

Large shocks, production networks and state-dependent pricing

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Discussion by Sasha Talavera

Overall impressions

- I enjoyed reading this work
- I learnt a lot

- Let me give a few suggestions based on the current content.

The paper is about

- This paper examines the propagation of large shocks in a production economy interconnected through input-output linkages.
- A non-linear model where firms change prices optimally in a state-dependent fashion
- This paper quantifies the dynamics of both large aggregate and sector-specific shocks

Main Findings

- When there is a large monetary shock, networks dampen the price response.
- While networks amplify the price adjustment when it comes to large TFP shocks.
- Significant variation in the response across sectors to monetary/TFP shocks.

Comments (as an empirical person)

- Symmetry of responses to TFP/M shocks
- Sectoral evidence: more explanations
- Micro-evidence: VAT (TFP Shock) and Announcements (M shocks)

Symmetrical response of repricing frequency

Figure 4: Frequencies

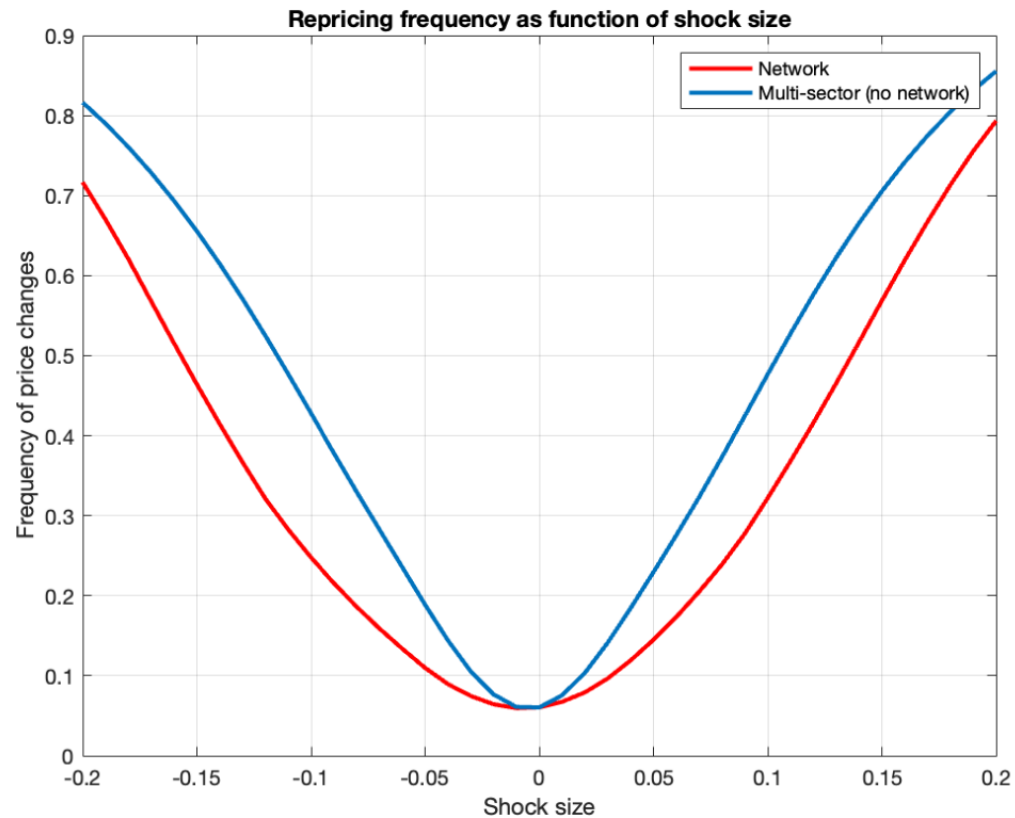
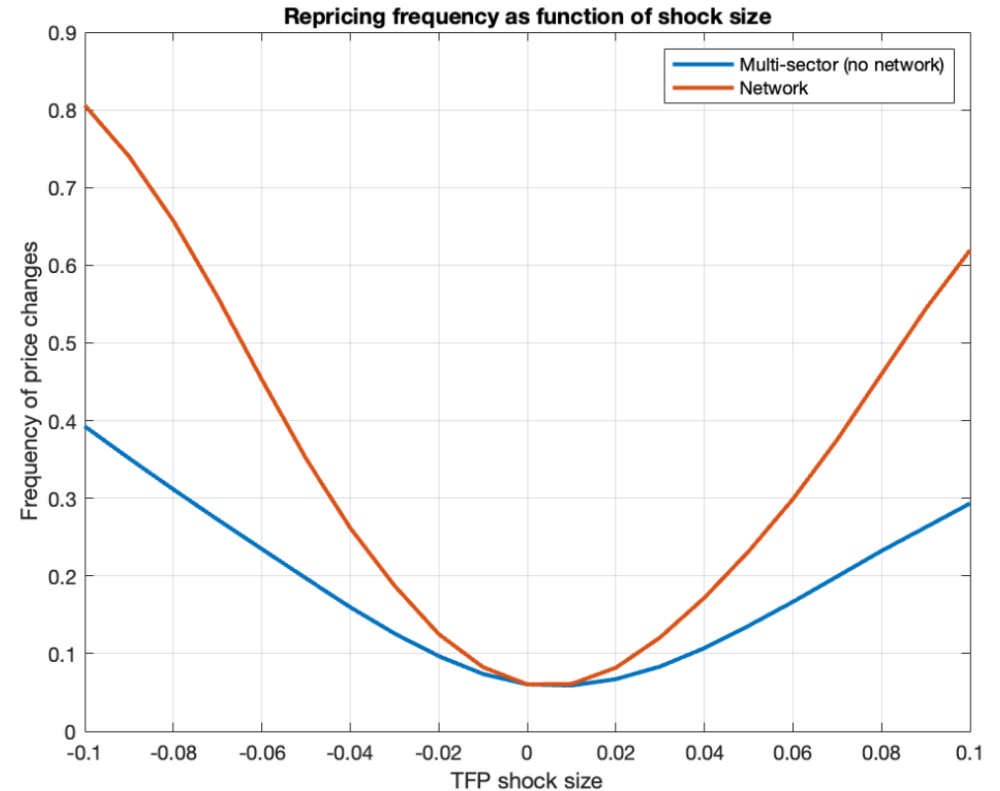


Figure 11: Aggregate frequency responses to aggregate TFP shocks



The symmetrical figures illustrate that the levels of price increases and decreases are almost equal.

Symmetrical response of repricing frequency

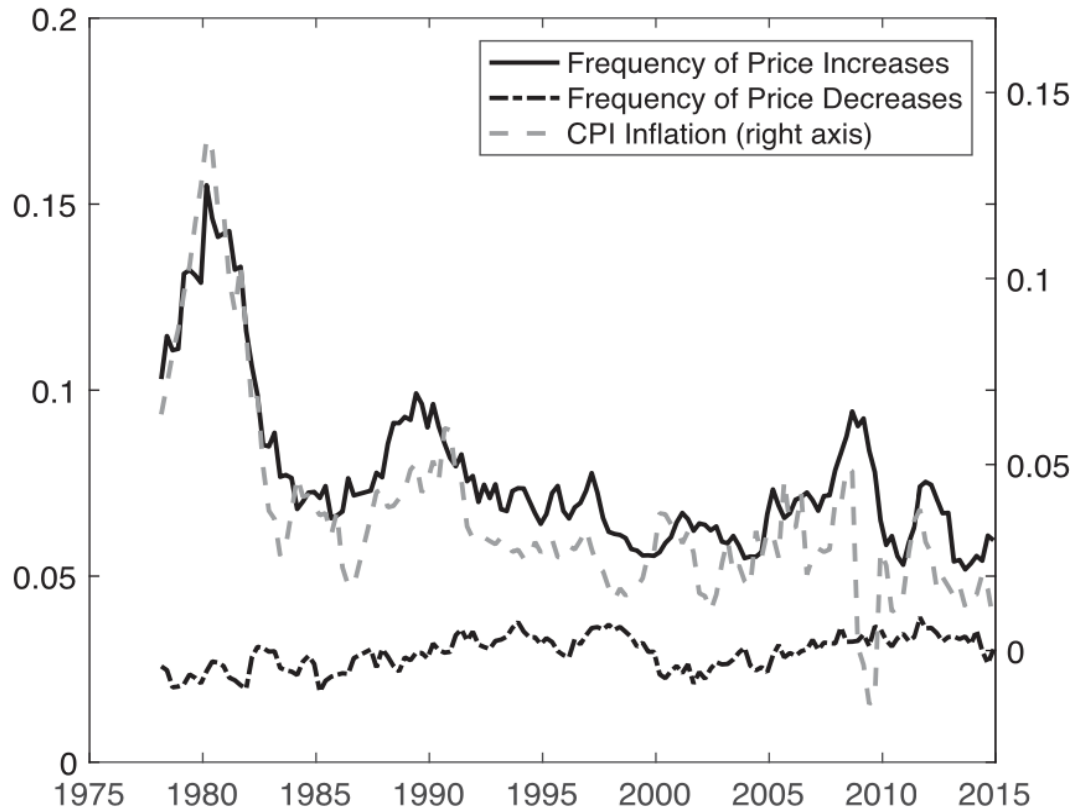


FIGURE XV

Frequency of Price Increases and Decreases

Nakamura et al. (2018) use US microdata to examine the frequency of price changes to monetary shocks.

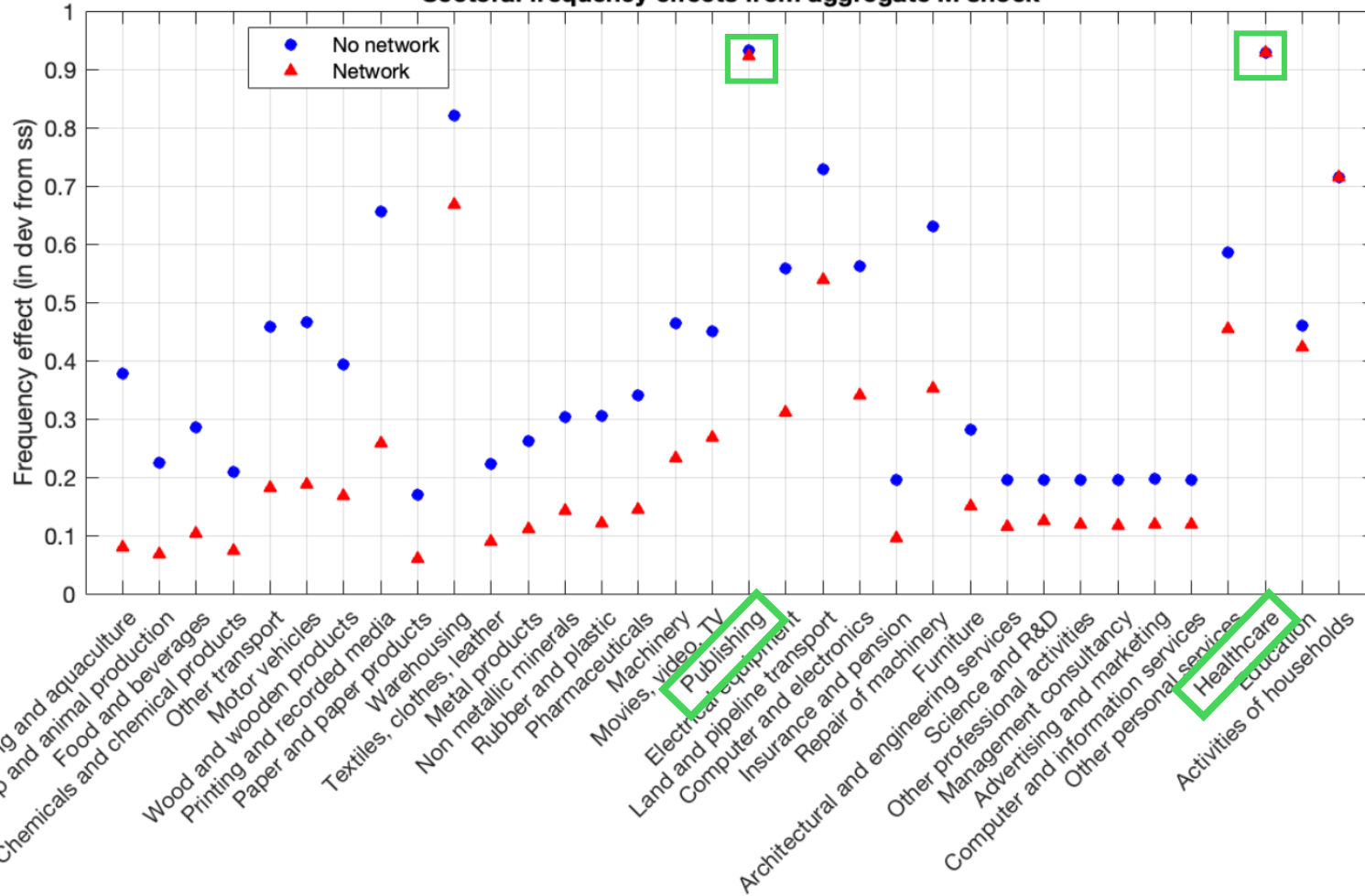
- frequency of price increases is much higher than the frequency of price decreases.
- more variations are found in the frequency of price increases.

Similar patterns of price change frequency are observed in Latvia (Benkovskis, 2014).

→ the negative shocks are more likely to have smaller effects on the frequency of price changes

Sectoral response: outliers

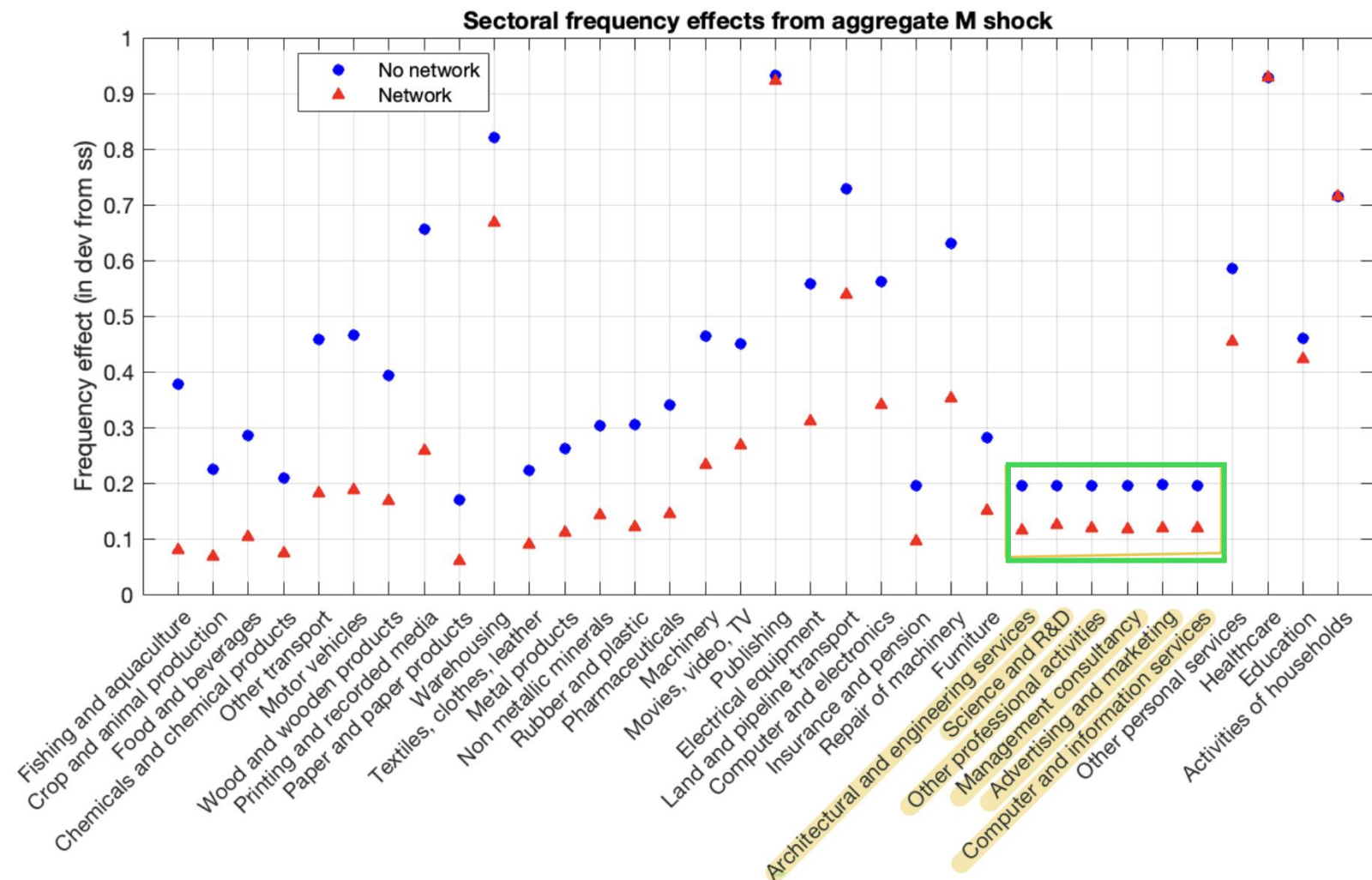
Sectoral frequency effects from aggregate M shock



Sectors Publishing and Healthcare:

- No network effect on frequency from a monetary shock
- Why these sectors? Why no effects?

Sectoral response: similarities



The significant similarities across highlighted six sectors:

- Similar patterns in frequency/price effect from monetary/aggregate TFP shocks

Possible extensions: TFP shock and price setting

VAT changes

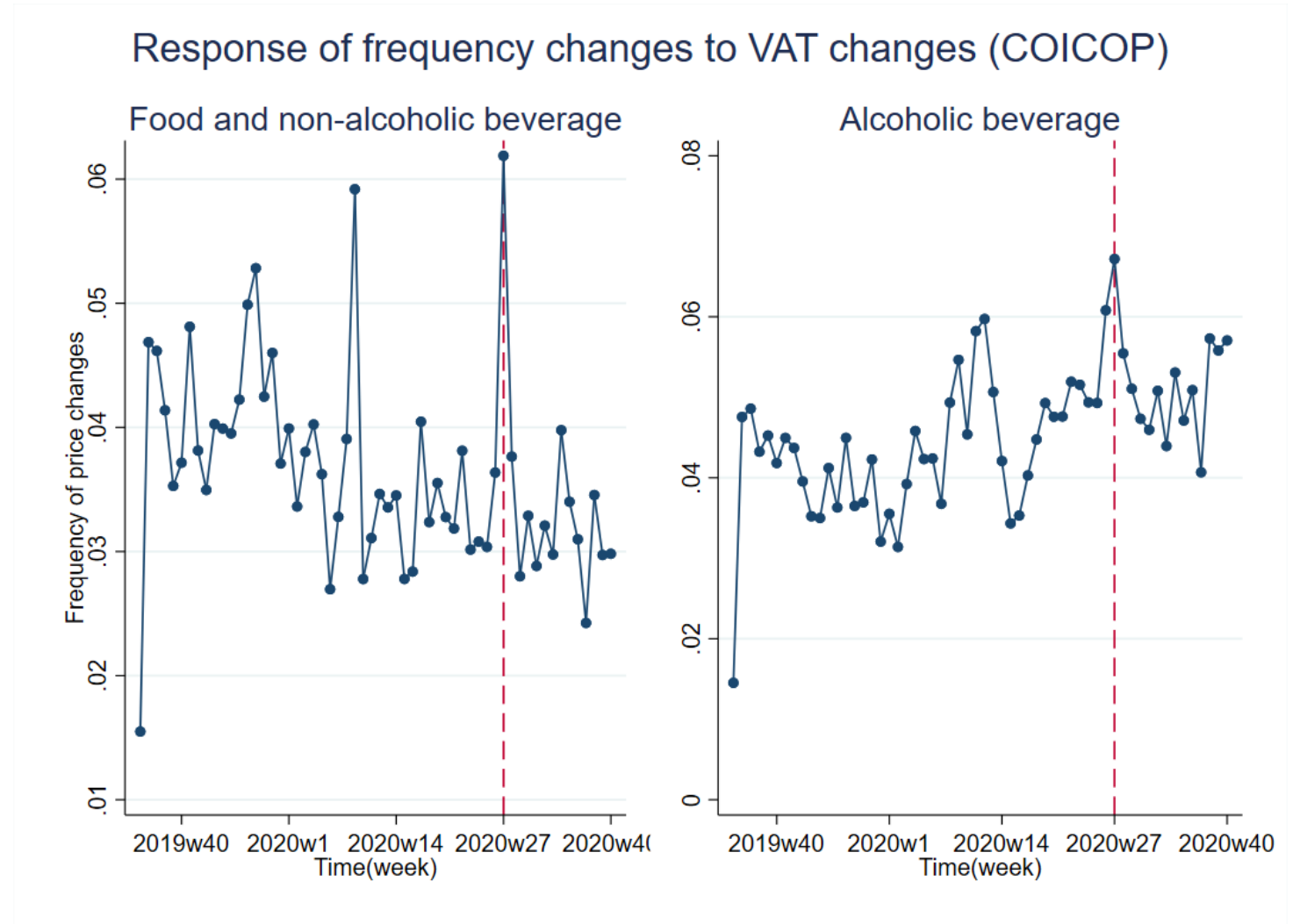
1. VAT changes can affect the **marginal profits** of firms, therefore suitable for studying TFP shocks
2. For instance, the VAT rates for food service and hospitality are adjusted during and after the COVID-19 period in the EU, for example, in Germany, a reduced rate of 7% was applied on July 1, 2019.

Grocery prices in German e-commerce

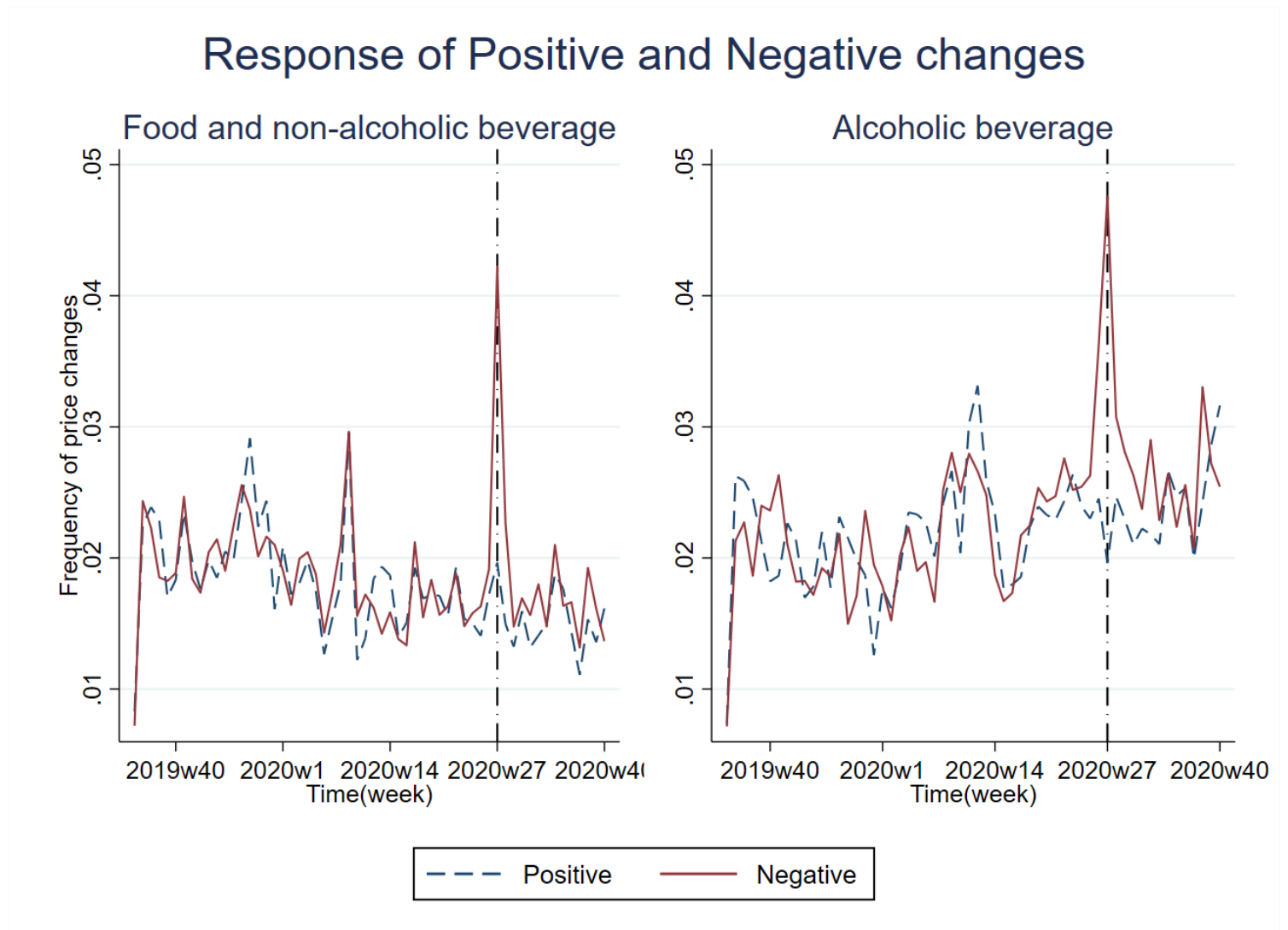
1. Daily food and beverages price quotes in the largest retailers from September 1, 2019, to September 30, 2020, <https://zenodo.org/records/8028017>
2. About 1 million products from 6 sellers are included, and over 120 million observations
3. For each product, we have a name, price, date, category, and subcategories. Sellers' IDs and categories are also collected.

Fedoseeva, Svetlana, and Ellen Van Droogenbroeck. "Temporary VAT rate cuts and food prices in e-commerce." *Journal of Retailing and Consumer Services* 77 (2024): 103693.

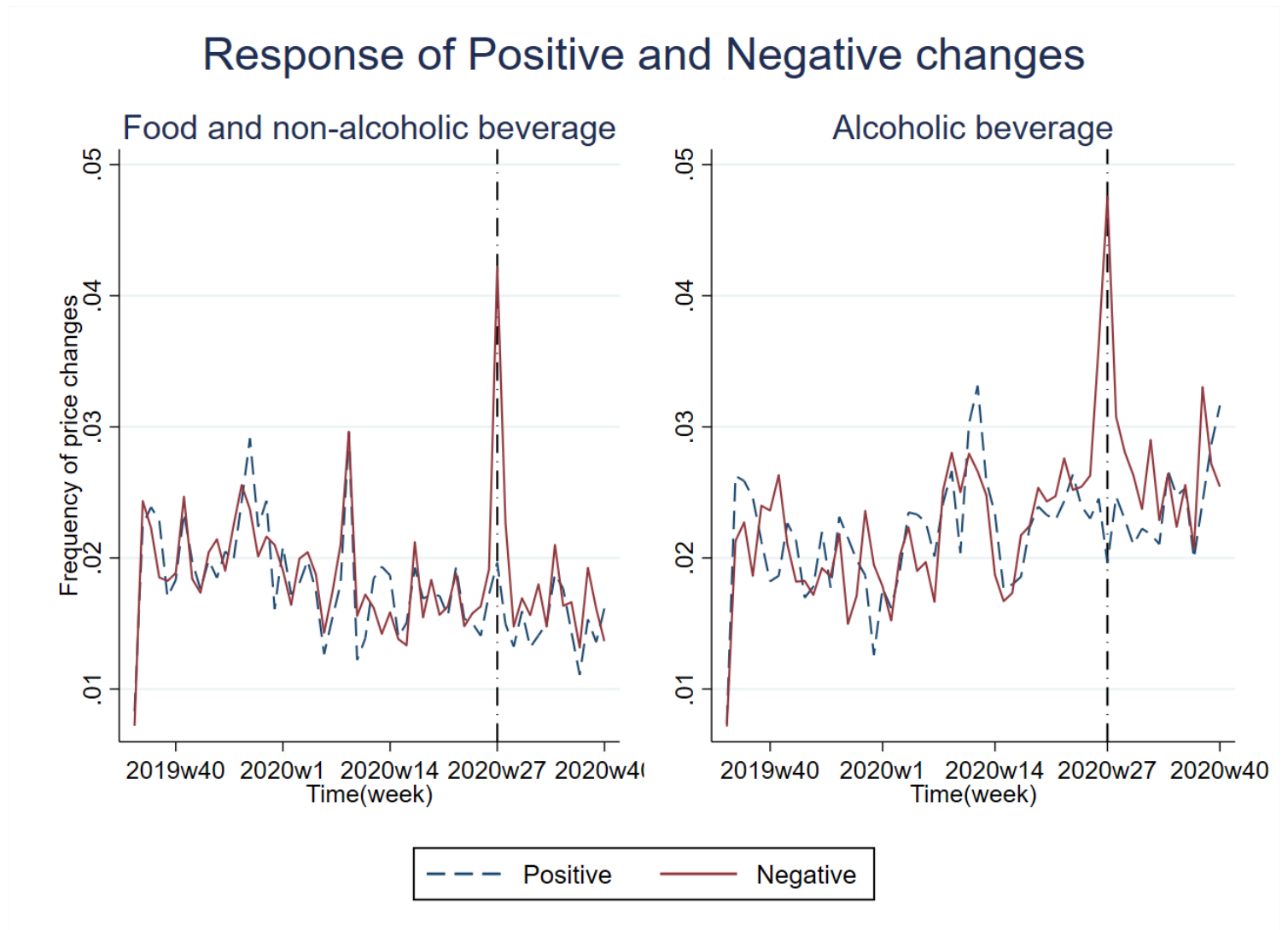
- Frequency of price changes significantly after the VAT cut on July 1, 2020
- In the week of the VAT cut, the weekly frequency of food and non-alcoholic beverages reaches 6%.
- The weekly frequency of Alcoholic beverages reaches 7%.



- The frequency of negative price changes is much higher than that of positive price changes
- VAT cuts improve the profit margins of online grocery sellers, leading to instant increment of price decreases
- The frequency of price increases is not affected by the VAT cuts



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Possible extensions: Announcement shocks

- US/UK data in 22 broadly defined consumer categories between May 2010 and February 2020
- Capacity utilization, consumer confidence, **core CPI**, the employment cost index, GDP, initial claims, the manufacturing composite index, new home sales, nonfarm sales, **PPI**, retail sales (total and excluding motor vehicles), and unemployment—14 series overall.
- The response of the cross-sectional frequency and size of regular price increases and decreases to realized shocks on the day of an announcement about variables in rows.

- Gorodnichenko, Y., Sheremirov, V., & Talavera, O. (2018). The responses of internet retail prices to aggregate shocks: A high-frequency approach. *Economics Letters*, 164, 124-127.

Table 1
Effects of macroeconomic shocks on pricing.

	On impact							Two weeks ahead						
	Regular price							Regular price						
	Frequency of		Absolute size of		Sales		Log number of clicks	Frequency of		Absolute size of		Sales		Log number of clicks
	Increases	Decreases	Inc.	Dec.	Freq.	Abs. size		Inc.	Dec.	Inc.	Dec.	Freq.	Abs. size	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	
Capacity utilization	-0.05 (0.48)	-0.10 (0.53)	3.45 (1.22)	-0.91 (1.47)	-4.26 (3.32)	1.00 (2.63)	-0.10 (0.12)	-0.04 (0.28)	-0.23 (0.29)	0.49 (0.75)	-0.12 (0.92)	-0.68 (2.10)	-0.01 (0.32)	-0.08 (0.13)
Consumer confidence	0.15 (0.54)	0.29 (0.49)	-4.36 (3.98)	0.16 (1.14)	0.00 (1.82)	0.21 (0.29)	0.11 (0.12)	0.40* (0.24)	0.26 (0.26)	-0.62 (0.65)	-0.96 (0.85)	0.44 (1.17)	0.17* (0.10)	0.05 (0.11)
CPI, core	-0.67 (0.88)	-0.58 (1.14)	-1.00 (2.01)	3.38 (2.06)	-0.78 (3.67)	-3.50 (2.89)	0.11 (0.18)	-0.60 (0.66)	-0.58 (0.67)	0.24 (1.06)	-0.44 (1.43)	-0.81 (1.83)	-1.04 (0.71)	0.18 (0.14)
Employment cost index	-0.02 (1.67)	0.25 (1.43)	-3.53 (3.06)	3.53 (3.83)	5.57 (5.08)	-0.56 (3.95)	0.01 (0.24)	0.06 (0.84)	0.06 (0.73)	-4.07** (1.73)	-5.69* (3.07)	1.14 (2.66)	-0.30 (0.36)	-0.15 (0.18)
GDP	1.85 (5.70)	1.81 (5.57)	9.03 (11.34)	-22.89 (10.74)	-10.55 (18.42)	1.17 (14.38)	-0.24 (0.71)	-0.58 (2.61)	-0.22 (2.41)	10.70 (8.96)	14.97 (14.89)	-1.41 (7.94)	0.49 (1.91)	0.16 (0.64)
Initial claims	-0.42 (0.35)	-0.29 (0.25)	0.67 (0.78)	-1.96 (1.47)	1.09 (1.38)	-0.52 (0.40)	-0.03 (0.04)	-0.27** (0.13)	-0.28** (0.11)	-0.10 (0.25)	-0.23 (0.32)	-0.65 (0.65)	-0.22* (0.13)	-0.05 (0.05)
ISM manufacturing index	0.14 (0.35)	0.00 (0.45)	-4.17 (4.33)	0.83 (2.29)	-1.60 (3.40)	0.74 (0.78)	0.10 (0.13)	0.13 (0.19)	0.14 (0.20)	-0.56 (0.54)	-0.65 (0.81)	2.38* (1.42)	-0.08 (0.31)	0.09 (0.11)
Leading indicators	-0.17 (0.55)	0.56 (0.64)	0.25 (1.37)	3.46 (1.40)	-3.09 (2.31)	3.34 (4.13)	0.09 (0.11)	0.40 (0.39)	0.15 (0.28)	0.22 (0.70)	0.00 (1.05)	1.02 (1.24)	0.10 (0.40)	0.09 (0.14)
New home sales	-1.15 (1.56)	-0.46 (1.24)	-0.98 (0.84)	-7.03 (11.38)	5.76 (4.24)	-0.93 (0.66)	0.07 (0.28)	0.17 (0.60)	-0.12 (0.55)	-0.23 (0.94)	-0.86 (1.06)	1.28 (2.06)	-0.29 (0.31)	-0.04 (0.26)
Nonfarm payrolls	0.85 (0.43)	1.09 (0.38)	-0.71 (1.89)	-0.48 (4.36)	-0.77 (3.19)	0.37 (0.18)	-0.11 (0.15)	0.18 (0.29)	0.26 (0.26)	-1.12* (0.63)	-0.09 (0.87)	1.54 (1.58)	-0.33 (0.46)	-0.07 (0.13)
PPI, core	-1.43* (0.79)	-2.20 (1.44)	0.26 (1.82)	-0.76 (1.93)	-3.52 (4.58)	-0.19 (3.89)	0.01 (0.14)	-1.30*** (0.47)	-1.29*** (0.41)	0.04 (0.90)	-0.32 (1.13)	-0.65 (3.35)	-1.49** (0.70)	-0.02 (0.14)
Retail sales	0.27 (1.33)	0.65 (1.56)	-4.90 (2.47)	1.96 (1.82)	7.11 (4.55)	1.43 (2.38)	0.22 (0.29)	0.41 (0.86)	0.47 (0.86)	1.06 (0.80)	1.83* (1.03)	1.60 (2.52)	1.45 (1.51)	0.24 (0.25)
<i>excluding motor vehicles</i>	-0.16 (0.45)	-0.48 (0.28)	-2.51 (2.11)	1.89* (1.07)	4.07 (3.95)	1.90 (2.70)	0.10 (0.22)	0.01 (0.22)	0.01 (0.21)	1.11*** (0.36)	1.50*** (0.50)	2.85 (2.42)	0.39 (0.59)	0.16 (0.14)
Unemployment	0.11 (0.34)	0.25 (0.36)	-1.42 (1.04)	-3.93 (2.71)	1.55 (2.18)	-0.01 (0.13)	-0.06 (0.11)	-0.09 (0.19)	-0.11 (0.19)	-1.09** (0.46)	-0.78 (0.50)	0.70 (0.98)	-0.05 (0.18)	-0.04 (0.09)
Composite shock	-0.17 (0.19)	-0.11 (0.18)	0.49 (0.80)	0.40 (1.47)	-0.57 (0.93)	-0.10 (0.11)	0.01 (0.05)	0.04 (0.10)	0.01 (0.09)	0.02 (0.25)	-0.26 (0.38)	-0.58 (0.52)	-0.01 (0.09)	-0.02 (0.05)

*, **, and *** represent the 10, 5, and 1 percent significance level, respectively. Bootstrap standard errors are in parentheses.

Overall

- Great paper with a solid theoretical framework!
- Additional micro-level analysis could make the arguments stronger.