

# Quantified Narrative Evidence on the Price-Setting Behavior of Publicly Traded Companies

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"During the recent tax season we reduced prices for our Quicken Turbotax product line in response to aggressive pricing by H&R Block and Microsoft." (Intuit Inc., fiscal year 2000)

#### 1. AN OVERVIEW OF THE PAPER

- Corporate reports often contain narrative discussions of firms' pricing decisions
- I search ~200,000 archived reports for such discussions and then quantify their contents
- The resulting dataset reflects unique causal information not captured by realized prices or price-setting surveys alone

#### 1.1 Methodology

- 1. Search ~200,000 corporate reports for narrative discussions of pricing decisions
- 2. Quantify the contents of these discussions
- 3. Explore causes of price changes and rigidities
- 4. Explore time-variation in these causes
- 5. Link this new evidence to aggregate inflation

#### 1.2 Properties of the dataset

- Encodes information on why firms did or did not change the prices of their products
- Does not reflect pre-defined answer choices
- Covers more than two full business cycles
- Each observation corresponds to a specific pricing decision a firm has actually taken

#### 1.3 Selected findings of the paper

- Reported pricing decisions are closely related to changes in the aggregate price level
- The causes of price changes are asymmetric
- Real rigidities are important
- Pass-through depends on demand conditions
- Price durations can decrease even when rigidities become more binding
- Commodity prices explain more price changes than labor costs

## 1.4 Main contributions of the paper

- Introduces a new type price-setting data
- Explores various aspects of the price-setting process difficult to assess using more standard types of data
- Discusses implications for policy and theory

## 2. CONSTRUCTION OF THE DATASET

# 2.1 Automatic pre-selection of sentences

## Patterns for price-change sentences

- 1. "we (have) [increased/decreased/raised/reduced/lowered/adjusted/changed]
   (\*word\*)(\*word\*)(\*word\*)(\*word\*)
   [price/prices/pricing]"
- 2. "the company (has)
  [increased/decreased/raised/reduced/low-ered/adjusted/changed]
  (\*word\*)(\*word\*)(\*word\*)(\*word\*)
  [price/prices/pricing]"

## Patterns for price-rigidity sentences

- 1. "we (were) [unable to/not able to/did not/could not/have not/had not] (\*word\*)(\*word\*)(\*word\*)(\*word\*) [price/prices/pricing]"
- 2. "the company (was) [unable to/not able to/did not/could not/has not/had not] (\*word\*)(\*word\*)(\*word\*)(\*word\*)(\*word\*) [price/prices/pricing]"

## 2.2 Manual removal of false positives

## 2.3 Manual quantification of contents

## 3. CODING A SAMPLE SENTENCE

- "Due to market conditions, we were unable to increase prices to fully compensate for increased costs."
- sentence type: rigidity sentence
- direction of desired change: price increase
- cause of the desired change: cost increase
- cause of the rigidity: demand conditions
- company: Westlake Chemical

#### price increases price decreases 100 of 50 competition profitability sales product demand other costs Schedule B: Causes of Price Rigidities rvations 0 0 0 0 0 0 50 desired price increases 40⊢ desired price decreases

4. REPORTED CAUSES OF PRICE CHANGES AND PRICE RIGIDITIES

Schedule A: Causes of Implemented Price Changes

Causes of Price Increases

2008sales result 2004quarter 2004quarte

competition

30

of

margins product price effort 2007 2006 Market 2005
INCREASE OFFSET

fiscal customers increase fourth approximately impact
margins product price effort 2007 2006 Market 2005
market 2006
market 2005
m

demand increased customers introductions product pressures factors

future Competitive

prices prices prices prices prices price maintain past markets customer increased customers in customers i

contract

Causes of Price Decreases

nature increased competition therefore economic pricingCustomers environment contracts industry from intense with prices ales business current impacting prices current impacting these serve product customers prices increases conditions year markets ales pressures conditions year markets pressure products which many negatively customer pressure

other

sales

#### Finding 1: The drivers of price changes are asymmetric (costs vs pricing of competitors)

- ⇒ Monetary transmission may also be asymmetric
- $\Rightarrow$  Theoretical and empirical monetary models should allow for asymmetries in price setting

#### Finding 2: Strategic pricing complementarities (real rigidities) between competing firms are important

⇒ Monetary transmission may be affected by the modes and degrees of competition

demand

⇒ Real rigidities are an appropriate tool for generating monetary non-neutrality in structural models

## Finding 3: Price increases are impeded by competitor pricing, weak aggregate demand, and existing contracts

- ⇒ Nominal frictions alone do not accurately describe why prices are sticky
- $\Rightarrow$  Pass-through and monetary transmission may vary over the business cycle

#### Finding 4: Raw material costs matter even beyond the food and commodity sectors

⇒ Positive aspect: raw-material prices respond strongly and quickly to monetary policy (e.g. Uhlig 2005)

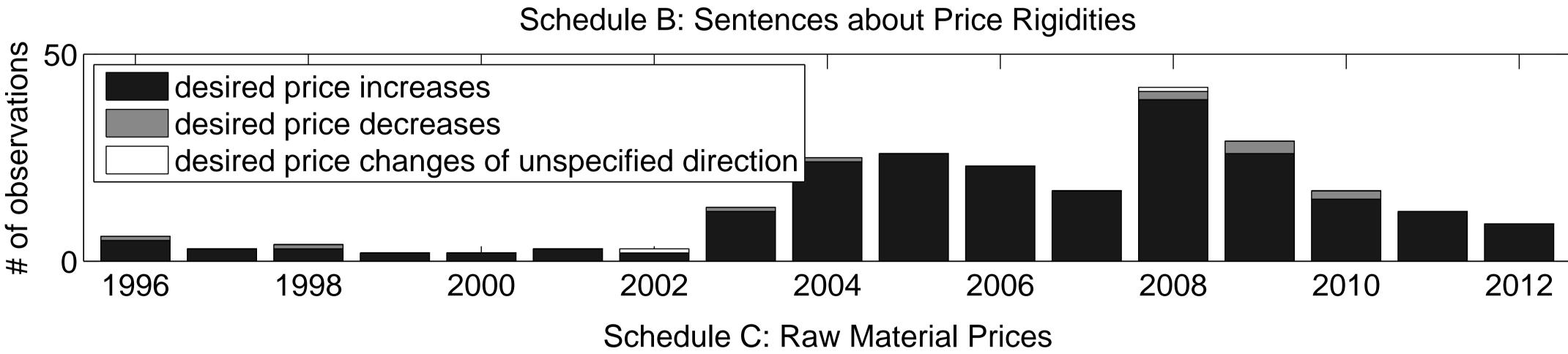
 $\Rightarrow$  Even when targeting core inflation, monetary policy should take the role of commodities into account

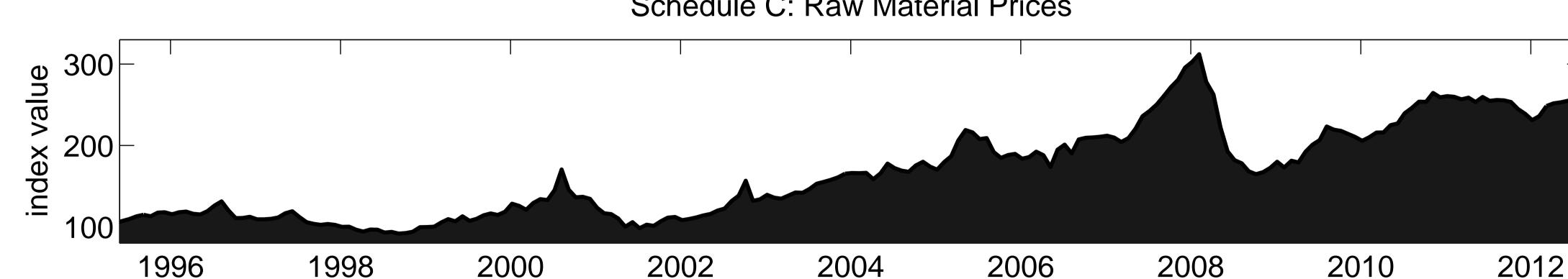
 $\Rightarrow$  Negative aspect: raw-material prices may be subject to speculation and at times be detached from fundamentals

# 5. TIME VARIATION: PRICE CHANGES, RIGIDITIES, AND INPUT COSTS

Schedule A: Sentences about Implemented Price Changes

price increases
price changes of unspecified direction
price changes of unspecified direction
1996 1998 2000 2002 2004 2006 2008 2010 2012





## Finding: The late-2000 commodity boom caused a simultaneous increase in price changes and price rigidities

- ⇒ Price durations alone do not necessarily measure price rigidities
- $\Rightarrow$  There appear to be frictions other than fixed costs of nominal adjustment
- ⇒ These frictions stabilized inflation during the commodity boom, but were not binding before

#### 6. COMOVEMENT BETWEEN REPORTED PRICE CHANGES AND THE US GDP DEFLATOR Net Fraction of Reported Price Increases 0.2 -0.2 -0.4└ 1996 2000 2002 2004 2010 2012 1998 2006 2008 Changes in the US GDP Deflator 300 □ 200 100 1996 1998 2000 2002 2004 2006 2010 2012 2008

Finding: The reported pricing decisions are closely related to the actual aggregate price level

 $\Rightarrow$  The results of this paper are particularly informative for macroeconomists and monetary policy makers