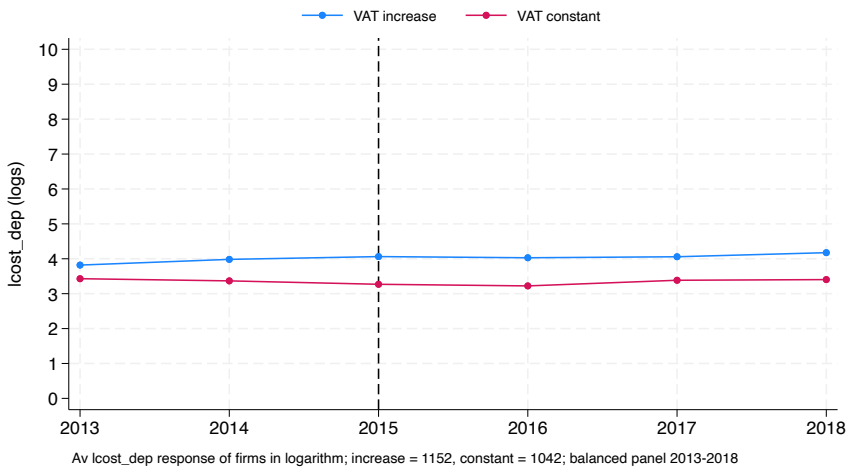
Av lcost_sales response of firms in logarithm; increase = 1152, constant = 1042; balanced panel 2013-2018



Av lcost_other response of firms in logarithm; increase = 1152, constant = 1042; balanced panel 2013-2018

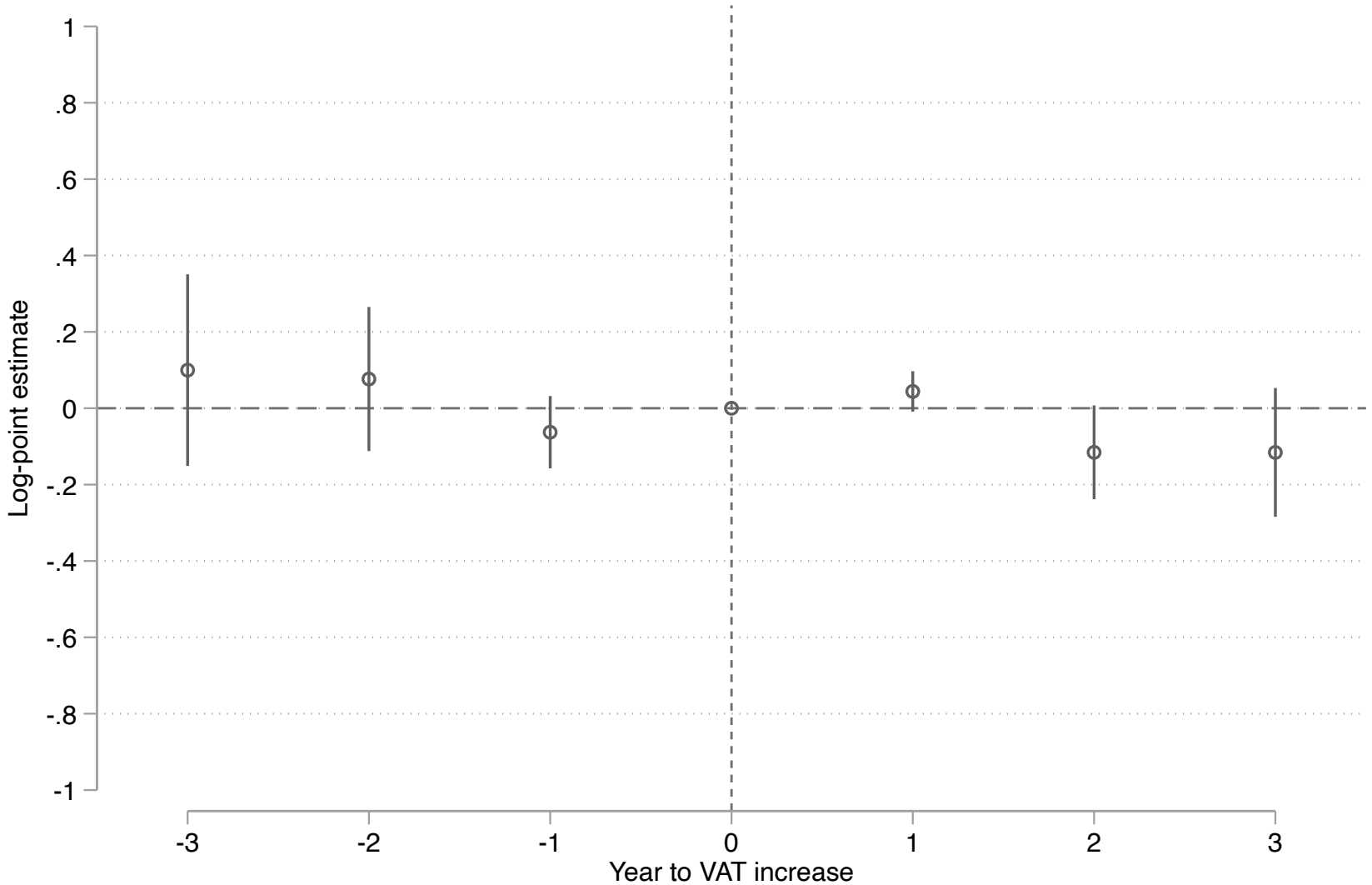


Av lcost_fin response of firms in logarithm; increase = 1152, constant = 1042; balanced panel 2013-2018

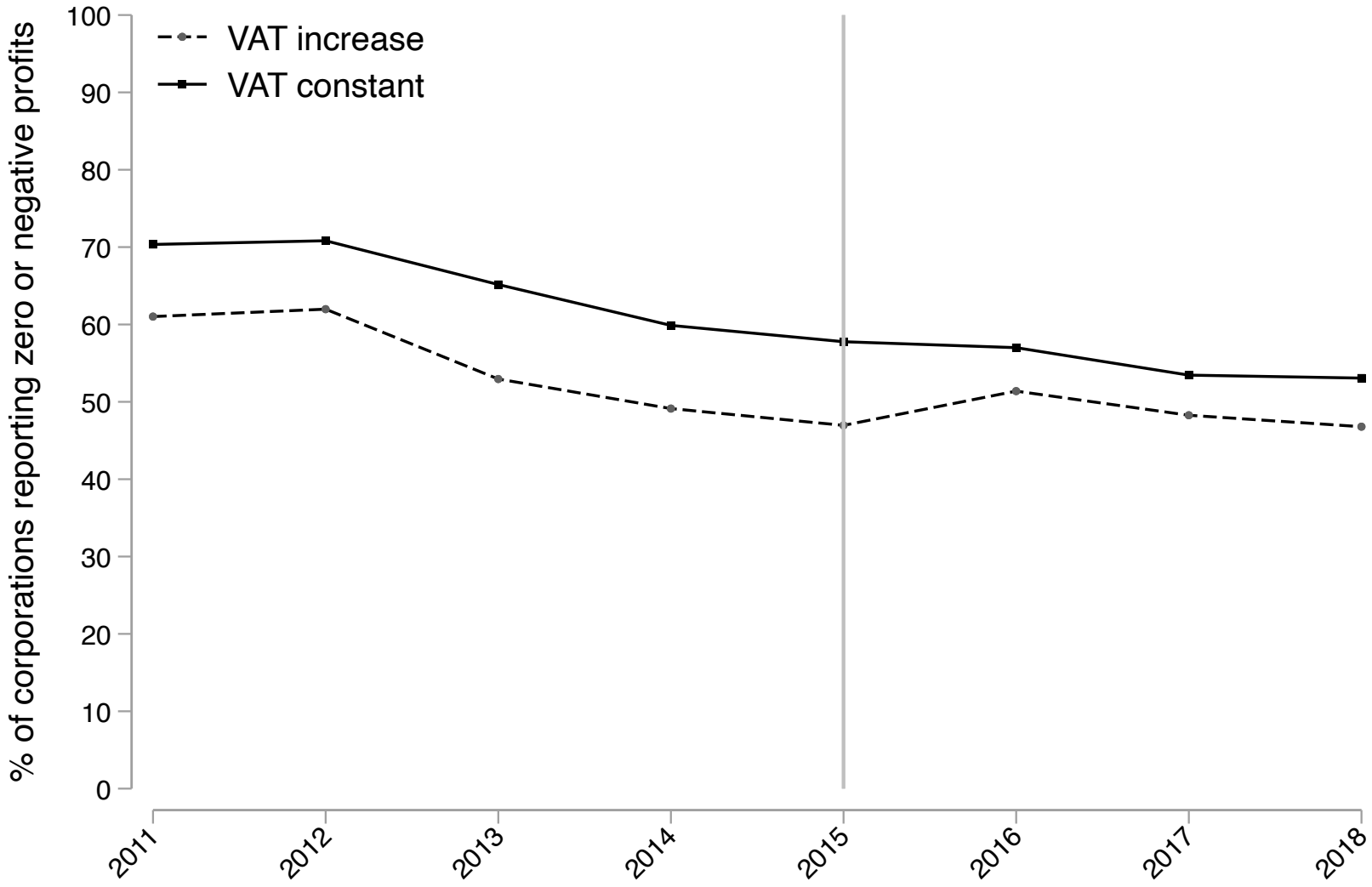


Av lcost_dep response of firms in logarithm; increase = 1152, constant = 1042; balanced panel 2013-2018

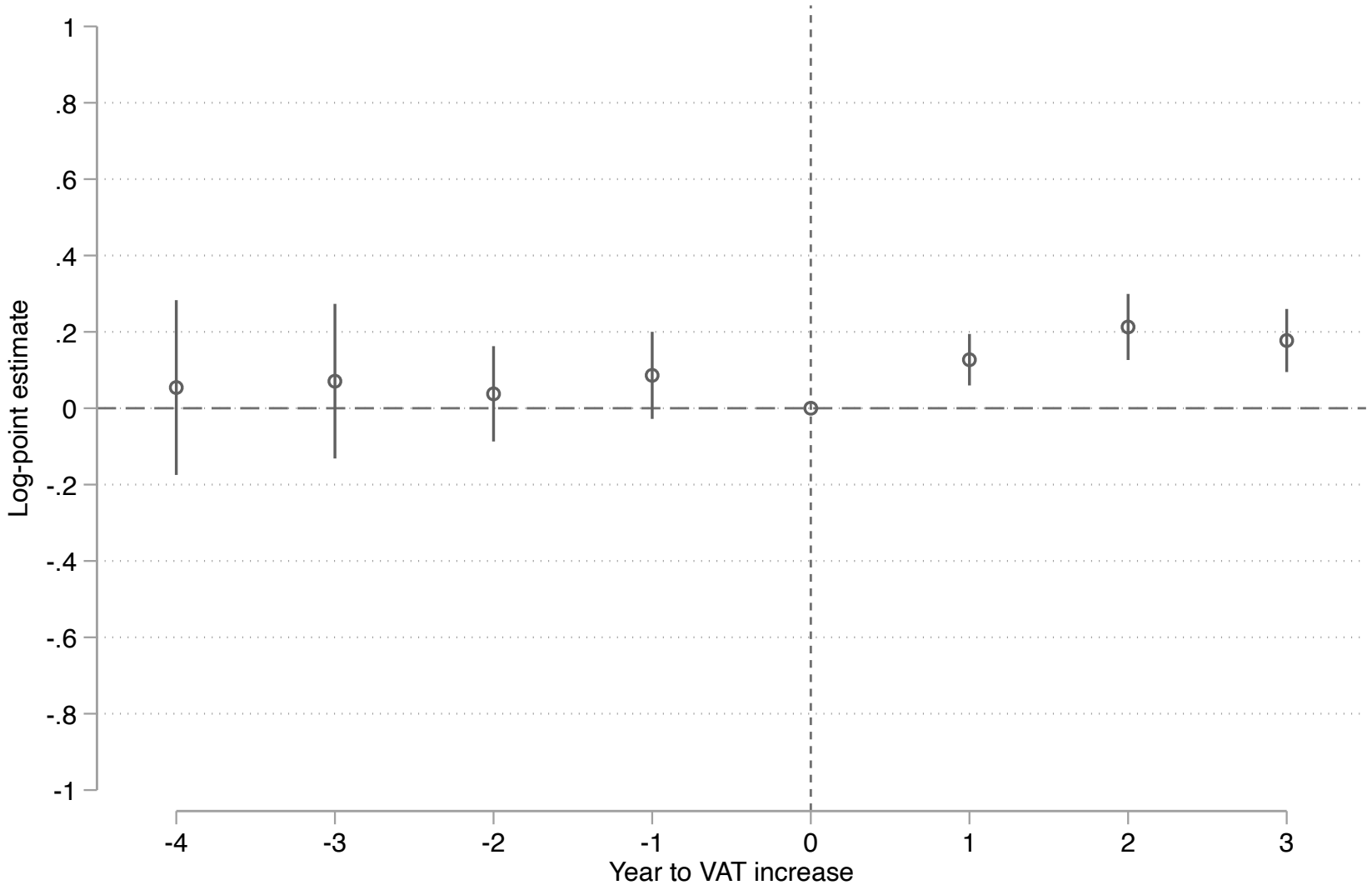
Costs (PPML with controls & FEs)



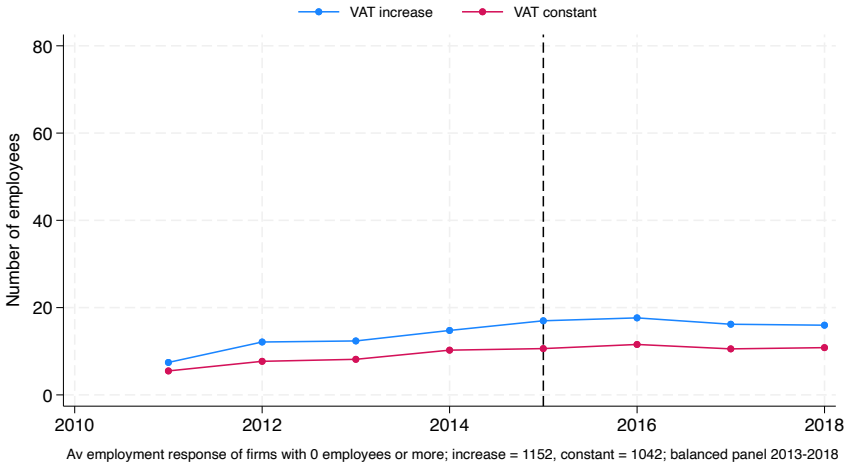
Zero or Negative Profits



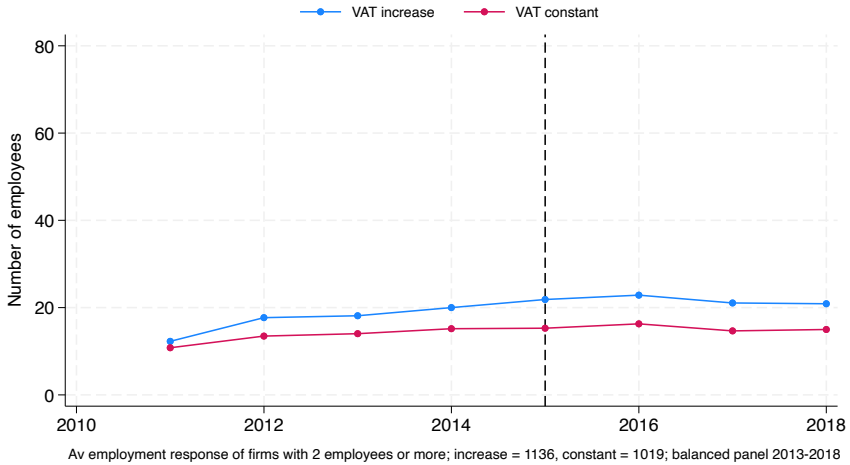
Losses (PPML with controls & FEs)



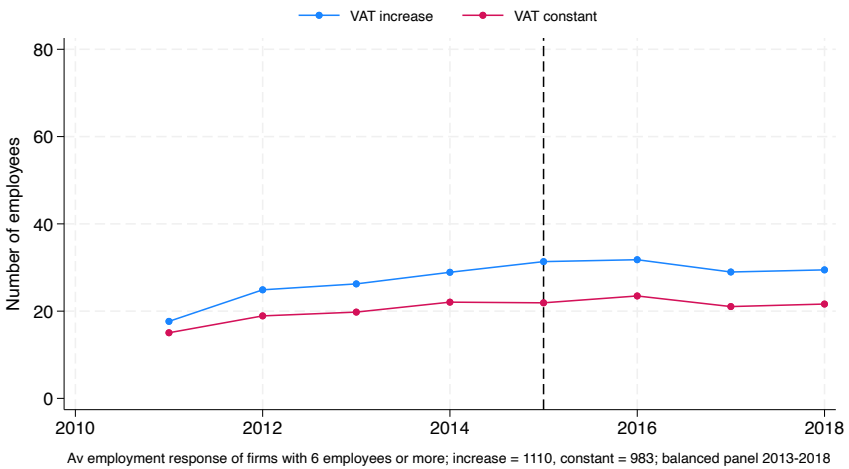
Unconditional Differences in Employment



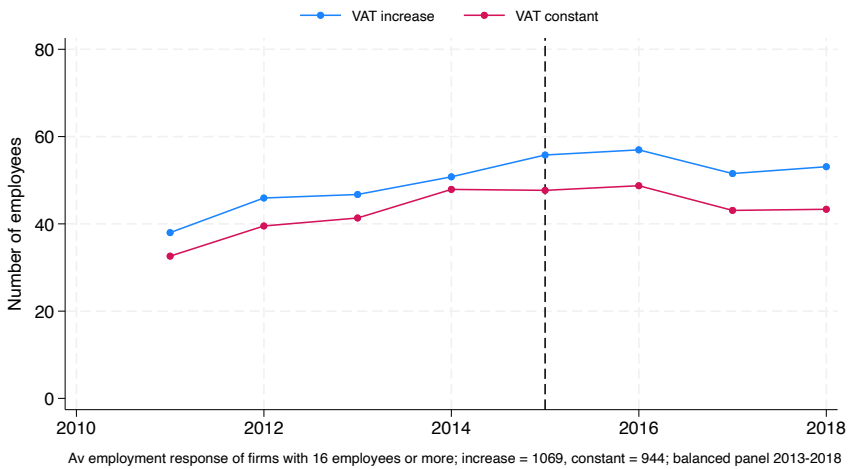
Av employment response of firms with 0 employees or more; increase = 1152, constant = 1042; balanced panel 2013-2018



Av employment response of firms with 2 employees or more; increase = 1136, constant = 1019; balanced panel 2013-2018



Av employment response of firms with 6 employees or more; increase = 1110, constant = 983; balanced panel 2013-2018



Av employment response of firms with 16 employees or more; increase = 1069, constant = 944; balanced panel 2013-2018

Event Study Results (PPML with Postcode-Firm & Year FEs)

	(1) CIT	(2) Revenues	(3) Costs	(4) Profits	(5) Losses
2011 × VAT ↑	-0.0863	0.1091		-0.0442	0.0542
	(0.2101)	(0.0795)		(0.2122)	(0.1168)
2012 × VAT ↑	-0.1258	0.1154	0.0998	-0.0859	0.0708
	(0.2076)	(0.0819)	(0.1280)	(0.2122)	(0.1033)
2013 × VAT ↑	0.0080	0.0111	0.0765	0.0558	0.0377
	(0.0915)	(0.0489)	(0.0963)	(0.0942)	(0.0637)
2014 × VAT ↑	0.1236	-0.0183	-0.0629	0.1083	0.0861
	(0.0954)	(0.0325)	(0.0483)	(0.0978)	(0.0582)
2016 × VAT ↑	-0.1560**	-0.0205	0.0440	-0.1139**	0.1271***
	(0.0642)	(0.0619)	(0.0270)	(0.0568)	(0.0344)
2017 × VAT ↑	-0.2983***	-0.0880*	-0.1155*	-0.2487***	0.2129***
	(0.0677)	(0.0485)	(0.0627)	(0.0886)	(0.0441)
2018 × VAT ↑	-0.2934***	-0.1494***	-0.1158	-0.2508***	0.1774***
	(0.0850)	(0.0503)	(0.0861)	(0.0933)	(0.0421)
Log cash	0.0557***	0.0328***	0.0577***	0.0558***	-0.0140***
	(0.0059)	(0.0097)	(0.0078)	(0.0058)	(0.0035)
Log dividends	0.0395***	0.0010	-0.0049	0.0389***	-0.2233***
	(0.0067)	(0.0013)	(0.0097)	(0.0066)	(0.0528)
Log net fixed assets	0.0075	0.1625***	0.1297	0.0126	-0.0061
	(0.0382)	(0.0294)	(0.0955)	(0.0396)	(0.0071)
Log accommodation nights	0.7148*	0.9136***	0.7597**	0.7009	-0.6373***
	(0.3955)	(0.2676)	(0.3778)	(0.4740)	(0.2047)
Annual hotel capacity	-0.0156**	-0.0119***	-0.0041	-0.0149*	0.0101***
	(0.0069)	(0.0035)	(0.0052)	(0.0083)	(0.0030)
Corporate t-varying controls	Yes	Yes	Yes	Yes	Yes
Island t-varying controls	Yes	Yes	Yes	Yes	Yes
Postcode FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Number of Observations	12798	12798	2213	12798	12798
Number of Postcodes	46	46	36	46	46
Ps. R-squared	0.90	0.97	0.97	0.88	0.51

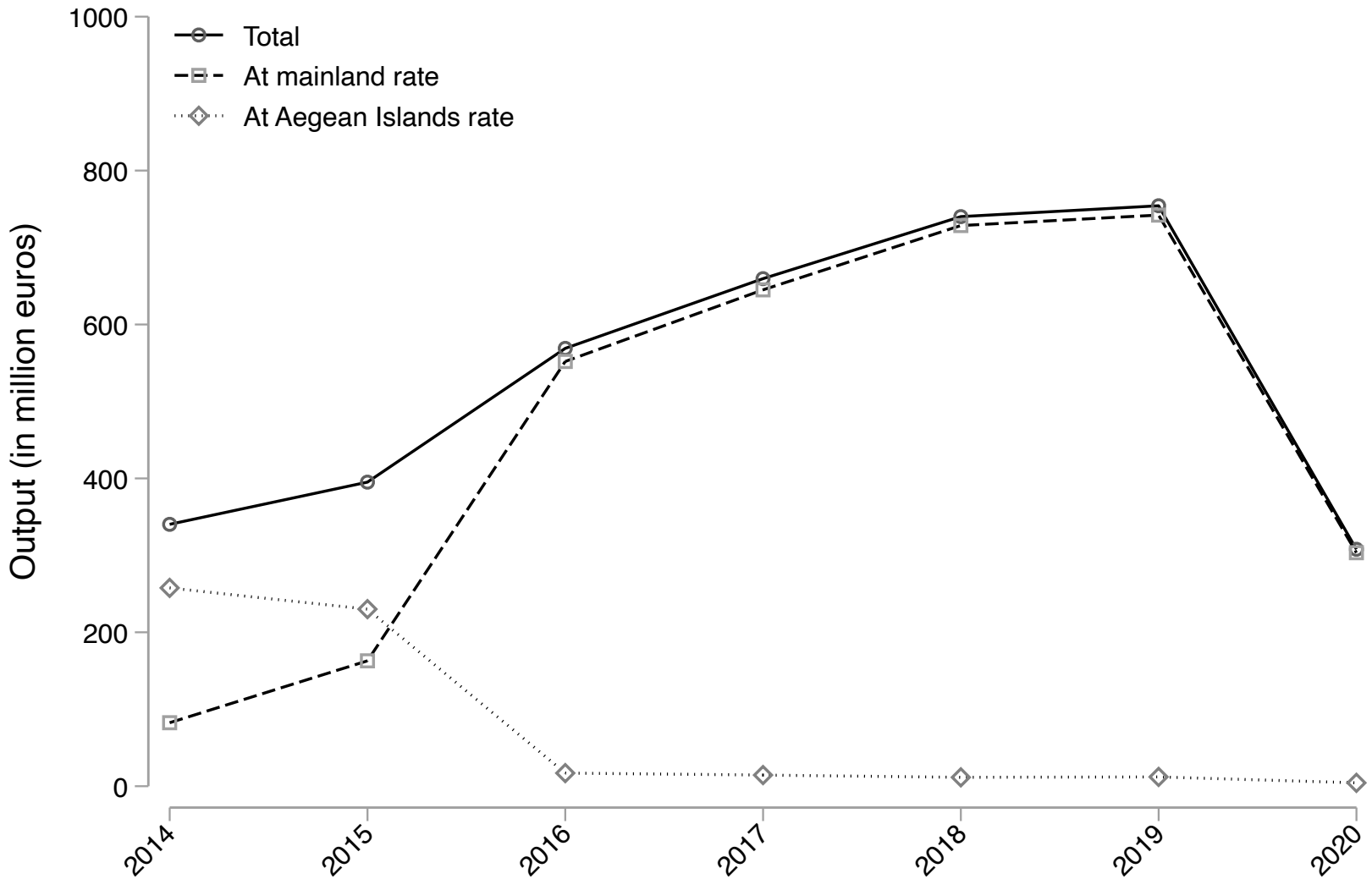
VAT Returns

VAT Returns Breakdown

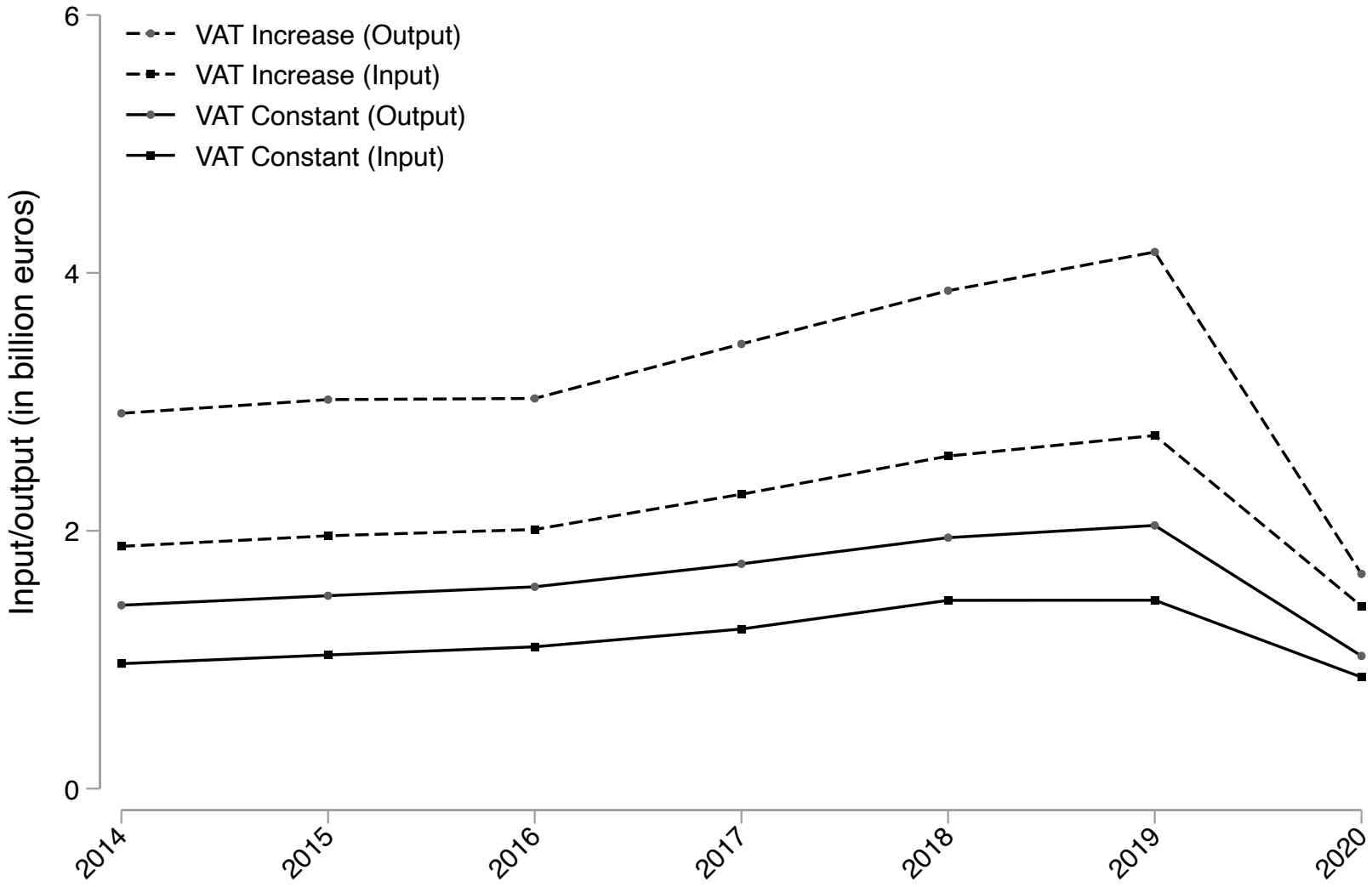
B. TABLE OF OUTPUTS – INPUTS after the reduction (according to the VAT rates) of refu

a	Taxable OUTPUTS (supply of goods or services, etc) INTRA-COMMUNITY ACQUISITIONS AND REVERSE CHARGE TRANSACTIONS that mechanismis applied.			VAT Rate %	VAT AMOUNT OF OUTPUTS DUE	
I. OUTPUTS, INTRA- COMMUNITY ACQUISITIONS & REVERSE CHARGE TRANSACTIONS in Greece apart from the Aegean Islands		301		13	331	
		302		6	332	
		303		24	333	
II. OUTPUTS, INTRA-COMMUNITY ACQUISITIONS & REVERSE CHARGE TRANSACTIONS in the Aegean Islands and from the rest of Greece towards the Aegean Islands		304		9	334	
		305		4	335	
		306		17	336	
TOTAL TAXABLE OUTPUTS		307		TOTAL VAT	337	

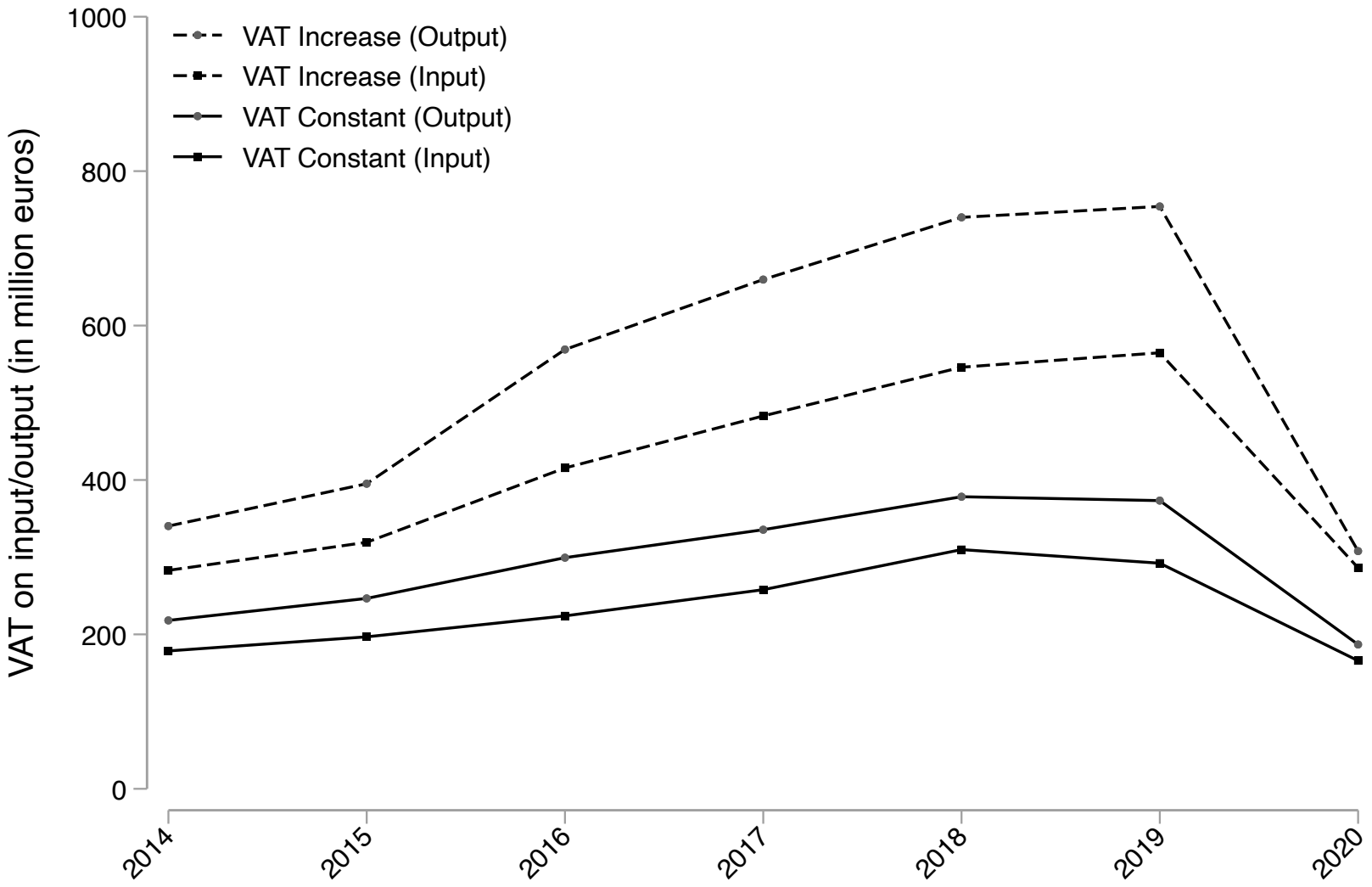
Responses in VAT Returns (Treatment Group)



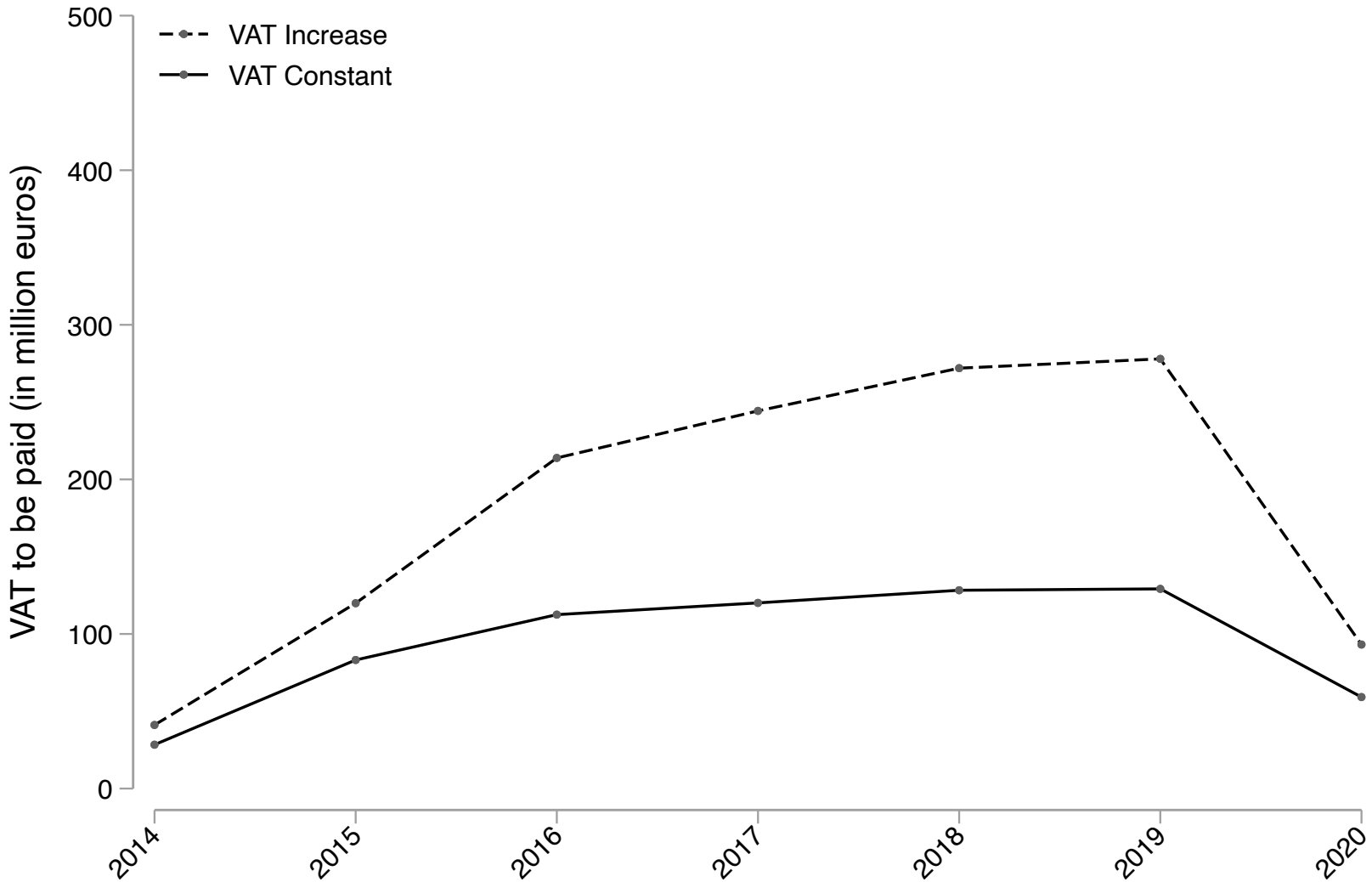
Input and Output



VAT on Input and Output



VAT Paid (VAT on Input minus VAT on Output)



Corporations in treatment islands faced an increase in VAT payments

Implications

Economic effects

1. VAT liability increases and more firms declare non-positive profits (extensive margin) and less profits (intensive margin)

2. Overall, corporations decrease profits and CIT in response to a VAT increase

3. One explanation is demand changes: VAT affects prices and so firm markups (price/cost) can change

4. Another explanation is evasion: No change in costs/employment and small change in revenue might signal tax evasion (Note: this is a weak enforcement environment!)

   Economic implication: We should account for corporate responses to VAT changes since VAT appears not to be immune to imperfections.

Fiscal effects

Elasticity of CIT with respect to VAT is large and negative

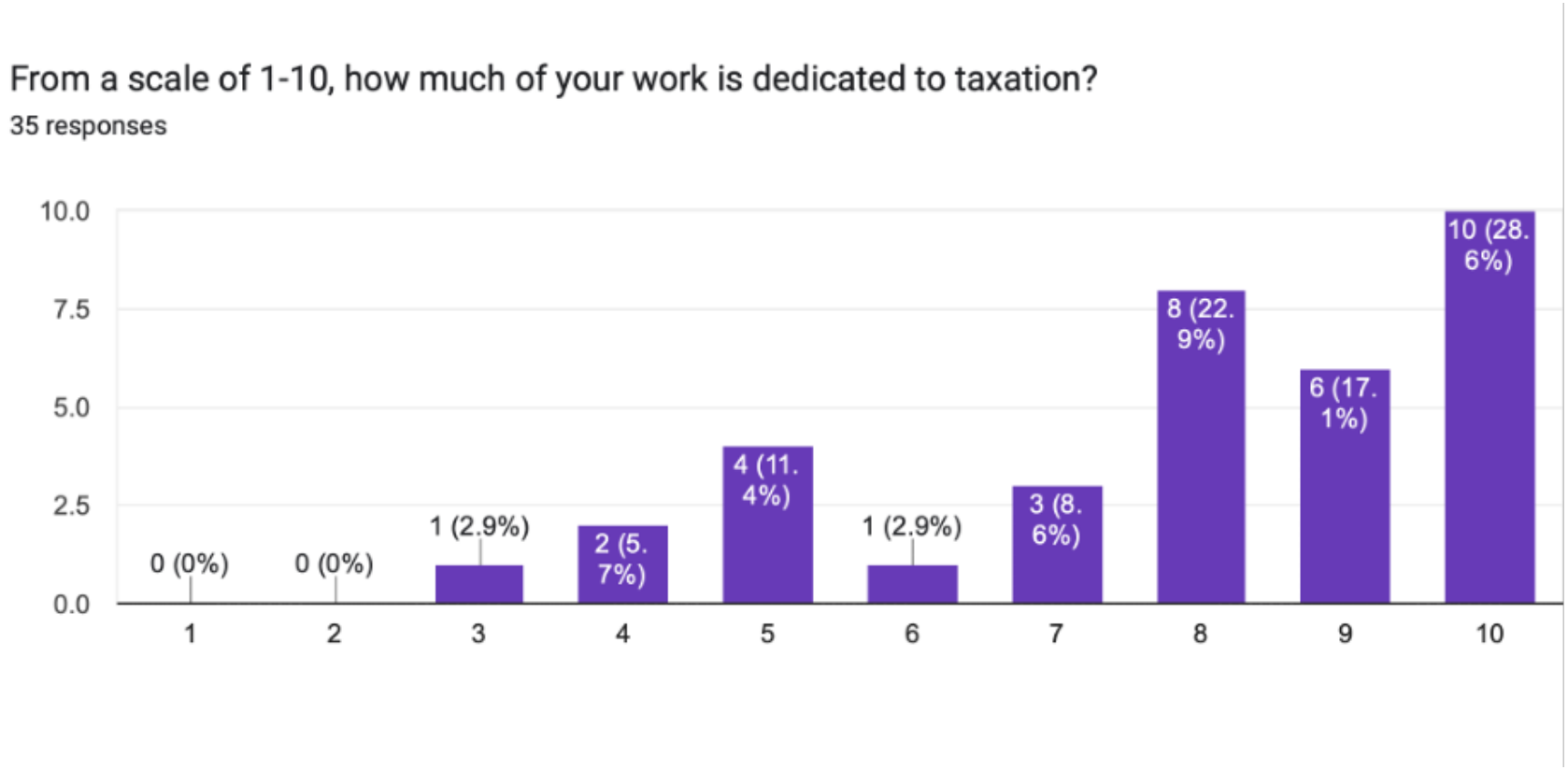
Inverse relationship between VAT rates and Corporate Income Taxes

Weak enforcement environment might facilitate this

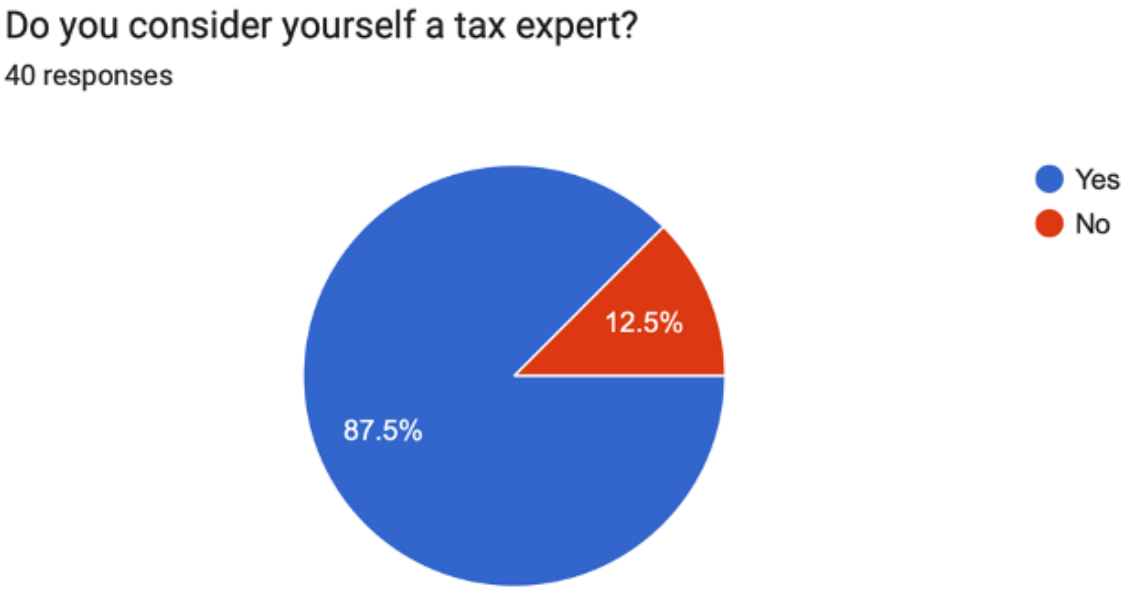
Fiscal implication: Governments need to account for elasticity of CIT with respect to VAT, especially in weak enforcement

Expert Survey

Mostly well-regarded academics/policy-makers



Mostly tax experts

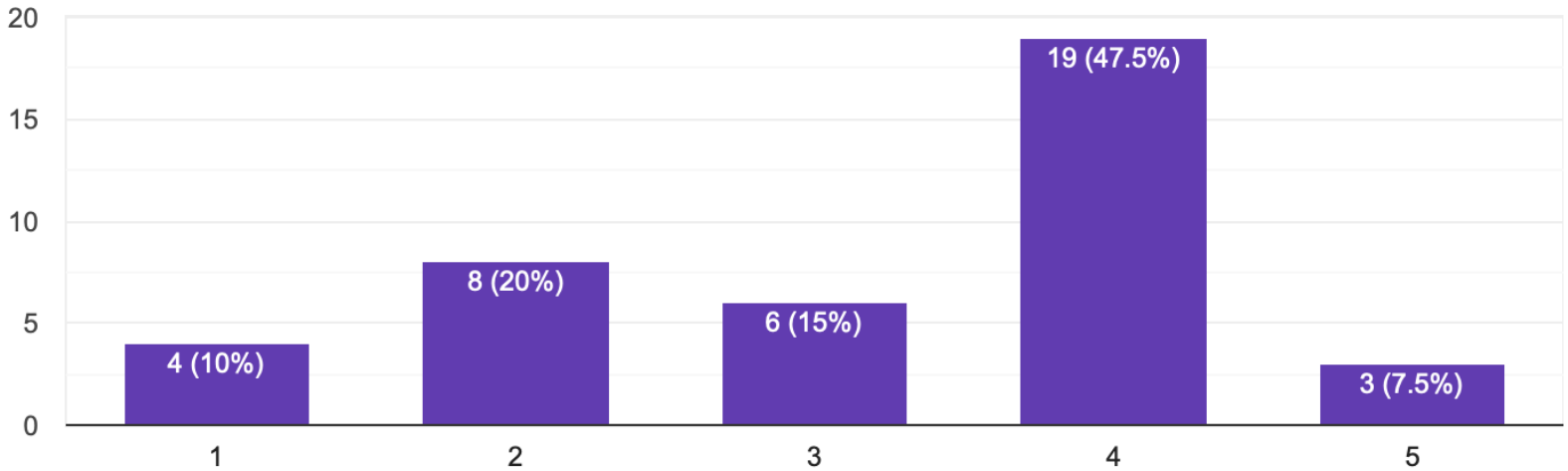


VAT considered efficient

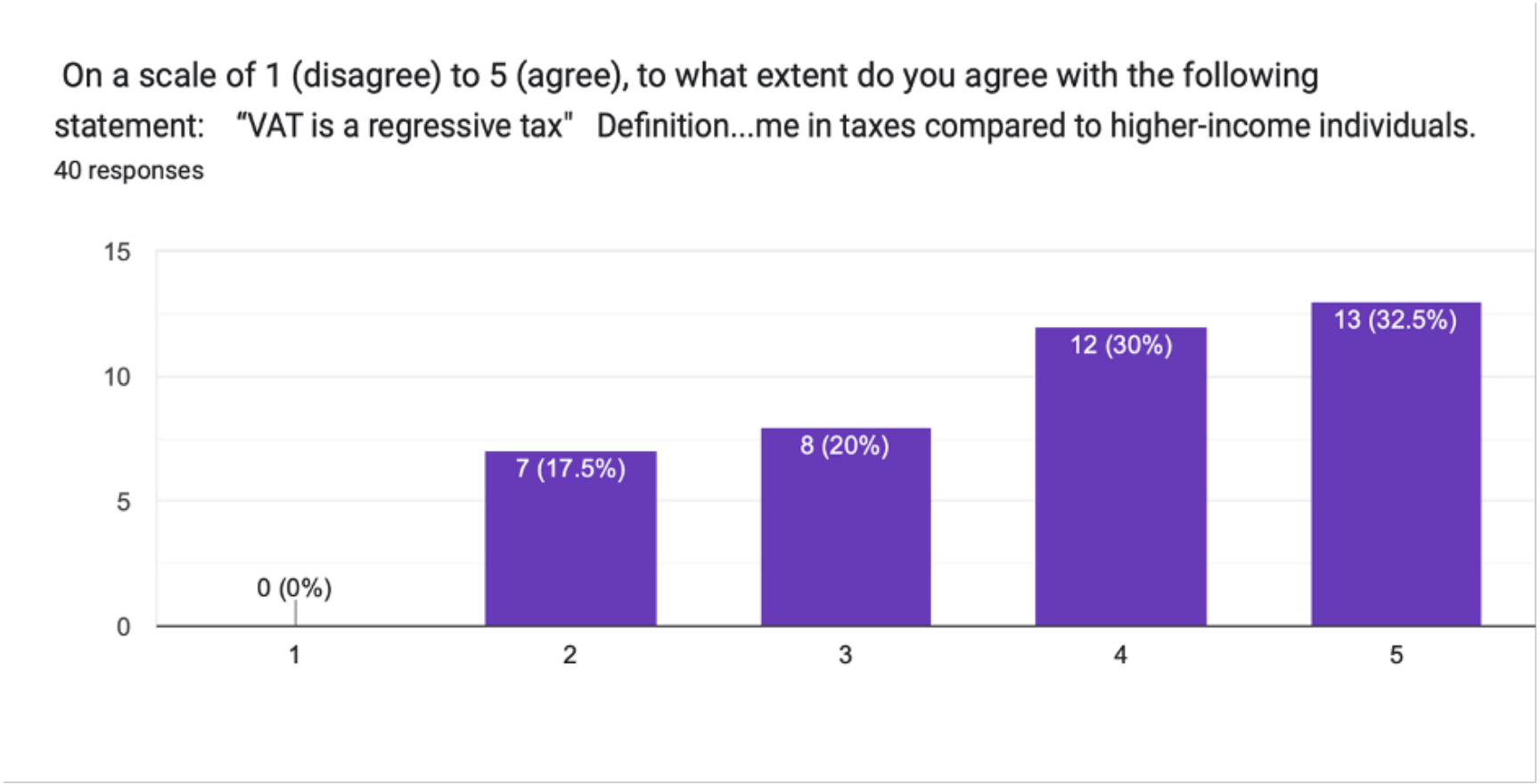
"**VAT is an efficient tax**: It generates tax revenue for the government without affecting negatively economics activity"

Definition note: An efficient tax in this case means minimizing distortions and maximizing the net benefit to society while raising necessary revenue

40 responses



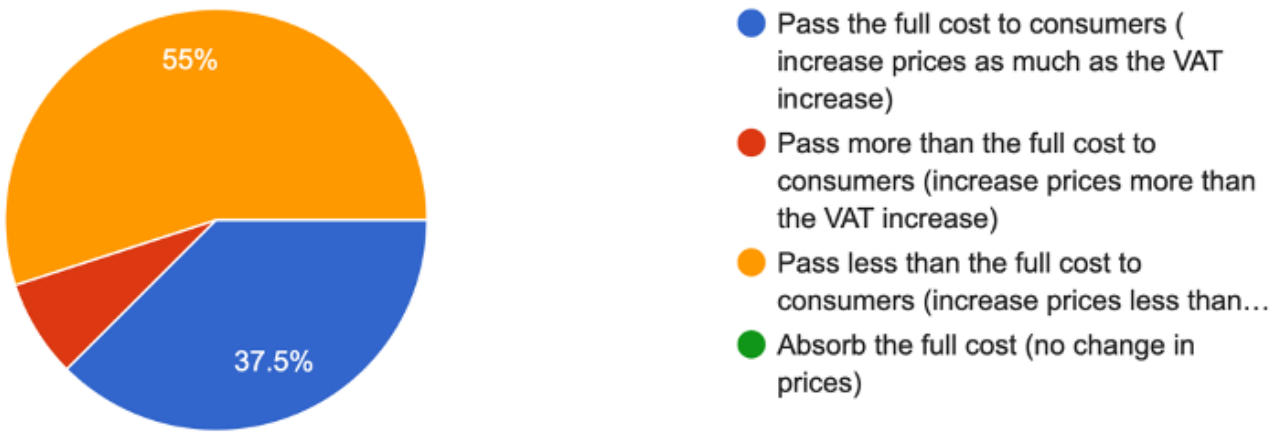
VAT considered regressive



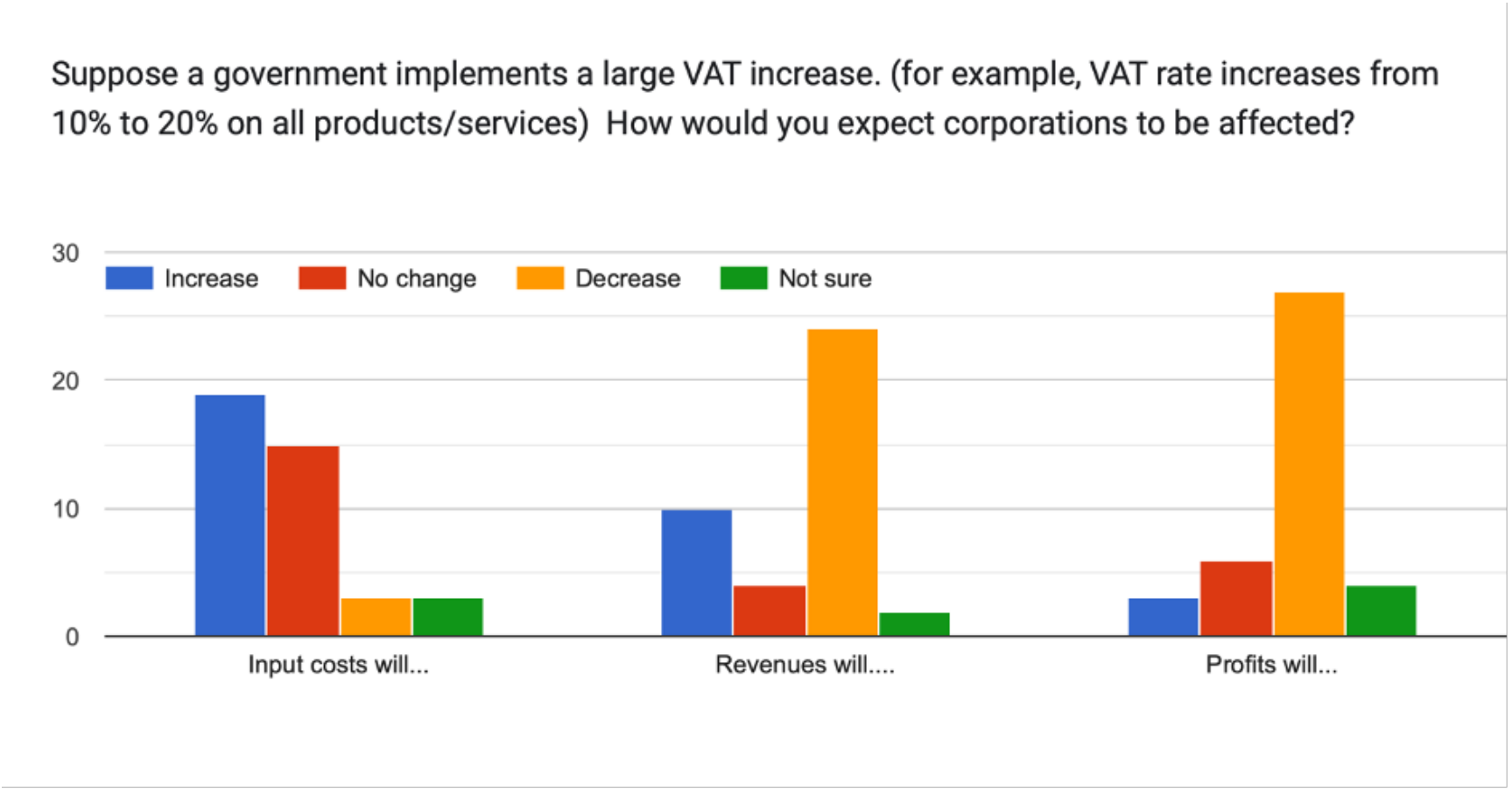
Pass-through expected when VAT increases

Suppose a government implements a large VAT increase. (for example, VAT increases from 10% to 20% on all products/services) Corporations will...

40 responses

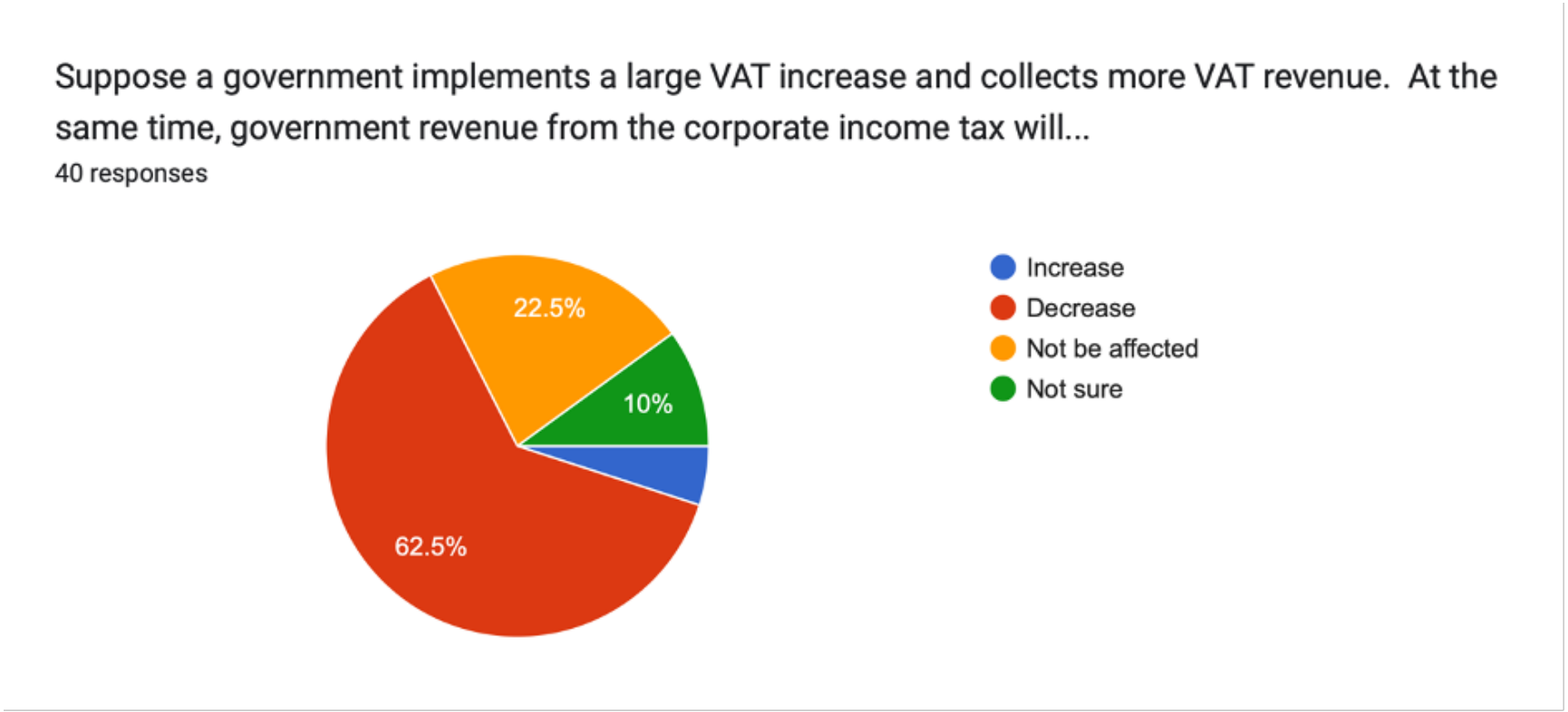


Firms expected to respond when VAT increases



Most mention **lower demand** due to price increase, as a reason for lower profits

CIT revenue expected to fall when VAT increases



Note that neither economic policy nor academic literature has accounted for cross-CIT effect of VAT despite expert expectation (!)

Survey results

1. VAT considered efficient by the majority
2. Full or some pass-through expected to consumers
3. Unsure what happens to input costs
4. Majority expects Revenue & Profits & CIT to fall, as shown in our results
5. They explain through demand effects. No mention of tax evasion.

Conclusion

Conclusion

We exploit a place-based VAT reform to show that a VAT ↑ can lead to:

(i) Decrease in declared profits

(ii) Negative cross-elasticity effect in CIT

Survey results show that **expert economic thinking aligns with our findings**.

Yet, experts explain lower profits and CIT through lower demand. **The tax evasion channel is not mentioned**.

Important economic and fiscal implications: Inverse relationship of VAT to CIT affects government revenue, especially in weak enforcement.

In general, we lack a theoretical framework to think of VAT optimality under market imperfections, tax evasion, production inefficiencies, asymmetric pass-through: recent evidence shows that these effects are empirically present.