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The Impact of Taxation on the Cost of Living: A Comprehensive Analysis

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Abstract: This study examines the taxation-related factors affecting Malaysia's cost of living. The rising cost of living, a persistent issue in economics and social well-being, is often linked to global challenges faced by emerging nations. Direct tax has been identified as a primary contributor to the financial strain on households, who must manage various essentials beyond food, clothing, and shelter, such as education, cellular services, and transportation. The study analyzes the relationship between seven independent variables—direct tax, unemployment rate, exchange rate, household consumption expenditure, house price index, subsidies, and net trade—and the cost of living in Malaysia, using 30 years of annual data (1992-2022) with EViews for econometric analysis. This study uses descriptive statistical analysis for the description of data, coefficient matrix analysis and regression analysis for determining the impact of dependent and independent variables. The findings show that the cost-of-living pressures are positively correlated with direct tax, housing price index, and net trade. Data was sourced from the National Property Information Centre (NAPIC), the World Bank, and the Economic Planning Unit (EPU). The analysis underscores the significant impact of direct tax on the cost of living. To mitigate this impact, governments could implement fair and progressive tax reforms, provide targeted subsidies, and promote economic growth to boost income levels. Additionally, social programs and efficient government investment can further reduce household financial burdens.

Keywords: *Cost of Living, Direct Tax, Unemployment Rate, House Price Index, Net Trade, Malaysia.*

1. Introduction and Background

According to data from Numbeo, 'the world's largest database of user-contributed data about cities and countries worldwide,' Malaysia's cost of living ranks 46th among Asian countries, with a Cost-of-Living Index of 34.6. This places Kuala Lumpur significantly lower than Singapore, which tops the list with an index of 81.9, and other major cities like Hong Kong (71.5) and Seoul (70.3). Even regional neighbors such as Bangkok (42.4) and Manila (37.6) have higher cost of living indices. Although Malaysia currently enjoys a relatively lower cost of living compared to these countries, this should not lead to complacency. The rising cost of living in Malaysia, influenced by factors such as inflation, currency fluctuations, and economic pressures, necessitates proactive measures to ensure that the gap does not widen further.

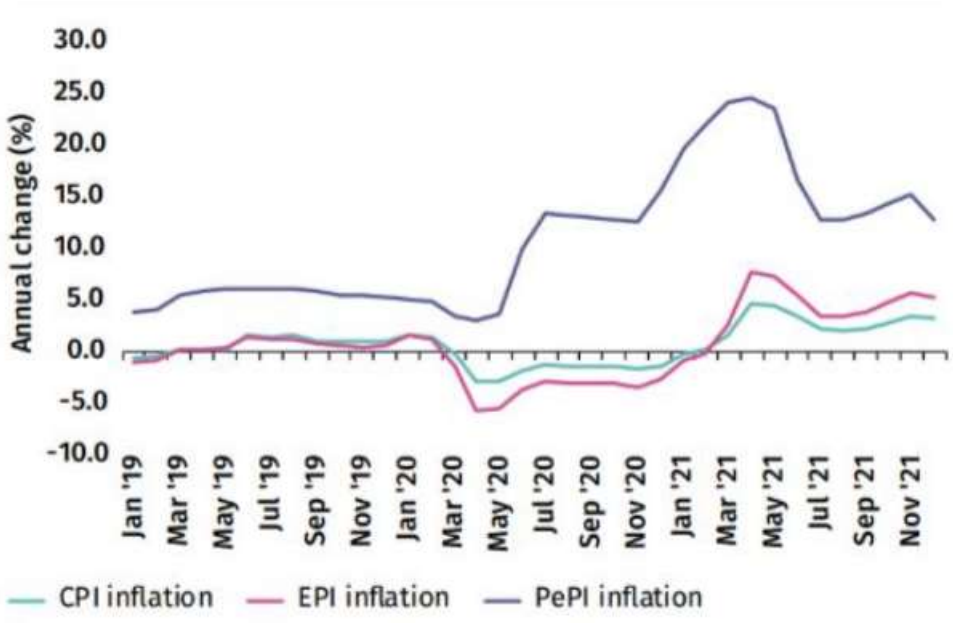
The issue of increasing living costs is not new; it tends to escalate over time for a variety of reasons. Malaysia is a developing nation that has seen steady economic growth. But starting in 2021, the cost of goods and services for basic needs including food, clothing, housing, and transportation has increased significantly. This is an unavoidable occurrence for Malaysian households as it is a global phenomenon. The rising cost of living will result in a decrease in Malaysian households' standard of living. Though Malaysia's inflation rate is currently modest and erratic, perceived rises in living costs have been a subject of continuous criticism and contention (Mazan et al., 2023).

The cost of living, on the other hand, is the amount needed at any given time to sustain a minimally respectable standard of living. It is sometimes referred to as the price of purchasing a wide enough variety of goods to keep up a minimal quality of living. In economic terms, a cost of living is "what is the minimum cost at this month's prices to achieve the actual level of utility attained in the base period," according to the Office for National Statistics (ONS) of the United Kingdom. In the meantime, the cost of living is defined as "How much more income would consumers need to be just as well-off with a new set of prices as the old" (Boskin, 2008). The total amount that households must spend on products and services in addition to paying off debt is referred to as the cost of living as stated by Bank Negara Malaysia (2015).

Since each consumer receives a specific amount of money to spend based on their overall income or financial limits, the concept of consumer choice also explains the cost of living. An increase in income or wage will enhance a person's purchasing power, allowing them to buy more of each common good. Consequently, the budget lines will advance and run parallel to one another in areas where the quantity of items required grows. This implies that living standards have increased. The intercept and slope of the budget restriction will change when prices fluctuate. The movement along the curve is the substitution effect. The shift in the curves that happens when real income rises, and utility levels rise is known as the income impact. The budgetary constraint rises in tandem with the price fall. This suggests that consumers' high purchasing power and utility maximization lead to an increase in their standard of life, from which a demand curve might be generated. The demand curve may shift as consumer preferences, income levels, or the price of other goods fluctuate. Prices reflect the standard of living as they change. Thus, upholding the previous standard of living or cost of living is contingent upon several variables that impact the demand function, including the price of related goods, the distribution of income, consumer preferences and tastes, and the probability of future changes in the prices of goods and services. Future prices, consumer preferences, and the cost of goods and services will all be directly impacted by government policy, which entails enacting taxes and subsidies. Meanwhile, a higher population and density of inhabitants suggest that there are many purchasers in the market (Latimaha, Ismal, and Bahari, 2020).

Bank Negara Malaysia states that the Consumer Price Index (CPI) inflation, which tracks price increases, is widely used to assess changes in the cost of living. In the meantime, changes in the cost of living for households can also be computed using the Consumer Price Index (CPI), according to the Department of Statistics Malaysia. The Malaysian consumer price index report's CPI figure is a weighted price index value that considers both changes in prices and household spending habits. An illustration of a figure format is provided below:

Figure 1: Evolution of CPI, EPI and PePI Inflation



Source: Bank Negara Malaysia, Department of Statistics, Malaysia and Bank Negara Malaysia estimates

The Consumer Price Index (CPI), which tracks a basket of items that represent normal household expenditure, is an essential tool for executing macroeconomic policies, especially monetary policy. It does not take changes in income into account, instead emphasizing the rate of price increases. The Everyday Price Index (EPI), which recognizes that regularly purchased products like groceries have a stronger impact on household opinions, focuses on these items to address frequency bias. Furthermore, the Perceived Price Index (PePI), which

assumes that decreased prices remain stable, only takes price increases into account when detecting memory bias. In addition to the overall CPI metric, the EPI and PePI provide more detailed viewpoints.

2. Literature Review

The Cost of Living: The minimal amount needed to buy a certain range of products and services to maintain a particular standard of life is referred to as the cost of living (Latimaha et al., 2020). The cost-of-living issue is unavoidable for Malaysian households due to rising prices for products and services, especially for necessities like food, housing, and transit, plus, there is a price differential between urban and rural areas, which raises the question of the cost of living experienced by households in the country as a result of the amount of urbanization (Ismail, Daud, Mohd, Samat, and Ridzuan, 2022). A previous study conducted by Ismail et al. (2022) stated that there is no separation between the expense of living and the standard of living. While economic progress might raise living standards, it can also drive-up costs. As a result, advances in one area can cause increases in the other. This can be supported by the study made by Latimaha et al. (2018) whereby they explored the variables of living standards and spending patterns which resulted in the high level of living in the city raising the household spending patterns and driving up the cost of living there. Furthermore, according to Latimaha et al. (2017), to mitigate the impact of rising living costs, salary rates should increase proportionately, allowing individuals to maintain or improve their standard of living by affording the same quantity of products and services as before. To go deeper into salary rates, Ahmad, Taha, Endut, and Baatwah (2021) concluded that it is necessary to understand the classification of Malaysian citizens based on income level whereby this study found that B40, M40, and T20 have median household incomes of RM3,166, RM7,093, and RM15,301 respectively, according to Department of Statistics Malaysia (2020).

Finally, the past study by Latimaha et al. (2020) found that the standard of living and the cost of living generally have a strong and causal relationship. By considering the lagged values of the cost of living instead of the lagged values of the standard of living, the cost of living may be utilized to forecast the standard of living more accurately. In the meantime, the Laspeyres index and Paasche index, $L > I > P$, are the boundaries around which the genuine cost of living is found. To further details about the Laspeyres index and the Paasche index, the Laspeyres index sets the highest limit for the actual cost of living, while the Paasche index sets the lowest limit. In essence, the true cost of living falls within the bounds defined by the Laspeyres and Paasche indices. The widely used Laspeyres price index serves as a foundation for calculating the overall cost-of-living index. Besides, the cost of living can also be explained by the theory of consumer choice, since each consumer is allocated a set amount of money to spend that matches their overall income or budgetary constraints (Latimaha et al., 2020).

Direct Tax: The relationship between direct tax and cost of living has been the subject of numerous research. Both direct and indirect taxes are significantly impacted by the cost of living, whereas direct taxes are primarily impacted by the house price index. Direct taxation affects the consumer burden and the house price index more than indirect taxation does. This implies that any modifications to policies that consider people's fluctuating purchasing power could have an impact on the government's capacity to collect taxes. Repayment of house loans has a stronger effect on direct taxation than on consumer goods since it accounts for over 40% of all consumer debt and influences industrial production more than consumer products. In addition, cutting the personal income tax can improve a household's disposable income and lessen their financial burden. On the other hand, if consumption-based taxes are imposed, people's burdens can rise depending on how they consume (Ahmad et al., 2021).

The concept of consumer choice also explains the cost of living since each consumer is allotted a certain amount of money to spend on their total income or financial limitations. A person's purchasing power will rise with an increase in income or wage, increasing the quantity of each common good they purchase. As a result, in places where the number of things required increases, the budget lines will advance and run parallel to each other. This suggests that the standard of living has risen. Future prices, consumer preferences, and the cost of goods and services will all be directly impacted by government policy, which entails enacting taxes and subsidies. Meanwhile, a higher population and density suggest that there are many purchasers in the market.

Furthermore, Latimaha et al. (2020) also found that the cost of living has no discernible effect on per capita

income and that its sign is uncertain. Gillingham and S. Greenlees (1987) found that the anticipated rate of inflation is significantly impacted by the addition of direct taxes. After dividing up the household sample, it is discovered that accounting for taxes considerably changes the inflation rate differences that are calculated only using consumption prices. The cost of living is demonstrated to be strongly correlated with per capita income due to higher overall pricing resulting from increased demand for goods and services.

A tax and price index (TPI), which can be used to incorporate direct taxes into the CPI, was found through research. A TPI requires significantly more computing resources to generate than a CPI does. To calculate the TPI, one must be aware of several household demographic and economic characteristics. As a result, CPI can be calculated using data on total usage, even though TPI should be established at the household level and then averaged. Both indicate that taxes affect living expenses and that the conditional cost of living index provides the most context for understanding the CPI. These metrics are referred to as an income cost of living index (ICOL), and the TPI is merely an upper bound on the actual ICOL (Gillingham & Greenlees, 1987).

Meanwhile, Balasoiu, Chifu, and Oancea (2023) investigated the impact of direct taxation on economic growth across 27 EU countries, revealing that corporate income taxes negatively affect growth in both high and low-fiscal efficiency countries. Personal income tax also hinders growth in countries with limited fiscal efficiency. These findings suggest that reducing direct taxes can boost disposable income, encourage spending, and promote economic growth. This relationship between direct taxation and economic growth can directly impact the cost of living, as increased growth and income levels generally lead to improved living standards and affordability. Coherently, another study by Elshani and Pula (2023) examines how different types of taxes—personal income tax (PIT), corporate income tax (CIT), and value-added tax (VAT)—affect economic growth in Eurozone countries. The study finds that PIT, social security contributions, and customs duties negatively impact GDP, while CIT and VAT positively influence growth. As tax revenue's share of GDP increases, its positive impact diminishes. The findings suggest that reducing PIT could increase disposable income, positively affecting the cost of living by enhancing purchasing power and economic growth.
Null Hypothesis (HO_1): There is no relationship between direct tax and cost of living.
Alternate Hypothesis ($H1_1$): There is a relationship between direct tax and cost of living.

Unemployment Rate: The second independent variable of this study is the unemployment rate. Unemployment refers to the condition in which an individual desires to work but cannot find employment. In other words, it is the actual exclusion of labor. Unemployment is typically categorized into three main types, which are frictional, structural, and cyclical. Globally, the natural rate of unemployment is typically between 3% and 5%. When an economy maintains an unemployment rate within the range of 3% and 5%, it can be argued that there is no significant unemployment problem (Korkmaz & Abdullazade, 2020). According to the study of Latimaha et al. (2017), the results from this study revealed that the unemployment rate is significant and negatively related to the cost of living at the 5% level in their model. In Malaysia, the long-term relationship is stable and consistent, preventing both inflation and the cost of living from rising. On the other hand, cyclical unemployment may have a favorable impact on living expenses. Because of the rising cost of living, cyclical unemployment contributes to social problems like increased crime rates among the unemployed. Depending on the type of unemployment, the effect of the rate on the cost of living may vary. For example, cyclical unemployment, which is caused by fluctuations in the business cycle may have a different impact on the cost of living than structural unemployment which is caused by changes in the structure of the economy. According to the study of Cebula and Todd (2004), the relationship between unemployment and the cost of living in Florida counties is not significant. The study suggests that a higher unemployment rate might reduce the demand for goods and services, potentially leading to a lower cost of living in the area. However, the study finds that the unemployment rate does not significantly affect the living-cost differentials in the countries analyzed.

The study of Mazan et al. (2023), suggests that the relationship between the unemployment rate and the cost of living in Malaysia is complex and may depend on various factors. Most previous studies found a significant relationship between unemployment and the cost of living, indicating that as the unemployment rate increases, the cost of living also tends to increase. Other studies have found a negative relationship between the unemployment rate and the cost of living, suggesting that as the unemployment rate increases, the cost of living tends to decrease. However, this study reviewed indicates that there is an insignificant association between the unemployment rate and the cost of living in Malaysia suggesting that the unemployment rate does not influence

the cost of living. Nonetheless, the study highlights the impact of unemployment on people's ability to make a living and their standard of living, leading to an increased risk of poverty.

In a more recent study by Feng, Lagakos, and Rauch (2024), they explored the relationship between unemployment and development. The study shows that unemployment rates are generally higher in wealthier countries than in poorer ones, especially for those with lower education levels. In rich countries, less-educated individuals are more likely to be unemployed, while the opposite is true in poorer nations. This relationship suggests that in wealthier countries, the cost of living could be higher due to increased unemployment among low-skilled workers, which reduces their income and purchasing power, thereby affecting their ability to meet living expenses.
Null Hypothesis (HO_1): There is no relationship between the unemployment rate and the cost of living.
Alternate Hypothesis ($H1_1$): There is a relationship between the unemployment rate and the cost of living.

Exchange Rate: Next, the independent variable is the exchange rate. An exchange rate is the value of one currency in terms of another currency. It represents the rate at which one currency can be exchanged for another currency. Fluctuations in exchange rates can have various effects on an economy, including influencing the cost of imported goods, affecting the competitiveness of exports, and impacting the purchasing power of consumers. In the context of the study by Latimaha et al. (2017), the exchange rate may have a significant impact on the cost of living in Malaysia. The decline in the world price of exports worsens the terms of trade that will cause the Ringgit Malaysia to depreciate, leading to a rise in the cost of living. The results of the study indicate that the exchange rate is significant and positively related to the cost of living in the short run. This suggests that changes in the real exchange rate may have a temporary impact on the cost of living in Malaysia.

The impact of the exchange rate on the cost of living is discussed in Lafrance and Schembr's (2000) study, which largely focuses on the relationship between Canada's and the United States' standards of living. According to the study, a drop in Canada's terms of trade, which is brought on by a drop in the price of some commodities globally, may result in a loss in the value of the currency and a drop in living standards. As a result, a given level of exports will buy fewer imports for domestic consumers, which could result in increased living expenses. For example, if a nation's currency gains value, imports may become less expensive, which could cut living expenses. On the other hand, a decline in the value of the currency could result in increased costs for imported items, raising living expenses. The cost of living in Malaysia appears to be significantly correlated with the exchange rate, according to a study by Mazan et al. (2023). It highlights how the two variables are related to one another and admits that various researchers will find different outcomes when examining the influence of exchange rates on the cost of living. The paper also covers the purchasing power parity (PPP) hypothesis. The exchange rate between two currencies that reflects changes in the relative price levels of the two countries is known as the Purchasing Power Parity (PPP) exchange rate, according to Sarno & Taylor (2002). The study's findings, however, suggest that the exchange rate has a detrimental impact on living expenses.
Null Hypothesis (HO_1): There is no relationship between the exchange rate and the cost of living.
Alternate Hypothesis ($H1_1$): There is a relationship between the exchange rate and the cost of living.

Household Consumption Expenditure: Latimaha et al. (2018) identified five categories of household expenditure: food, housing, transportation, communication, childcare and education. In previous studies, food and clothing were found to be more important than other components, indicating that household expenditure is critical for meeting basic needs. However, clothing expenditure was not considered a necessity but discretionary spending during festive seasons. Food is still the most important necessity, but transportation, communication, and electricity have all become crucial for maintaining an adequate standard of living. Household spending on education has also grown significantly in the late 20th and early 21st centuries. It is critical to recognize that the definition of basic needs evolves, with food remaining the most necessary. According to the study of Muhamad et al. (2023), the current economic climate is characterized by a rise in income that does not align with the cost of living, affecting consumers' purchasing power and saving abilities.

This has led to households spending more on necessities, particularly for low-income households. Price increases are closely related to consumers' purchasing power, as they pressure households and deteriorate the quality of goods available for purchase. Further, Muhamad et al. (2023) insisted that low-income groups are more vulnerable to risk due to their limited financial resources and lack of savings. However, rising living costs

due to economic uncertainty and rising prices for goods and services put pressure on everyone, especially the B40 group. Thus, low-income groups, particularly the B40 group, are more susceptible to risk due to their limited financial resources and lack of savings. At the same time, rising living costs and prices also impact everyone. According to Venkadasalam (2015), household consumption expenditure refers to the market value of all goods and services purchased by families, including durable goods like automobiles, washing machines, and home computers. It excludes home purchases but does include imputed rent for owner-occupied homes. It also includes provisions for paying governments for licenses and permissions. Household consumption expenditure (HCE) was found to be significantly related to the consumer price index (CPI). Household consumption expenditure includes the costs of nonprofit institutions that serve households, even when reported separately from land. This data consists of any statistical differences in resource utilization versus provision. The relationship between household final consumption expenditure (HCE) and the consumer price index (CPI) is critical to understanding inflationary dynamics and economic stability. Venkadasalam (2015) Malaysian study discovered that changes in HCE significantly impact the CPI, indicating a strong relationship between the variables. The study's findings suggest that increasing household consumption expenditure leads to a more than proportional increase in the CPI.

Null Hypothesis (HO_1): There is no relationship between household consumption expenditure and cost of living.

Alternate Hypothesis ($H1_1$): There is a relationship between household consumption expenditure and cost of living.

House Price Index: Based on the study that was conducted by Ahmad et al. (2021) stated that the amount that people may borrow from financial organizations, which is based on real income and interest rates, is often what determines the price of houses. The result of this study revealed that the Granger causality test reveals that home prices significantly affect consumer burden, particularly on direct taxes. Another finding that was observed by Latimaha et al. (2017) mentioned that when home prices are rising, mortgage approval standards are becoming more stringent, and options for middle-class consumers are scarce, it can be challenging to become a homeowner. Thus, this study summarizes that middle-income earners in capital cities face financial strain due to inadequate salaries, increased dependents, rising costs of goods and services, and escalating housing and rental expenses. Moreover, Drelichman and Agudo (2014) who investigated the effects of including rent in early modern pricing indices and living standard estimates, found that the effect of price indexes is moderate whereby rent cuts the difference between Toledo and two destinations in northern Europe by as much as 9.5%. In addition, the study calculated an ideal cost-of-living index, illustrating the disproportionate impact on the poor in high-rent cities by Albouy, Ehrlich, and Liu (2016). They confirmed that rising rents contribute to increased real income inequality, offering insights into the growing unaffordability of housing.

This analysis was supported by Ahmad et al. (2021) whereby concluded home ownership becomes more of a burden as the ratio rises, and rentals or other substitute effects are favored. On the other hand, Latimaha et al. (2017) found that the study that was conducted may serve as a foundation for upcoming research and as a reference for policymakers addressing matters about living expenses. It is intended that this study will serve as a foundational resource for upcoming research on a range of topics related to the budget for basic requirements and the cost of living. This study also added that even though the households are free to prioritize their needs, they would have to search more afield from the major cities for a reasonably priced home, which would increase their transportation expenses. For example, some working single-adult households may decide to purchase a car first and a house later. They might have to spend several months sleeping in a car in the worst situation.

Null Hypothesis (HO_1): There is no relationship between the house price index and the cost of living.

Alternate Hypothesis ($H1_1$): There is a relationship between the house price index and the cost of living.

Subsidies: Offering subsidies is one of the strategies the government uses. According to economic theory, subsidies can be used to counteract externalities and market imperfections to increase economic efficiency. If more subsidies were offered, the cost of living would rise but consumer prices would decrease. An industry can produce more items or services at a lower cost when government subsidies are implemented, increasing the quantity that is needed. Even if certain subsidies aim to increase output and reduce inequities in living standards, their inefficiency can increase the total economic burden on society (Latimaha et al., 2017). Economic theory states that when subsidies are provided, businesses can cut their cost of production and

provide customers with acceptable rates. The results of various research have demonstrated a strong correlation between subsidies and the cost of living (Mazan et al., 2023). Additionally, a study by Latimaha et al. (2017) demonstrated that the elimination of the energy subsidy will influence the economy since households will have to spend more money and have limited access to energy due to price rises, which will decrease household welfare. According to a World Bank Group study, the rationalization of gasoline subsidies in December 2014 and the implementation of the goods and services tax in April 2015 influenced Malaysia's rising cost of living (Latimaha et al., 2017). To ensure that subsidies reach the intended beneficiaries, the government streamlined the system of subsidy delivery, particularly for consumer items and petrol. This was done by widening the participation of middle-class groups and identifying suitable target groups. According to Sulaiman, Harun, and Yusuf (2022), the wealthiest 20 percent of the population receive a disproportionate 43 percent of the subsidy benefit, while the lowest 20 percent receive just 7 percent. From 2004 to 2010, the petroleum subsidy accounted for a significant portion of Malaysia's governmental spending, with a high of 26.4 percent in 2008 and a low of 10.1 percent in 2004.
Null Hypothesis (HO_1): There is no relationship between subsidies and cost of living.
Alternate Hypothesis ($H1_1$): There is a relationship between subsidies and cost of living.

Net Trade: The difference between a country's exports and imports refers to net trade, also known as the trade balance (Keho, 2021). Net trade is another factor that affects the cost of living. If a country exports more than it imports, it has a positive net trade balance known as a trade surplus. People will focus on buying local products which are less expensive than imported products. Meanwhile, if it imports more than it exports, it has a negative net trade known as a trade deficit. If the cost of imported goods increases, it can contribute to higher prices for consumers which will lead to an increase in the overall cost of living (Mazlan et al., 2023). The dynamics of international commerce play a critical role in altering the economic landscape of individual nations to secure an integrated global economy. There is a stronger positive association between the import ratio and CPI utilizing correlation and Granger causality approaches (Adetiloye & Adekunle, 2010). Indeed, the relationship between net trade and the cost of living is complex and influenced by several factors. Exchange rates play a critical role in determining the impact of net trade on the cost of living. A strong national currency resulting from a trade surplus can make imports more affordable, benefiting customers. Conversely, a weaker currency due to a trade deficit may increase the cost of imported goods, potentially leading to inflation and negatively affecting the cost of living (Krugman, 1995). Furthermore, tariffs and trade agreements implemented by the government can have a substantial impact on the cost of living. Import tariffs can raise the pricing of imported goods, affecting consumer affordability. Trade agreements that promote the cross-border movement of goods and services may have the reverse consequence of making imported items more accessible.
Null Hypothesis (HO_1): There is no relationship between net trade and cost of living.
Alternate Hypothesis ($H1_1$): There is a relationship between net trade and cost of living.

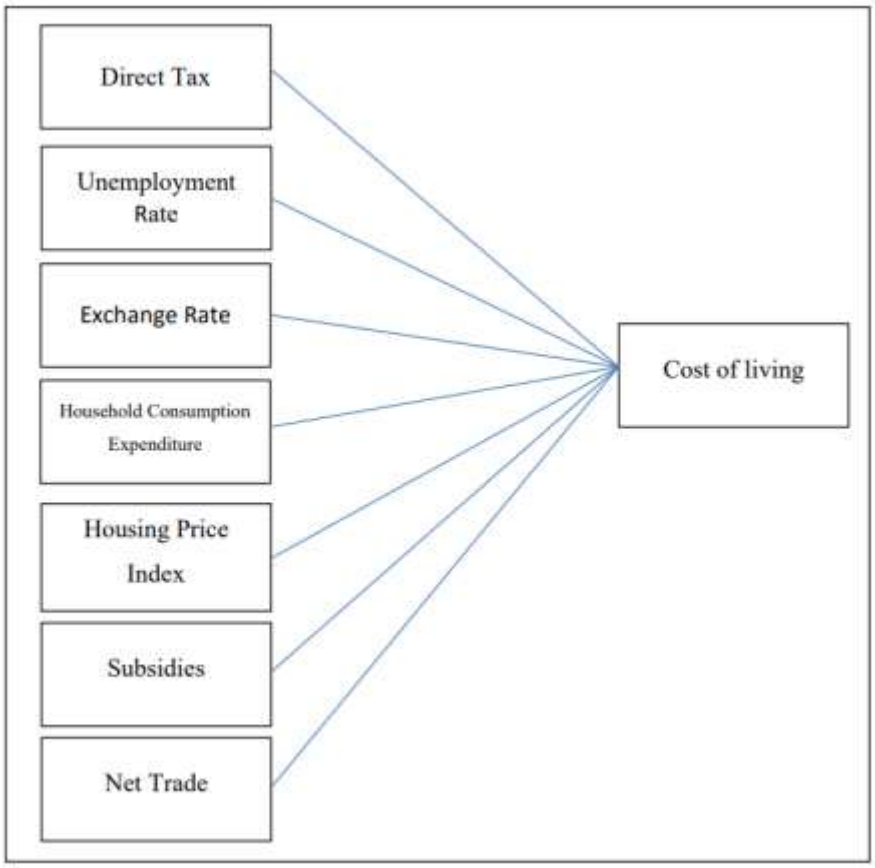
3. Research Methodology

This study will investigate the variables influencing Malaysia's cost of living based on the research base. Multiple linear regression is one of the main statistical techniques used to examine the relationship between one or more independent variables to forecast the result of a dependent variable (James, Witten, Hastie, Tibshirani, and Taylor, 2023). According to James et al. (2023), the technique allows analysts to determine the model's variation and the relative contributions of each independent variable to the total variance. This research aims to make a regression model and predict the variables using the regression coefficient. The sample applied in this study comprised cost of living data between the years 1992 to 2022. The study incorporated secondary data that comprised our independent variables, which include net trade, household consumption expenditure, housing price index, exchange rate, unemployment rate, and direct tax. The World Bank, Economic Planning Unit (EPU), and National Property Information Center (NAPIC) websites provided the data for this study. This study will use a time series of yearly data as its sample. A correlation analysis will be performed to find the multicollinearity issue in the regression and determine the correlation between the dependent and independent variables.

Figure 2 below depicts the relationship between the dependent and independent variables. The dependent variable responded to the independent variable. The dependent variable for this study is the cost of living. Meanwhile, the independent variables are taxation, unemployment rate, real exchange rate, household

consumption expenditure, housing price index, subsidies, and net trade. Hence, in this study, we will investigate how all these seven independent variables influence the dependent variable.

Figure 2: Research Framework



Before the analysis of the multiple regression model, two preliminary tests will be performed which are descriptive statistics analysis and correlation coefficient analysis. This was followed by statistical tests in the regression analysis such as the T-test and F-test were conducted and the R-squared and Adjusted R-squared were then determined.

4. Results

This section discusses descriptive statistics analysis, correlations, variance inflation factor, and multiple regression results.

Table 1: Descriptive Statistics

Variables	Mean	Maximum	Minimum	Standard Deviation
CL	94.55806	127.2000	62.10000	19.70424
DT	61.57286	71.35113	46.08892	8.222097
UR	3.382290	4.540000	2.450000	0.420187
ER	3.520328	4.401076	2.504404	0.579413
HCE	4.37E+11	9.08E+11	1.57E+11	2.34E+11
HPI	153.5242	216.8000	100.0000	39.74266

SUB	40.89571	48.43363	33.69598	3.784069
NT	1.05E+09	2.84E+09	1.37E+08	6.53E+08

Descriptive Statistics: Table 1 shows the result of the descriptive statistics of the variables for 31 observations from 1992 to 2022. The descriptive analysis includes cost of living, direct tax (DT), unemployment rate (UR), exchange rate (ER), household consumption expenditure (HCE), housing price index (HPI), subsidies (SUB) and net trade (NT). As demonstrated in Table 1, the mean cost of living is 94.55806 ranging from a minimum of 62.10000 to a maximum of 127.2000. The cost of living has a standard deviation of 19.70424, indicating that the amount of cost of living does not diverge too far from the mean of 94.

As for the independent variables, the direct tax had a maximum of 71.35113 percent in 2012 and a minimum of 46.08892 percent in 1996. While it has an average score of 61.57286 percent. This is because the direct tax was high in 2012 due to a household income survey, the top decile of households earns 32 percent of total household incomes and pays an effective income tax ranging between 15-25 percent (Washington, 2014), whereas the direct tax was low in 1996 due to the personal income tax rate was reduced in the 1996 budget to 30 percent (H Zee, 1996). The unemployment rate has a maximum of 4.540000 percent in 2020 and a minimum of 2.450000 percent in 1997 with a mean of 3.382290 percent. According to the Department of Statistics Malaysia (2020), it recorded the highest rate due to the COVID-19 pandemic which has affected the labor market (Samsudin and Khan 2020). Employers' cost-cutting efforts, including job losses and work schedule reductions, were seen in nearly all industries impacted by unemployment in 2020 when the number of unemployed people rose to 711,000 from 508,200 in 2019. The unemployment rate also jumped to 4.5 percent in 2020 from 3.3 percent in 2019 (Nga, Ramlan, and Naim, 2021).

In addition, this study reveals that the maximum value of the exchange rate was RM 4.401076 per USD in 2022 and the minimum value was RM 2.504404 per USD in 1995. While it has a mean of RM 3.382290 per USD. The highest exchange rate in 2022 is because the US Federal Reserve raised its policy interest rate aggressively by 425 basis points to a target range of 4.25-4.50% to address inflation. The minimum was in 1995 because of the restrictions were reversed in the third quarter of 1994, and the ringgit strengthened, reaching RM 2.43 per dollar in June 1995 (U.S. Department of State, 1995).

Next, the household consumption expenditure has a maximum of RM 908 billion (2022) and a minimum of RM 157 billion (1992) with a mean of RM 437 billion. This is because 2022 was largely driven by domestic demand, mainly from firm private sector expenditure. Improvements in labor market conditions and wage growth led to an increase in household spending (Bank Negara Malaysia, BNM). The housing price index has a maximum of 216.8000 which is in the year 1997 and the minimum is in 2020 by 100.0000 with a mean of 153.5242. The high housing prices may happen because of the Asian financial crisis. As the crisis hit the real estate sector, house prices rose by 1.9% in 1997 before they collapsed by 9.0% in 1998 and property prices dropped (Zulkarnain & Nawi, 2023).

The subsidies had a maximum of 48.43363 percent in 2000 and a minimum of 33.69596 percent in 2003. While the mean is 40.98571 percent with a mean of 40.89571 percent. The highest subsidies were in 2000 because of the recovery from the financial crisis in 1997. During this period, the Malaysian government implemented various economic policies to stabilize the economy and encourage growth (Nambiar, 2023).

Lastly, the net trade has a maximum of RM 2840 million in 2022 and a minimum of RM 137 million in 2013 with a mean of RM 1050 million. In 2022, it recorded the highest net trade because exports of agricultural goods were valued at RM120.94 billion, expanded by 23.3% from 2021 and comprised a 7.8% share of total exports. Increased exports of palm oil and agricultural products derived from it, which increased by 27.3% to RM96.53 billion, drove the expansion. The standard deviation for the variables of direct tax, unemployment rate, exchange rate, household consumption expenditure, housing price index, subsidies and net trade is 8.222097 percent, 0.420187 percent, RM 0.579413 per USD, RM 234 billion, 39.74266, 3.784069 percent, RM 653 million respectively.

Table 2: Correlation

Variables	CL	DT	UR	ER	HCE	HPI	SUB	NT
CL	1	0.7454	0.1664	0.6834	0.9746	0.2414	0.0917	0.8910
DT		1	0.0980	0.5468	0.6197	-0.2607	0.3494	0.5869
UR			1	0.3278	0.2220	-0.0452	-0.8168	0.2496
ER				1	0.6248	0.1182	-0.0850	0.6932
HCE					1	0.3803	0.0355	0.9035
HPI						1	-0.2813	0.3082
SUB							1	0.0119
NT								1

Correlation: According to the table, this study found that direct tax, unemployment rate, exchange rate, housing price index and subsidies are lower than the threshold for the correlation analysis at 0.8. Thus, this indicates that the mentioned independent variables are free from correlation issues. However, household consumption expenditure and net trade have a correlation issue as the values exceeded the threshold of 0.8. This shows that there is a multicollinearity issue between independent variables in this study. Therefore, this study decided to run the VIF to make a diagnostic check regarding the exceeded values for additional confirmation.

Table 3: Variance Inflation Factor

Variables	Coefficient Variance	Uncentered VIF	Centered VIF
DT	0.093190	147.3515	2.499598
UR	16.98214	80.84074	1.189639
ER	18.97625	98.94487	2.527691
HPI	0.002121	21.82171	1.328983
SUB	0.237455	164.1718	1.349078
NT_LOG	62.75580	2051.032	2.603122
C	3783.517	1551.220	NA

Variance Inflation Factor: Based on the VIF result, direct tax, unemployment rate, exchange rate, housing price index, subsidies, and net trade-centered VIF scores below 5. However, only household consumption expenditure exceeds 5. Hence, this study decided to drop the household consumption expenditure because the VIF score was 5.260342 from the model due to the high correlation among them. After dropping the Household Consumption Expenditure, the researchers rerun the Variance Inflation Factor. As a result, all the independent variables are below 5. Thus, there is no severe multicollinearity.

Table 4: Multiple Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Direct Tax	1.421338	0.305270	4.656006	0.0001
Unemployment Rate	2.405203	4.120939	0.583654	0.5649
Exchange Rate	1.903158	4.356174	0.436887	0.6661
House Price Index	0.168186	0.046050	3.652217	0.0013
Subsidies	-0.110823	0.487294	-0.227426	0.8220
Net Trade Log	20.89353	7.921856	2.637454	0.0144

Constant	-215.5071	61.51030	-3.503594	0.0018
R-squared	**0.844205**			
Adjusted R-squared	**0.805256**			
F-statistic	**21.67470**			
Prob (F-statistic)	**0.000000**			

Based on the result above, the F-statistic of 21.67470 indicates that the models are fit as the F-statistic is significant at a 1 percent level and proved with a probability lower than 0.05 (0.00000). This model is good for interpretation and free from multicollinearity issues after being fixed by the Newey-West test. The model is mainly to analyze whether the independent variables are significant or insignificant to the dependent variable. Thus, the researcher has conducted and developed the hypothesis statement where the null hypothesis (H0) determines there is no relationship between the independent variables and dependent variables (insignificant), meanwhile, the alternate hypothesis (H1) determines there is a relationship between independent variables and dependent variables (significant). Therefore, if the value of probability (p-value) is lower than 0.05, meaning that the model is significant, we reject the H0 and accept the H1.

Based on the regression results in the table above, R-squared shows 84.42 percent of the multiple cases of cost of living in Malaysia that could be explained by the variation of independent variables which are direct tax (DT), unemployment rate (UR), exchange rates (ER), housing price index (HPI), subsidies (SUB) and log net trade. Meanwhile, the adjusted R-squared indicates that only 80.53 percent of the cost of living in Malaysia can be explained by the variation in all independent variables. The remaining 19.47 percent show that there are independent variables that are not included in the above model also explaining the dependent variables in this study. Therefore, the researcher may suggest future research to further explore the reasons for the increase in the cost of living in Malaysia. This is because there are still factors that have not been studied by the researchers. Hence, we can see there are only three independent variables found to be significant to the dependent variables in this study.

As for the first independent variable which is direct tax (DT) based on the table above, we can see that the p-value of the direct tax (DT) is 0.0001 determining a positive and significant relationship with the cost of living (COL). The probability value shows that it is below 0.01 with a 99 percent confidence level and 1 percent error. Therefore, we need to reject the null hypothesis (H0) and accept the alternative hypothesis (H1) because there is a relationship between direct tax and cost of living.

The second of the independent variables which is the unemployment rate (UR) shows a positive and insignificant relationship whereby the probability is 0.5649 since it is higher than the threshold of 0.05 and a 1 percent increase in UR will indicate 2.41 units of cost of living (COL) which also can be obtained from the negative coefficient. Therefore, we accept the null hypothesis (H0) and reject the alternate hypothesis (H1) as it indicates there is no relationship between the unemployment rate (UR) and the cost of living (COL).

Moreover, the exchange rate as the third independent variable revealed that there is a positive insignificant relationship where the p-value is 0.6661 since it is higher than the threshold of 0.05. Plus, the positive relationship comes from the 1.903158 coefficient. In addition, a 1% increase in ER will indicate 1.90 units of cost of living (COL). Therefore, we accept the null hypothesis (H0) which indicates that there is no relationship between exchange rate (ER) and cost of living (COL), and reject the alternate hypothesis (H1).

Furthermore, the fourth of our independent variables, which is the housing price index (HPI), determines a positive significant relationship with the cost of living (COL). The probability value of the housing price index is 0.0013 at a 99% confidence level with a 1% error clearly showing that there is a relationship between the housing price index and the cost of living. Therefore, we must reject the null hypothesis (H0) and accept the alternate hypothesis (H1).

Apart from that, another of our independent variables, which is subsidies (SUB), presents a negatively insignificant relationship to the cost of living (COL) and a 1% increase in the subsidies will indicate -0.1108 units of cost of living (COL). Therefore, we accept the null hypothesis (H0) and reject the alternate hypothesis

(H1).

Finally, net trade (NT) has a positive and significant relationship with the cost of living (COL) as the p-value is 0.0144 with a 99 percent confidence level and 1% error since it is below the threshold level in which it is 0.01. Therefore, we reject the null hypothesis (H0) and accept the alternate hypothesis (H1) because there is a relationship between the net trade and the cost of living.

Table 5: Regression Results Summary

Independent Variable	Hypotheses (+/-)	Result (Significant/ Insignificant)	Confidence Level (%)	Support to Hypotheses (Yes/ No)
Direct Tax	Positive	Significant	99	Yes
Unemployment Rate	Positive	Insignificant	-	No
Exchange Rate	Positive	Insignificant	-	No
House Price Index	Positive	Significant	99	Yes
Subsidies	Negative	Insignificant	-	No
Log Net Trade	Positive	Significant	99	Yes

Discussion

The first independent variable, direct tax (DT), shows a p-value of 0.0001, indicating a positive and significant relationship with the cost of living (COL). Since the p-value is below 0.01, we can reject the null hypothesis (H0) with 99% confidence and accept the alternative hypothesis (H1), confirming that there is indeed a relationship between direct tax and cost of living. This finding aligns with previous research by Ahmad et al. (2021), which demonstrated that higher taxes, particularly on income, reduce disposable income, leading to increased financial strain. Additionally, Gillingham and Greenlees (1987) noted that direct taxes could be included in the conditional Consumer Price Index (CPI), though this requires more processing power. The findings are also supported by Balasoiu, Chifu, and Oancea (2023) who suggested that the relationship between direct taxation and economic growth can directly impact the cost of living, as increased growth and income levels generally lead to improved living standards and affordability.

The second independent variable, the unemployment rate (UR), exhibits a positive but insignificant relationship with a p-value of 0.5649, which is above the 0.05 threshold. A 1% increase in UR is associated with a 2.41-unit change in COL, as indicated by the negative coefficient. Therefore, we accept the null hypothesis (H0) and reject the alternative hypothesis (H1), suggesting that there is no significant relationship between the unemployment rate and the cost of living. This result is consistent with earlier studies, such as those by Cebula and Todd (2004), which found that higher unemployment might reduce demand for goods and services. Conversely, Latimaha et al. (2018) found a significant negative relationship between unemployment and the cost of living in Malaysia, highlighting the role of long-term stability in preventing inflation and rising costs.

For the third independent variable, the exchange rate (ER), the analysis reveals a positive but insignificant relationship, with a p-value of 0.6661, which is also above the 0.05 threshold. A 1% increase in ER corresponds to a 1.90-unit increase in COL. Hence, we accept the null hypothesis (H0) and reject the alternative hypothesis (H1), indicating no significant relationship between the exchange rate and the cost of living. This finding is supported by Mazan et al. (2023), who observed that exchange rate fluctuations, as explained by Purchasing Power Parity, impact the cost of living by influencing the prices of imported goods and services. Furthermore, Latimaha et al. (2018) noted that exchange rates and cost of living are closely linked in small, open economies like Malaysia, where any shifts can affect both.

The fourth independent variable, the housing price index (HPI), shows a positive and significant relationship with the cost of living (COL), with a p-value of 0.0013 at a 99% confidence level. This result indicates a significant relationship between the housing price index and the cost of living, leading to the rejection of the null hypothesis (H0) and acceptance of the alternative hypothesis (H1). Rising housing costs, especially in high-rent cities, disproportionately affect lower-income individuals, increasing income inequality and making housing less affordable. This finding is consistent with research by Ahmad et al. (2021) and Latimaha et al. (2017), who highlighted the financial strain faced by middle-income earners in urban areas due to rising rents, stringent mortgage approval standards, and limited housing options. Additionally, these findings are also

supported by Drelichman and Agudo (2014) who investigated the effects of rent and living standard estimates and another study by Albouy, Ehrlich, and Liu (2016) who confirmed that rising rents contribute to increased real income inequality, offering insights into the growing unaffordability of housing and subsequently higher cost of living.

Another independent variable, subsidies (SUB), displays a negative but insignificant relationship with the cost of living (COL), with a 1% increase in subsidies corresponding to a decrease of 0.1108 units in COL. As the p-value is not significant, we accept the null hypothesis (H0) and reject the alternative hypothesis (H1). This outcome is supported by previous studies, such as Latimaha et al. (2018), which suggested that while government subsidies aim to offset market failures and reduce the cost of living, their inefficiency may increase the overall economic burden on society.

Finally, net trade (NT) exhibits a positive and significant relationship with the cost of living (COL), with a p-value of 0.0144, below the 0.01 threshold. Thus, we reject the null hypothesis (H0) and accept the alternative hypothesis (H1), indicating that there is a significant relationship between net trade and the cost of living. This finding is consistent with the work of Adetiloye & Adekunle (2010), who noted that a country's net trade balance, the difference between exports and imports, influences the cost of living, where a positive trade balance leads to a surplus and a negative trade balance leads to a deficit. This finding is also supported by Mazlan et al (2023) whereby posited that if the cost of imported goods increases, it can contribute to higher prices for consumers that will lead to an increase in the overall cost of living.

5. Implications and Recommendations

Research has demonstrated a significant relationship between direct taxation and the cost of living, with direct taxes such as income and corporate taxes having a more substantial impact on consumer burden and the housing market than indirect taxes. Specifically, the repayment of house loans, which constitutes a large portion of consumer debt, influences direct taxation more significantly than other consumer goods. These findings suggest that policy adjustments aimed at accommodating fluctuations in purchasing power could affect the government's tax revenue collection capabilities. Additionally, reducing personal income tax could enhance household disposable income, thereby alleviating financial pressures.

Given these insights, the study recommends that Malaysia's tax agencies, particularly the Inland Revenue Board, consider restructuring direct taxes to balance revenue generation with living costs. This could involve revising tax rates, exemptions, or incentives to align better with governmental goals, ultimately promoting economic growth while mitigating adverse effects on household affordability. Supporting this approach, previous studies have shown that tax policy adjustments that consider cost-of-living impacts can lead to more sustainable economic outcomes and improved quality of life for citizens (Ahmad et al., 2021).

In addition, this study will benefit the Ministry of Finance by enabling informed decision-making when formulating fiscal policies that balance revenue generation and citizens' living expenses. Understanding the significance of direct taxes in this study of the cost of living allows the finance ministry to create policies that reduce the tax burden on individuals while supporting economic growth. Additionally, it offers the tools necessary to develop fiscal policies that promote business growth, investment, and employment creation, all of which contribute to financial stability. By promoting transparency in taxation, these findings respond to issues related to the cost of living and build public confidence in the government's financial management.

Further, the results show the significance of direct tax, housing price index and net trade which has shown a strong dependence on cost of living. Thus, it implies a serious implication for employers. Employers know that direct tax and house prices change over time due to economic conditions, government policies, and market demand and supply. Therefore, wages and benefits must be taken seriously by the employer to ensure that employees can maintain a reasonable standard of living. Wages are also expected to vary because of cost-of-living differences across locations (Sturman, Ukhov, and Park, 2017). By doing so, employers can help reduce the pressure of rising living expenditures by demonstrating their commitment to helping their employees' financial well-being.

In general, the rising cost of living causes a change in the standard of living. The standard of living measures the quality of life, or the level of material prosperity enjoyed by individuals (Bank Negara Malaysia, 2015). It is required to maintain some minimum basic needs and wants. For example, housing, food, transportation, healthcare, and other necessities. Therefore, this study is important in enabling people to spread out their consumption of goods and services throughout their lives. Apart from that, this study found that direct tax, housing price index, and net trade have a positive significance on the cost of living. Therefore, those who have been in the workforce will tend to increase their daily expenses according to their income level.

An important limitation that needs consideration is the availability of data for the chosen independent variables, which impacts the study's time frame. Even though this study began in 1992 and lasted over 30 years, the recommendation for future researchers is to explore other independent variables that are characterized by continuously available data over a longer period. This suggestion promotes the creation of creative approaches to deal with missing data in particular years, providing a possible means of making use of a more extensive data set without compromising the accuracy of the findings of the research.

In terms of the study's research, the limited selection of independent variables presents a tempting direction for further research. Future researchers are urged to expand their scope as the current analysis of the association between only seven variables and the cost of living is so narrow. Enhancing the completeness and reliability of future findings can be achieved by identifying additional factors impacting the cost of living and performing sensitivity studies to assess the impact of integrating various independent variables. This suggestion calls for a more thorough comprehension of the relevant variables and acts as a call to action for researchers to negotiate the complex web of factors affecting the costs of living.

Finally, the study faces resource constraints, especially when it comes to locating articles and data associated with variables. It is recommended that future researchers investigate multidisciplinary methodologies, varied databases, and collaborations to increase the pool of available resources. Furthermore, it becomes imperative to critically assess the techniques of measurement, particularly regarding factors such as subsidies and taxes. Making sure that the applied formulas are accurate and fit the intended context will allow for more accurate and consistent outcomes across investigations. By providing a comprehensive toolkit to overcome resource constraints, this advice seeks to encourage a deeper analysis of variables and their effects on the cost of living for future researchers.

Conclusion

Using time series data from 1992 to 2022, the objective of this study was to investigate the determinants of the cost of living in Malaysia (i.e., direct tax, unemployment rate, exchange rate, household consumption expenditure, housing price index, subsidies, and net trade). This study uses the technique of empirical investigation, the multiple regression method, which allows us to analyze the effects of the cost of living on several variables. Based on the results, this study has found that household consumption expenditure and net trade have a multicollinearity issue as it has a value of more than the threshold of 0.8. Therefore, this study has conducted a Variance Inflation Factor (VIF) to validate the results. As a result, household consumption expenditure has been dropped due to its VIF value exceeding the threshold of 5, indicating a multicollinearity issue. Thus, the other independent variables which are direct tax, unemployment rate, exchange rate, housing price index, subsidies, and net trade are retained. Based on this study, the cost of living is significantly and positively related to the direct tax, housing price index, and log net trade. Also, the study reveals that the unemployment rate, exchange rate and subsidies have a negative relationship but are not significant. Further, this study found a positive significance between direct tax, housing price index and net trade to the cost of living with a 99% confidence level and the value of probability lower than the threshold of 0.05. which means, we can reject the null hypothesis (H0) and accept the alternate hypothesis (H1). Additionally, the R-squared is 84.42% which means that it can be explained by the variation of all independent variables in our study. Henceforth, this study will help the relevant authorities to understand the impact of direct tax on the cost of living of Malaysians.

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