

ASSESSING THE FISCAL ADEQUACY AND DISTRIBUTIONAL EQUITY OF MALAYSIA'S MEDICAL INSURANCE TAX RELIEF

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Article history

Received date : 19-6-2026

Revised date : 20-6-2026

Accepted date : 25-7-2026

Published date : 1-8-2026

To cite this document:

Ismail, Z., Basri, M. F., Abdul Halim, H., Ahmad, A. S., & Mahjom, N. (2026). Assessing the fiscal adequacy and distributional equity of Malaysia's medical insurance tax relief. *International Journal of Accounting, Finance and Business (IJAFB)*, 11 (67), 208 - 225.

Abstract: *Medical insurance tax relief constitutes a significant tax expenditure within Malaysia's dual-tier healthcare financing framework. It is designed to encourage private medical insurance ownership while reducing households' exposure to catastrophic out-of-pocket healthcare expenditure. However, post-pandemic medical inflation, extensive premium repricing by commercial insurers, and the prolonged stagnation of the statutory deduction ceiling have raised concerns regarding the policy's fiscal adequacy and distributional equity. This study evaluates Malaysia's medical insurance tax relief using a two-pronged quantitative approach. First, approximately 6.5 million individual medical insurance claims from 2022 to 2024 were analyzed using a Generalized Linear Model (GLM) to identify the key drivers of healthcare cost escalation. Second, a macro-level benefit-incidence analysis based on institutional data from 2014 to 2025 was conducted to evaluate changes in the purchasing power of the tax relief and the distribution of tax benefits across income groups. The findings reveal that healthcare utilization and treatment intensity drive 71.5% of the total escalation in medical claims, while pure price inflation accounts for the remaining 28.5%. This shift toward higher intensity and volume has placed significant pressure on financial sustainability, as evidenced by the Relief Coverage Ratio (RCR), which plummeted from 1.62 in 2014 to 0.71 in 2024. This represents a 56% reduction in the purchasing power of the tax relief before the policy revision introduced under Budget 2025. These results demonstrate that the current*

deduction-based framework has become increasingly inadequate in preserving the real value of the tax incentive and increasingly regressive in its distributional effects. The analysis further shows that the existing deduction mechanism disproportionately benefits higher-income taxpayers (T20), while lower-income households (B40) receive limited benefits because many are unable to maintain private medical insurance coverage following premium repricing. The study concludes that Malaysia's medical insurance tax relief requires structural reform through the introduction of an income-targeted refundable tax credit and automatic inflation indexation. These reforms would preserve fiscal adequacy, improve distributional equity, and strengthen the long-term sustainability of Malaysia's healthcare financing system.

Keywords: *Medical Insurance Tax Relief; Fiscal Adequacy; Distributional Equity; Medical Inflation*

Introduction

Medical insurance tax relief has been a significant source of tax expenditure in Malaysia's fiscal economy. As a tax expenditure, medical insurance tax relief aims to stimulate individual taxpayers' demand for private medical insurance and offset out-of-pocket (OOP) medical expenditures. The Malaysian government's initiative seeks to foster Medical and Health Insurance/Takaful (MHIT) participation, reduce the burden on the heavily subsidized public healthcare system, and create an alternative source of private healthcare financing. Malaysia's healthcare system is a dual system in which public healthcare is financed through general taxation, and private healthcare is primarily privately funded (Chua & Cheah, 2012). Healthcare financing in Malaysia faces significant challenges as public healthcare expenditures are rising, and the government's budget is limited. The cost of medical services in Malaysia has been increasing at an unprecedented rate in the wake of the pandemic. The medical inflation rate in Malaysia has been between 12.6% and 15.0% in 2024 and 2025, surpassing the overall economic growth rate. Malaysians' households' expenditures on medical services constitute the most significant component of OOP health expenditures, reaching RM34.84 billion in 2024. They accounted for 78.7% of total private expenditures on health and 39% of total expenditure on health (TEH). The figures highlight the need to review the tax expenditures on medical insurance to ensure financial protection and promote equity in accessing healthcare.

The increasing costs are evident in the commercial insurance industry. In particular, the number of medical insurance claims increased by 73% from 2021 to 2023, compared to the 21% growth of the premiums received from the policyholders during the same period. The primary drivers for the increase in claims are the aging population, growing prevalence of non-communicable diseases, and heightened demand for healthcare services. However, the most prominent reason for the surge is the change in the claim frequency, which grew by 130% from 11 claims per 100 policyholders in 2018 to 25 claims per 100 policyholders in 2023. Moreover, due to the "as charged" options of cashless treatment, the insured population is not incentivized to control their expenditures, leading to the so-called "buffet syndrome." The moral hazard emerges because the actual out-of-pocket spending is lower, thus eliminating the need to control expenditures. As a result, the hospital supplies and consumables comprise 60 – 70% of all hospital charges, with an additional 5 to 10% attributed to inflation.

To meet the increasing claims and decreasing loss ratios which soared to 68.3% in 2024, the private insurers embarked on significant premium revision cycles for most of their policies. Consequently, the premium adjustments which ranged between 40 and 70 percent attracted public complaints that the coverages had become unaffordable, especially for the poor and the middle class. As of June 2025, there were 340,000 people who canceled their MHIT coverage, indicating the percentage of those who could no longer afford the plans. The intervention packages by the Bank Negara Malaysia and the Ministry of Health through regulated co-payments and standardized insurance plans under the 'RESET' program have been effective in stabilizing the insurance market. The proposals which have taken effect do not elaborate on whether the tax-expenditure structure is appropriate for the individual taxpayers. At the same time, the fiscal value of the tax-expenditure has significantly reduced over time. Although the healthcare costs and private insurance premiums have been rising progressively over the past decade, the maximum allowable deduction for medical and education insurance remained stagnant at RM3,000 between 2014 and 2024. Thus, the current RM4,000 deduction allowed by the 2025 Budget to promote the adoption of co-payment insurance policies might have been appropriate for a decade.

The existing literature on healthcare in Malaysia explores the universal coverage, financial risk protection, and premium specifics for most insurance products. Still, there is limited an analysis of how medical inflation, premium revisions, and co-payments affect individual finances. This study aims to fill this research gap by reviewing the relevant fiscal data to understand better how health insurance operates while addressing the budgetary concerns experienced by middle-class and low-income groups. Using a national insurance claims database comprising approximately 6.5 million individual medical insurance claims from 2022 to 2024, this study integrates micro-level insurance claims data with macro-level fiscal evidence to provide a comprehensive evaluation of Malaysia's medical insurance tax relief. In addition to the claims analysis, aggregated institutional data spanning 2014 to 2025 are employed to examine the fiscal impact of the tax relief and its distributional effects across income groups. Specifically, the study aims to identify the drivers of medical claims inflation using national insurance claims data, evaluate whether the statutory medical insurance tax relief has maintained its purchasing power between 2014 and 2025, assess the distribution of tax benefits across the B40, M40, and T20 income groups. Lastly, to propose evidence-based policy reforms to enhance the fiscal adequacy and distributional equity of Malaysia's medical insurance tax relief in the face of rising medical inflation and insurance premium repricing.

Literature Review

Malaysia's Healthcare Financing System and Financial Risk Protection

Malaysia's dual-tier healthcare model uses a highly subsidized public tier alongside a market-driven private tier. Previously, public finance experts considered this system progressive and equitable because it aimed to minimize the tax burden on low income group. Comparing to other middle-income countries, Malaysia's healthcare system has proven to be an efficient mixed financing model that delivers high-quality care at affordable prices while maintaining excellent health indicators. Adopting a dualistic approach that has enabled the country to provide high-level care to citizens while keeping expenditure on health care relatively low for the GDP. However, demographic, technological, and financial factors currently pose significant risks to the sustainability of the healthcare financing system in Malaysia. One of

them is a large out-of-pocket (OOP) mode of payment for health care, which is especially harmful to the poor population (Logarajan et al. 2022). For instance, in Malaysia, OOP accounts for nearly 39% of overall health expenditure.

When assessing the impact of tax policy on health insurance, it is essential to note that previously Malaysia's healthcare financing system was considered equitable. According to Yu, Whynes, and Sach (2008) (2008), using regression formulas and concentration indices, they proved that Malaysia's healthcare financing was progressive and equitable to a large extent due to substantial public financing through general taxation. In other words, the public healthcare component reduced the tax burden on the poor and facilitated access to health care. Another study conducted by Jaafar et al. (2013) revealed that the dualistic approach to financing healthcare ensured universal accessibility to health care while reducing the pressure on the public system.

Despite the flexibility and efficiency of the current healthcare financing system, there is growing concern about its sustainability in view of the rising burden of disease, an aging population, and increased health care needs (Atun et al., 2016). In other words, demographic and epidemiological factors pose a serious challenge to achieving sustainable development in Malaysia. Indeed, despite being one of the countries at the forefront of implementing the strategy for achieving Universal Health Coverage (UHC) (Atun et al., 2016), Malaysia has been revealed to have significant health financing vulnerabilities.

Baharin, Juni, and Abdul Manaf (2022) found that health care financing in Malaysia is not equitable because lower incomes group are characterized by a higher relative health care burden than those with higher incomes. It means that middle- and low-income families have to pay more for their health care than the ones paying higher taxes. In Malaysia, families and individuals from the lower-middle and upper-middle income groups have to bear almost 39% of overall health expenditure (Baharin et.al , 2022). In other words, the Malaysian population has to pay significant amounts of money for health care, which constrains their capacity to pay taxes and access other essential services. Comparing to other middle-income countries, Malaysia's healthcare system has proven to be an efficient mixed financing model that delivers high-quality care at affordable prices while maintaining excellent health indicators (Rannan-Eliya et al., 2016)

Medical Inflation and Health Insurance Premiums

Medical inflation has become a key phenomenon and one of the main challenges to healthcare financing in most countries worldwide. The tendency of medical inflation to increase in medical costs due to various reasons, including technological progress, expensive treatments, high pharmaceutical prices, an aging population, an increase in the incidence of chronic diseases, and more complex healthcare delivery. These factors cause healthcare costs to rise faster than prices in general, which puts an additional burden on healthcare payers.

Medical inflation is to be the critical trend in Malaysia, where medical costs have grown significantly faster than overall inflation levels after pandemic restrictions were lifted. According to Bank Negara Malaysia (2024), hospital costs, specialist visits, and diagnostic tests have risen by 12.6% to 15% on average over the past year, resulting in higher claim costs for Malaysia's insurance companies. At the same time, Aljunid (2019) notes that the structural

reforms in the Malaysian private hospital sector, accompanied by the overall corporatization healthcare trends, also contributed to the rise in medical costs. As a result, all this leads to increases in medical insurance premiums since insurance companies offset their costs by increasing the prices for their services.

As the premium rates increase, the proportion of private medical insurance decreases due to limited purchasing power among individuals or families that cannot afford to buy or renew the insurance policies. The main reason is that the premiums' growth rate surpasses the average wage or family income growth rate. This is consistent with Chernew, Cutler, and Keenan (2005) showed that premium rates' changes could influence the percentage of insured population negatively since the number of people who can afford to pay increases or decreases depending on the rates. Thus, private medical insurance becomes unaffordable to the majority of Malaysian citizens since most are middle- and low-income family members.

A decline in the extent of private medical insurance coverage undermines the financial protection that is compelled to depend increasingly on direct out-of-pocket expenditures for healthcare services. The absence of private insurance, many low income earners confront elevated exposure to unaffordable medical costs, thereby diminishing their overall financial security. Empirical evidence indicates that private insurance premiums are influenced by the interplay between moral hazard and rising healthcare spending (Zweifel & Manning, 2000). The moral hazard combined with the growing costs of treatment leads to higher overall spending on health care which raises the amounts that insurers have to pay out, causing premiums to increase. Since higher prices reduce the affordability of private medical insurance, the purchasing power of families and thus their protection against high out of pocket payments are reduced. Individuals with inadequate insurance are particularly constrained and unable to protect themselves from exorbitant expenditures on treatments.

Research on medical inflation, its causes, and effects on society and healthcare financing in general has received considerable attention from scholars. However, studies on how fiscal policy can affect medical insurance and healthcare financing are limited. Specifically, there is insufficient information on whether Malaysia's fiscal policies, namely medical insurance tax relief, are appropriate and up-to-date enough to help taxpayers afford private medical insurance. The issue of medical insurance taxes in Malaysia needs to be explored since medical inflation tends to increase faster than general price levels. This makes it relevant to assess whether tax relief for medical insurance is appropriate to ensure the level of insurance coverage, residents' protection, and long-term healthcare financing sustainability.

The Political Economy of Tax Expenditures and Regressive Subsidies

Tax expenditures have grown progressively prevalent as instruments through which governments provide deductions, exemptions, and preferential tax provisions. This is to shape societal conduct and advance particular socioeconomic objectives albeit at the cost of foregone fiscal revenue. Surrey (1973) pioneered the conceptualization of tax expenditures as indirect public spending, arguing that such fiscal concessions should be subject to the same rigorous evaluation and oversight as direct outlays in the public budget. A number of studies have revealed the regressive nature of most tax expenditures, particularly deductions. Gruber (2002) found that the ability to claim a deduction is often associated with high-income households since the value of the deduction depends directly on the taxpayer's marginal tax rate. The same

can be said about itemized deductions for medical expenses which mainly benefit the wealthy. In turn, Redonda and Axelson (2021) claim that most tax expenditures are misdirected, providing unwarranted benefits to taxpayers regardless of their income level. Ultimately, there is evidence that tax expenditures tend to increase the overall level of inequality while creating a burden on the budget due to lost revenue.

There is no doubt that in Malaysia, tax expenditures should be reviewed as attention given, to Saman and Ismail (2020), they account for a significant amount of forgone revenue. Said and Nor (2018) prove that the Malaysian income tax system is progressive, meaning that high-income taxpayers receive more benefits than those with lower or moderate incomes. This characteristic is evident in the case of medical insurance, creating disparities between various groups of society. Perhaps, the threshold of RM3,000 for medical or education insurance tax relief is too high considering that Malaysia is a developing country with limited access to quality healthcare and expensive private education. From 2014 to 2024, prices in clinics and hospitals increased significantly, reducing the value of the RM3,000 tax deduction for most Malaysian taxpayers. Therefore, the introduction of tax expenditures on medical insurance in Malaysia has led to two contradictory outcomes: on the one hand, they provide much-needed relief to some taxpayers while, on the other, contribute to the overall level of inequality.

The Premium Repricing Crisis and Insurance Regulation

The period 2024-2026 was marked as the critical era concerning private health financing in Malaysia. This is mainly attributable to the substantial rise in healthcare claims and expenses that triggered premium revisions in an effort to maintain profitability of Medical and Health Insurance/Takaful (MHIT) in the country. Industry reports register a whopping 73% increase in medical claims during 2021-2023, thereby necessitating premium hikes between 40-70%. According to the Life Insurance Association of Malaysia (LIAM, 2025), rising cost of claims, utilization, and high-tech health care advancement also triggered the premium revision. Chan and Ramesh (2024) associate the rise in claim costs to the corporatization, concentration, and commercialization of health care in Malaysia.

The premium adjustments also caused significant public uproar, triggering the intervention of the Bank Negara Malaysia which instituted policies that guided MHIT on adjustments to premium, products, and co-payments to enhance affordability. Notably, Cheah (2021) observes that income is one of the leading factors influencing the decision to purchase insurance in Malaysia. As such, the increased premiums would primarily affect low and middle-class earners. While there is overwhelming literature on public reaction and policy interventions to the premium revision, there is limited information on the relationship between the tax relief on medical insurance and the premium adjustments. By extension, it is yet to be established whether the introduction of tax relief on medical insurance premiums would offset the effect of premium hikes on the accessibility of health care insurance and, if not, what other relief measures can be deployed.

Global Microsimulation and Mathematical Models for Tax Reform

Microsimulation modelling has become one of the most widely used tools for evaluating public policy reforms. By analyzing the effects of policy changes at the individual or household level, microsimulation models enable policymakers to estimate fiscal impacts, distributional consequences, and behavioral responses before implementation. Consequently, these models

have become central to evidence-based policymaking in taxation, healthcare financing, and social protection.

Immervoll and O'Donoghue (2009) identify microsimulation as one of the most effective approaches for evaluating tax and transfer policies because of its capacity to analyse equity and efficiency simultaneously. Numerous international studies demonstrate the value of microsimulation in designing more equitable fiscal interventions. For example, Decoster and Van Camp (2001) found that tax credits generally produce more progressive outcomes than deductions because benefits are distributed more evenly across taxpayers. Similarly, Selden and Gravelle (2013) showed that income-targeted subsidies are more effective than universal tax deductions in increasing insurance participation among lower-income households. Another research has also highlighted the importance of adjusting fiscal incentives to reflect inflationary pressures. Peden and Freeland (1998) and Immervoll (2005) demonstrate that static deduction ceilings gradually lose their real value when inflation is not accounted for, reducing policy effectiveness over time. These findings are particularly relevant to medical insurance tax relief, given the rapid growth of healthcare costs in Malaysia.

Although microsimulation modeling is widely regarded as the international benchmark for evaluating tax policies, its application in Malaysia remains constrained by limited access to individual-level taxpayer and insurance microdata. Consequently, existing Malaysian studies have relied primarily on descriptive assessments and policy reviews, providing limited evidence regarding the fiscal adequacy and distributional consequences of alternative tax relief structures. In such circumstances, macro-level fiscal proxy analysis and benefit-incidence approaches provide a practical and policy-relevant alternative for evaluating tax expenditures. By combining healthcare claims decomposition, purchasing power assessment, and distributional analysis, the present study offers one of the first integrated evaluations of Malaysia's medical insurance tax relief within the broader context of medical inflation, insurance affordability, and healthcare financing sustainability.

While existing Malaysian literature, such as Jaafar et al. (2013) and Baharin et al. (2022), provides a foundational understanding of healthcare financing and insurance demand, these studies largely treat medical inflation, tax expenditure, and financing equity as isolated variables. This study departs from that descriptive tradition by shifting the focus from structure to interaction, specifically, how persistent medical inflation erodes the fiscal adequacy of insurance tax relief. Unlike earlier work by Cheah (2021) which focuses on policy descriptions, this study bridges the gap between healthcare claims decomposition and distributional outcomes. Furthermore, while international scholarship has moved toward data-intensive microsimulation models, the Malaysian context has been hindered by microdata constraints. This study overcomes that barrier by integrating fiscal proxy analysis with benefit-incidence assessment. Consequently, this work offers a critical advancement by evaluating the efficiency-equity trade-off of tax relief in a way that previous, more fragmented analyses

Research Gap and Conceptual Framework

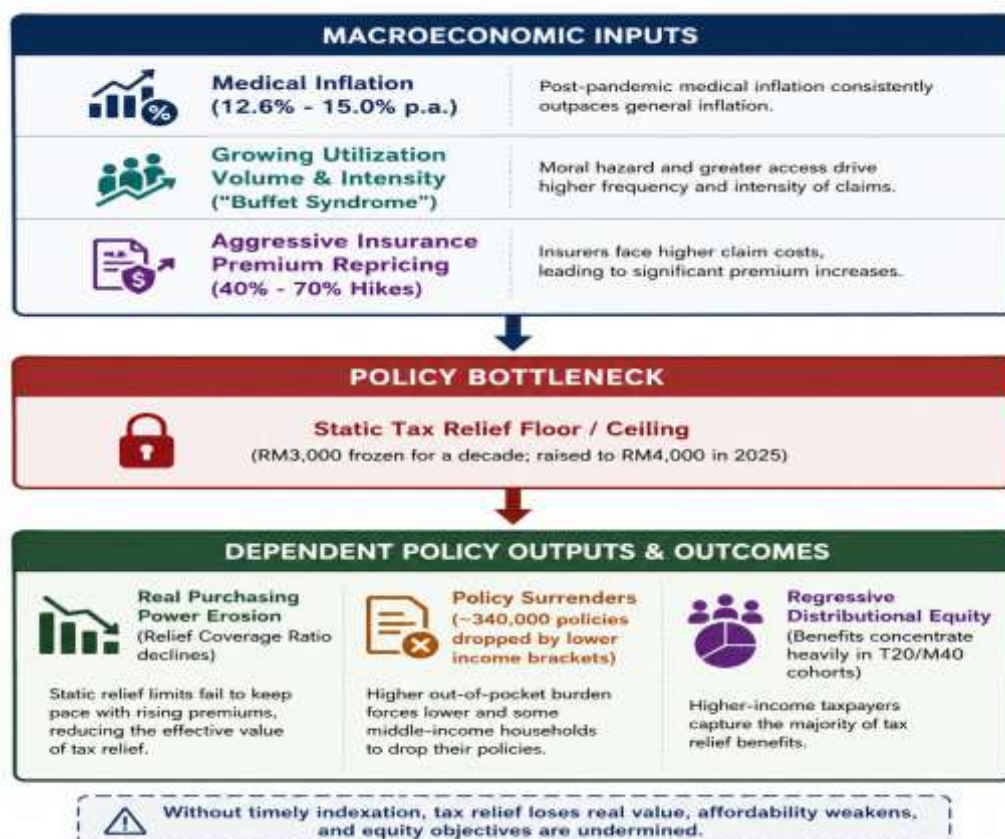
The literature review reveals limited understanding of the interrelationships among healthcare financing, medical inflation, tax expenditure policy, and fiscal sustainability in Malaysia. Previous studies have examined healthcare financing equity, medical inflation, insurance demand, and tax expenditure as separate research streams. However, few studies have

integrated these perspectives to evaluate whether Malaysia's medical insurance tax relief remains fiscally adequate and equitable in an environment of persistent medical inflation and rising insurance premiums. Existing research has also paid limited attention to how the deduction-based tax relief affects taxpayers across different income groups, particularly the B40, M40, and T20.

Microsimulation is widely recognized as the preferred approach for evaluating tax expenditure reforms because it enables detailed analysis of fiscal and distributional effects at the individual taxpayer level. However, access to taxpayer-level administrative data in Malaysia is restricted by confidentiality requirements, making conventional microsimulation analysis infeasible. To address this limitation, the present study adopts a macro-level fiscal proxy and benefit-incidence approach, combining national insurance claims data with institutional fiscal data to evaluate the fiscal adequacy and distributional equity of Malaysia's medical insurance tax relief. This approach provides a practical and policy-relevant assessment of the current tax relief framework despite the absence of taxpayer microdata.

Based on the identified research gap, a conceptual framework is developed to illustrate how macroeconomic factors, including medical inflation, insurance premium repricing, healthcare utilization, and tax policy parameters, influence the fiscal adequacy and distributional outcomes of Malaysia's medical insurance tax relief. The framework guides the empirical analysis by linking external economic pressures with policy design and taxpayer outcomes.

Table 1: Conceptual Framework of the Fiscal Adequacy and Distributional Effects of Malaysia's Medical Insurance Tax Relief



Research Methodology

Research Design

This study uses a two-pronged design of quantitative research that integrates the micro-level of health economics with the macro-level of public finance analysis. As the effectiveness of the tax relief for health insurance depends on both its purchasing power and its reach, the study is structured in two analytical phases: an empirical breakdown of the drivers of health costs using a centralized claims database, and a macro-prudential analysis to assess the fiscal adequacy and distributive justice of the policy from 2014 to 2025.

Data Sources and Collection

In order to implement this two-pronged approach, the study builds a comprehensive panel dataset using data from the primary sector and secondary institutional sources. The collection of data is divided into three main areas:

1. **Micro Claims Database:** We utilize a national medical insurance claims dataset from Insurance Services Malaysia (ISM). This database contains approximately 6.5 million individual transaction records from 2022 to 2024, detailing demographics, clinical treatment types, hospital networks, and line-item billing data
2. **Macroeconomic and Income Indicators:** Income trends, median household distributions, and income-group thresholds (B40, M40, T20) are drawn from the Department of Statistics Malaysia (DOSM) Household Income Surveys
3. **Fiscal and Budgetary Data:** Historic tax parameters, revenue metrics, and policy frameworks are gathered from official Inland Revenue Board of Malaysia (LHDN) documentation, Ministry of Finance (MoF) budget reports, Bank Negara Malaysia (BNM) financial stability reviews, and Malaysia National Health Accounts (MNHA) annual releases spanning 2014 to 2025..

To ensure data quality, we remove pure cash-benefit claims (which function as income replacement rather than direct clinical billings) and exclude claimants aged 65 and older to prevent extreme geriatric outliers from skewing the main baseline estimates

Data Sources and Pre-Processing

To ensure the validity and reliability of the empirical claims analysis, the Insurance Services Malaysia (ISM) statistical yearbook underwent a rigorous multi-stage data cleaning and pre-processing procedure. Cash benefit claims were excluded because they function as income replacement rather than reflecting actual healthcare utilization or hospital expenditure. Consequently, their inclusion could bias estimates of medical service consumption and healthcare costs. Claims involving policyholders aged 65 years and above, representing approximately 6% of the raw dataset, were also excluded. Healthcare expenditure within this age group is disproportionately influenced by multiple chronic conditions, prolonged hospitalization, and end-of-life care, resulting in exceptionally high and highly variable claim costs. These observations constitute extreme outliers that may distort parameter estimates and obscure the underlying relationship between healthcare utilization and insurance claims among the working-age insured population. Since Malaysia's medical insurance tax relief is primarily intended to encourage private medical insurance participation among economically active taxpayers, restricting the analysis to individuals below 65 years provides a more representative assessment of healthcare utilization patterns and the policy's fiscal effectiveness. The final

analytical dataset therefore reflects the population most directly affected by the medical insurance tax relief, thereby enhancing the robustness, internal validity, and policy relevance of the empirical findings.

Mathematical and Econometric Specifications

As the Department of Statistics Malaysia (DOSM) publishes the Household Income and Basic Amenities Survey at irregular intervals (2014, 2016, 2019, and 2022), household income estimates for intervening years are derived using linear interpolation. For the out-of-sample projection period (2023 to 2025), Household incomes are projected using the compound annual growth rate (CAGR) observed between 2019 and 2022:

$$g = \left(\frac{Y_{2022}}{Y_{2019}} \right)^{\frac{1}{3}} - 1$$

$$Y_t = Y_{2022} \times (1 + g)^{t-2022}$$

Y_t represents the estimated median household income for target year t , and g is the compound annual growth rate.

To model the determinants of medical claims inflation, a Generalized Linear Model (GLM) with a Gamma distribution and a log link were employed. This specification is widely recommended for healthcare cost data because medical claims are continuous, strictly positive, and highly right skewed. Unlike Ordinary Least Squares (OLS), which relies on assumptions of normally distributed residuals and constant error variance, the Gamma GLM accommodates the heteroscedasticity and skewness inherent in healthcare expenditures. Consequently, it yields more efficient parameter estimates and ensures positive fitted values.

$$\ln \ln (E [Y_i]) = \beta_0 + \sum_{j=1}^k \beta_j X_{ji} + \gamma_{year} T_i$$

Where

$\ln$ = The natural logarithm, representing the log link function used in this specific GLM.

$E [Y_i]$: The expected value of the continuous dependent variable (the gross cost of an individual insurance claim i).

β_0 : The intercept or baseline constant.

$\sum_{j=1}^k$: The summation sign that was missing in the text, indicating the sum of k number of explanatory variables (like age, gender, hospital tier, etc.).

$\beta_j X_{ji}$: The coefficient (β_j) multiplied by the value of the explanatory variable (X_j) for a specific claim (i).

$\gamma_{year} T_i$: The coefficient for the time vector or year effect (γ_{year}) applied to the time variable (T) for claim (i).

The main variables are defined as Table 2:

Table 2: Operational Specifications of Variables in the GLM Model

Variable Group	Variable Code	Operational Definition & Reference Category
Age & Gender	AGE, FEMALE	Continuous age in years; binary gender marker (Ref: Male).
Treatment Setting	INPATIENT	Binary indicator: Inpatient vs. Outpatient care (Ref: Outpatient).
Hospital Category	HOSP_TIER	Classification of provider: Premium tier, Standard private network, or Day surgery center (Ref: Standard private).
Diagnostic Group	ICD_CHAPTER	18 primary ICD-10 chapters including oncology, cardiovascular, and musculoskeletal disorders (Ref: Infectious diseases).
Length of Stay	LOS	Continuous count of overnight hospital stays.
Time Vector (T)	YEAR_EFF	Chronological year markers mapping 2022, 2023, and 2024 to capture structural shifts over time

Following the GLM estimation, a chain-substitution method has been applied to break down changes in total medical expenditures into individual drivers: price updates, total utilization volume, treatment intensity, and patient case-mix. To assess the eroding value of the tax deduction, the Relief Coverage Ratio (RCR) and the Affordability Index (AI) across different income cohorts are calculated. Together, these approaches provide an integrated assessment of healthcare affordability, insurance sustainability, and the extent to which the current tax relief framework remains effective in promoting financial protection and equitable access to healthcare amid rising medical costs.

$$RCR_t = \frac{\text{Statutory Tax Deduction Ceiling}_t}{\text{Average Annual Private Insurance Premium}_t}$$

$$AI_{c,t} = \frac{\text{Average Annual Private Insurance Premium}_t}{\text{Median Annual Household Income}_{c,t}}$$

Where c represents the specific income group (B40, M40, T20) during fiscal year t

Findings and Discussion

Empirical Drivers of Medical Claims Escalation

The decomposition analysis for 2022 to 2024 indicates that price increases account for only 28.5% of total growth in medical claims expenditure, whereas changes in service volume and treatment intensity explain the remaining 71.5%. This finding extends the evidence reported by Chan and Ramesh (2024), who attributed rising healthcare expenditure primarily to the

corporatization of private hospitals, by demonstrating that increased healthcare utilization and treatment intensity are the dominant drivers of claims inflation. The results are also consistent with the moral hazard framework proposed by Zweifel and Manning (2000), which predicts that comprehensive insurance coverage reduces the marginal cost of healthcare consumption and may encourage greater utilization of medical services.

This behavioral response is particularly relevant in the Malaysian context, where comprehensive "as charged" cashless insurance products impose few financial constraints at the point of care. The decomposition results are further supported by line-item claims data, which show that expenditures on Hospital Supplies and Services (HSS), including unindexed clinical consumables, advanced diagnostics, and specialized medical procedures, increased substantially faster than regulated professional fee schedules. By late 2024, HSS accounted for 64.2% of the average inpatient hospital bill, indicating that the growth in claims is increasingly driven by service intensity and the use of resource-intensive treatments rather than by increases in regulated unit prices alone.

Table 3: GLM Parameter Estimates for Individual Claim Costs

Parameter Code	Operational Variable	Coefficient t (β)	Standard Error	z-value	p-value
Intercept	Base Baseline Constant	6.842	0.012	570.17	<0.001
AGE	Continuous Age Vector	0.014	0.0003	46.67	<0.001
FEMALE	Gender (Binary)	-0.041	0.005	-8.20	<0.001
INPATIENT	Clinical Admission Setting	1.314	0.009	146.00	<0.001
HOSP_TIER	Premium Private Hospital	0.452	0.007	64.57	<0.001
LOS	Length of Stay (Days)	0.089	0.002	44.50	<0.001
YEAR_EFF23	Trend Variance (2023)	0.112	0.006	18.67	<0.001
YEAR_EFF24	Trend Variance (2024)	0.235	0.006	39.17	<0.001

Fiscal Adequacy of Medical Insurance Tax Relief

The fiscal indicators presented in Table 4 indicate a substantial deterioration in the adequacy of Malaysia's medical insurance tax relief over the study period. The statutory relief ceiling of RM3,000, since it introduced and remain unchanged for ten consecutive years despite persistent growth in medical insurance premiums. Following the COVID-19 pandemic, medical inflation accelerated to approximately 12.6% to 15.0% annually, leading insurers to increase premiums in response to higher claims costs. Consequently, the Relief Coverage Ratio (RCR) declined from 1.62 in 2014 to 0.71 in 2024, representing a 56% reduction in the purchasing power of the tax relief. By 2024, the statutory relief covered only 71% of the cost of a representative medical insurance policy. These findings provide empirical support for the theoretical predictions of Peden and Freeland (1998) and Immervoll (2005), who argue that fixed statutory deduction ceilings progressively lose their real value when they are not indexed to inflation. The Malaysian experience demonstrates that discretionary policy adjustments are insufficient to preserve the fiscal adequacy of tax relief during periods of sustained medical inflation. Then, the Budget 2025 increased the statutory relief ceiling from RM3,000 to RM4,000, representing the first revision since the relief was introduced, however this adjustment partially restores the value of the tax incentive. In fact, it primarily compensates for

a decade of accumulated medical inflation rather than establishing a mechanism that preserves its real value over time. Without automatic indexation or regular evidence-based revisions, the real value of the tax relief is likely to continue declining as medical costs and insurance premiums increase.

The distributional analysis further indicates that the current deduction-based tax relief provides greater benefits to higher-income households because its value increases with the taxpayer's marginal tax rate. This pattern is consistent with the findings of Gruber (2002) and Redonda and Axelson (2021), who argue that deduction-based tax expenditures disproportionately benefit higher-income taxpayers. Consequently, the existing design limits the effectiveness of the relief in improving affordability for lower-income households, which are more vulnerable to rising healthcare costs. Replacing the current deduction with a refundable or income-targeted tax credit could improve both horizontal and vertical equity while expanding access to financial support among lower-income taxpayers.

The findings suggest that reforms to Malaysia's healthcare financing framework should address both the fiscal adequacy and distributional equity of medical insurance tax relief. While insurance market reforms, including co-payment arrangements, may help moderate excessive healthcare utilization, tax policy should incorporate inflation indexation and income-targeted fiscal incentives to maintain the real value of tax support and improve affordability, particularly for lower-income households facing sustained medical inflation and recurring premium repricing.

Table 4: Long-term Trends in Relief Coverage Ratio (RCR) and Affordability

Fiscal Year	Deduction Cap (RM)	Avg. Annual Premium (RM)	Baseline RCR	Affordability Index: B40	Affordability Index: M40	Affordability Index: T20
2014	3,000	1,850	1.62	4.8%	2.3%	0.8%
2018	3,000	2,420	1.24	5.5%	2.7%	0.9%
2022	3,000	3,380	0.89	7.2%	3.5%	1.1%
2024	3,000	4,250	0.71	8.6%	4.1%	1.3%
2025	4,000	4,890	0.82	9.4%	4.5%	1.4%

Distributional Equity and Benefit-Incidence Analysis

Aside from the observed insufficient fiscal outcome, the analysis Table 5 demonstrated that the medical insurance tax relief was distributed unequally between the Malaysian taxpayers. The Affordability Index for B40 households hit 9.4% in 2025, suggesting that private medical insurance becomes less affordable for low-income families. Thus, the number of families that do not renew their subscriptions is projected to increase. The analysis also showed that as the prices increase, the tax base becomes narrower.

The distribution aspect of the medical insurance tax relief becomes essential since the eligibility criteria require taxpayers to purchase private medical insurance and pay sufficient taxes to claim the deduction. For example, low-income taxpayers who renew their private medical insurance subscription will fail to meet the income threshold and will be unable to claim the deduction. By contrast, high-income taxpayers who do not renew their subscriptions can claim

larger deductions as the tax they save is directly proportional to their marginal tax rates; thus, the distribution of the tax expenditures for medical insurance is skewed towards the top 20% and middle 40% of the population. In 2024, for instance, T20 taxpayers received 65.2% of the fiscal value of the medical insurance tax relief, whereas the B40 only acquired 3.2%.

Since, the distribution of the tax expenditures is also linked with the overall Malaysians' expenditure on health. According to the Malaysia National Health Accounts (MNHA), the Malaysians spent about RM34.84 billion on Out-of-Pocket (OOP) payments, accounting for about 39% of the Total Expenditure on Health (TEH) in 2024. This showing that the affordability of private medical insurance is lower for the B40 and M40. Both groups are highly likely to reduce their private medical insurance renewal and spend more on OOP payments. Thus, an increase in premiums reduces accessibility to private medical insurance, creating a regressive taxation impact on the OOP payments. The findings imply that the majority of Malaysians will bear the costs of private medical insurance through higher OOP payments, with limited tax expenditures for medical insurance benefits.

Table 5: Benefit Incidence Share and Value Concentration (Fiscal Year 2024)

Income Cohort Group	Marginal Tax Rate Range	Policy Retention Rate	Share of Total Fiscal Value Derived
B40 (Bottom 40%)	0% – 1%	14.2%	3.2%
M40 (Middle 40%)	1% – 19%	46.8%	31.6%
T20 (Top 20%)	19% – 30%	88.5%	65.2%

Discussion

Medical Inflation is Primarily Driven by Healthcare Utilization rather than Price Growth

The results of the analysis conducted contradict the existing theories that attempt to explain medical inflation in Malaysia. Unlike previous research, which focuses mainly on the relationship between medical costs and the utilization of services, the decomposition analysis revealed that service volumes and treatment intensity accounted for a significant portion of claims inflation. In particular, a high percentage of Ambulatory Care Sensitive Conditions (ACSC) admissions and the increasing role of Hospital Supplies and Services (HSS) suggest that the dynamics of “fee for service” reimbursement and “as charged” insurance payment methods have stimulated overuse of medical services.

The results align with the moral hazard theory, which Zweifel and Manning (2000) applied to the analysis of the insurance market. According to the theory, the provision of comprehensive coverage stimulates demand for services beyond the level needed for optimal health. The results suggest that insurance in Malaysia is used to raise healthcare spending above the first-order level by taking advantage of the fact that reimbursement is based on fees charged. Overall, the analysis concluded that Malaysia's private medical inflation is determined by both cost and utilization trends. As a result, physician payment policies alone will be insufficient to control the overall costs and claims, and utilization management and purchasing strategies should be considered.

Medical Inflation Has Reduced the Fiscal Adequacy of Medical Insurance Tax Relief

In addition, the study revealed some interesting facts about the fiscal adequacy of the medical insurance tax relief for Malaysia's healthcare system. As the previous studies of Peden and Freeland (1998), and Immervoll (2005), have predicted, that once a certain level of health insurance premium is set, its deduction value tends to depreciate due to the continuous rise in the prices of medical services and treatments. Indeed, the Table 6 shows that although the tax-deductible amount has not changed since 2014, the costs of health insurance have increased significantly during the same period, and as a result, the Relief Coverage Ratio has constantly decreased. It appears that the changes in the 2025 Budget for tax-deductible amount have been made too late and in insufficient amounts in order to restore the balance between the growth of insurance premiums and the relief coverage. Therefore, it is essential to recognize the importance of ongoing adjustments following the changes on the market in order for tax-deductible amounts to remain appropriate in relation to the purchasing power of the population.

Table 6: Comparative Policy Matrix of Structural Fiscal Incentive Designs

Structural Feature	Existing Malaysian Deduction Model	International Refundable Tax Credit Systems	Mandatory Co-payment Interventions ("RESET")
Progressivity Profile	Regressive; benefits scale upward with higher marginal tax brackets.	Progressive; provides flat or means-tested financial support across all brackets.	Mixed; reduces premium inflation but increases point-of-care costs.
Low-Income Inclusion	Low; excludes non-taxable earners and those without formal policies	High; provides direct cash credits to low earners, even if they have no tax liability	Moderate; depends on the availability of affordable baseline products.
Response to Inflation	Low; requires manual legislative updates, leading to policy lag.	High; can be automatically linked to broader healthcare cost indices.	Indirect; lowers consumption claims by addressing user moral hazard.

Concluding Remarks

This study evaluated the fiscal adequacy and distributional equity of Malaysia's medical insurance tax relief in light of medical inflation and insurance premium hikes. These results revealed that the medical insurance tax relief's fiscal capacity has been eroded by the medical inflation, as the deduction ceiling failed to track the surge in medical costs. Despite the increment in the deductible amount from RM3,000 to RM4,000 under Budget 2025, tax deductions for medical insurance have been undermined by a decade of premium hikes. The finding found that medical inflation is triggered not only by increasing medical prices but also by higher healthcare utilization and treatment intensity. The latter aspect has contributed to higher insurance claims and premiums for Malaysians, constraining citizens' capacity to purchase private medical insurance. With the increasing burden of insurance premiums, lower-income households are unable to subscribe to any private medical insurance, thus limiting their capacity to offset rising healthcare costs with insurance payouts. The medical insurance tax

relief is inherently redistributive, as it primarily offsets the tax liability of middle- and higher-income taxpayers who can afford to subscribe to private medical insurance. Under the existing fiscal design, taxpayers who cannot subscribe to private medical insurance upon premium hikes are entirely denied any tax deductions, defeating the original purpose of the fiscal policy. Conversely, higher-income taxpayers claim larger tax deductions due to higher marginal tax rates, rendering the existing medical insurance tax relief regressive tax expenditure.

The identified inefficiencies in the fiscal design of medical insurance tax relief have significantly affected the policy for healthcare financing in Malaysia. To enhance the efficacy of medical insurance as a fiscal device to cushion the burden of healthcare costs, policymakers should consider alternative approaches to the status quo of adjusting the deductible amount on a discretionary basis. First, policymakers should index the deduction ceiling to medical inflation or insurance premium hikes to ensure its adequacy in offsetting the rising healthcare costs. Second, the income-based approach to medical insurance tax relief should be phased out in favor of a needs-based or refundable tax credit approach. Such a shift would enhance the fiscal protection of lower-income households without undermining the tax liabilities of higher-income households. Third, public authorities should consider complementary healthcare financing measures to curb medical inflation and ensure the sustainability of health insurance as an essential component of household budgets.

The proposed healthcare financing reforms entail several benefits for healthcare maintenance and family finances in Malaysia. By adopting a more progressive fiscal design for medical insurance tax relief, policymakers can improve the capacity of Malaysian households to subscribe to private medical insurance while facilitating equitable distribution of tax benefits between lower- and higher-income households. In doing so, public authorities can ensure the sustainability of the health insurance scheme as an essential component of citizens' household budgets. Policymakers should acknowledge that medical insurance tax relief is only one element of a broader healthcare financing system. As such, they should consider tax expenditures in conjunction with healthcare utilization, insurance costs, and medical inflation when designing fiscal policies for private medical insurance.

This study has several limitations that future researchers can address in subsequent studies. First, this study's scope prevented an exhaustive analysis of the relationship between tax expenditures and private medical insurance at the individual level. Future analysts can conduct similar studies using individual-level microsimulation or administrative data, which would allow a more comprehensive analysis of the causal relationships between taxpayers' characteristics and private medical insurance affordability. Additionally, future scholars can utilize individual-level data to estimate the magnitude of tax expenditures required to facilitate middle- and lower-income households' subscription to private medical insurance. Such data would allow analyzing the fiscal implications of alternative design options, including inflation-indexed medical insurance tax relief, refundable tax credits, and hybrid approaches.

Acknowledgements

This research was supported by Universiti Pendidikan Sultan Idris (UPSI) through the Geran Komprehensif Universiti (GKPU), Faculty of Management and Economics (FPE), under the Grant Code-2025-0211-106-01

References

- Aljunid, S. M. (2019). Structural drivers of medical inflation in private hospital networks across Southeast Asia. *Journal of Health Economics and Outcomes Research*, 6(3), 142–151.
- Atun, R., et al. (2016). Universal Health Coverage in Malaysia: Maintaining equity amid fiscal pressures. *The Lancet*, 388(10062), 2843–2845.
- Baharin, M. F. A., Juni, M. H., & Abdul Manaf, R. (2022). Equity in out-of-pocket payments For healthcare services: Evidence from Malaysia. *International Journal of Environmental Research and Public Health*, 19(8), 4500.
- Bank Negara Malaysia. (2024). *Financial stability review — The macroeconomics of medical cost inflation and insurance repricing frameworks*. Kuala Lumpur: Central Bank of Malaysia.
- Chan, W. Y., & Ramesh, M. (2024). Private hospital corporatization and medical inflation in Malaysia: Explaining the 15% claims escalation. *Social Science & Medicine*, 340, 116–128.
- Cheah, Y. K. (2021). Socioeconomic determinants of the demand for private health insurance in Malaysia: A double-hurdle model approach. *International Journal of Social Economics*, 48(6), 882–898.
- Chua, H. T., & Cheah, J. C. H. (2012). Financing Universal Coverage in Malaysia: a case study. *BMC Public Health*, 12. <https://doi.org/10.1186/1471-2458-12-s1-s7>
- Chernew, M. E., Cutler, D. M., & Keenan, P. S. (2005). Increasing health insurance premiums and the decline in insurance coverage. *Health Affairs*, 24(4), 1021–1031.
- Decoster, A., & Van Camp, G. (2001). Redistributive effects of the shift from tax deductions to income-tiered tax credits: A micro-simulation analysis. *Public Finance Review*, 29(4), 283–311.
- Gruber, J. (2002). *The tax exclusion for employer-sponsored health insurance: A regressive subsidy framework* (Working Paper No. 9181). National Bureau of Economic Research (NBER).
- Immervoll, H. (2005). The choice between automatic inflation indexing and discretionary fiscal revisions: Simulation evidence from the EU. *Public Finance Review*, 33(4), 419–448.
- Immervoll, H., & O'Donoghue, C. (2009). Towards a systematic classification of structural tax-benefit models: Simulating indexation vs. discretionary adjustments. *International Journal of Microsimulation*, 2(1), 33–54.
- Jaafar, S., et al. (2013). Malaysia health system review. *Health Systems in Transition*, 3(1). World Health Organization.
- Logarajan, R. D., Nor, N. M., Sirag, A., Said, R., & Ibrahim, S. (2022). The Impact of Public, Private, and Out-of-Pocket Health Expenditures on Under-Five Mortality in Malaysia. *Healthcare*, 10, 589. <https://doi.org/10.3390/healthcare10030589>
- Life Insurance Association of Malaysia (LIAM). (2025). *Joint industry report: Managing the escalation of medical claims inflation and private hospital fee schedules*. Kuala Lumpur: LIAM/PIAM/MTA.
- Peden, E. A., & Freeland, M. S. (1998). Insurance effects on premium growth and the deadweight loss of static statutory tax ceilings. *Journal of Health Economics*, 17(5), 591–611.
- Rannan-Eliya, R. P., Anuranga, C., Manual, A., et al. (2016). Improving Health Care Coverage, Equity, And Financial Protection Through A Hybrid System: Malaysia's Experience. *Health Affairs*, 35, 838-846. <https://doi.org/10.1377/hlthaff.2015.0863>
- Redonda, A., & Axelson, M. (2021). *Assessing the distributional impact of personal income*

tax expenditures: A global equity perspective (Policy Note 2021/3). Council on Economic Policies (CEP).

Said, R., & Nor, N. M. (2018). The regressive nature of personal income tax deductions in emerging economies: The Malaysian experience. *Malaysian Journal of Economic Studies*, 55(2), 241–260.

Saman, M. S., & Ismail, N. (2020). Tax expenditures in Malaysia: Estimation of revenue forgone from personal income tax reliefs. *Journal of Tax Research*, 18(2), 195–218.

Selden, T. M., & Gravelle, H. (2013). Tax subsidies for private health insurance: Microsimulation estimates and sensitivity to alternative tiered incidence assumptions. *Journal of Health Economics*, 32(4), 668–682.

Surrey, S. S. (1973). Pathways to tax reform: The concept of tax expenditures. Harvard University Press.

Yu, C. P., Whynes, D. K., & Sach, T. H. (2008). Equity in health care financing: The case of Malaysia. *International Journal for Equity in Health*, 7(1), 15.

Zweifel, P., & Manning, W. G. (2000). Moral hazard and consumer behavior in private health insurance: A framework for premium indexing. *Handbook of Health Economics*, 1, 409–459.

<https://www.bnm.gov.my/bnm-annual-report>

<https://www.hasil.gov.my/en/individu/pelepasan-cukai/>

<https://www.ism.net.my/resources/>

<https://www.piam.org.my/>

<https://www.liam.org.my/>

<https://takaful4all.org/ms/statistics/>