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| RESEARCH ARTICLE

Predictive Insights: Using Macro and Micro Models for Wage Growth Forecast in Malaysia

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| ABSTRACT

The Malaysian government has implemented the Progressive Wage Policy (PWP) to accelerate wage growth and address the low contribution of employee compensation (CE) to Gross Domestic Product The objective, as outlined in the Twelfth Malaysian Plan (RMKe-12), is to achieve a median wage of RM2,700 per month by 2025 and attain an annual productivity growth rate of 3.7% from 2021 to 2025[22]. In line with this policy, Social Security Organization (PERKESO), an organization under the Ministry of Human Resource, has taken proactive measures to analyze and model wage growth forecasting for the upcoming years. This paper aims to develop a forecasting model by examining the relationship between wages and various macroeconomic and microeconomic variables, including the unemployment rate. The methodology employs both Phillips Curve and Artificial Intelligence Model to predict wage increments, covering the period from 2016 to 2023. The approach ensures the development of a robust model supported by big data. This study establishes a predictive relationship within a stylistic framework of wage bargaining, indirectly fostering dynamic ecosystems between the prevailing economic conditions and employers' market trends in the Macro Model. The model considers the institutional structure of the current economic condition and employers' market trends, incorporating factors based on economic indicators and contributions. Additionally, a Machine Learning Gradient Boosting Regressor Model is utilized to predict the output from micro models. This enhances the overall reliability of the model. Significantly, the methodological innovation revolves around the integration of Macro and Micro Models, utilizing detailed data from job placements and monthly contributions spanning from 2020 to 2023 for the wage forecast framework. This distinct approach facilitates forecast development through model averaging techniques customized to maximize the accuracy of wage increase and estimated salary predictions.

| KEYWORDS

Wage forecast; micromodel; micromodel; economy; labour market

| ARTICLE INFORMATION

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1. Introduction

Understanding the intricacies of wage forecasting in Malaysia is paramount for both the workforce and overall economic development. Bank Negara Malaysia highlights that while labor demand is on the rise due to increased economic activity, wage

growth remains moderate, reflecting a balanced labor supply[5]. The Malaysian labor market, evolving from agriculture to manufacturing and services, plays a pivotal role in the country's economic growth. An imminent development in the wage landscape is the implementation of the Progressive Wage Policy in June 2024. This policy aims to incrementally elevate compensation for low-income workers, factoring in their skills, experience, and performance. The strategic move is expected to address issues of inequality and the rising cost of living, fostering a more equitable society[4] . The significance of wage forecasting extends beyond social concerns to impact the country's productivity growth, particularly in the services sector, which contributes about 55% to the national output. According to anticipated data from Mercer's Total Remuneration Survey, a median salary increases of 5.1% is expected in Malaysia for 2024, a slight uptick from the 4.8% recorded in 2023[3]. This boost in salaries is anticipated to have a positive influence on the nation's economic growth.

Comparatively, Malaysia's current wage growth rate stands at 5% as of 2022. Mercer's survey, encompassing over 660 multinational corporations across 15 industries in Malaysia, provides valuable insights into these projections. Long-term forecasts suggest an expected rise to RM3,350.00/month in 2024, with a future projection of RM3,420.00/month. In the broader economic context, Malaysia's economy is projected to expand by 3.9% in 2023 and is expected to further increase to 4.3% in 2024[3]. Despite a slowdown to 2.9% GDP growth in Q2 2023 due to subdued external demand, domestic demand continued to grow. Economic dynamics, including indicators such as the unemployment rate, inflation rate, augmented inflation rate, and the overnight policy rate (OPR), are intricately linked to the growth trajectory[6]. The correlation between economic factors extends to a direct association with the rate of wage increase. These interconnections underscore the complexity of economic factors that collectively shape and influence the growth trajectory of a nation's economy. The introduction of the Progressive Wage Policy in June 2024 is poised to play a pivotal role in shaping a more equitable and sustainable wage landscape, addressing immediate concerns related to inequality and the cost of living[15]. As Malaysia navigates these economic dynamics, the strategic alignment of wage policies with broader economic goals becomes increasingly essential for fostering inclusive growth and shared prosperity.

2. Literature Review

Several models have attempted to fill in and predict missing wage data, exhibiting variations in terms of country coverage, model specifications, and the level of analysis performed. Despite numerous papers dedicated to examining the interplay between wages and employment, there is still some debate regarding the mechanism by which wages adjust, and the array of methodologies chosen in these wage projection models reflects this diversity. This model framework focuses on employing a macroeconomic model that delineates economic indicators and a microeconomy model that utilizes detailed data on job placement and monthly contributions, encompassing demographic information such as age, skill level, industry, employer size, state, wage increase rate, and estimated salary.

The assessment of the overall economic well-being and the prediction of future trends heavily depend on macroeconomic indicators. These indicators, including employment figures, inflation rates, and others, are crucial for interpreting wage increments and making informed policy decisions. Combining these macroeconomic indicators with microeconomic data provides a comprehensive understanding of economic trends at both broad and detailed levels.

2.1 Economic Indicators Correlate with Wage Growth Forecast Macroeconomic Model

In this model, the determinant factors dataset is unemployment rate, inflation rate, augmented inflation rate, OPR and wage increase rate. Standard macroeconomic theory relates wage growth to unemployment using different variations of the Phillips curve argument[14]. The Phillips curve relates real wage inflation to unemployment, stressing that wage claims can be more easily achieved in periods oflow unemployment rates. Hence, wage growth is negatively related to the level of the unemployment rate. Based on micro-econometric evidence, Blanchflower and Oswald (1994) refute this relationship and claim that it is instead the level of wages that is inversely related to the unemployment rate, giving rise to the "wage curve"[2]. Similarly to the wage Phillips curve, however, it is changes in the outside option for workers that allow them to achieve higher wages in periods and areas where unemployment is low. The wage curve makes up for a more persistent impact of (supply) shocks on wages as workers will aim at recovering the (expected) level of wages even after the shock has disappeared. Even though both claims look irreconcilable, Whelan (2000) argues that the wage Phillips curve is compatible with any microeconomic relationship between the level of wages and unemployment[14]. However, existing evidence points to a more persistent effect of shocks on wages, which is also reflected in our empirical strategy discussed below. Hence, inflation indicator and unemployment has traditionally been an inverse correlation.

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2.2 Unemployment Rate Relationship with Economic Indicators

Wage forecasts and unemployment rates are deeply intertwined economic indicators with significant impacts on each other. The relationship between these two variables is dynamic and plays a crucial role in shaping labor market dynamics and economic conditions[6]. High unemployment rates often exert downward pressure on wages as there is a surplus of available workers competing for limited job opportunities. In such scenarios, employers have a larger pool of candidates to choose from, allowing them to offer lower wages due to increased bargaining power. Conversely, in periods of low unemployment rates, employers face labor shortages, compelling them to offer higher wages to attract and retain talent. This phenomenon arises from the heightened competition among employers for a limited workforce[11]

As a result, there exists an inverse relationship between wage forecasts and unemployment rates. A decrease in the unemployment rate typically correlates with an increase in wage forecasts, reflecting a robust labor market where workers possess greater bargaining power to negotiate higher wages. Conversely, an increase in the unemployment rate may lead to more conservative wage forecasts as employers face less pressure to offer competitive wages amidst a larger pool of job seekers[14,16]. In summary, wage forecasts and unemployment rates are intricately linked, with changes in one indicator exerting significant impacts on the other. A strong labor market characterized by low unemployment rates tends to coincide with higher wage forecasts, while elevated unemployment rates often result in more conservative wage projections. Understanding and monitoring this relationship is essential for policymakers, businesses, and individuals alike in navigating the complexities of the labor market and making informed decisions regarding employment and wages.

3. Methodology

The wage growth forecast model was meticulously crafted by leveraging retrospective data through a cross-sectional study, supplemented by pooling of data for comprehensive analysis. To ensure robustness, reliability analysis was conducted, with Cronbach's Alpha exceeding 0.80, indicating high reliability in handling covariates and associated variables. Additionally, employing regression models in both the Macroeconomics and Microeconomics contexts, augmented by cross-sectional analyses including relationship assessments, correlations, and regressions, ensures a robust prediction of the wage growth landscape in 2024, with a stringent threshold of $R2>0.7$ for inclusion, thus ensuring the model's validity.

3.1 Wage Growth Forecast Model Framework

The methodology embraced the Phillips curve framework as the cornerstone for guiding assumptions in macroeconomic-based wage forecasts. Moreover, to complement macroeconomic perspectives, microeconomic insights were integrated through the implementation of Machine Learning Models. Criteria selection was meticulous, predicated upon collinearity assumptions with accurate prediction, facilitating the identification of closely interrelated variables crucial for model accuracy. The model framework is presented in Figure I below. By synergizing Macro Model variables with Micro Model variables to create Synergy Effect or One-Way Interaction Effect (Macro Model to Micro Model) which applicable in multiple linear regression setting in machine learning, which when increase in the value of independent variable will increases the impact of another independent variable on the dependent variable. This approach is applicable in a model where both models are integrated to predict wage growth in the Malaysian ecosystem. This not only enhances the impact between variables but also improves the efficiency of the combined analysis using the Phillips curve and Gradient Boosting Regressor. These methods signify the validity and reliability of the model employed.

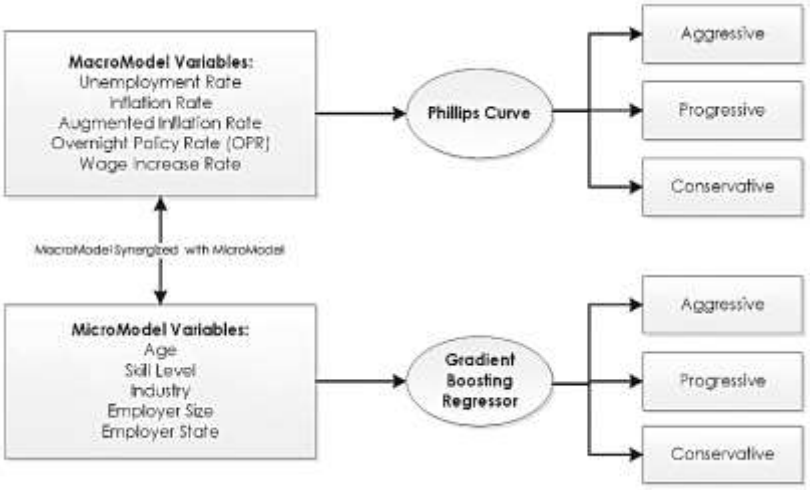

Figure I: Wage Growth Forecast Model Framework

3.1.1 Wage Forecast Based on Macro Models

The reliability of this wage forecast model is fortified by an exhaustive data collection effort spanning both quarterly periods from 2016 to 2023 and monthly intervals from 2020 to 2023. This comprehensive coverage is meticulously tailored to the private sector, encompassing salary ranges from RMl,500 to RM5,000 which represents majority of the employees. By leveraging regression models in both Macro and Micro contexts, complemented by cross-sectional analyses encompassing relationship assessments, correlations, and regressions, a robust prediction of the wage growth landscape in 2024 is ensured. This holistic approach not only resonates with economic policy objectives but also yields invaluable insights into the nuanced dynamics of wage determination within the Malaysian economy. In a relentless pursuit of precision in wage forecasting, this study harnesses macro models firmly grounded in the principles of three Phillips curve models. These models collectively yield a spectrum of values representing potential wage increases. The assumptions underpinning these models are encapsulated in the following equations:

$$\textbf{Inflation Rate} = \beta 0 + \beta 1 \times \text{Unemployment Rate} + \beta 2 \times \text{OPR} + \varepsilon$$

$$\textbf{Augmented Inflation Rate} = \beta 0 + \beta 1 \times \text{Unemployment Rate} + \beta 2 \times \text{Augmented Inflation} + \beta 3 \times \text{OPR} + \varepsilon$$

$$\textbf{Organic Wage Increase} = \beta 0 + \beta 1 \times \text{Unemployment Rate} + \beta 2 \times \text{Wage Increase} + \varepsilon$$

Where:
OPR represents Overnight Policy Rate *B*
signifies as coefficients to be estimated *ε*
signifies the error term

By anchoring methodologies in these equations, a sturdy foundation is laid for precise and insightful wage forecasts vital for informed decision-making in economic planning and policy formulation. Each assumption encapsulates a distinct facet of economic dynamics. The Inflation Rate Model, akin to the basic Phillips Curve, exhibits less sensitivity to changes in the unemployment rate. In contrast, the Augmented Inflation Rate Model displays heightened sensitivity compared to its counterpart, incorporating the additional variable which is augmented inflation. The Organic Wage Increase Model is derived from the actual estimated wage increases obtained from PERKESO's contributions. The formulation of these three assumptions allows for the delineation of upper (aggressive), middle (progressive), and lower (conservative) bands. This stratification enables the capture of inherent uncertainty, variability, and potential range of outcomes within economic relationships as shown in Figure 2. Furthermore, this approach facilitates scenario analysis and equips the policymaking process by providing a comprehensive understanding of potential wage increase scenarios. Through these models, nuanced insights are aimed to cater to the multifaceted nature of economic forecasting. By delineating these assumptions, a robust framework is established for analyzing and interpreting wage dynamics, offering valuable insights into the intricate interplay of economic variables.

Based on the adapted methodology, the framework prioritizes the collinearity of predictor variables, aiming to examine the linear relationships within the regression model. Figure 2 illustrates the Phillips Curve, depicting the aggregate linear demand including inflation rate, augmented inflation rate, and organic wage increase. This Phillips Curve displays the movement of these variables within their respective ranges, with organic wage increase demonstrating high variance due to its granular data distribution, consisting of a sample size of This model introduces a novel approach to predicting wage growth by determining the grouped

median within each of these multicollinear variables, as detailed in the findings. Hence, it is supported with the regression value that presented in Table I below which shows that these variables used in this study is highly correlate with each other.

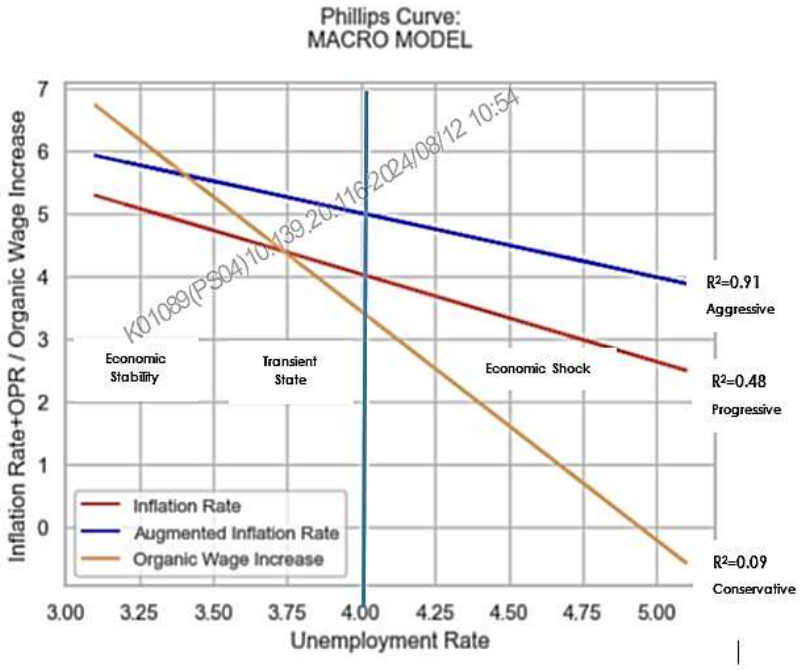

Figure 2: Phillips Curve: Macro Model of Wage Growth Forecast

Variables	R^2
Inflation Rate	0.09
Augmented Inflation Rate	0.91
Organic Wage Increase	0.48

Table 1: Multiple Regression of Inflation Rate, Augmented Inflation Rate and Organic Wage Increase

3.1.2 Wage Forecast Based on Micro Models

Drawing insights from the micro model, meticulously crafted through granular data sourced from placements and monthly contributions spanning 2020 to 2023, the dataset encompasses crucial labor market variables. These include age, skill level, industry, employer size, state, wage increase rate, and estimated salary, forming a comprehensive understanding of the intricate dynamics within the labor market. With the integration of a Machine Learning model utilizing linear regression, this model predicts a continuous dependent variable which is wage forecast based on one or more independent variables (placement and contributions data) and estimates probabilities within this framework. This model synergizes with the macro model, intelligently absorbing its output to fine-tune forecasts: the wage increases range. The mathematical representation of this synergy is encapsulated in the equations below:

$$y1=\Sigma\ N(i=1)\ learneri\ (x1,\ x2,\ x3,\ x4,\ x5)$$

Where

• y1 are the predicted outputs.
• N is the number of trees (learners) in the ensemble
• $learneri$ is the i-th decision tree learner.
• $x1$, $x2$, $x3$, $x4$, $x5$ are the five features used for prediction (case, skill level, industry, employer size, employer state)

The Organic Wage Increase is derived from actual estimated wage increments gleaned from PERKESO's Placement and Contribution data. Furthermore, the 'Progressive' result serves as a crucial offset, aligning the micro model with the overarching macro model. The Machine Learning Gradient Boosting Regressor model meticulously analyzes five distinct features or variables (Case, Skill Level, Industry, Employer Size, Employer State) extracted from Placement data, mapped in conjunction with Contribution data. Leveraging this comprehensive dataset, it adeptly predicts upper (aggressive), middle (progressive), and lower (conservative) bounds of wage increases, providing valuable insights into the nuanced dynamics of the labor market as presented in Figure 3 below. The forecast for 2024 wage growth is depicted in the scatter plot below, presented through a distribution graph. This graph, utilizing the Random Forest Regressor employed in this analysis, illustrates that the predicted median value is nearing the threshold. The accumulation of data points in the distribution suggests that the median is anticipated to closely align with the mean (SD), indicating minimal deviation between the two measures. Additionally, linear Ridge Regression is utilized instead of the Ordinary Least Squares (OLS) model to mitigate potential problems related to overfitting and multicollinearity in the data, which could inaccurately influence the forecast. Moreover, Ridge Regression is chosen because of its robustness in managing high variance and covariates within the analysis[17]. As presented in this Figure 3, it is apparent that Ridge Regression does shrink the coefficients, to find standard least squares fit as presented below. Therefore, in this forecast, the median line illustrates the estimated ranges of the forecast.

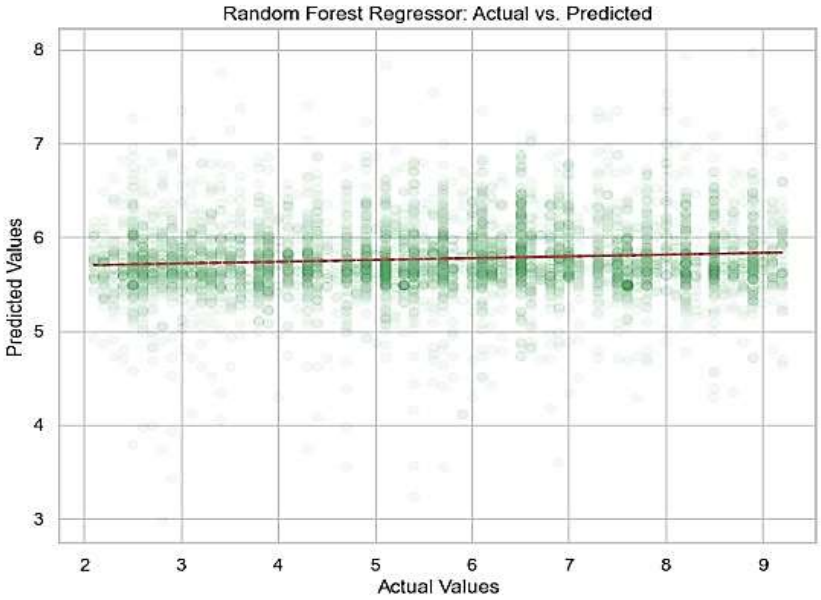

Figure 3: Wage Growth Forecast Prediction Graph

4. Results

4.1 Model Analysis

In this comprehensive analysis, the integration of the Phillips Curve and Machine Learning Model facilitates the identification of probabilities and assumptions crucial for predicting the wage forecast in 2024. Leveraging correlation analysis and probability assessment, this study adeptly forecasts wage trends. The data sample distribution is assumed to be normal, aligning with the central limit theorem (CLT). According to the CLT, the distribution of sample means approximates a normal distribution as the sample size increases, irrespective of the population's distribution. This normalization of data distribution enhances the reliability and accuracy of the wage forecast, contributing to informed decision-making processes in economic planning and policy formulation.

4.2 Prediction of Wage Forecast in 2024

Within the expansive realm of economic dynamics, this study meticulously examines the intricate task of forecasting wage trends for the year 2024. Anchored in a comprehensive framework, our analysis draws upon a wealth of data, including Quarterly Economic Indicators and Contributions data spanning from 2016 to 2023. This dataset encapsulates critical determinants such as the unemployment rate, inflation rate, augmented inflation rate, OPR, wage increase rate, and estimated salary. This multifaceted model is designed in concordance with the objectives of the PWP outlined in the RMKe-12, emphasizing the urgent need to address the low contribution of CE to GDP and to accelerate wage growth.

Through the functionalities of the Wage Forecast calculator website, users can input varying unemployment rates, defaulting to the current rate, or introducing scenarios of economic shock. The forecasting process employs three Phillips Curve models, strategically categorizing percentage forecasts into upper (aggressive), middle (progressive), and lower (conservative) bounds. Noteworthy distinctions emerge in aggressive states, presenting as 6.0% under the current scenario and 5.2% in the presence of an economic shock. Progressive states, reflecting a strategic balance, are projected at 5.7% and 4.3%, respectively.

	Current Rate (%)	**With Economic Shock (%)**
Aggressive	6.0	5.2
Progressive	5.7	4.3
Conservative	5.0	4.2

Table 2: Prediction Rate of Wage Growth Forecast based on the Macro Models

Transitioning to the micro model, granular data harvested from placements and monthly contributions between 2020 and 2023 offer a nuanced perspective on the labor market. Variables encompassing age, skill level, industry, employer size, and state contribute to this intricate analysis. Inputs into the Wage Forecast calculator website, specifying age (44), skill level (Low-Skilled), industry (Manufacturing), employer size (Micro), and state (W.P. Kuala Lumpur), serve as crucial parameters for the gradient boosting regressor. This element predicts estimated wage growth within the aggressive (5.4%), progressive (5. I %), and conservative (4.4%) classifications.

	Estimated Wage Growth Forecast (%)
Aggressive	5.4
Progressive	5.1
Conservative	4.4

Table 3: Prediction Rate of Wage Growth Forecast based on the Micro Models

In the analytical aftermath, our study underscores the pivotal role of economic landscapes in shaping wage progression, particularly the influence of economic shocks on variables like economic growth. This integrated approach not only aligns with economic policy objectives but also offers invaluable insights into the intricate dynamics of wage determination within the Malaysian economy.

5. Discussion

Based on the results projected, range rate of wages related with economic variables is 5.0% to 6.0% considering without the economic shock. Although with economic shock, it is predicted to be lower, ranging between 4.2% to 5.2%. As reflected to current economic phases, it can be concluded that expected wage forecast related to economy indicator is 5.0% to 6.5%. This forecast aligns with the projections for wage growth in the coming years, indicating a positive trend in wages as part of the economic outlook. Considering factors related to that, inflation is another critical factor affecting wage growth. This aligns with wage forecast in Malaysia, as released by Bank Negara Malaysia, with country's economy is projected to grow between 4.0% and 5.2% in 2024[3,4]. This forecast is supported by resilient domestic demand and an improvement in external demand. The central bank anticipates that the transition period of upcoming reforms, which include the rationalization of subsidies and reduction of the fiscal deficit, may pose some short-term challenges but are considered investments for the country's future prosperity. Additionally, the central bank projects headline inflation to average between 2% and 3.5% in 2024, with potential upside risks due to price adjustments on food and energy items, as well as external pressures from exchange rate and global commodity price developments.

In connection with the unemployment rate, the range of rates spans from 3.3% to 6.5%. This emphasizes the inverse relationship between wage forecasts and unemployment rates. Typically, a decline in the unemployment rate corresponds with an upsurge in wage forecasts, signaling a robust labor market where workers possess increased bargaining power to negotiate higher wages.

This can be attributed to the dynamics of the employment market relative to the Malaysian population within the range outlined in this study. Despite variations in unemployment rates, factors such as market demand, skill shortages, and structural

characteristics of the labor market may influence the stability of wage levels. The relationship between the unemployment rate and wage growth is intricate, influenced by various economic factors. Research suggests a notable correlation between these variables, with unemployment rates impacting wage growth dynamics. At times, a higher unemployment rate may result in subdued wage growth, even amidst an uptick in job creation. This can be attributed to factors like labor market slack, involuntary part-time employment, and sluggish productivity growth. This nuanced understanding underscores the complex interplay between labor market dynamics, economic conditions, and wage determinants. It stresses the significance of considering multiple factors beyond just the unemployment rate when forecasting wage trends and devising economic policies. After a comprehensive analysis of these variables, it can be deduced that this wage forecast model exhibit's reliability and validity. It accurately predicts wages by utilizing two crucial indicators: economic conditions and unemployment rates, which play pivotal roles in wage forecasting. In summary, the Wage Forecast Model utilized in this study encompasses all major indicators and variables necessary for accurate wage forecasting. Furthermore, additional covariates have been considered to account for bias and confounding factors.

6. Conclusion

In conclusion, the wage forecast for 2024 reveals a trend towards more modest salary increases, influenced by factors such as turnover rates, inflation, and prevailing economic conditions. Furthermore, the analysis underscores the challenges posed by the disparity between unemployment rates and wage growth, underscoring the critical need to comprehend the intricate interplay between labor market dynamics and wage trends. This comprehensive understanding is essential for policymakers and stakeholders to navigate the complexities of the labor market effectively and formulate strategies that promote sustainable economic growth for Malaysian population.

6.1 Study Limitations and Future Research

Although, this model has shown to be reliable but the limitations of wage-growth expectations as a forecasting tool include biases, inefficiencies, limited predictive power, and challenges in accurately predicting future inflation trends. These limitations underscore the complexity of using wage data alone to forecast economic variables like inflation, highlighting the need for a comprehensive approach that considers multiple economic indicators for more accurate predictions.

Further research endeavors should focus on enhancing the prediction accuracy and stability of models. This can be achieved by incorporating additional characteristic variables such as the inflation rate, cost of living, household income, and industry, thereby augmenting the model's capacity to elucidate salary trends. Moreover, during the model construction phase, exploration of alternative machine learning algorithms and deep learning techniques can be explored to enhance model performance. Additionally, extending the application of salary prediction models to diverse domains such as finance and healthcare can cater to a broader spectrum of needs. Moreover, continued in-depth research in this domain is imperative to furnish more precise and efficient solutions for salary forecasting challenges within the labor market.

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References

[1] Analysis of wage growth. (2017). http://www.itsanhonour.gov.au/

[2] Blanchflower, D. G. , & Oswald, A. J. (1995). An introduction to the wage curve. Journal of Economic Perspectives, 9(3), 153—167. https://doi.org/10.1257/jep.9.3.153

[3] Chong, E., & Khong, F. A. (2018). The Living Wage: Beyond Making Ends Meet. www.bnm.gov.my

[4] Devadas, S., Guzman, J., Kim, Y. E., Loayza, N., & Pennings, S. (2020). Malaysia's economic growth and transition to high income an application of the world bank long term growth model (LTGM). http://www.worldbank.org/prwp.

[5] Economic & Monetary Review 2022. (n.d.).

[6] Jasmi, Z. S., Hassan, N., & Rosli, A. R. (n.d.). Issue 2, Factors determining overnight policy rate (OPR) in Malaysia (Vol. 10).

[7] Jiang, W. (2024). The investigation and prediction for salary trends in the data science industry. Applied and Computational Engineering, 50(1), 8—14. https://doi.org/.10.54254/2755-2721/50/20241102

[8] Jonsson, T., & Österholm, P. (n.d.). The forecasting properties of survey-based wage-growth expectations.

[9] MALAYSIA 2019 ARTICLE IV CONSULTATION-PRESS RELEASE; STAFF REPORT; AND STATEMENT BY THE EXECUTIVE DIRECTOR FOR MALAYSIA. (2018). http://www.imf.org

[10] Martin, 1., Mariello, A., Battiti, R., & Hernåndez, J. A. (2018). Salary Prediction in the IT Job Market with Few High-Dimensional Samples: A Spanish Case Study. International Journal of Computational Intelligence Systems (Online), 11(1), 1192. https://doi.org/10.2991/ijcis.11.1.90

[11] Mihaljek, D., & Saxena, S. (2010). Wages, productivity and "structural" inflation in emerging market economies. BIS Papers Chapters, 49, 53—75. https://www.bis.org/publ/bppdf/bispap49d.pdf
[12] Narasimhan, V., Ernst, E., Viegelahn, C., Duda-Nyczak, M., Belser, P., Sobeck, K., & Vazquez-Alvarez, R. (2016). Predicting Wages. A new model to estimate and project wage developments around the globe https://d0i.org/10.13140/RG.2.1.1123.4961
[13] Nickel, C., Bobeica, E., Koester, G., Lis, E., & Porqueddu, M. (2019). Understanding low wage growth in the Euro area and European countries. Social Science Research Network. https://doi.org/10.2139/ssrn.3447190
[14] Whelan, K. (2000). Real wage dynamics and the Phillips Curve. Social Science Research Network. https://doi.org/10.2139/ssrn.224049
[15] Progressive Wage Policy White Paper, November 2023. Ministry of Economy. Malaysia
[16] McDonald, I. M., & Solow R. M. (1981). Wage bargaining and employment. The American Economic Review. 71(5), 896-908. https://www.jstor.org/stable/1803472
[17] Fitrianto, A., & Lee, C. Y. (2014). Performance of ridge regression estimator methods on small sample size by varying correlation coefficients: a simulation study. Journal ofMathematics and Statistics. 10(1), 25-29. https://doi.org/10.3844/imssp.2014.25.29
[18] Hall, R. E., & Milgrom, P. (2008). The limited influence ofunemployment on the wage bargain. The American Economic Review, 98(4), 1653-1674. https://d0i.org/lO.1257/aer.98.4.1653
[19] Mares, I. (2006). Taxation, wage bargaining, and unemployment. https://doi.org/10.1 0 17/cb09780511625688
[20] Levine, L. (2013). Economic growth and the unemployment rate. http://cdn.cnsnews.com/documents/CRS%20Economic%20Growth%20and%20Unemployment%20Rate.pd
[21] Carroll, C. D. (2003). Macroeconomic expectations ofhouseholds and professional forecasters. The Quarterly Journal of Economics, 118(1), 269-298. https://doi.org/l O. 1 162/00335530360535207
[22] 12th Malaysia Plan. 2021-2025 A Prosperous, Inclusive, Sustainable Malaysia. (n.d.).