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Demographic Ageing and Macroeconomic Determinants of Public Healthcare Fiscal Sustainability in Malaysia: Evidence from the ARDL Approach

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Abstract: Fiscal sustainability in Malaysia's public healthcare system has become increasingly important in the face of unprecedented challenges arising from population ageing and macroeconomic volatility. This study aims to analyse the factors affecting the fiscal sustainability of healthcare in Malaysia over the period from 1975 to 2024 using the Autoregressive Distributed Lag (ARDL) model. The Healthcare Fiscal Sustainability Index (HFSI) is used as the dependent variable, while the old-age dependency ratio, real GDP growth rate, labour force participation rate, life expectancy, healthcare inflation rate, and unemployment rate are included as independent variables. The analytical framework is based on three theories: Demographic Transition Theory, Wagner's Law, and the Fiscal Space Framework. The results indicate that the old-age dependency ratio has the strongest and most statistically significant positive relationship with HFSI in both the long-run and short-run models. The compression of morbidity hypothesis is supported by the significant positive relationship between life expectancy and HFSI. Real GDP growth has a significant positive effect on HFSI in the long run, suggesting that the government should leverage economic growth to strengthen sustainable healthcare financing. Labor force participation is not statistically significant, while the unemployment rate is marginally significant. Overall, the findings indicate that demographic ageing represents a major challenge to the fiscal sustainability of Malaysia's healthcare system and provide important insights for policymakers to implement proactive measures to ensure long-term fiscal sustainability.

Keywords: *Healthcare Fiscal Sustainability, Ageing Population, ARDL, Malaysia, Healthcare Expenditure*

1. Introduction and Background

Malaysia's healthcare system is undergoing a pivotal transformation from a heavily subsidized public model to one increasingly confronted by rapid demographic shifts and financial variability. The country is expected to be an "aged society" by the year 2040 and the increasing burden of the old-age dependency ratio, combined with the fact that inflation in healthcare services is set to climb to 16% by the year 2026, presents a great challenge to the sustainability of healthcare funding in the long term (Moideen et al., 2025). The government has been effective in the provision of health outcomes in the past, but the volume of services and the complexity of medical needs are challenging the government's fiscal capacity (Nasir et al., 2021).

According to Williams (2005), the concept of fiscal sustainability refers to the ability of governments to sustain spending on their desired purpose for their planned duration. The sustainability of healthcare finance extends beyond medicine; it is a vital component of Malaysia's economic and social sustainability. Government expenditure significantly influences economic expansion, particularly when excessive resources are directed toward the healthcare sector without a corresponding rise in productivity, thereby leading to budgetary pressures and the diversion of funds from other sectors (Azreen et al., 2022). Investment in health is not just an investment; it is also an important contributor to economic development, as a healthy population is an important contributor to a better-growing economy (Atun et al., 2025).

Figure 1: Healthcare Fiscal Sustainability Index (HFSI) in Malaysia (1975-2024)

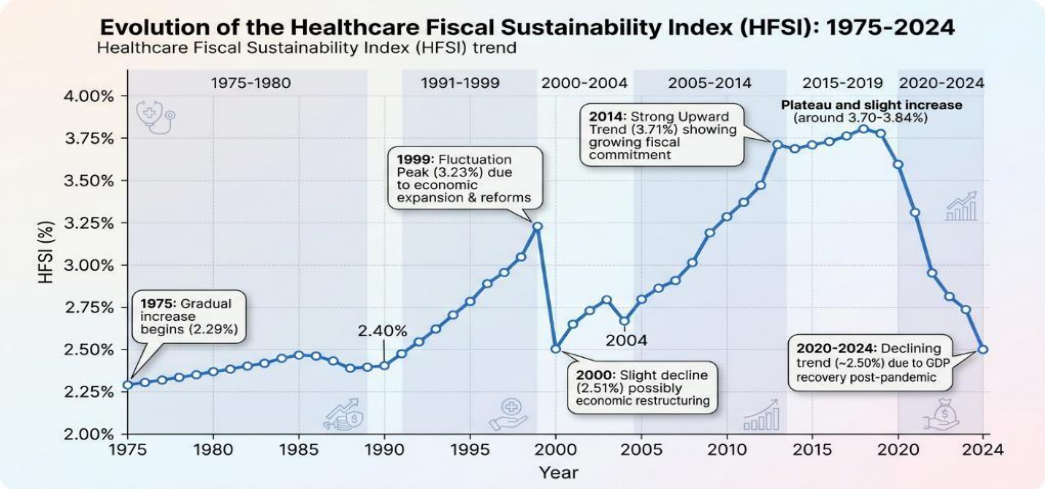


Figure 1 illustrates the trend of Healthcare Fiscal Sustainability Index (HFSI) in Malaysia between the period of 1975 to 2024. Overall, the ratio of HFSI to GDP has risen from around 2.29% in 1975 to a peak of 4.49% in 2014, fluctuated thereafter, and dropped to around 2.50% in 2024. This trend is indicative of the changing healthcare policy landscape in Malaysia, where government expenditure has increased due to various factors such as the increase in healthcare costs, demographic pressure, economic volatility, and fiscal constraints, leading to fluctuations in expenditure in recent years (Mohd et al., 2021).

This study investigates the factors affecting the Healthcare Fiscal Sustainability Index (HFSI) in Malaysia using the Healthcare Fiscal Sustainability Index over the 50 years from 1975 to 2024 and relates it to six important variables: old-age dependency ratio, real GDP growth rate, labor force participation rate, life expectancy, healthcare inflation rate, and unemployment rate. The study uses the Autoregressive Distributed Lag (ARDL) model, which is especially suitable for the time series analysis of variables with mixed orders of integration, and it helps to estimate short-run dynamic and long-run equilibrium relationships (Pesaran et al., 2001).

In spite of growing concerns over population ageing and fiscal pressures, empirical evidence on the determinants of healthcare fiscal sustainability in Malaysia remains limited. Previous literature has focused primarily on healthcare expenditure rather than fiscal sustainability, hardly integrating demographic and macroeconomic factors and their short-run and long-run effects. In addition, limited research has employed a comprehensive Healthcare Fiscal Sustainability Index (HFSI) supported by multiple theoretical viewpoints. This study addresses these gaps by examining the long-run and short-run determinants of healthcare fiscal sustainability in Malaysia using the ARDL model and providing evidence to promote sustainable healthcare financing policies.

The goal of this research is to offer empirical proof that can support proactive policies to gain equitable access to quality healthcare services and limit the stress on the rapidly shrinking working-age population. The rest of this research is organized into the following parts: The literature review and theoretical background are reviewed in part 2. The methodology is reported in part 3. The findings from part 4 are interpreted. The research closes in part 5 and provides suggestions for policy implications.

2. Literature Review

Theoretical Findings: The three theories on which this study relies are the Demographic Transition Theory, Wagner's Law, and the Fiscal Space Framework. Demographic Transition Theory describes the process of a country moving from high to low fertility and mortality rates and then on to an older population structure (Biase et al., 2022). The change is more evident in Malaysia as the country is transitioning into an aged society (Seah, 2025). The theory holds that an "old-age society" is caused by longevity and declining birth rates,

resulting in an increase in the use of healthcare services by older people compared to younger ones, threatening the fiscal sustainability of the tax-funded healthcare system (Mohd et al., 2021).

Wagner's Law, commonly referred to as the Law of Increasing State Activity, suggests that an increase in national income leads to a more than proportionate rise in public expenditure on social services relative to GDP (Nasir et al., 2021). Increased real GDP in Malaysia will result in higher expectations of quality specialist healthcare services, as healthcare will be regarded as a "superior good". This means that it is likely that the amount spent on health will also surpass the growth of the country's economic output, as in the case of Malaysia, health expenditure has been growing steadily and is projected to reach RM100.5 billion in 2026 (Azreen et al., 2022).

World Bank estimates a government's capacity to spend additional expenditure on a specific sector, e.g., health, without jeopardizing debt sustainability and macroeconomic stability. Fiscal space is not an a priori reality nor pre-ordained but depends on the Government's ability to raise revenues from a fully engaged and productive labor force (Sum & Mansor, 2025). With a shrinking tax base coupled with high public debt, the health system is more vulnerable to external shocks and demographic ageing, as projected healthcare inflation is expected to hit 16% in Malaysia by 2026 (Aon, 2026).

Empirical Findings: Fiscal sustainability is the capacity of governments to continue funding for a planned period at the level of spending to achieve the desired purpose (Williams, 2005). The Healthcare Fiscal Sustainability Index (HFSI) links the economy, public policies, and population health, while additional healthcare funding could reduce the resources available for other sectors, such as education and infrastructure (Tang et al., 2025). As per the literature, the increase in elderly citizens in the working population has positive impacts on healthcare expenditure (Biase et al., 2022).

Higher life expectancy is associated with increased healthcare expenditure, as longer-lived populations tend to require greater healthcare services, particularly for chronic conditions and long-term care (Cylus & Al Tayara, 2021). The "compression of morbidity" hypothesis, however, indicates that an increase in the duration of healthy life could be achieved (Atun et al., 2025). The correlation between RGDP and fiscal sustainability of healthcare is not clear-cut. Increased economic growth typically leads to an increase in tax revenues and fiscal capacity (Cornevin et al., 2024); fiscal pressure on health care systems tends to be high when the GDP grows slowly, or even negatively (Iuga et al., 2024). The higher the labor force participation rate, the more people in the workforce directly increasing the tax base of governments, which helps them to finance the cost of healthcare (Riaz et al., 2024).

The steady increase in prices paid for healthcare goods and services, known as healthcare inflation, may contribute to a misalignment of public budgets and healthcare financing. In addition, the positive and significant long-run effect of healthcare inflation indicates that rising healthcare prices contribute to higher healthcare expenditure per capita over the long run (Dunn et al., 2018; Hartman et al., 2026). Unemployment has adverse effects on government revenues as it reduces tax revenues and may increase the demand for publicly funded medical services (Azam & Yusuf, 2024).

Therefore, it is hypothesized that:
H1: Real GDP growth rate has a significant impact on HFSI.
H2: Labor force participation rate has a significant impact on HFSI
H3: Healthcare inflation rate has a significant impact on HFSI
H4: Unemployment rate has a significant impact on HFSI
H5: Old age dependency ratio has a significant impact on HFSI
H6: Life expectancy has a significant impact on HFSI.

Literature Gap: Although there is a large body of literature on the economic impact of demographic changes, particularly population aging, there are still gaps in the Malaysian context. While most of the literature deals primarily with the macroeconomic costs of population aging on GDP growth (Mohd et al., 2021) and fiscal decentralization (Yusof et al., 2020), there are few studies that have used an indicator of healthcare fiscal sustainability. In addition, most of the literature from the ASEAN region has researched healthcare financing

needs but not in a single model to analyze the combined effect of demographic factors and macroeconomic indicators on healthcare fiscal sustainability. This article offers a primary contribution to the literature by addressing the gaps identified in Malaysia.

Following the literature reviews summarized, this study aims to investigate the locally specific impact of demographic and macroeconomic determinants on the fiscal sustainability of Malaysian healthcare and to utilize recent data to build a model that estimates Healthcare Fiscal Sustainability in Malaysia.

3. Research Methodology

Model Specification: The theoretical framework of this study is derived from the Demographic Transition Theory, Wagner's Law, and the Fiscal Space Framework. The model was adopted from Nasir et al. (2021) and Mohd et al. (2021) and extended to comprise all six independent variables as follows:

$$HFSI_t = \propto + \beta_1 RGDP_t + \beta_2 LFPR_t + \beta_3 HCINF_t + \beta_4 UNEMP_t + \beta_5 OADR_t + \beta_6 LE_t + \varepsilon_t \quad (1)$$

where HFSI represents the dependent variable (Healthcare Fiscal Sustainability Index) and RGDP, LFPR, HCINF, UNEMP, OADR and LE represent real GDP growth rate, labor force participation rate, healthcare inflation rate, unemployment rate, old-age dependency ratio and life expectancy, respectively.

Data Description: The dataset consists of 50 annual observations for Malaysia covering the period from 1975 to 2024. Data were obtained from the World Bank, Department of Statistics Malaysia (DOSM), Index Mundi, and Trading Economics. Table 1 summarizes the variables, definitions, measurements, and sources.

Table 1: List of Variables and Measurement

Type of Variables	Variables	Source of Data	Measurement
Dependent Variable	Healthcare Fiscal Sustainability Index (HFSI)	MoH, DOSM, World Bank	Percentage (%)
Independent Variable	Real GDP Growth Rate (RGDP)	World Bank	Percentage (%)
	Labor Force	DOSM	Percentage (%)
	Participation Rate (LFPR)	DOSM	Percentage (%)
	Healthcare Inflation Rate (HCINF)	DOSM	Percentage (%)
	Unemployment	Index Mundi, Trading Economics	Percentage (%)
	Rate (UNEMP)	World Bank	Percentage (%)

Unit root test: A unit root analysis was conducted to ensure that the regression results were not affected by spurious relationships or biased inferences (Granger & Newbold, 1974). The Augmented Dickey–Fuller (ADF) test (Dickey & Fuller, 1979) and the Phillips–Perron (PP) test (Phillips & Perron, 1988) were employed to establish the integration order of each variable. While the ADF test addresses serial correlation through the inclusion of lagged first-difference terms, the PP test applies a non-parametric adjustment to account for both serial correlation and heteroskedasticity.

Auto-Regressive Distributed Lag (ARDL): The ARDL approach was adopted to examine the relationships among the variables and address the objectives of the study, owing to several methodological considerations that support its application. First, the ARDL technique offers greater flexibility and eliminates the restriction that all time-series variables must have the same order of integration (Kuri et al., 2024), regardless of whether the regressors are integrated of order I (0) or I (1) (Pesaran & Shin, 1999), reducing uncertainty associated with pre-testing (Narayan & Narayan, 2005). Second, the ARDL approach is suitable for small sample sizes and provides more reliable estimates (Pesaran & Shin, 1999). Third, ARDL estimators produce more efficient and consistent coefficient estimates (Laurenceson & Chai, 2003), and the ARDL framework effectively represents the data-generating process through a general-to-specific modelling approach by employing a sufficient number of lags.

The unrestricted error correction representation (UECM) of the ARDL model is specified as:

$$\Delta HFSI_t = \beta_0 + \sum_{i=1}^{p} \beta_1 \Delta HFSI_{t-i} + \sum_{i=0}^{q} \beta_2 \Delta RGDP_{t-i} + \sum_{i=0}^{q} \beta_3 \Delta LFPR_{t-i} + \sum_{i=0}^{q} \beta_4 \Delta HCINF_{t-i} + \sum_{i=0}^{q} \beta_5 \Delta UNEMP_{t-i} + \sum_{i=0}^{q} \beta_6 \Delta OADR_{t-i} + \sum_{i=0}^{q} \beta_7 \Delta LE_{t-i} + \delta_1 \Delta HFSI_{t-1} + \delta_2 \Delta RGDP_{t-1} + \delta_3 \Delta LFPR_{t-1} + \delta_4 \Delta HCINF_{t-1} + \delta_5 \Delta UNEMP_{t-1} + \delta_6 \Delta OADR_{t-1} + \delta_7 \Delta LE_{t-1} + \varepsilon_t \quad (2)$$

where,

- Δ denotes the first-difference operator.
- p, q captures the optimal lag length.
- The lagged level variables (X_{t-1}) capture the long-run relationship and are jointly tested using the Bounds Test for cointegration.
- ε_t is the white-noise error term.

The calculated F-statistic is used to determine the existence of a long-run relationship by comparing it with the lower and upper bound critical values. If the F-statistic exceeds the upper critical bound, the hypothesis of non-cointegration is rejected (Pesaran et al., 2001). After establishing cointegration, the short-run dynamics are investigated by adding the error correction term (ECT) to the model:

$$\Delta HFSI_t = \beta_0 + \sum_{i=1}^{p} \beta_1 \Delta HFSI_{t-i} + \sum_{i=0}^{q} \beta_2 \Delta RGDP_{t-i} + \sum_{i=0}^{q} \beta_3 \Delta LFPR_{t-i} + \sum_{i=0}^{q} \beta_4 \Delta HCINF_{t-i} + \sum_{i=0}^{q} \beta_5 \Delta UNEMP_{t-i} + \sum_{i=0}^{q} \beta_6 \Delta OADR_{t-i} + \sum_{i=0}^{q} \beta_7 \Delta LE_{t-i} + \propto ECT_{t-1} + \varepsilon_t \quad (3)$$

where,

- ECT_{t-1} represents the error correction term derived from the long-run cointegrating relationship.
- $\propto$ denotes the coefficient of the error correction term

Diagnostic assessment: The ARDL model undergoes several diagnostic tests to assess its adequacy and ensure that the estimated specification is reliable. The Jarque–Bera test is employed to determine whether the residuals are normally distributed, while the Breusch–Godfrey LM test is used to detect serial correlation. To test for heteroscedasticity and non-constant variance in the residuals, the Breusch-Pagan-Godfrey test is used. The Ramsey RESET test (Regression Equation Specification Error Test) is employed to check whether the model is correctly specified.

4. Result and Discussion

This part clarifies the empirical results on the relationship between macroeconomic and demographic factors and the healthcare fiscal sustainability index (HFSI) in Malaysia. The analysis consists of unit root tests, bound assessment, long-run and short-run cointegration, and diagnostic tests.

Unit Root Test: Table 2 displays the results of the ADF and PP unit root tests. The findings show a combination of stationary and non-stationary variables. HFSI, LFPR, OADR, and LE are integrated of order one [I(1)], while RGDP, HCINF, and UNEMP are integrated of order zero [I(0)] and order one [I(1)]. The absence of variables integrated of order two [I(2)] satisfies the main condition for the application of the ARDL bounds assessment approach (Pesaran et al., 2001).

Table 2: Unit root test results

		ADF		PP		Order of Integration
Variables		Level	First Order Difference	Level	First Order Difference	
HFSI	Intercept	0.357	-7.049***	0.111	-7.712***	I(1)
	Intercept with trend	-2.084	-7.090***	-1.761	-8.012***	I(1)
RGDP	Intercept	-5.914***	-9.076***	-5.920***	-30.74***	I(0)
	Intercept with trend	-6.523***	-8.977***	-6.523***	-32.58***	I(0)
LFPR	Intercept	-0.627	-2.838*	-0.658	-7.539***	I(1)
	Intercept with trend	-1.107	-3.394*	-1.008	-7.811***	I(1)
HCINF	Intercept	-4.659***	-12.88***	-4.866***	-13.22***	I(0)
	Intercept with trend	-4.404***	-12.74***	-5.775***	-13.08***	I(0)
UNEMP	Intercept	-2.781*	-4.673***	-2.085	-4.276***	I(0)
	Intercept with trend	-2.931	-4.436***	-2.204	-4.208***	I(1)
OADR	Intercept	5.286	-3.592***	4.483	-3.417***	I(1)
	Intercept with trend	0.702	-6.108***	0.700	-6.080***	I(1)
LE	Intercept	-2.167	-1.665	-5.276***	-1.665	I(0)
	Intercept with trend	-3.184*	-2.392	-3.290*	-2.497	I(0)

Note: ***,**, * denote the rejection of the null hypothesis at the 1%, 5%, and 10% levels, respectively. The optimal lag length is chosen automatically by applying the Schwarz Information Criterion (SIC) for the ADF test, and the bandwidth is chosen by applying the Newey-West and user-specified methods for the PP unit root test.

Bound assessment and long-run co-integration: Table 3 reports the results of the ARDL bounds test for cointegration. The calculated F-statistic for the healthcare fiscal sustainability model is 5.35, which exceeds the upper-bound critical values of 3.22, 3.71, and 4.88 at the 10%, 5%, and 1% significance levels, respectively. Hence, the null hypothesis of no cointegration among the variables is rejected, indicating the existence of a long-run equilibrium relationship between the healthcare fiscal sustainability index (HFSI) and its explanatory variables, namely RGDP, LFPR, HCINF, UNEMP, OADR, and LE, in Malaysia over the period 1975–2024.

Table 3: Bound assessment

Test Statistic	Value	k
F-statistic	5.35***	6
Significance	Lower 1(0)	Upper 1(1)
10%	2.17	3.22
5%	2.55	3.71
1%	3.42	4.88

This finding provides a theoretical foundation for examining both long-run and short-run dynamics and facilitates the development of an Error Correction Model (ECM) to analyze the adjustment process following short-run deviations from long-run equilibrium. Thus, given the significant result of the bound assessment in Table 3, further evaluation was extended to long-run and short-run cointegration, as exhibited in Table 4.

Table 4: ARDL Long-run and short-run

Variables	Long-run	Short-run
RGDP	0.0358*** (0.0162)	
LFPR	-0.0183 (0.0356)	
HCINF	0.0489* (0.0263)	
UNEMP	0.0823* (0.0450)	
OADR	0.2481*** (0.0675)	
LE	0.0596** (0.0262)	
D (RGDP)		-0.0141* (0.0081)
D (LFPR)		0.0136 (0.0267)
D (HCINF)		0.0187 (0.0150)
D (UNEMP)		0.0613* (0.0359)
D (OADR)		0.1849*** (0.0532)
D (LE)		0.0444* (0.0226)
ECT (Speed Adjustment)		-0.7452*** (0.1396)
Constant		-4.4446 (2.9810)
R-squared	0.9137	

Note: *, p < 0.1, **, p< 0.05, and *** p < 0.01. Standard errors are presented in parentheses.

Diagnostic assessment: Table 5 presents the necessary diagnostic tests for the reliability and accuracy of the dynamic ARDL methods' estimated equation. The diagnostic test results display a normal distribution of residuals; the functional form is linear, proving the absence of serial correlation and heteroskedasticity issues.

Table 5: Diagnostic assessment results

Diagnose tests	Null hypothesis	Chi-Square
Jarque-Bera test	H_0: The residuals have a normal distribution	0.8455
Lagrange Multiplier test	H_0: There is no autocorrelation	0.6064
Breusch-Pagan-Godfrey	H_0: There is no heteroskedasticity	0.3192
Ramsey RESET test	H_0: Functional form is linear	0.8858

Discussion

The long-run results show that the most relevant positive determinant of the Healthcare Fiscal Sustainability Index (HFSI) at the 1% level is the Old Age Dependency Ratio (OADR), thus demonstrating that the main driver of healthcare expenditure as a percentage of GDP is demographic ageing. This discovery is consistent with the Demographic Transition Theory, which posits that ageing populations create more fiscal stress on healthcare systems (Biase et al., 2022). Both Life Expectancy (LE) and the long-run effect show significant positive effects, and short-run effects are marginally significant, supporting the "compression of morbidity" hypothesis (Atun et al., 2025).

However, Real GDP Growth Rate (RGDP) has a significant positive long-run relationship with HFSI, which is consistent with Wagner's Law, suggesting that economic growth leads to an increase in healthcare expenditure as a proportion of GDP (Nasir et al., 2021). The positive marginal long-run effect of the healthcare inflation rate (HCINF) indicates that the cost-pressure level has a positive impact on healthcare spending per capita in the long run (OECD, 2025). The Fiscal Space Framework (Azam & Yusuf, 2024) is partly supported by the Unemployment Rate (UNEMP), which shows a positive marginal effect both in the long run and the short run. Labor Force Participation Rate (LFPR) is not particularly meaningful in either period, probably because of structural problems like the existence of low-paid or informal workers (Cylus & Al Tayara, 2021).

The results show that the short-run dynamics of the factors involved suggest that demographic ageing has the highest positive and significant impact at the 1% level, thus reinforcing the argument that demographic ageing is a factor that also affects healthcare spending in the short term. D(LE) and D(UNEMP) have a slight positive marginal effect at the 10% level, and D(RGDP) has a negative marginal effect at the 10% level. D(LFPR) and D(HCINF) are negligible, underscoring that the influence of these two parameters on healthcare fiscal sustainability is negligible.

The Error Correction Term (ECT) is negative and statistically significant at the 1% level, which validates the stability of the long-run relationship between the variables (Engle & Granger, 1987). The ECT coefficient shows that around 74.5% of the short-run disequilibrium may be resolved in one year, suggesting a relatively quick rate of correction towards long-run equilibrium. This R-squared of 0.9137 shows that 91.37% of the variation in HFSI is explained by the model, which has high explanatory power (Brooks, 2023). In general, demographic variables, especially OADR and LE, are significant and dominant determinants of the fiscal sustainability of healthcare in Malaysia, whereas the other macroeconomic variables like RGDP and UNEMP play important but less dominant roles.

5. Conclusion and Recommendations

The factors affecting healthcare fiscal sustainability in Malaysia are explored in this paper and the Healthcare Fiscal Sustainability Index (HFSI) in Malaysia is analyzed for the years 1975-2024. This study combines the analysis of demographic and macroeconomic determinants in one empirical framework to help better understand the key drivers that affect healthcare fiscal sustainability performance in Malaysia. The empirical results show that the OADR, LE, RGDP, and UNEMP have significant long-run impacts on the HFSI. The results indicate that both demographic and macroeconomic factors are significant, with OADR and LE, and RGDP and UNEMP, being significant in determining the fiscal sustainability of healthcare in Malaysia.

From the policy implication standpoint, the positive relationship between OADR and HFSI implies that the Malaysian government should enhance fiscal space through structural measures such as gradually adopting a hybrid financing system in healthcare to meet the demand for healthcare services resulting from demographic ageing. The association of LE with HFSI suggests that further investments in health outcomes are needed through the public health system and primary healthcare. However, measures to control costs and value-based care plans are vital to ensure sustainability of healthcare spending when life expectancy is being extended.

The positive impact of RGDP on HFSI suggests that the Malaysian government should leverage economic growth to strengthen sustainable healthcare financing and increase investment in preventive and primary healthcare. It should also improve healthcare spending efficiency and cost-effectiveness to ensure that rising healthcare expenditure remains fiscally sustainable. In the meantime, the positive and weakly significant result for UNEMP indicates that better economic policy instruments should be implemented to encourage sustainable economic growth, better labor market performance, and lower structural unemployment, which would also have a positive effect on the fiscal capacity for financing health care.

Although this research study has made contributions, there are some limitations. The analysis is limited to a few macroeconomic and demographic variables and excludes variables like government debt levels, out-of-pocket healthcare expenditure, technological advancements in the healthcare sector, or policy changes in healthcare financing. This study would be continued if more variables were added to the study, and if it were to be compared with other countries in the ASEAN group, it would be possible. This extension would provide a better insight into the interaction between economic conditions, demographic change, and healthcare fiscal sustainability. Overall, this paper can be added to the current literature on health economics as it proves the utmost importance of both macroeconomic and demographic factors in shaping healthcare fiscal sustainability in Malaysia.

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