Capacity Constraints and Inflation Dynamics

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1. Motivation and contribution

In recent years, inflation in advanced economies has surged to levels not observed in decades. Following the Covid-19 pandemic, inflation in the US and Europe rose sharply, driven in part by disruptions to global supply chains, energy markets, and productive capacity, as well as Russia's invasion of Ukraine in February 2022. More recently, one of the world's most crucial energy corridors, The Strait of Hormuz, has been effectively closed following the outbreak of the US-Israeli conflict with Iran. This has contributed to yet another surge in inflation. Similar mechanisms were at play during the oil crises of the 1970s, where sharp increases in oil prices generated persistent inflationary pressures and contributed to stagflation. These developments have drawn renewed attention to the role of **capacity constraints** in shaping inflation dynamics.

Despite their apparent importance, capacity constraints are not integrated into standard macroeconomic models or empirical frameworks. Most existing models assume that firms can substitute smoothly across inputs or adjust production without binding constraints. However, when key inputs—such as energy or specialized capital (e.g., microchips)—are scarce and difficult to substitute, firms may face sharply increasing marginal costs. This can lead to highly nonlinear inflation dynamics, where inflation responds strongly to shocks that lead capacity constraints to bind but only weakly to shocks that do not induce binding capacity constraints.

In a recent working paper, titled *Inflation Plucking Cycles* (Juul and Jørgensen 2026), we document a new empirical regularity consistent with this mechanism, namely that inflation in nearly all OECD countries displays "plucking cycles:" Inflation frequently rises above its long-term trend but rarely drops below it.[1] One interpretation of this asymmetric pattern is that inflation is occasionally "plucked" upward by shocks that lead capacity constraints to bind (such as positive demand shocks or negative supply shocks). But in contrast, inflation is rarely pushed below its trend by shocks that do *not* cause binding capacity constraints (such as negative demand shocks or positive supply shocks).[2]

[1] Specifically, inflation displays the following empirical pattern: Increases in inflation tend to be followed by decreases of similar magnitude, while the size of a decrease does not predict the size of the subsequent increase. In Juul and Jørgensen (2026), we provide strong empirical evidence of this asymmetric pattern for 33 out of 38 OECD countries, including Denmark and the US.

[2] Consistent with this mechanism, Dupraz, Nakamura and Steinsson (JME, 2025) provide strong empirical evidence that the US unemployment rate displays plucking cycles.

The purpose of this project is to examine the consequences of capacity constraints for firms' pricing behavior. Using detailed firm-level Danish data on prices, production, costs, and capacity constraints the project aims to shed light on the relationship between capacity constraints and price setting at the firm-level. In particular, the project investigates the extent to which binding constraints can help explain recent inflation surges.

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2. Project description

Standard theory states that firms set prices as a markup over marginal cost. However, both the markup—a measure of market power—and marginal costs are unobservable. The state-of-the-art approach to estimating firm-level markups is the production-based method developed by De Loecker and Warzynski (AER, 2012). This method relies on the assumption that certain inputs—typically materials—are fully flexible and can be adjusted freely in response to changes in demand or costs. Under this assumption, observed input choices can be used to infer markups.

However, this assumption is violated when firms face binding capacity constraints in their use of material inputs. For example, during periods of supply-chain disruptions or input shortages, firms may be unable to adjust their material inputs optimally. In such cases, standard markup estimates will be biased upward, leading to misleading conclusions about the underlying drivers of inflation.[3]

The aim of this sub-project is to develop and implement a new approach to markup estimation that explicitly accounts for occasionally binding capacity constraints. The empirical analysis will use detailed Danish firm-level data from Statistics Denmark on, e.g., prices, costs and production, coupled with survey-based measures of capacity constraints from the Danish Business Sentiment Survey ("Konjunkturbarometret").

The project will proceed in two steps. First, it will analyze theoretically how capacity constraints affect firms' input choices and pricing decisions. Second, it aims to develop an extended markup estimation framework that relaxes the assumption of fully flexible inputs and allows for occasionally binding constraints. For this purpose, the Danish Business Sentiment Survey contains direct measures of both labor and material shortages at the firm-level, which allows us to identify which production inputs are truly flexible at any given point in time. By coupling the firm-level survey data on capacity constraints with data on firms' prices, production and costs, the project will provide more accurate

[3] For instance, the empirical literature typically finds evidence that post-pandemic inflation was associated with a rise in markups (see, e.g. Adam, et al. 2025). Some observers interpret this finding as evidence of so-called "greedflation" (e.g., Weber 2021).

estimates of markups and marginal costs and shed light on how firms adjust prices when faced with input scarcity. This will, in turn, improve our understanding of the transmission of supply and demand shocks to inflation and the roles of market power versus marginal costs in shaping inflation dynamics.

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3. Plan, feasibility and publication

The project is co-authored with Yang Liu (Boston College). Yang is a very promising PhD student at Boston College whom I met at the 2026 annual meeting of the American Economic Association in Philadelphia. He is an expert in firm-level analysis and applied microeconometrics. In his sole-authored paper, *Financial Constraints and Price Rigidities* (Liu 2025), which is currently R&R at the *Journal of Monetary Economics*, he uses product-level data from India to show that financially constrained firms exhibit higher cost pass-through following input price shocks, giving rise to asymmetric inflation dynamics at the aggregate level. Given his strong expertise in working with firm-level microdata and production-based estimation, Yang Liu is the ideal co-author for the project.

The project is planned over a three-year period from January 2027 to December 2029. In the first year, the focus will be on assembling the microdata from Statistics Denmark and developing the theoretical and empirical frameworks. In the second year, the main analyses will be carried out, and a preliminary draft of a working paper will be prepared. In the final year, the results will be presented at international conferences and seminars, after which the draft will be revised and submitted for publication.

The project is expected to result in (at least) one research paper, targeting leading field journals such as the *Journal of Monetary Economics*, the *Review of Economics and Statistics*, or the *American Economic Journal: Macroeconomics*. Given the strong policy relevance of the topic—particularly in light of recent inflation developments—the results are also expected to be of interest to central banks and other policy institutions.

By combining new empirical methods with detailed microdata, the project aims to produce research of high international standards with a significant impact on both academic research and policy discussions.

References

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