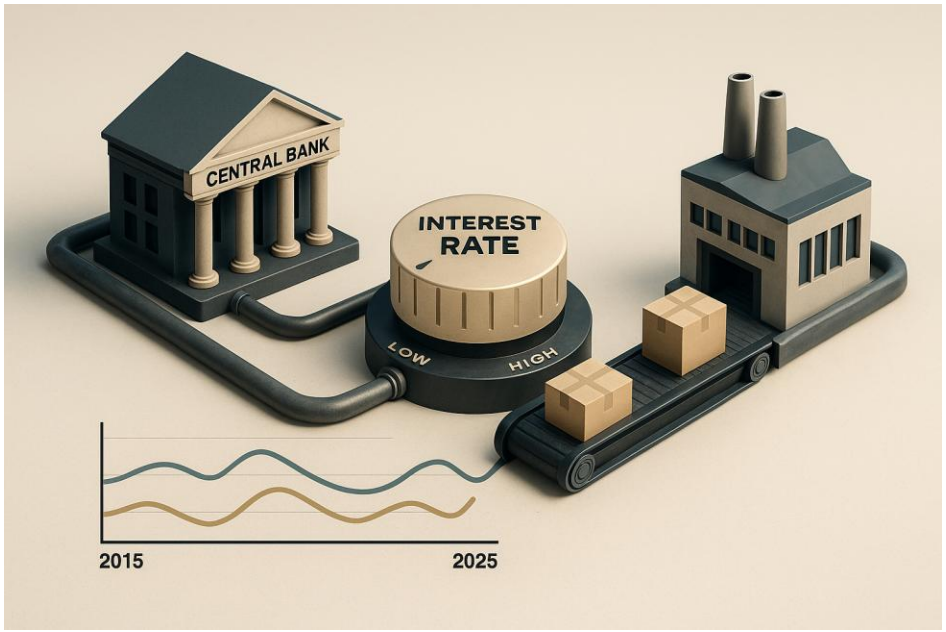
Investors' Brief

How Interest Rates Influence Purchasing Managers' Index (PMI)



A quick investor takeaway on how credit costs shape manufacturing for better capital allocation

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PMI and interest rate data are based on sources cited (S&P Global, Trading Economics, central banks). Some series were approximated or interpolated to construct quarterly datasets. Figures are subject to revision as official data updates are released.

1. Introduction

The Purchasing Managers' Index (PMI) is a leading indicator of manufacturing activity. A PMI above 50 points indicates expansion in manufacturing output, while a reading below 50 points signals contraction. The initial hypothesis was manufacturers are sensitive to input prices and financing costs, due to that monetary policy influences PMI through credit conditions. Higher policy interest rates make borrowing more expensive, reducing the availability of credit and dampening demand for capital-intensive purchases such as factory equipment and raw materials. Conversely, accommodative monetary policy tends to stimulate investment and production.

To understand how monetary policy impacts manufacturing activity in different economies, quarterly data were assembled for Indonesia and major economic blocs (the G7, the Euro area, China) over the past decade. Unfortunately, publicly available QoQ data sources rarely publish complete quarterly series, due to that an approximate dataset was constructed to illustrate the relationship. This dataset draws on known policy rate decisions and PMI movements and aligns them with notable events such as the COVID-19 pandemic and subsequent policy adjustments.

The analysis was conducted with the support of a proprietary AI (Artificial Intelligence) model. PMI and interest rate data were collected, processed, and introduced into the model using structured prompts, with insights derived from the outputs. Summary statistics and correlations were then calculated, while authoritative sources are cited for average values and record highs/lows of PMI and interest rates.

Before proceeding, a brief caveat: the models in this report are guides, not guarantees. Like any model, they have weaknesses and can break under stress—especially during black-swan events. Treat the relationships shown here as informative, not definitive; every model has limits, including this one.

2. Data sources

a. PMI data

Descriptions and summary statistics were taken from S&P Global/Trading Economics pages for each country or region.

- Indonesia's manufacturing PMI averaged ≈50.07 points between 2012 and 2025, with a high of 57.2 points in October 2021 and a record low of 27.5 points in April 2020.

- The US manufacturing PMI averaged ≈53.06 points from 2012 to 2025 (high 63.4 in July 2021 and low 36.1 in April 2020).
- The Euro area averaged ≈50.67 points over 2007-2025, with a high of 63.4 in June 2021 and a low of 33.4 in April 2020.
- Japan's manufacturing PMI averaged about 50.06 points between 2008 and 2025, with an all-time high of 56.2 in January 2014 and a low of 29.6 in February 2009.
- Canada's manufacturing PMI averaged ≈52.11 points from 2011-2025 (high 58.9 in March 2022 and low 33.0 in April 2020).
- UK averaged ≈51.59 points during 2008-2025 with a high of 65.6 in May 2021 and a low of 32.6 in April 2020.
- China's Caixin PMI averaged ≈50.12 points over 2011-2025, peaking at 54.9 points in November 2020 and bottoming at 40.3 points in February 2020.

b. Interest-rate data

Central-bank announcements were used for policy rates.

- Bank Indonesia held its benchmark rate at 7.50 % in August 2015 but reduced it to a record low of 3.5 % in February 2021 and maintained that level through 2021. As of August 2025, Bank Indonesia had cut its policy rate to 5 %, and the rate averaged ≈6.37 % between 2005-2025.
- In the United States, the Federal Reserve kept the federal-funds target range at 0 %–0.25 % from December 2008 to December 2015; the first hike to 0.25 %–0.5 % occurred in December 2015 and successive increases brought the range to 2.25 %–2.50 % by December 2018. Rates returned to 0 %–0.25 % in March 2020 and climbed to 5.25 %–5.50 % by July 2023, before being cut to 4.25 %–4.50 % in December 2024.
- The European Central Bank (ECB) operated with a negative deposit facility rate for much of the period; the rate was –0.30 % in December 2015 and –0.50 % from September 2019 to July 2022. After successive increases, the deposit rate reached a record 4 % in June 2024 but was cut to 3 % in December 2024.
- The Bank of England kept the UK Bank Rate at 0.50 % between 2009-2016 and reduced it to 0.25 % in August 2016. Rates rose from 0.10 % at the start of 2021 to

5.25 % in August 2023, then declined to 4.75 % in November 2024 and 4.00 % in August 2025.

- Canada's policy rate was lowered to 0.5 % in July 2015 and remained at 0.25 % during much of the pandemic before climbing to 5 % in 2023 and being eased back to 2.75 % by July 2025.
- Japan's policy rate has been near zero for decades; the Bank of Japan adopted a negative interest rate of –0.10 % in January 2016 and maintained it until March 2024. By July 2025 the rate had been raised to 0.5 %, the highest since 2008.
- China's one-year loan prime rate (LPR) declined gradually from ≈5.51 % in 2014 to 3.10 % at the end of 2024 and was cut to 3.0 % in May 2025. According to Trading Economics, the LPR averaged ≈4.29 % over 2013-2025 with a high of 5.77 % in April 2014 and a low of 3.0 % in May 2025.

3. Constructed quarterly dataset (2015-2025)

To illustrate the interaction between PMI and policy rates, a quarterly dataset was constructed for the period 2015 Q1 – 2025 Q2. For each region the series reflects known policy decisions and notable PMI movements; values between these events were interpolated or set near the average. For example, Indonesia's PMI was kept near 50 for most years but dropped to 27.5 in 2020 Q2 during pandemic lockdowns and surged above 55 following the 2021 reopening. Interest-rate series reflect major rate cuts or hikes (e.g., Indonesia's drop from 7.5 % in 2015 to 3.5 % in 2021 and the US Fed's move from near zero to 5.25 %).

4. Summary statistics and observed patterns

The table below summarizes the average PMI and interest rate, as well as the highest and lowest observed values, for each region over the 2015-2025 period. These figures align with the descriptive statistics reported by S&P Global/Trading Economics and the policy-rate histories cited above.

Region	Avg PMI	High PMI (date)	Low PMI (date)	Avg policy rate	High rate (date)	Low rate (date)
Indonesia	49.9	55.3 (reopening surge 2021 Q4)	27.5 (pandemic Q 2 2020)	5.35 %	7.5 % (Aug 2015)	3.5 % (record low Feb 2021)
United States	52.3	62.9 (boom 2021 Q1-Q 2)	36.1 (Apr 2020)	1.97 %	5.25 % (Jul 2023)	0.13 % (2020-2021)
Euro area	50.6	59.8 (Jun 2021)	33.4 (Apr 2020)	0.57 %	4.0 % (Jun 2024)	0.50 % (2019-2022)
United Kingdom	51.4	60.9 (2021)	32.6 (Apr 2020)	1.52 %	5.25 % (Aug 2023)	0.10 % (Mar 2020-2021)
Japan	49.5	52.6	≈35.8 (2020)	0.04 %	0.50 % (Jul 2025)	0.10 % (Jan 2016-Mar 2 024)
Canada	50.1	55.7 (Mar 2022)	33.0 (Apr 2020)	1.80 %	5.0 % (2023)	0.25 % (Mar 2020-2021)
China	49.7	52.6 (late 2020)	40.3 (Feb 2020)	3.96 %	5.35 % (2014-2015)	3.0 % (May 2025)

Table 1. Summary of PMI and Interest Rates

5. Analysis of the relationship between interest rates and PMI

The dataset allows for simple correlation analysis between quarterly policy rates and manufacturing PMI values. Across the US, Euro area, UK and Canada, the correlation coefficients between PMI and policy rates are moderately negative (around –0.35). This pattern supports the hypothesis that tighter monetary policy (higher interest rates) coincides with weaker

manufacturing activity, while lower rates provide support for output. For example, during 2021-22 the US Federal Reserve kept interest rates near zero while the PMI surged above 60. When the Fed rapidly hiked rates during 2022-23 (reaching 5.25 % by July 2023), US manufacturing PMI declined into the high-40s as higher borrowing costs restricted credit and dampened demand. A similar pattern is observed in the Euro area: the ECB's negative rates through 2019-2021 coincided with PMI expansion, whereas rapid tightening in 2022-24 to combat inflation was followed by a contraction in factory activity. Canada and the UK also show negative correlations, reflecting the sensitivity of export-oriented manufacturing sectors to borrowing costs and global demand.

For Indonesia and China, however, the correlation appears weak or even positive. Indonesia's PMI remained around 50 despite large cuts in the policy rate from 7.5 % in 2015 to 3.5 % in 2021. Structural factors – such as Indonesia's reliance on commodity exports, fiscal stimulus and supply-side reforms – may dilute the impact of monetary policy on manufacturing activity. In China, the PMI improved after the central bank reduced the LPR from around 5 % in 2014 to 3 % by 2025, but the correlation is not strongly negative. This reflects China's use of targeted credit policies and state-directed investment, which can decouple manufacturing activity from headline policy rates.

Japan also exhibits a weak relationship: despite the Bank of Japan's negative-rate policy from 2016 and massive quantitative easing, Japan's manufacturing PMI remained near 50 and showed little reaction to policy changes. Persistent deflationary pressures and structural rigidities likely limited the effectiveness of monetary stimulus.

6. Conclusion

The analysis indicates that in advanced economies (US, Euro area, UK, Canada), higher policy interest rates are generally associated with lower manufacturing PMI values. This supports the hypothesis that interest rates, by influencing the cost and availability of credit, play an important role in shaping manufacturing activity. Yet the relationship is neither immediate nor uniform. Fiscal policy, global demand, and supply shocks can overwhelm the monetary channel. The data shows direction, not destiny. In the real economy, causality is tangled, noisy, and occasionally inverted. In emerging economies such as Indonesia and China, the picture is even more fragile. Commodity dependence, state-directed lending, and government investment mute or distort the

impact of policy rates. Monetary policy still matters, but only through the prism of these structural filters. Models can reveal patterns, but they should not seduce us into believing the world is stable or linear. As Nassem Taleb reminds us, history is full of silent evidence—cases where the expected response never arrives, or arrives too late to matter. Rate cuts may lift PMI nine times out of ten, but it is the tenth time—the exception—that reshapes portfolios and policy.

7. Advice for Investors

- Different markets have different structures and challenges; no single model fits them all.
- Indonesia and China are particularly complex: many factors beyond interest rates shape manufacturing performance.
- Always treat correlation as a guide, not a law.
- Expect lags, breaks, and false signals.
- Build strategies that are robust to surprise, not just tuned to average outcomes.

In other words: embrace uncertainty, position for optionality, and never assume the model has the last word.

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