

Undisclosed Material Inflation Risk

Yaniv Konchitchki
University of California, Berkeley

Jin Xie
Peking University

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Agenda

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- Research Framework and Questions
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Motivation

- Inflation: Talk of the nation, considerable effects on capital market
 - ▶ Inflation attracts attention from media, researchers, & practitioners
 - ▶ Since mid-2021, inflation overtook COVID-19 as the top investor risk
- In practice, stock market concerns about risk imposed by inflation
 - ▶ See VIX spikes and headlines on a daily basis
- Inflation has a substantial effect on firms, which vary cross-sectionally
 - ▶ Economic theories predict various effects depending on factors such as cost stickiness, fluidity, pass-throughs, industry (e.g., utility)
 - ▶ Firms affected differently based on composition of investment and financing activities (Konchitchki, 2011, 2013)

Motivation (contd.)

- Yet, little is known how many firms are exposed to material inflation risk, whether they disclose it in their SEC filings
- Broadly: What are U.S. firm managers' attitudes toward inflation?
 - ▶ Determine firms' intertemporal choice (set prices & wages, financial decisions)
 - ▶ Firms' inflation expectations & Phillips curve
- Surprisingly, not much is known; until recently

Related Research

- Only recently, notable new research line provides survey-based evidence on firm managers' attitudes toward inflation *dynamics*
 - ▶ Coibion, Gorodnichenko, Kumar (2018, AER)
 - ▶ Coibion, Gorodnichenko, Ropele (2020, QJE)
 - ▶ Candia, Coibion, Gorodnichenko (2021, Working paper)
 - ▶ Weber, D'Acunto, Gorodnichenko, Coibion (2022, JEP)
 - ▶ Systematic managerial inattention to inflation dynamics
 - ▶ Firms' attention to inflation dynamics varies with their incentives to collect & process inflation information
 - ▶ Consistent with the rational inattention model, e.g., Sims (2003), Mackowiak and Wiederholt (2009)
 - ▶ Inflation rebound turned the evolution & management of inflation expectations into urgent policy questions
 - ▶ Prior literature focuses on dynamics and expectations

We complement prior research by analyzing inadequate attention to inflation *risk*

Research Framework and Questions

Our research framework first identifies whether and how firms are exposed to material inflation risk in the cross section of U.S. firms, and it then probes the disclosure practices of those firms highly exposed to inflation risk

Research Questions:

- How pervasive is inflation risk?
- Does the exposure vary across firms?
- Do managers of inflation-exposed firms adequately disclose risk?
- Any triggering event causing firms to disclose inflation risk?
- What is shareholders' value destruction?

Summary of Main Findings

14%-18% U.S. firms exposed to inflation risk (2005 – 2020)

- Event study around CPI announcements by BLS

As of 2021, 60% inflation-exposed firms never disclose risk

- Even though they are mandated to disclose
- Regulation S-K, Item 105(c), SEC 2005
- Most significant factors make company speculative or risky

Exposed firms are more likely to disclose inflation risk after class-action lawsuits

- Managers more sensitive to costs of omitting material risks
- Consistent with Coibion, Gorodnichenko, Kumar (2018, AER)

Valuation destruction of \$0.9 trillion to \$2.8 trillion

- Simulating 2%-6% inflation shocks over 2022-2024

Data

- Textual analysis techniques of official disclosures to the SEC by a large sample of major U.S. firms
- COMPUSTAT: Item 1A of 10-K annual reports
- CRSP: Stock data
- Fed: Inflation forecasts and realizations
- U.S.-headquartered firms with fiscal years spanning 2005-2020
- General sample starts in 2005
 - ▶ First year SEC required firms to discuss "the most significant factors that make the company speculative or risky" (Regulation S-K, Item 105(c), SEC 2005) in Item 1A of 10-K annual reports
 - ▶ Sample for DiD analyses begin 5 years before 2005
- Exclude firms (1) valued below \$10 million; or (2) end-of-fiscal-year stock price below \$1

Analyses and Results: Material Inflation Risk

Shareholders' value destruction by inflation shocks: 2005Q1–2020Q3

$$CAR_{i,t} = \alpha + \beta_i \times \text{Unexpected Inflation}_t + \epsilon_{i,t},$$

- $CAR_{i,t}$: cumulative daily market-adjusted returns for firm i [-1, +1] days relative to BLS releases of CPI for quarter t
- $\text{Unexpected Inflation}_t$: actual minus recently forecasted CPI
- Static material inflation risk
whether firm i is exposed = $\begin{cases} \text{Yes} & \text{if } \beta_i < 0, \text{ t-stat} < -1.96 \\ \text{No} & \text{otherwise.} \end{cases}$
- Rolling window over 20 quarters
whether firm i is exposed in t = $\begin{cases} \text{Yes} & \text{if } \beta_{i,t} < 0, \text{ t-stat} < -1.96 \\ \text{No} & \text{otherwise.} \end{cases}$

Analyses and Results: Material Inflation Risk (contd.)

- Possible time-varying inflation risk
- Refined short windows: (a) mitigate confounding factors (e.g., GDP announcements), (b) address Fama (1981) that shocks should be uncorrelated with business activities

Inflation Risk Disclosure

Keywords/terms from Item 1A of firms' 10-K reports

- "inflation," "deflation," "inflationary," "hyperinflation," "hyperinflationary"

Nike Inc 10-K for the year ended May 31, 2008

- *General economic factors beyond our control, and changes in the global economic environment, including fluctuations in **inflation** and currency exchange rates, could result in lower revenue, higher costs and decreased margins and earnings*

Excerpt from Item 1A: "Risk Factors" in Starbucks

Item 1A. Risk Factors

You should carefully consider the risks described below in addition to the other information set forth in this Annual Report on Form 10-K, including the Management's Discussion and Analysis of Financial Conditions and Results of Operations section and the consolidated financial statements and related notes. If any of the risks and uncertainties described in the cautionary factors described below actually occur or continue to occur, our business, financial condition and results of operations, and the trading price of our common stock could be materially and adversely affected. Moreover, the risks below are not the only risks we face and additional risks not currently known to us or that we presently deem immaterial may emerge or become material at any time and may negatively impact our business, reputation, financial condition, results of operations or the trading price of our common stock.

• ***Economic conditions in the U.S. and international markets could adversely affect our business and financial results.***

As a retailer that is dependent upon consumer discretionary spending, our results of operations are sensitive to changes in or uncertainty about macro-economic conditions. Our customers may have or in the future have less money for discretionary purchases and may stop or reduce their purchases of our products or switch to Starbucks or competitors' lower-priced products as a result of various factors, including job losses, inflation, higher taxes, reduced access to credit, changes in federal economic policy and recent international trade disputes. Decreases in customer traffic and/or average value per transaction without a corresponding decrease in costs would put downward pressure on margins and would negatively impact our financial results. There is also a risk that if negative economic conditions or uncertainty persist for a long period of time or worsen, consumers may make long-lasting changes to their discretionary purchasing behavior, including less frequent discretionary purchases on a more permanent basis or there may be a general downturn in the restaurant industry.

• ***Our success depends substantially on the value of our brands and failure to preserve their value could have a negative impact on our financial results.***

We believe we have built an excellent reputation globally for the quality of our products, for delivery of a consistently positive consumer experience and for our global social impact programs. The Starbucks brand is recognized throughout the world, and we have received high ratings in global brand value studies. To be successful in the future, particularly outside of the U.S. where the Starbucks brand and our other brands are less well-known, we believe we must preserve, grow and leverage the value of our brands across all sales channels. Brand value is based in part on consumer perceptions on a variety of subjective qualities.

Business incidents, whether isolated or recurring and whether originating from us or our business partners, that erode consumer trust can significantly reduce brand value, potentially trigger boycotts of our stores or result in civil or criminal liability and can have a negative impact on our financial results. Such incidents include actual or perceived breaches of privacy or violations of domestic or international privacy laws, contaminated food, product recalls, store employees or other food handlers infected with communicable diseases or other potential incidents discussed in this risk factors section. The impact of such incidents may be exacerbated if they receive considerable publicity, including rapidly through social or digital media (including for malicious reasons) or result in litigation. Consumer demand for our products and our brand equity could diminish significantly if we, our employees, licensees or other business partners fail to preserve the quality of our products, act or are perceived to act in an unethical, illegal, racially-biased, unequal or socially irresponsible manner, including with respect to the sourcing, content or sale of our products, service and treatment of customers at Starbucks stores, or the use of customer data for general or direct marketing or other purposes. Additionally, if we fail to comply with laws and regulations, publicly take controversial positions or actions or fail to deliver a consistently positive consumer experience in each of our markets, including by failing to invest in the right balance of wages and benefits to attract and retain employees that represent the brand well, our brand value may be diminished.

Material Inflation Risk and its Financial Disclosure

Panel A: Static Inflation-Risk Exposure

Total Firms = 6,289

- Not Exposed = 5,175 (82.3%), of which
 - * Disclosing firm = 2,205 (42.7%)
- Exposed = 1,114 (17.7%), of which
 - * Disclosing firm = 434 (39.0%)

Panel B: Time-Varying Inflation-Risk Exposure

Total Obs = 49,342

- Not Exposed = 42,525 (86.2%), of which
 - * Disclosing firm 8,909 (21.0%)
- Exposed = 6,817 (13.8%), of which
 - * Disclosing firm 1,287 (18.9%)

Regression Analysis

Four separate regressions of the following form:

$$Disclosure_{i,t} = \alpha + \beta_1 \times InflationExposure_{i,t} + X'_{i,t} \times \theta + \gamma_j + \gamma_t + \epsilon_{i,t},$$

- $Disclosure_{i,t}$: a dummy variable equal to 1 if firm i mentions (1) inflation (2) monetary policy, (3) oil & gas first time in Item 1A (4) reports non-zero unrealized derivative gain or loss in year t
- $InflationExposure_{i,t}$: whether firm i exposed to inflation risk in t
- $X'_{i,t}$: firm or industry characteristics (e.g., size, leverage, HHI, profitability, inventory, PPE)
- γ_j, γ_t : industry and time fixed effects
- Standard errors: bootstrapped 200 times

Regression Analysis (contd.)

	<i>FirstInflation</i>	<i>FirstMonetary</i>	<i>FirstOilGas</i>	<i>Derivative</i>
	(1)	(2)	(3)	(4)
InflationExposure	-0.004 (-1.43)	0.000 (0.09)	-0.003 (-1.53)	0.008 (0.58)
Controls	X	X	X	X
Industry FE	X	X	X	X
Year FE	X	X	X	X
N	29,130	29,130	29,130	29,130
R ²	0.01	0.01	0.02	0.24

- Takeaway 1: Exposed firms are NOT more likely to initiate inflation risk disclosure
- Takeaway 2: Exposed firms are NOT more likely to initiate inflation-related risk disclosure

Securities Class Action Lawsuits

- Coibion et al., (2018, AER): "Much of the dispersion in beliefs can be explained by firms' incentives to collect and process information."
- We build on this finding and related theories (e.g., Sims, 2003) to use securities class action lawsuits
- Hypothesis: Recently-sued firms have more incentives to collect & process information about risk from inflation

$$\text{FirstInflation}_{i,t} = \alpha + \beta_1 \times \text{InflationExposure}_{i,t} + \beta_2 \times \text{InflationExposure}_{i,t} \\ \times \text{Lawsuit}_{i,t} + \beta_3 \times \text{Lawsuit}_{i,t} + X'_{i,t} \times \theta + \gamma_j + \gamma_t + \epsilon_{i,t},$$

- $\text{Lawsuit}_{i,t}$: a dummy variable equal to 1 if firm i is sued in a securities class action lawsuit either in the current or previous fiscal year, and 0 otherwise

Securities Class Action Lawsuits (contd.)

	<i>FirstInflation</i>			$\Delta\text{Length} \geq 15\%$		
	(1)	(2)	(3)	(4)	(5)	(6)
InflationExposure \times Lawsuit	0.017** (2.12)	0.017** (2.11)	0.017** (2.10)	-0.018 (-0.86)	-0.003 (-0.15)	0.003 (0.10)
Lawsuit	-0.002 (-0.78)	-0.003 (-1.22)	-0.003 (-1.18)	0.030*** (3.62)	0.035*** (5.25)	0.030*** (4.12)
InflationExposure	-0.005* (-1.92)	-0.005** (-1.99)	-0.005** (-2.13)	0.010 (1.00)	0.001 (0.20)	0.001 (0.16)
Controls	X	X	X	X	X	X
Year FE		X			X	
Industry FE						
Industry \times Year FE			X			X
N	32,739	29,130	29,130	32,739	29,130	29,130
R^2	0.00	0.01	0.04	0.00	0.05	0.09

- Takeaway 1: Exposed firms after lawsuits are more likely to disclose inflation risk (Coibion et al., 2018)
- Takeaway 2: All firms have more lengthy Item 1A after lawsuits

Value Destruction Analysis

- Shareholders' value destruction due to unexpected inflation shocks
- Firms exposed to inflation risk but never disclosed it
- We estimate dollar amount of the sum of firm-level value to be destroyed by unexpected inflation over different horizons

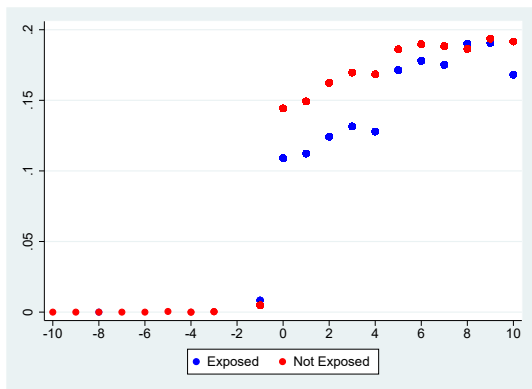
Value Destruction Analysis (contd.)

Value Destruction in \$B					
1 Year					
Annual rate=	2%	3%	4%	5%	6%
Exposed non-disclosing firms	-312	-469	-625	-781	-937
Exposed disclosing firms	-42	-62	-83	-104	-125
2 Year					
Annual rate=	2%	3%	4%	5%	6%
Exposed non-disclosing firms	-625	-937	-1,250	-1,562	-1,875
Exposed disclosing firms	-83	-125	-166	-208	-249
3 Year					
Annual rate=	2%	3%	4%	5%	6%
Exposed non-disclosing firms	-937	-1,406	-1,875	-2,343	-2,812
Exposed disclosing firms	-125	-187	-249	-311	-374
Calibration Paramaters for Destruction Analysis					
	Exposure	Market Cap (\$B)			
Exposed non-disclosing firms	-4.780	4017.47			
Exposed disclosing firms	-4.156	499.30			

Takeaway 1: Our analysis provides the sum of firm-level forecasted market cap destruction in response to future inflation shocks

Robustness Analyses: DiD Design, Regulation S-K

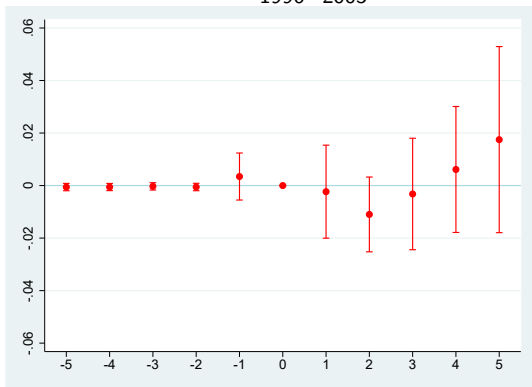
- Does Regulation S-K work?
- Possibility: Unobservable factors affecting exposed vs. unexposed groups and/or the disclosing vs. nondisclosing groups



- Takeaway 1: A shift in disclosure for both exposed & unexposed firms. Regulation S-K works – it affects both exposed and unexposed.

Robustness Analyses: DiD Design, Regulation S-K (contd.)

$$FirstInflation_{i,t} = \alpha + \sum_{t=-5}^5 \beta_t \times \underbrace{InflationExposure_i}_{1996-2005} + X_i' \times \theta + \gamma_t + \gamma_j + \epsilon_{i,t},$$



- Takeaway: Exposed firms are not more likely than non-exposed firms to disclose inflation risk
- Overall conclusion: Any possible unobservable factors do not generate a significant effect on exposed vs. unexposed groups

Conclusion

- Public U.S. corporations exposed to inflation risk do not disclose it in financial reports, as required by the SEC
- Complement recent research on managerial attention to inflation dynamics (e.g., Coibion et al., 2018; Candia et al., 2021a, 2021b)
 - ▶ Central banks' communication & forward guidance are not effective in managing firms' inflation expectations
 - ▶ We show this case for inflation risk
 - ▶ Firms' ineffective expectations regarding inflation risk
 - ▶ While inflation risk may cause managers to be aware of inflation, we find that managers are not fully attuned to inflation risk
- Extend research on limited attention & information disclosure in capital markets (e.g., Hirshleifer et al., 2009, 2011)
 - ▶ Identified another dimension of attention
- Introduce into macroeconomic analyses of inflation the wealth of information from SEC's mandated financial statements

Thank You!