

Nowcasting Gross Domestic Product (GDP) of the Philippines: Using Nonfarm Payroll and Monthly Indicators Through Mixed Data Sampling (MIDAS)

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ONS-SMU

PSAI 2026 Annual Conference

October 20 – 21, 2026



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GDP estimation importance & challenge

- Vital for analyzing economic performance, monitoring growth, and guiding government policy (e.g., debt-to-GDP ratio).
- Official GDP figures are released 1–2 months after the reference quarter.
- Relies on massive benchmark data volume with delayed availability.

The need for nowcasting

- Nowcasting - generating early estimates using a timely information set correlated with GDP.
- Previous limitations: The Leading Economic Indicator (LEI) approach suffers from frequency mismatch (e.g., monthly CPI vs. quarterly GDP) and aggregation bias.
- MIDAS models accommodates multi-frequency data without biased aggregation.
 - utilizes indicators available before and even concurrent with the GDP quarter of interest.

Exploring new data: Nonfarm Payroll (NFP)



- A measure tracking the number of jobs added or lost.
- Increased employment implies business growth and higher disposable income.
- Previous study in USA: Models with NFP better at forecasting GDP growth (1947 to 2021)
- Philippine context: This study introduces a localized NFP derived from monthly Labor Force Survey (LFS) by PSA
 - employed in industry and services, excluding agriculture, fisheries and forestry, in private firm or government/government corporation employee.

Data and methodology

The simple linear MIDAS theoretical model that can nowcast GDP is represented faithfully to the notation of Ghysels et al. (2004),

$$\ln(GDP_t) = \gamma \ln(GDP_{t-1}) + \beta_0 + \beta_1 B(L^{1/m}) \ln(X_t^{(m)})$$

The monthly indicators are enumerated, $X_t^{(m)} \subseteq \{\text{NFP, Consumer Price Index (CPI), Volume of Production Index (VoPI), Exports, Government expenditures, Reverse repurchase rate (RRP)}\}$

- Model Specifications: MIDAS with various lag polynomial forms (Exponential Lag Almon, Beta, UMIDAS).

Estimation and evaluation

- Ensemble Approach: GDP was regressed on monthly indicators to build simple regression models, which were then averaged.
- Estimation Periods:
 - Beginning 2021: Inclusion of the monthly NFP data.
 - Beginning 2001: Long-term comparison without NFP
- Simulate growth rate nowcast for quarter of interest
- Deviation of nowcast from official growth rate - Mean Absolute Difference (MAD)

Findings

- Seasonally adjusted GDP models produced significantly better nowcasts (MAD < 1%) compared to non-seasonally adjusted models.
- Seasonally adjusted models consistently predicted correct positive growth, avoiding false contraction forecast.
- Seasonally adjusted MIDAS models outperformed random walk models.



	Q1 2025	Q2 2025	Q3 2025	Q4 2025	Q1 2026	MAD 2025 to 2026 Q1
GDP YoY growth official	5.40%	5.40%	4.00%	3.00%	2.80%	-
GDP forecast average MIDAS 1 UMIDAS	2.11%	-0.29%	3.85%	-0.79%	6.79%	3.38%
GDP forecast average MIDAS 2 Seasonal Adjusted UMIDAS, without NFP	5.06%	5.22%	5.28%	3.71%	3.03%	0.55%
Random walk without drift	16.54%	21.08%	-4.27%	3.99%	3.02%	7.26%

- Models with NFP (especially the UMIDAS functional form) showed strong nowcasting ability
- (MAD: 0.52%), proving its accuracy despite a shorter historical data span.



	Q1 2025	Q2 2025	Q3 2025	Q4 2025	Q1 2026	MAD 2025 to 2026 Q1
GDP YoY growth official	5.40%	5.40%	4.00%	3.00%	2.80%	-
GDP forecast average MIDAS 2 Seasonal Adjusted PDL Almon, with NFP (starting 2021)	5.08%	5.18%	5.25%	3.84%	3.15%	0.60%
GDP forecast average MIDAS 2 Seasonal Adjusted Beta, with NFP (starting 2021)	4.99%	5.16%	5.10%	3.87%	3.17%	0.60%
GDP forecast average MIDAS 2 Seasonal Adjusted UMIDAS, with NFP (starting 2021)	5.04%	5.18%	5.25%	3.50%	3.09%	0.52%
GDP forecast average MIDAS 5 Seasonal Adjusted PDL Almon (starting 2001)	6.01%	5.41%	5.11%	4.44%	3.13%	0.70%
GDP forecast average MIDAS 5 Seasonal Adjusted Beta (starting 2001)	5.48%	5.34%	5.16%	4.53%	3.31%	0.67%
GDP forecast average MIDAS 5 Seasonal Adjusted UMIDAS (starting 2001)	5.49%	5.38%	5.48%	4.52%	3.09%	0.68%

- Models (MIDAS 3) using CPI and government expenditure formed the most accurate ensemble models overall (Lowest MAD: 0.46%).

	Q1 2025	Q2 2025	Q3 2025	Q4 2025	Q1 2026	MAD 2025 to 2026 Q1
GDP YoY growth official	5.40%	5.40%	4.00%	3.00%	2.80%	-
GDP forecast average MIDAS 2 Seasonal Adjusted PDL Almon, without NFP	5.10%	5.17%	5.21%	3.79%	3.09%	0.56%
GDP forecast average MIDAS 2 Seasonal Adjusted Beta, without NFP	4.98%	5.20%	5.10%	3.83%	3.11%	0.57%
GDP forecast average MIDAS 2 Seasonal Adjusted UMIDAS, without NFP	5.06%	5.22%	5.28%	3.71%	3.03%	0.55%
GDP forecast average MIDAS 3 Seasonal Adjusted PDL Almon, without NFP	5.04%	5.25%	5.01%	3.48%	3.22%	0.48%
GDP forecast average MIDAS 3 Seasonal Adjusted Beta, without NFP	4.96%	5.18%	5.03%	3.54%	3.24%	0.53%
GDP forecast average MIDAS 3 Seasonal Adjusted UMIDAS, without NFP	5.03%	5.17%	5.04%	3.42%	3.02%	0.46%

Conclusions

- **MIDAS is effective:** MIDAS models successfully generate accurate, early estimates of Philippine GDP growth.
- **Shorter data, strong results:** The shorter estimation period (starting 2021) utilizing NFP performed comparably to 20-year estimation period, highlighting the predictive power of the NFP data.
- **A notable limitation:** While models correctly nowcast stable growth and trend, they struggled to forecast the exact magnitude of a sudden slowdown (Q3 2025).

Recommendations & future research

- Regularly generate, report, and integrate total NFP into economic models.
- Utilize monthly government expenditure alongside inflation/CPI as primary inputs for future GDP nowcasts/early estimates.
- Explore specifying higher-frequency data (daily or weekly indicators) within MIDAS models to produce more accurate nowcasts.



Thank you

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