



# Managing Price Risk in Buyer-Supplier Contracts Through Indexing

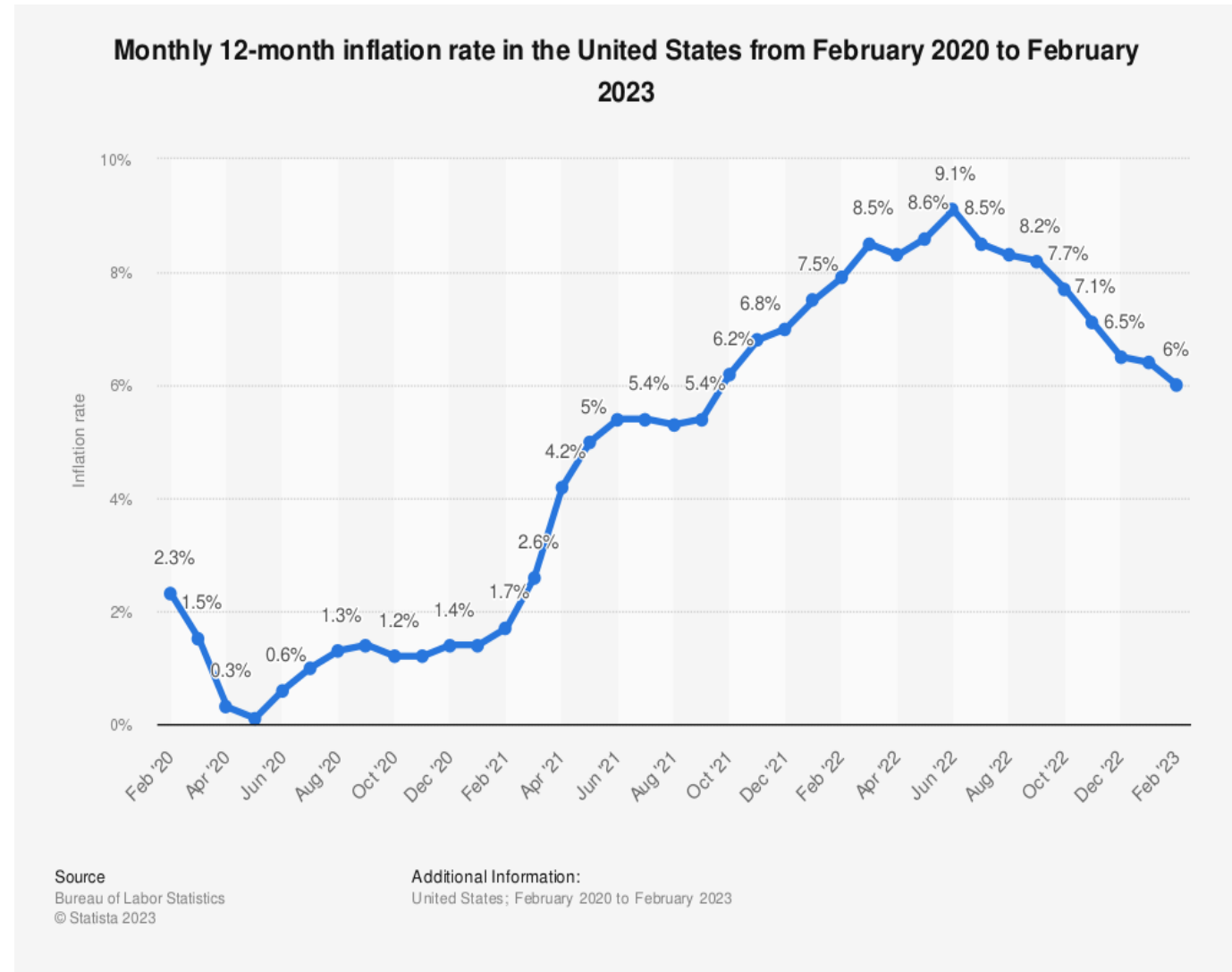


*Professor Sime (Sheema) Curkovic (Western Michigan University)*



# Inflationary Times Are Here to Stay

- Supply chain disruptions seem to be persistent since the pandemic
- Increased volatility of commodity and energy costs
- Structural shifts in labor markets
- Inflation woes will remain a key challenge for supply chain professionals moving forward





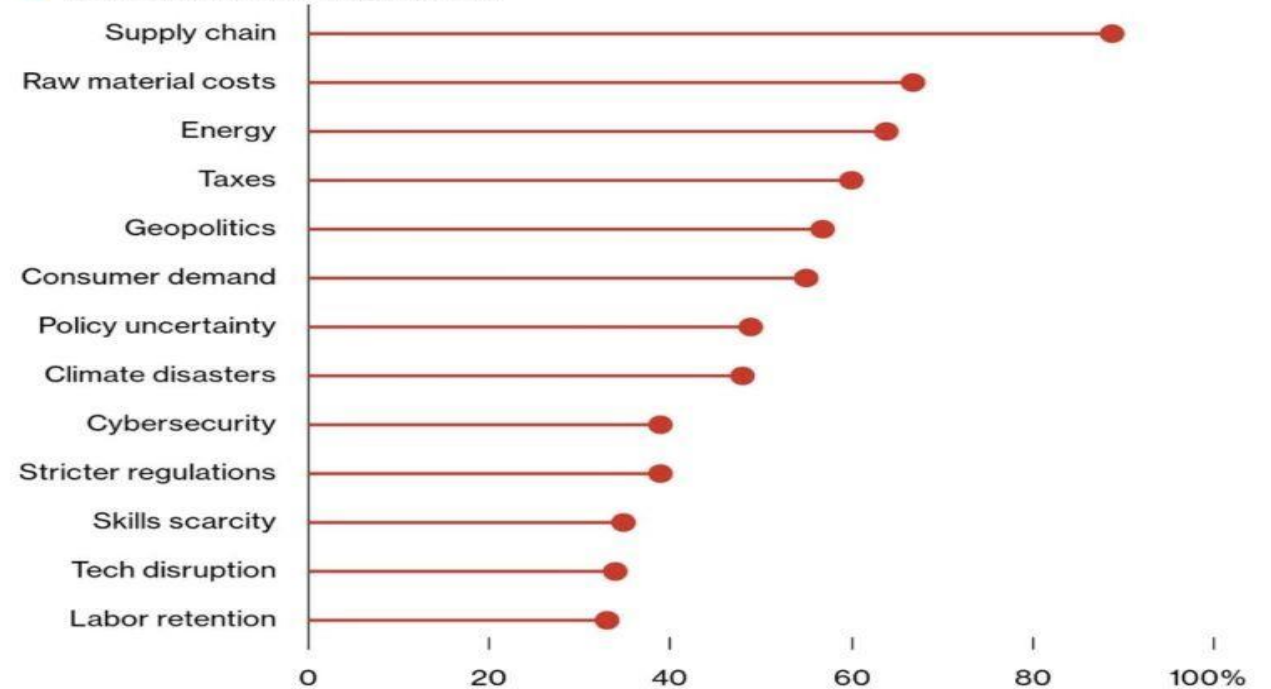
# Adjusting to a New Reality

- Inflationary pressures generate increased tensions between buyers and sellers
- Collaboration and strategic partnering are viewed as a necessity for long term supply chain resilience, where buyers and sellers share inflationary risks

## Still a Top Concern

Supply chains are still the top concern for firms over the next 18 months

● % of executives ranking top risks



Source: Capgemini Research Institute

Bloomberg

Capgemini Research Institute 2023

<https://prod.ucwe.capgemini.com/wp-content/uploads/2023/01/Final-Web-Version-Report-Davos-2023.pdf>

# World C&C Study (July 2022)



 World Commerce  
& Contracting

443 participants, 23 industries, key finding:

- Survey respondents indicated that 70% of new supplier agreements contain inflation driven economic adjustment clauses with the use of indices being the most common.
- Link to study: <https://www.worldcc.com/the-impact-of-inflation>





# Benefits of Price Indexing

- Risk sharing between buyers and sellers
- Increased transparency towards financial planning, where price adjustment clauses take into consideration cost structures and protecting profit margins
- Index-linked pricing adjustments are definitive and can be automated, as opposed to annual reviews that often require multiple meetings and rely on mutual goodwill
- Solution offers flexibility and adaptability

# Key Aspects of Contracts with Price Indexing / Economic Adjustments



- The contract adjusts prices based on changes to a specific, recognized and transparent index
- The contract includes a pre-defined price adjustment formula using an index or multiple indices
- The frequency of the indexing calculation is defined (monthly, quarterly, semi-annual, annual, etc.)
- Additional clauses may be added: trigger event, floors, ceilings, risk sharing ratios, escalation / de-escalation conditions
- Common indices used for price indexing:
  - Commodity exchange data
  - 3<sup>rd</sup> party pricing services: S&P, Dow Jones, CRU, Argus, Fastmarkets, etc.
  - Government agencies: Bureau of Labor Statistics (BLS), Energy Information Administration (EIA), US Department of Agriculture (USDA)



# Indexing Based Contracts – Example 1

## Supplier Agreement with Quarterly Price Adjustment using Labor and Commodity Bureau of Labor Statistics (BLS) Producer Price Index (PPI)

$P_0$  is a Base price for January 2017

$X_0$  is taken from a labor index: BLS CEU (current employment, manufacturing) index for 12/2016

$Y_0$  is taken from a commodity index: BLS WPU (all commodities) index for 12/2016

Step 1:  $F_n$  is an unadjusted price  $F_n = P_0 \left( 20\% + 35\% \frac{X_n}{X_0} + 45\% \frac{Y_n}{Y_0} \right)$

$X_n$  is the average of the BLS CEU indices for the previous quarter

$Y_n$  is the average of the BLS WPU indices for the previous quarter

Step 2: Adjustment: Sharing the risk in case of large change vs. previous quarter Price,  $P_{n-1}$

$P_n$  - Adjusted Price:

- if the change between  $F_n$  and  $P_{n-1}$  is between -3% and +3% then  $P_n = F_n$  : use the unadjusted price
- if the change between  $F_n$  and  $P_{n-1}$  is between -6% and -3% then  $P_n = 97\%P_{n-1}$
- if the change between  $F_n$  and  $P_{n-1}$  is between +3% and +6% then  $P_n = 103\%P_{n-1}$
- if the change between  $F_n$  and  $P_{n-1}$  is greater than 6% split the remainder evenly
- if the change between  $F_n$  and  $P_{n-1}$  is smaller than -6% split the remainder evenly



# Indexing Based Contracts – Example 2

Cost Calculation for Manufactured Steel Part Monthly Indexed Price using 3<sup>rd</sup> party steel price index, 3<sup>rd</sup> party steel scrap price index, and BLS CEU

$$P_n \text{ monthly Price} = X_n + Y_n + Z_n$$

$X_n$  material cost,  $Y_n$  insourced cost (manufacturing process),  $Z_n$  outsourced cost (packaging, transportation, etc.)

Material cost formula:

$$X_n = W_1 A_n - W_2 C_n$$

$W_1$  part weight,  $A_n$  raw material 2<sup>nd</sup> Wednesday price by steel price index

$W_2$  scrap weight,  $C_n$  scrap material end of month price by scrap price index

Insourced cost formula:

$$Y_n = t(C + L * D_n)(1 + M)$$

$t$  processing time,  $C$  machine burden rate,  $L$  number of operators,

$D_n$  average of the BLS CEU indices for the previous 6 months,

$M$  markup percent (including SG&A)

Outsourced cost:  $Z_n$





# Price Indexing Challenges

- Incorporate multiple data services as inputs – each of which has its own frequency for pricing; different units that take part in the formulas {lb., short ton, metric ton}, {seconds, hours}; multiple currencies, etc.
- Selecting the correct index and relevance in terms of industry, geography, and schedule
- Ongoing collection of index and other inputs and consequent calculations of pricing to remain up-to-date (complexity and administration)
- Extensive manual labor to manage multiple spreadsheets
- Auditing of formulas and their outcomes (different users, errors)
- Managing timestamps
- Accurately forecasting future pricing trends can still be challenging



# Ongoing Study by Western Michigan University's SCM Program

- Studying how companies in different industries administer indexing and economic adjustments, their challenges, and how such processes may be improved
- Initial findings:
  - Organizational ownership of process is not well defined
  - Human error, lack of audit trail
  - Lack of automation, requiring sufficient time and manual effort
  - Limited collaboration and visibility
  - Scalability issues
  - Data security and access control
  - Limited integration
- You are invited to join our study
- Software tools will be provided to evaluate how companies may implement business process automation, for example → Technology Demo...



# Thank You!

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