

The effect of tax incentives, matching contributions, and perceived government policy on retirement savings behaviour

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ABSTRACT

Malaysian civil servants generally have low retirement savings, which compromises their financial stability after retirement. As the population ages, living costs rise, and reliance on pensions remains substantial, improving retirement savings has become increasingly critical. However, there is limited evidence regarding the factors that affect this behaviour. This study investigates whether tax incentives, matching contributions, and perceptions of government policy predict retirement saving behaviour among Malaysian civil servants. It draws on the behavioural economic model and rational choice theory. Using a cross-sectional quantitative design, the study surveyed 285 permanent civil servants (Grades 9–15) with income tax records, selected through purposive sampling. Data were analysed using SPSS 29 and SmartPLS 4.0. The results showed that tax incentives and perceived government policy had a positive effect on retirement saving behaviour, whereas matching contributions did not. These findings highlight the role of incentives and policy perceptions, indicating that interventions such as tax incentives and automatic enrolment could improve participation in retirement savings schemes.

1. Introduction

Retirement savings have become an increasing public concern due to population ageing and rising living costs. In response, governments have introduced various measures, such as tax incentives (TI), matching contributions (MC), and retirement schemes, to encourage higher levels of individual savings. In Malaysia, these policies aim to increase the perceived benefits of saving and promote greater financial contributions. Malaysian civil servants who save between 10% and 20% of their income are less likely to experience debt

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burden compared to those who save a smaller proportion of their income (Sabri et al., 2019). However, existing evidence suggests that actual saving behaviour remains inadequate, with many individuals failing to accumulate sufficient retirement funds (Azmi et al., 2023; Ishak et al., 2022; Mansor et al., 2015).

The Employees Provident Fund (EPF) has established retirement income targets of RM1.3 million for the enhanced tier, RM650,000 for the adequate tier, and RM390,000 for the basic tier. Achieving these benchmarks requires consistent savings, financial discipline (Tan et al., 2026), and a long-term commitment to future financial goals (Rosli, 2026). According to TheGlobalEconomy.com (2023), Malaysia ranked 60th globally in 2023, with a savings rate of 24.01% of GDP, falling behind countries such as Singapore (9th; 38.67%), Indonesia (13th; 35.87%), and Bangladesh (18th; 34.9%) (TheGlobalEconomy.com, 2024). This comparison highlights the relative underperformance of Malaysia's national savings rate.

Furthermore, this study identifies notable gaps in cross-country knowledge regarding the structure and effectiveness of tax incentives. In Malaysia, although incentives are relatively easy to claim, they are constrained by low annual caps. The caps are RM7,000 for EPF and RM3,000 for Private Retirement Scheme (PRS) contributions (EPF, 2026a; Private Pension Administrator Malaysia, 2026). By contrast, countries such as Singapore, the United Kingdom, the United States, Canada, and Australia typically allow higher contribution limits that qualify for preferential tax treatment. However, their systems often involve greater complexity, and tax benefits are frequently deferred until withdrawal (Australian Tax Office, 2026; Canada Revenue Agency, 2026; GOV.UK, 2026; Internal Revenue Service, 2026; Inland Revenue Authority of Singapore, 2026). New Zealand, on the other hand, employs a credit or subsidy-based model rather than a tax-deduction approach (New Zealand Legislation, 2026). Thus, further study is needed to examine how tax incentives positively affect retirement savings behaviour among Malaysian civil servants.

From a behavioural economics perspective, mechanisms such as tax incentives and matching contributions may not adequately address psychological barriers such as present bias, limited financial literacy, and other cognitive constraints that cause individuals to undervalue future consumption. In contrast, rational choice theory posits that individuals will respond positively to such policies only if the schemes' returns, governance, and rules are perceived as transparent, stable, and trustworthy. Therefore, individuals' perceptions of government policies, including their understanding of incentives, match rates, and withdrawal conditions, play a significant role in shaping retirement saving decisions.

Recent policy shifts that allow easier access to retirement funds may offer short-term financial relief but risk encouraging immediate consumption and weakening long-term saving behaviour (Arfa, 2024). These issues are especially relevant for Malaysian civil servants, who, despite benefiting from job security and structured retirement schemes, often exhibit low voluntary savings and may rely on debt to sustain their standard of living (Poh et al., 2021). Previous studies have not sufficiently examined the combined effects of tax incentives, matching contributions, and policy perceptions within both behavioural and rational frameworks. Understanding this interaction is essential for designing more effective retirement policies tailored to civil servants.

While general evidence supports the effect of tax incentives on saving behaviour, relatively few studies have explored their impact on the amount, type, or timing of contributions. The literature suggests that tax incentives are widely used to encourage retirement savings, but their effectiveness varies by context. For example, several studies have shown that tax-advantaged accounts can positively affect contribution rates and long-term planning, although these effects are sometimes limited (Attanasio et al., 2004; Ayuso et al., 2019; Cifuentes, 2005; Lindeboom & Montizaan, 2020).

Similarly, while most studies have explored the relationship between MC and retirement saving behaviour (RSB), findings remain mixed. Some research has indicated that employer matching and plan design significantly increase participation and influence asset allocation (Choi et al., 2004). When framed as a "bonus", MC has been shown to increase both contributions and participation (Saez, 2009). However, other studies report weak or inconsistent effects. For instance, even with high match rates in certain 401(k)

plans, many employees remained unresponsive (Mitchell et al., 2007), and older workers showed limited sensitivity to match incentives (Engelhardt & Kumar, 2004).

This study examines the effect of tax incentives, matching contributions, and perceived government policy on retirement saving behaviour among Malaysian civil servants. International evidence suggests that tax-advantaged accounts often have limited effects on increasing overall savings, as individuals may simply reallocate existing assets (Attanasio et al., 2004; Ayuso et al., 2019; Chetty et al., 2013). In contrast, interventions such as default enrolment or matching contributions, whether by governments or employers, tend to yield more significant and sustained increases in participation, particularly among low and middle-income earners (Eren & Genç İleri, 2022; Falk & Karamcheva, 2022). This study addresses the gap by analysing the impact of both tax-based incentives and direct subsidies, an area that is still underexplored in emerging markets.

Malaysian civil servants form a critical segment of the population for this analysis due to their stable employment and access to defined-benefit pensions. Despite generally demonstrating responsible financial behaviour and high levels of financial literacy, many remain inadequately prepared for retirement (Tan & Singaravelloo, 2020). Research has highlighted persistent gaps in retirement knowledge, attitudes, and planning practices, placing many at risk of financial insecurity in later life (Ishak et al., 2022). These findings suggest that retirement outcomes are shaped not only by income and institutional arrangements but also by behavioural and psychological factors. In this context, the perceived credibility, fairness, and consistency of government policies become especially important.

Recent studies indicate that Malaysian civil servants respond positively to both tax incentives and matching contributions. Grounded in rational choice theory and behavioural economics, policy tools such as subsidies, automatic enrolment, and revised retirement accounts have been shown to enhance savings by improving both incentives and decision-making contexts (Chetty et al., 2013; Thaler & Benartzi, 2004). By incorporating perceived government policy alongside tax and matching incentives, this study offers an integrated perspective on how both structural mechanisms and subjective perceptions positively affect the retirement saving behaviour among Malaysian civil servants.

Malaysia has over 1.6 million civil servants, including those employed in statutory bodies (Tuan Muhamad Adnan, 2024), making them a significant portion of the national workforce. Their financial preparation for retirement has broad socio-economic implications. Inadequate savings among retirees may affect household well-being, public sector finances, and national economic stability. Civil servants participate in a dual retirement system that includes the Civil Service Pension Scheme and the EPF, which shapes their savings decisions differently than those of private-sector employees (Jaafar et al., 2019). As beneficiaries of job security, fixed salaries, and structured retirement benefits, such as monthly pensions, lump-sum gratuities, the Cash Award in Place of Leave (GCR), and healthcare coverage, civil servants may be less inclined to save voluntarily. This highlights the importance of cultivating a savings culture despite guaranteed benefits (Retirement Fund (KWAP), 2024).

According to the KWAP, 54% of civil servants save monthly for retirement, but many do so inconsistently. Approximately 26.9% do not save, and 1.2% allocate no portion of their salary. While 13.6% of respondents reported saving 30% of their income, 36% saved only 1% to 9%. These statistics reflect deeper systemic challenges, including low financial literacy, limited budgets, weak incentive structures, inconsistent policies, rising costs of living, and broader fiscal pressures. A nuanced understanding of these factors is essential for developing effective policy interventions to improve retirement saving behaviour.

This study examines the effect of tax incentives, matching contributions, and perceived government policy on retirement saving behaviour among Malaysian civil servants, by applying the Behavioural Economics Model (BEM) and Rational Choice Theory (RCT). Specifically, the study outlines three research objectives: (1) to examine the effect of tax incentives on retirement saving behaviour; (2) to assess the effect of matching contributions; and (3) to analyse the role of perceived government policy in influencing retirement saving behaviour. Data was collected via an online questionnaire distributed through

Google Forms, resulting in 285 valid responses. Then, the data were analysed using SPSS Version 29 and SmartPLS 4.0.

2. Literature review

Three points are discussed in this section, starting with the underpinning model and theory, hypothesis development, and conceptual framework.

2.1 Underpinning model and theory

2.1.1 Behavioural economic model

Behavioural economics integrates psychological insights into economic theory to explain deviations from fully rational financial decision-making. It explores how cognitive biases, bounded rationality, financial literacy, and self-control affect retirement saving behaviour (Knoll, 2009; Kumar & Chaurasia, 2024; Sekita et al., 2022). For instance, Thaler and Benartzi (2004), in their “Save More Tomorrow” (SMarT) programme, demonstrated that behavioural interventions, particularly automatic features such as pre-committed contribution increases, improve both participation and contribution rates. However, these studies also emphasize the need to evaluate the long-term effectiveness of such escalation strategies. Other evidence suggests that commitment strategies and matching contributions increase deposit frequency and short-term savings. Nevertheless, higher match rates do not consistently lead to sustained growth in savings balances (Eren & Genç İleri, 2022; Wang et al., 2018). These findings are particularly relevant to public policy initiatives, including Malaysia’s efforts to enhance retirement savings among civil servants through tax incentives and matching schemes. They also highlight the need to assess the effectiveness of these tools in influencing retirement saving behaviour. Research on self-control and present bias further supports the role of external mechanisms, such as incentives, penalties, and structured programmes, in helping individuals to align short-term behaviour with long-term financial goals (Duckworth et al., 2018; Yusof et al., 2019). Overall, the literature suggests that incentive structures, including tax incentives and matching contributions, are the key determinants of retirement saving behaviour.

2.1.2 Rational choice theory

Rational Choice Theory (RCT), initially developed by Homans (1961), conceptualises decision-making as a rational evaluation of costs and benefits. The theory has been applied in the fields of criminology, sociology, and political science to explain how individuals seek to maximise utility within specific constraints (Akers, 1990; Hiep & Tram, 2020; Lovett, 2006; Sato, 2013). Additionally, RCT assumes that individuals hold consistent preferences and choose options that yield the highest expected utility. Later developments expanded the model to incorporate additional factors, including self-control, experience, social relationships, cultural norms, and environmental constraints. These developments acknowledge that decision-making involves more than legal sanctions or self-interest alone (Burns & Roszkowska, 2016; Hechter & Kanazawa, 1997; Pratt, 2008). In public policy, RCT emphasises the role of incentives, information, and social norms in shaping individual behaviour, while also recognising its limitations in accounting for emotions, cognitive biases, and bounded rationality (Sato, 2013). When applied to retirement saving, RCT views it as a rational response to costs, benefits, and policy mechanisms, such as subsidies, automatic deductions, and plan design features (Askari et al., 2019; Benartzi et al., 2017; Cardella et al., 2021; Chetty et al., 2014). However, empirical evidence, such as the low uptake of annuitisation despite its theoretical benefits, reveals inconsistencies between RCT predictions and observed behaviour. These discrepancies highlight the importance of financial literacy, planning behaviour, psychological factors, social support, and institutional conditions in shaping individuals’ perceptions of savings adequacy and their participation in public retirement schemes (Ab Rahim et al., 2022; Benartzi et al., 2011; Chou et al., 2015; Etgeton et al., 2023; Lusardi & Mitchell, 2007).

Table 1: Literature review on underpinning model and theory

Theory/Model	Author (Year)	Description
Behavioral Economics Model	Thaler & Benartzi (2004)	The "Save More Tomorrow" (SMarT) programme applied behavioural economics principles to increase employee savings. Future research should examine on the effectiveness of automatic escalation plans and the broader impact of behavioural economics on retirement savings.
	Knoll (2010)	Traditional economic theories typically assume rational decision-making and overlook the psychological and behavioural aspects of financial choices.
	Duckworth et al. (2018)	Behavioural economics provides insights into how external interventions, like incentives or penalties, can be designed to facilitate people making choices that align with their long-term interests without relying solely on willpower.
	Wang et al. (2018)	Higher matching incentives increased deposit frequency but did not result in to higher savings balances.
	Sekita et al. (2022)	Behavioural economics recognises the importance of psychological aspects, such as financial literacy and self-control, in determining individuals' retirement savings behaviour.
Rational Choice Theory	Hiep & Tram (2020)	The groundwork for understanding decision-making processes based on rational calculations of costs and benefits.
	Sato (2013)	Individuals are assumed to rank preferences based on the utility or payoff they expect to receive, and to choose the option that maximises that utility.
	Akers (1990)	This approach has been explored in explaining criminal behaviour by proposing that individuals respond to incentives and adjust their choices according to the costs and benefits of their actions.
	Benartzi et al. (2011)	While rational choice theory predicts that annuities should be attractive as a means of insuring against longevity risk, research indicates that few individuals annuitize a substantial share of their wealth.
	Chetty et al. (2013)	These policies can influence individuals' choices through incentives or nudges that guide their decision-making process.
	Askari et al. (2019)	This theory suggests that individuals rationally pursue goals to increase their interests, which affects their retirement savings behaviour.

2.2 Hypotheses development

2.2.1 Tax incentives and retirement savings behaviour

This study defines tax incentives as government concessions, rebates, credits, or subsidies, delivered either directly or through employers, that reduce the tax burden on eligible retirement savings to support greater retirement income accumulation (Yusof et al., 2019). For Malaysian civil servants, TI refers to policy measures that provide tax relief, deferrals, or performance-based tax benefits on pension fund contributions and related retirement products, without incurring additional direct government expenditure. In the proposed retirement saving behaviour (RSB) framework, TI functions as a structural factor that

reinforces psychological effects by utilising the tax system to enhance retirement income security for both the government and civil servants.

Empirical studies generally find a positive effect between tax incentives and retirement saving behaviour. Incentives such as deductions, credits, and tax-deferred plans encourage saving by reducing current tax liabilities and increasing the future value of retirement assets (Cifuentes, 2005). Evidence from Spain, Chile, and France supports this effect, particularly when incentives are delivered through back-loaded plans or offer higher financial returns (Ayuso et al., 2019; Cuccia et al., 2019; Risch, 2020). These measures align with behavioural economics by reducing immediate costs and emphasising future benefits (Cifuentes, 2005). Research also demonstrates that tax incentives affect behaviour in other domains, including environmentally friendly vehicle purchases and energy-efficient home improvements, further validating their effectiveness in shaping economic decisions (Jurlin, 2023; Nanez Alonso, 2020; Risch, 2020). Additionally, tax policy reforms influence retirement planning by promoting saving and altering the timing of retirement (Lindeboom & Montizaan, 2020). Furthermore, studies show that well-designed financial incentives also foster capital accumulation and long-term economic growth by enabling income to be shifted from high- to low-tax periods (Cifuentes et al., 2005). Based on the reviewed evidence, the following hypothesis is proposed:

H₁: Tax incentives have a positive effect on retirement saving behaviour, matching contributions and retirement savings behaviour

For every Malaysian Ringgit (RM) contributed by an individual, the government or employer provides a proportionate amount, thereby increasing the overall value of retirement savings (Engelhardt & Kumar, 2004). This mechanism encourages long-term saving behaviour, increases accumulated retirement funds, and promotes financial stability during retirement. Currently, the only schemes in Malaysia that incorporate matching contributions are administered under the Employees Provident Fund (EPF), including i-Saraan (which provides a 20% incentive on voluntary EPF contributions, capped at RM500 per year), i-Suri (which offers a 50% matching incentive for each RM1 contributed, capped at RM300 per year), and the Simpan SSPN Prime matching grant (an education-linked private savings scheme that offers matching contributions subject to specific eligibility conditions and caps) (EPF, 2026b; Perbadanan Tabung Pendidikan Tinggi Nasional, 2026). Malaysian civil servants can benefit from the matching contributions only if they voluntarily contribute to the i-Saraan scheme. Otherwise, they are not eligible for such benefits when saving through other investment accounts outside the scheme, such as Tabung Haji or Amanah Saham Bumiputera (ASB).

Several studies have found a positive effect between matching contributions (MC) and retirement saving behaviour (RSB). MC increases employee participation in retirement saving plans by making contributions more attractive, as they are often perceived as an additional employment benefit (Saez, 2009). Employees are more likely to save when they understand the advantages of matching, and employer contributions significantly influence both participation rates and contribution amounts (Choi et al., 2004). Evidence from the United States and Türkiye demonstrates that MC policies lead to higher enrolment and greater savings, especially among low-income individuals (Madrian, 2012; Yanıkkaya et al., 2023). For example, the introduction of MC in Türkiye's individual pension system resulted in a 111% increase in new participants and an 18% rise in contributions (Yanıkkaya et al., 2023). MC also promotes long-term saving by incorporating principles from behavioural economics and offering financial incentives (Eren & Genç İleri, 2022). Moreover, studies identify MC as a cost-effective strategy for increasing savings, particularly when combined with automatic enrolment, thereby supporting better financial preparedness for retirement (Madrian, 2012). Based on these arguments, the following hypothesis is proposed:

H₂: Matching contributions have a positive effect on retirement saving behaviour.

2.2.2 Perceived government policy and retirement savings behaviour

This study defines perceived government policy as individuals' assessment of the clarity, effectiveness, and implementation of policies and incentives aimed at encouraging retirement saving. It reflects their belief in the policy's capacity to promote greater saving behaviour (Xu et al., 2017). Empirical studies examining the relationship between perceived government policy and retirement saving behaviour among Malaysian civil servants remain limited. However, evidence among public university staff indicates that favourable perceptions of government retirement policy directly support financial planning and reinforce the effect of clear retirement goals on saving behaviour (Ghadwan et al., 2023). Other Malaysian studies show that although government officers demonstrate sound financial habits, their retirement planning remains inadequate, highlighting the need for more consistent and credible policy signals (Tan & Singaravelloo, 2020). In a broader context, greater trust in pension institutions, shaped by perceived fairness and policy stability, has been found to promote voluntary pension saving behaviour (Goedkoop et al., 2023). Earlier research further suggests that tax-incentivised retirement schemes can increase private savings rather than merely reallocating existing assets (Hubbard & Skinner, 1996). Overall, the evidence suggests that among Malaysian civil servants, positive perceptions of government retirement policy, particularly in terms of clarity, reliability, generosity, and protective features, have resulted in a more disciplined and consistent retirement saving behaviour. Based on these arguments, the following hypothesis is proposed:

H₃: Perceived government policy effectiveness has a positive effect on retirement saving behaviour.

Research Model

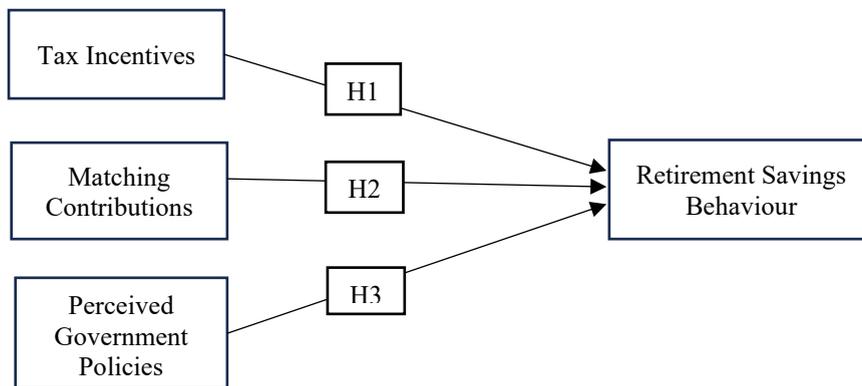


Figure 1: Research model

As illustrated in Figure 1, the research framework identifies retirement saving behaviour as the dependent variable, shaped by three policy mechanisms. H₁ proposes that tax incentives positively affect retirement saving decisions by offering fiscal benefits. H₂ proposes that matching contributions have a positive effect on retirement savings behaviour, suggesting that financial incentives from employers or institutions promote higher participation and contribution levels. H₃ proposes that perceived government policies have a positive effect on retirement saving behaviour, suggesting that individuals' interpretations and trust in policy signals affect their willingness to save. The framework assumes that both objective incentives and subjective policy perceptions independently explain retirement saving behaviour, without implying a sequential or mediating relationship.

3. Research methodology

This section outlines the research design, target population, sampling strategy, data collection procedures, research instruments, and data analysis techniques. It also discusses data management considerations and specifies the study's timeframe and geographical context.

3.1 *Research approach and research design*

The study adopted a deductive approach to test hypotheses derived from underlying theoretical frameworks, consistent with the quantitative, positivist paradigm. A cross-sectional design was employed to collect data at a single point in time, enabling a timely and cost-effective assessment of relationships between variables. A collection of data was conducted between February and March 2025 among Malaysian civil servants.

3.2 *Research population and sampling method*

The study focused on Malaysian civil servants in permanent positions within the Federal Government, federal schemes, federal constitutions, state officers, state constitutions, and local authorities. The target population includes civil servants in Grades 9 to 15 with active income tax records across various regions of the country. Officers in grades above 15 are excluded, as their higher income and more established financial standing could skew the results. Similarly, civil servants in grades below 9 are excluded to minimise income disparities that could introduce bias between lower and higher income groups. This study employed a non-probability sampling technique, selected for its practicality in obtaining relevant data on the determinants of retirement saving behaviour among civil servants in a timely and cost-effective manner.

3.3 *Sample size*

Using G*Power 3.1, the minimum required sample size for structural equation modelling (SEM) was calculated to be 87 for this study. To enhance robustness and account for potential non-responses, a total of 285 complete responses were collected and analysed. This sample size exceeded the minimum requirement and provided sufficient statistical power for hypothesis testing using partial least squares structural equation modelling (PLS-SEM).

3.4 *Data collection procedure and instrumentation*

Data were collected using a structured online questionnaire administered via Google Forms, with confidentiality assured throughout the process. The data collection period spanned approximately three weeks and encountered several challenges, including delayed responses from some facilities due to staff shortages and scheduling constraints. These issues necessitated multiple follow-up reminders to ensure adequate participation.

To establish content validity, the questionnaire was adapted from previously validated instruments used in prior empirical studies. The measurement items were selected from widely cited literature and underwent a rigorous translation and back-translation process between Malay and English to ensure linguistic and contextual suitability (Kowal, 2024).

The final instrument comprised 19 items measuring the constructs such as tax incentives, matching contributions, and perceived government policy. These items were rated on a 5-point Likert scale ranging from "strongly disagree" to "strongly agree". Retirement saving behaviour was assessed separately using a 7-point Likert scale with the same response anchors. The use of uniform scale formats across constructs may reduce respondents' cognitive engagement, increase the risk of response consistency, and thereby introduce potential common method bias (Podsakoff et al., 2024).

3.4.1 Retirement savings behaviour (RSB)

The retirement saving behaviour (RSB) construct was measured using five items adapted from a previous study by Alkhwaja and Albaity (2022). Respondents were asked to indicate their level of agreement on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The measurables are presented in Table 3.7. Three items were slightly modified for clarity and contextual relevance, while two items remained unchanged from the original instrument. The original scale demonstrated high internal consistency, with a composite reliability (CR) value of 0.96.

3.4.2 Tax incentives (TI)

The tax incentives (TI) construct was operationalised using four items adopted from Tirimba et al. (2016). The wording of the items was modified to suit the present study context. Respondents were asked to indicate their level of agreement using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The items, presented in Table 3.7, were designed to assess respondents' perceptions of tax-related incentives for retirement saving. The original scale reported acceptable internal consistency, with a Cronbach's Alpha value of 0.70.

3.4.3 Matching contributions (MC)

The matching contributions (MC) construct was measured using three items adopted from Tirimba et al. (2016). Consistent with the tax incentives construct, the wording of the items was modified to reflect the context of the present study, with particular emphasis on incentive-related concepts. Respondents were asked to indicate their level of agreement using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The original scale reported acceptable internal consistency, with a Cronbach's Alpha value of 0.70.

3.4.4 Perceived government policy (PGP)

The perceived government policy (PGP) construct was measured using seven items adopted from Ghadwan et al. (2023). Respondents were asked to indicate their level of agreement using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The items were modified to align with the specific context of this study. The original scale demonstrated good internal consistency, with a composite reliability (CR) value of 0.88.

3.5 Techniques of data analysis

3.5.1 Structural equation modelling (SEM)

Structural Equation Modeling (SEM) is a second-generation multivariate analysis technique that allows for the simultaneous examination of multiple relationships among observed and latent variables (Hair Jr. et al., 2017). This method enables a comprehensive analysis of retirement savings behaviour.

3.5.2 Partial least squares structural equation modelling (PLS-SEM)

In this study, partial least squares structural equation modelling (PLS-SEM) enables a comprehensive evaluation of the factors influencing retirement saving behaviour by testing the proposed relationships within the conceptual framework.

3.5.3 Measurement model evaluation

The measurement model was assessed for reliability and validity prior to hypothesis testing. Composite reliability (CR) values exceeding 0.70 were indicated as acceptable internal consistency. Convergent validity was established based on average variance extracted ($AVE \geq 0.50$) and individual item loadings (≥ 0.50). Discriminant validity was confirmed using the Heterotrait-Monotrait (HTMT) ratio, with all values falling below the recommended threshold of 0.90.

3.5.4 Structural model evaluation

Following the confirmation of the measurement model, the structural model was evaluated to determine the significance and strength of the hypothesised relationships using a bootstrapping procedure with 10,000 subsamples. Variance Inflation Factor (VIF) values were below 3.3, indicating the absence of multicollinearity. The analysis considered both direct and mediating effects. Results were reported using standardised beta coefficients (β), t-values, p-values, effect sizes (f^2), and 95% confidence intervals.

4. Results

4.1 Respondent profile analysis

A structured questionnaire, adapted from established sources, was developed and translated into both English and Malay. It comprised 19 items measuring four constructs involving tax incentives, matching contributions, perceived government policy, and retirement saving behaviour. The first three constructs were assessed using a 5-point Likert scale, while retirement saving behaviour was measured using a 7-point Likert scale. Table 1 presents the demographic profile of the respondents. The study utilised SPSS Version 29 to perform descriptive statistical analysis. As shown in Table 2, the majority of respondents were female (60%) and primarily aged between 40 and 49 years (60.7%). Most participants held a Bachelor's degree (55.4%), and 22.8% reported a monthly income ranging from RM7,690 to RM9,449.

Table 2: Profile of the Respondents

Demographic	Percentage (%)	Demographic	Percentage (%)
Gender		Retirement Option	
Male	40	Pension (Defined Benefit)	94.4
Female	60	Contribution (Defined Contribution, e.g., EPF)	3.9
Age		The Armed Forces Fund	1.8
<30 years old	2.8	Current Monthly Income	
30 - 39 years old	26	< RM2,560	0.4
40 - 49 years old	60.7	RM2,560 - RM3,439	2.1
50 - 59 years old	10.5	RM3,440 - RM4,309	3.9
Education		RM4,310 - RM5,249	11.2
Bachelor's Degree	55.4	RM5,250 - RM6,339	18.6
Master's Degree	39.3	RM6,340 - RM7,689	19.3
Doctorate/ PhD	2.1	RM7,690 - RM9,449	22.8
Others (Diploma)	3.2	RM9,450 - RM11,819	14.4
		RM11,820 - RM15,869	6
		\geq RM15,870	1.4

Demographic	Percentage (%)	Demographic	Percentage (%)
Position		Savings Amount	
Grade 41/42 (SSM)@Grade 9(SSPA)	11.6	No saving	6.5
Grade 43/44 (SSM)@Grade 10(SSPA)	41.8	<RM1000	10.9
Grade 47/48 (SSM)@Grade 12(SSPA)	26	RM1,000 – RM5,000	19.6
Grade 51/52 (SSM)@Grade 13(SSPA)	16.1	RM5,001 – RM10,000	9.5
Grade 53/54 (SSM)@Grade 14(SSPA)	4.2	RM10,001 – RM15,000	9.5
Grade 55/56 (SSM)@Grade 15(SSPA)	0.4	RM15,001 - RM20,000	3.6
Years of Service		RM20,001- RM25,000	4.0
1- 3 years	4.6	RM25,001- RM30,000	4.4
4-6 years	7	RM30,001 - RM35,000	4.0
7-9 years	9.5	RM35,001 – RM40,000	3.6
≥ 10 years	78.9	RM40,001 - RM45,000	1.8
		≥RM45,001	22.5

4.2 Model assessment

This study employed SmartPLS version 4.1.0.3 to perform data analysis. A reflective measurement model was applied, in which latent constructs were presumed to cause their observed indicators. The measurement model was evaluated for reliability and validity, following established guidelines (Cheah et al., 2018; Hair et al., 2019). A bootstrapping procedure with 10,000 resamples was conducted to assess the significance of indicator loadings, outer weights, standard errors, and path coefficients. The analysis used percentile-corrected confidence intervals and a one-tailed significance test at the 0.05 level. Consistent with the two-step approach proposed by Anderson and Gerbing (1991), the measurement model was evaluated prior to the assessment of the structural model for hypothesis testing.

4.2.1 Measurement model analysis

A measurement model is considered valid and reliable when indicator loadings exceed 0.70, the average variance extracted (AVE) is greater than 0.50, and composite reliability (CR) exceeds 0.70 (Hair et al., 2019). In this study, most indicator loadings met the recommended threshold, with only one or two falling slightly below 0.708. One item (PGP7) was removed due to its low factor loading of 0.346, which was below the acceptable minimum of 0.50. Since all constructs reported AVE values above 0.50, the remaining items were retained (Hair et al., 2019). Table 4 presents the measurement model results.

Discriminant validity was assessed using the Heterotrait-Monotrait ratio of correlations (HTMT), which is a method considered more robust than the Fornell-Larcker criterion (Hair et al., 2019). Consistent with prior PLS-SEM research, all HTMT values in this study were below the recommended threshold of 0.90, indicating adequate discriminant validity (Hair & Alamer, 2022; Henseler et al., 2015).

Table 3: Measurement Model (Convergent Validity)

Constructs	Items	Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Retirement Savings Behaviour	RSB1	0.819	0.926	0.944	0.771
	RSB2	0.846			
	RSB3	0.906			
	RSB4	0.924			
	RSB5	0.891			
Tax Incentives	TI1	0.843	0.876	0.909	0.670
	TI2	0.873			
	TI3	0.866			
	TI4	0.859			
	TI5	0.623			
Matching Contributions	MC1	0.945	0.955	0.971	0.918
	MC2	0.966			
	MC3	0.963			
Perceived Government Policy	PGP1	0.839	0.880	0.910	0.633
	PGP2	0.882			
	PGP3	0.706			
	PGP4	0.851			
	PGP5	0.867			
	PGP6	0.583			

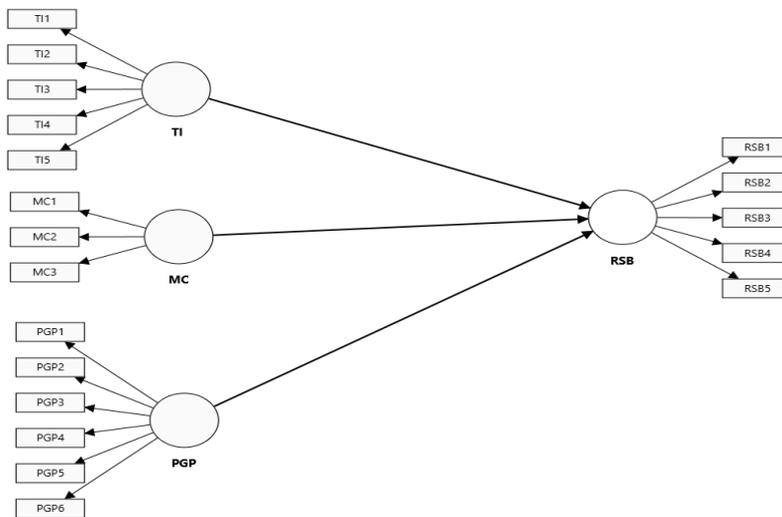


Figure 3: Measurement Model

Table 4: Discriminant Validity Using HTMT Criterion

	MC	PGP	RSB	TI
MC				
PGP	0.255			
RSB	0.194	0.236		
TI	0.463	0.203	0.342	

Notes: MC-Matching Contributions, PGP-Perceived Government Policy, RSB-Retirement Savings Behaviour, TI-Tax Incentives

4.2.2 Structural model analysis

The structural model, also known as the inner model in PLS-SEM, specifies the hypothesised relationships among the latent constructs in this study, such as the effect of tax incentives on retirement saving behaviour. Prior to hypothesis testing, Mardia's multivariate skewness (> 3) and kurtosis (> 20) indicated a violation of the assumption of multivariate normality. Consequently, bootstrapping with 10,000 resamples was employed to generate robust estimates. This procedure enabled the assessment of collinearity, path coefficients, standard errors, t-values, and p-values (Becker et al., 2023). As the marker variable analysis showed no indication of common method bias, a full collinearity test was deemed unnecessary. In response to concerns about the overreliance on p-values, the analysis also examined t-values, confidence intervals, and effect sizes (Hahn & Ang, 2017). Effect sizes (f^2) were interpreted based on established thresholds of 0.02 (small), 0.15 (medium), and 0.35 (large), following Chin (1998) and Vinzi et al. (2010). Emphasis was placed on both statistical and practical significance (Sullivan & Feinn, 2012). The final analysis reported path coefficients, standard errors, R^2 values, t-values, p-values, confidence intervals, effect sizes (f^2), and the model's predictive accuracy.

5. Discussion and Conclusion

5.1 Discussion

5.1.1 The effect of tax incentives on retirement savings behaviour among Malaysian civil servants

The study found that the measurement scales used to assess tax incentives were both reliable and valid, thus effectively capturing the construct. The results confirmed a positive effect of tax incentives on retirement saving behaviour. These findings are consistent with behavioural economics theory, which posits that well-structured tax incentives can encourage individuals to make decisions that support long-term financial goals by mitigating the effects of cognitive biases, emotional responses, habitual behaviour, and social influences (Duckworth et al., 2018; Knoll, 2010; Thaler & Benartzi, 2004).

In Malaysia, tax incentives for retirement savings, such as EPF contributions, are offered as recurring annual benefits under a combined tax relief cap of RM7,000, which includes insurance premiums. While the incentive amount is relatively small compared to those in other countries, it is considered easy to claim. The study revealed that, despite the modest size of the incentive, its perceived simplicity and accessibility may enhance its effectiveness in promoting saving behaviour.

Table 6: Hypothesis Testing of Direct Relationships

Hypotheses	Relationship	Std. Beta	Std. Dev.	t -value	p- value	BCI LL	BCI UL	f^2	Effect size	Decision
H1	TI → RSB	0.284	0.073	3.868	p<0.001	0.154	0.397	0.076	Small	Supported
H2	MC → RSB	0.026	0.078	0.328	0.371	-0.096	0.159	0.001	None	Not supported
H3	PGP → RSB	0.168	0.062	2.711	p<0.001	0.057	0.260	0.030	Small	Supported

Moreover, the findings suggest that the observed effect, though statistically significant, was small in magnitude ($f^2 = 0.076$). This emphasises the need for policymakers to revisit the structure of current tax incentives, for example, by increasing the contribution cap. As these incentives have been in place for many years and operate as non-cash benefits, their expansion could further support retirement preparedness while easing the government's fiscal burden. Overall, the results indicate a meaningful causal effect between tax incentives and retirement saving behaviour, with important implications for both public policy and individual financial planning.

5.1.2 The effect of matching contributions on retirement savings behaviour among Malaysian civil servants

Matching contributions are widely employed by governments to incentivise retirement savings and are recognised as a key policy tool in various countries (Engelhardt & Kumar, 2004; Eren & Genç İleri, 2022; PTPN, 2018; Yang, 2020; Yanıkkaya et al., 2023). The results of this study confirm the reliability and validity of the matching contributions construct. However, in contrast to prior studies that found positive effects (e.g., Choi et al., 2004; Eren & Genç İleri, 2022; Madrian, 2012; Saez, 2009; Yanıkkaya et al., 2023), this study found that matching contributions did not have a significant effect on retirement saving behaviour.

As discussed earlier, Malaysia applies the concept of matching contributions through the i-Saraan scheme under the Employees Provident Fund (EPF). However, this policy is limited in scope and only applies to voluntary contributors under specific platforms. In practice, many civil servants prefer to invest their retirement savings in alternative, well-established instruments such as Tabung Haji and ASB, which offer additional benefits, including insurance coverage. These platforms, however, do not currently offer matching contributions.

Furthermore, the existing matching incentive under i-Saraan is relatively low, amounting to 20% of voluntary EPF contributions, capped at RM500 per year. This means that for every RM2,500 contributed, depositors receive only RM500 in matching funds, reflecting a 0.2:1 match ratio rather than a 1:1 ratio commonly seen in more generous schemes. This relatively modest incentive may reduce the attractiveness of the policy among Malaysian civil servants. Overall, these contextual limitations may explain the absence of a significant relationship between matching contributions and retirement saving behaviour observed in this study.

5.1.3 The effect of perceived government policy on retirement savings behaviour among Malaysian civil servants

The findings indicate that more positive perceptions of government retirement policies resulted in stronger retirement saving behaviour among Malaysian civil servants. These policies act not only as formal guarantees but also as behavioural signals that enhance individuals' confidence in the retirement system and reduce uncertainty about future financial security. When civil servants perceive government retirement policies as credible, stable, and supportive, they are more likely to respond by increasing voluntary retirement preparation, such as making additional EPF contributions, participating in Private Retirement Schemes (PRS), and adjusting their investment portfolio choices. This result aligns with previous research showing that perceptions of government policy and institutional retirement structures significantly influence saving behaviour and financial planning among public sector employees in Malaysia (Ghadwan et al., 2023; Jakaria et al., 2024).

Although the effect size observed for perceived government policy was relatively small ($f^2 = 0.030$), the findings nonetheless suggest that favourable perceptions could play an important role in shaping retirement saving decisions. This highlights the importance of policy clarity, trust, and perceived fairness in enhancing the effectiveness of retirement savings initiatives among civil servants.

5.2 Theoretical contribution

The present study provides new insights into the factors shaping financial and economic behaviour, particularly tax incentives and matching contributions, by applying a behavioural economics framework to long-term investment decisions, with an emphasis on retirement savings. The findings indicate that tax incentives have a significant positive effect on retirement saving behaviour, whereas matching contributions do not emerge as significant predictors. By examining these policy mechanisms in the Malaysian context, the study extends existing knowledge in the field.

These findings refine both incentive-based and behavioural perspectives on retirement saving in three keyways. First, the significant impact of tax incentives supports behavioural economic theories of incentive-driven decision-making and confirms that tax incentives remain an important mechanism in encouraging retirement saving behaviour among Malaysian civil servants. Second, the non-significant effect of matching contributions challenges assumptions that such incentives universally promote savings. This indicates that their effectiveness may depend on contextual factors such as income level, institutional trust, or financial literacy, variables that are often overlooked in conventional models. In this regard, policymakers should reconsider the scope and accessibility of matching contribution schemes. Rather than limiting matching contributions to specific platforms such as *i-Saraan* under EPF, these incentives could be extended to other well-established and widely used investment instruments like *Tabung Haji* and *ASB*, which already serve a significant portion of civil servants.

Third, the significant positive effect of perceived government retirement policy suggests that individuals' interpretations and trust in policy signals play an important role in shaping retirement saving behaviour. This suggests that policy outcomes could be strengthened when policies are communicated clearly and perceived as credible by the target group.

These findings respond to ongoing calls for research on strategies that encourage Malaysian civil servants to enhance their retirement preparedness (Asch et al., 2005; Dini Wulandari, 2022; Grable et al., 2020; Jaimes & Westerhout, 2023; Kadir et al., 2021; Kumaraguru & Geetha, 2021; Prasetyo et al., 2020). Although prior studies have examined the influence of government policy on financial behaviour through the lens of rational choice theory (e.g., Citci & Yanikkaya, 2024; Ghadwan et al., 2023; Madrian, 2012), this study confirms and extends those findings by demonstrating that perceived government policy directly affects retirement saving behaviour. As such, the findings provide a valuable foundation for future empirical investigations and further theoretical development in the area of retirement saving behaviour.

5.3 Practical contribution

Perceived government policy, as a cognitive factor, significantly shapes how individuals respond to financial incentives introduced through public policy (Ghadwan et al., 2023). Beyond designing effective policy instruments, governments must adopt clear, targeted communication strategies to enhance public awareness, build trust, and clarify the relevance of retirement policies for civil servants. Such strategies could help bridge the gap between policy design and actual behavioural outcomes.

In addition, the study reveals that matching contributions have no significant effect on retirement saving behaviour. This finding suggests that policymakers should not rely solely on financial incentives but instead develop empirically grounded interventions based on observed behavioural patterns rather than assumed rational decision-making. Strengthening outreach and engagement efforts for voluntary saving schemes could further increase participation. Overall, the findings support the need for more behaviourally informed and context-specific strategies to enhance Malaysia's social security system, particularly for civil servants.

At the community level, the study promotes increased public awareness of retirement planning and long-term financial preparedness. It identifies the key financial and institutional factors influencing saving

behaviour, thereby informing public education and financial literacy initiatives. Improved awareness may enable individuals to make more informed and proactive financial decisions.

These insights are also relevant to financial institutions such as banks, insurance providers, and retirement planning firms. A better understanding of civil servants' behavioural tendencies can support the development of more accessible, tailored, and user-friendly retirement savings products, ultimately aligning financial services with users' needs and improving retirement outcomes.

5.4 Limitations and future research directions

This study focuses on Malaysian civil servants in salary grades 9 to 15, which limits the generalisability of the findings to other population groups. Future research should include individuals from higher salary grades, non-taxable income brackets, the private sector, pensioners, and those in informal employment to provide a more comprehensive understanding of retirement saving behaviour across diverse socioeconomic and occupational segments.

Additionally, the cross-sectional survey design restricts the ability to draw causal inferences. Future research should consider adopting longitudinal or experimental designs to establish causal relationships and track changes in retirement attitudes and behaviours over time, particularly in response to policy shifts or financial education interventions (Mitchell et al., 2022). It is also recommended that future models incorporate psychological variables, such as financial anxiety, planning tendencies, or self-efficacy, to further enhance explanatory power in shaping saving behaviour.

Finally, the reliance on self-reported data may have introduced response biases or inaccuracies in capturing actual behaviours and perceptions. To address this limitation, future studies should consider incorporating qualitative methods, such as interviews or focus groups, to enable data triangulation and improve the validity and depth of findings.

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Conflict of Interest Statement

The authors agree that this research was conducted in the absence of any self-benefit, commercial or financial conflicts, and declare the absence of conflicting interests with the funders.

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Appendix

A. Table A1: Questionnaire items for all constructs

Variable	Codes	Items
Retirement Savings Behaviour	RSB1	I made a meaningful financial contribution to my voluntary retirement savings plan.
	RSB2	Relative to my peers, I have saved a great deal for retirement.
	RSB3	I had accumulated substantial savings for retirement.
	RSB4	I make a conscious effort to save specifically for retirement.
	RSB5	My retirement savings are planned based on my expected lifestyle in retirement.
Tax Incentives	TI1	I make use of tax incentives to save for retirement.
	TI2	Tax incentives are an important factor when making retirement savings decisions.
	TI3	Tax reductions and exemptions allow me to save more for retirement.
	TI4	The existing laws on income tax are predictable, clear and transparent.
Matching Contributions	MC1	Matching contributions allow me to save more for retirement.
	MC2	Matching contribution is an important factor when making retirement savings decisions.
Perceived Government Policy	MC3	Matching contributions helps to sustain my life after retirement.
	PGP1	The government has clear guidelines on retirement.
	PGP2	The current retirement guidelines from the government on retirement is adequate to serve pensioners during their retirement.
	PGP3	I am confident that the government pension payout from the government is sufficient to sustain my life after retirement.
	PGP4	The government has effective guidelines/programs to encourage financial planning for retirement among government servants.
	PGP5	There are sufficient guidelines to ensure retirees are self-sufficient after retirement.
	PGP6	The proposal from the government to raise tax incentives on Retirement Schemes and Deferred Annuity Schemes (Private Retirement Schemes, I-Saraan under EPF, and retirement insurance plans) is a good policy.
PGP7	The proposal from the government to offer a 1:1 matching contribution, up to a maximum of RM500, for civil servants who save money in any Retirement Scheme and Deferred Annuity Schemes (Private Retirement Schemes, I-Saraan under EPF, Life and retirement insurance plans) is a good idea.	

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Attia Azarina Amirludin contributed wrote the original draft, data collection and data processing. Mohamad Nizam Jaafar play a role in supervising, visualising, reviewing, and editing the articles. Sylvia Nabila Azwa Ambad conceptualised research idea and the theoretical framework and editing the the articles that have been written.



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