

## Rational Choice Approach on Ramadan Activity: A Conceptual Study

Agung Riyardi<sup>1\*)</sup>, Abdul Haris Romdhoni<sup>2)</sup>, Faturrochman Syahputra<sup>3)</sup>, Dwi Arum Nur Insyarah<sup>4)</sup>

<sup>1,3,4</sup> Universitas Muhammadiyah Surakarta

<sup>2</sup> Insitut Teknologi dan Bisnis AAS

\*Email correspondence: [ar233@ums.ac.id](mailto:ar233@ums.ac.id)

### Abstrak

Umat Islam melakukan ibadah lebih banyak dan lebih keras selama bulan Ramadan dibandingkan non-Ramadan. Berbagai studi yang menunjukkan efek positif mengindikasikan bahwa ibadah Ramadan sebagai sesuatu yang rasional. Namun belum ada penelitian yang membahas ibadah Ramadan berdasarkan pendekatan pilihan rasional meskipun pendekatan ini dapat mengungkap apa, mengapa, dan bagaimana suatu keputusan rasional. Berdasarkan pendekatan pilihan rasional, penelitian ini bertujuan untuk menunjukkan secara grafis kombinasi ibadah Ramadan dan aktivitas umum, harga relatif, kendala, dan keseimbangan ibadah Ramadan. Tulisan ini menggunakan pemodelan grafis pilihan rasional yang terdiri dari grafik kurva indifferen ibadah Ramadan, penetapan harga relatif, grafik garis kendala, dan grafik keseimbangan. Empat hasil ditemukan. Pertama, kurva indifferen ibadah menunjukkan bahwa ibadah merupakan pelengkap sempurna bagi aktivitas umum. Kedua, harga relatif ibadah menurun dari non-Ramadan ke Ramadan. Ketiga, garis kendala ibadah yang berputar ke atas disebabkan oleh penurunan harga relatif ibadah. Keempat, keseimbangan Ramadan menunjukkan bahwa umat Muslim puas dengan ibadah Ramadan yang disebabkan oleh penurunan harga yang relatif besar, yang mengeksploitasi kemampuan fisik tetapi tanpa mengganggu aktivitas umum.

**Kata Kunci:** Ramadan, Ibadah, Pendekatan Pilihan Rasional

### Abstract

Muslims conduct more and harder worship during Ramadan than non-Ramadan. Studies show positive effects indicating Ramadan hard worship as rational. However, no studies discuss Ramadan worship based on the rational choice approach although this approach can reveal what, why, and how a decision is rational. Based on the rational choice approach, this study aims to demonstrate graphically Ramadan worship and general activity combination, relative price, constraint, and equilibrium. This paper employs the rational choice graphical modelling that consists of the Ramadan worship indifference curve graphing, relative price setting, constraint line graphing, and equilibrium graphing. Four results are found. Firstly, the worship indifference curves reveal that worship perfectly complements to general activity. Secondly, the worship relative price decreases from non-Ramadan to Ramadan. Thirdly, the worship constraint lines rotate up caused by decreasing worship relative price. Fourthly, the Ramadan equilibrium demonstrates that Muslim is satisfied by a relative price-decreasing-caused Ramadan hard worship that exploits physical capability but without general activity interfering.

**Keywords:** Ramadan, Worship, Rational Choice Approach

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## 1. INTRODUCTION

Ramadan is the 9th month of Islamic Calendar. Ramadan is a special month. Different from other months, Muslims conduct many rituals. Consistently performing non-Ramadan rituals, they fast in the Ramadan daytime and pray evening praying. In addition, they recite Qur'an, stay in the mosque during night or during Ramadan last ten days, and pay Ramadan charity.

Ramadan indicates religion-science superiorities. Muslims' hard praying during Ramadan indicates religion superiority, whilst Ramadan positive effect empirical studies indicate science domination. Interestingly, they support religion domination such as reviewing Ramadan positive effects and human adjustments. Several studies analyse contradiction results (Campante & Yanagizawa-Drott, 2015; Hodler et al., 2023; Kuran, 2018; Lee et al., 2020), but they often provide a specific note to indicate that negative findings are minor problems (Hodler et al., 2023; Lee et al., 2020).

Ramadan studies reveal at least three vital analyses. The first is Ramadan hard worship motivation sources that consists of individual commitment and sacrifice, social support such as religion market role, and society welcomes and tolerance (Aksoy & Gambetta, 2022; Husna et al., 2023; Idris et al., 2016; Nafisi, 2018; Ridwan & Zain, 2021), the second is Muslims conduct adjustments in order to solve hunger, fatigue, and thinness problems during Ramadan by consuming nutritious food and short napping in the daytime (Al-Fairusy et al., 2022; Z. Ali & Abizari, 2018; Barakat et al., 2020; Buckley & Carland, 2023; Busaeri, 2018; Faris et al., 2020; Khan et al., 2023; Najiyya, 2018; Saad, 2021; Shadman et al., 2014; Sulaiman et al., 2022; Trabelsi et al., 2022), and the third is Ramadan studies show that Ramadan provides positive effects for human value, healthy, and economy (I. Ali et al., 2023; Baynouna AlKetbi et al., 2022; Eyerci et al., 2021; Hodler et al., 2023; Islamy, 2021; Lee et al., 2020; Munusamy, 2019; Nurani et al., 2022; Possamai et al., 2022; Rehman & Zeb, 2023; Rosmelia et al., 2019;

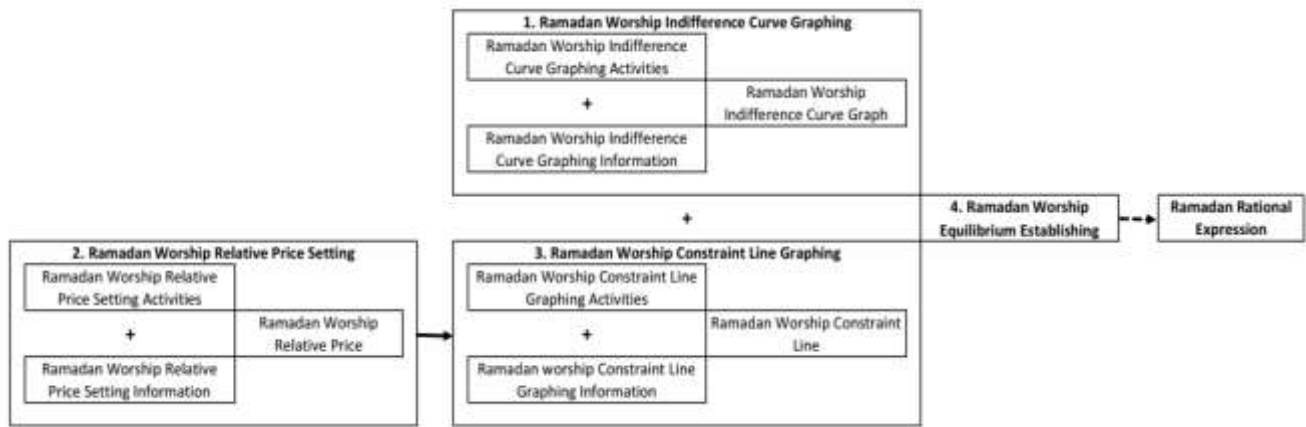
Shalihin et al., 2020; Sulaiman et al., 2022; Waston et al., 2024).

All of them mean that Ramadan hard worship provides religious satisfaction and makes sense and raise a question about how rational Ramadan is. However, no studies discuss Ramadan hard worship based on the rational choice approach although this approach has been developed widely and Islamic teaching accommodates this approach. The wide development of this approach includes requirements for convexity and non-satiation for indifference curve and its types (Roldán et al., 2022), indifference curve theoretical and practical studies on varied aspects including religion aspect (Aguirre Sotelo & Block, 2014; Khaled, 2018; Lenfant, 2012; Lizein et al., 2023; Miljkovic, 2021; Pastor-Bernier et al., 2017), rational choice general description (İnan & Gül, 2022), and critiques from religion field (Gauthier & Spickard, 2022; Reda, 2018; Sharot, 2002). Islamic welcome is considered by rational choice framework application in various Islamic aspects (Amelia & Fauzi, 2021; Hajjaj, 2023; Idris et al., 2016; İnan & Gül, 2022; Reda, 2018).

In this perspective, observing the Ramadan rationality based on the rational choice theory lens is certainly very interesting. Some questions can be addressed such as Ramadan hard worship preference, supporting, maximizing process, and impact. Therefore, this study aims to analyse Ramadan hard worship based on the rational choice approach by developing the Ramadan worship relative pricing, indifference curves, constraint lines, and equilibrium graphs.

## 2. RESEARCH METHOD

The rational choice graphical modelling has established the Ramadan hard worship rational expression. Four continuous stages established the graphical model: They were the Ramadan worship indifference curve graphing, relative price setting, constraint line graphing, and equilibrium establishing stages. Every stage consisted of establishing activities and essential information (See Figure 1).



**Figure 1. The Rational Choice Graphical Modeling to Express Ramadan Worship Preference**

The Ramadan worship indifference curve Graphing stage consisted of three activities. The first was drawing horizontal and vertical axes. The second was marking along the horizontal and vertical axes various worship and general activity time consumptions. The third was drawing curve by connecting various time consumption marks.

The essential information was about daily worship and general activities. Worship was all Islamic rituals and praying, while general activity was all activities besides worship. Their unit could be converted into hour unit and a day limited by 24 hours.

Working and non-working activities during Ramadan and non-Ramadan consumed constantly 18 hours. The healthy daily sleeping consumed 7 hours but during Ramadan was reduced by 4 hours. Worship can be divided into three stages. Non-Ramadan stage meant that worship was not hard and consumed approximately one hour. Reasonable Ramadan stage showed that worship consumed 4 hours and sleeping time reducing. Realistic Ramadan illustrates hard worship that supported by sleeping time reduction and physical capability exploitation (See Table 1).

**Table 1. Muslim's Daily Activities and Time Needed**

Activities	Hour(s)		
	Non-Ramadan	Reasonable Ramadan	Realistic Ramadan
Working	8	8	8
Non-working	8	8	8
Sleeping	7	4	4
Worship	1	4	4
Total Time	24	24	24 + physical capability overusing
Worship Activities	Non-Ramadan: Five Times Daily Praying, etc.		
	Ramadan: Five Times Daily Praying, Ramadan Fasting, Ramadan Night Praying, al Quran Reciting, etc.		

Note: Author's Estimation. All activities unit can be converted by hour(s) unit. The Table means that Ramadan hard worship is characterized by less sleeping and physical capability exploitation.

The information enabled the activities to establish the indifference curve. Beginning from establishing worship and general activity time consumption as vertical and horizontal axes and fixing the working and non-working time consumption, the model marked the non-Ramadan, reasonable Ramadan, and realistic Ramadan worship time

consumptions. All of this allowed to draw the worship and general activity indifference curves.

The Ramadhan worship relative price setting performed division between worship cost and benefit along non-Ramadan, reasonable Ramadan, and realistic Ramadan stages. Essential information accepted the relative price setting. The first information was all units could be transformed into single time unit. The second information was worship benefit can be approached by God reward on Ramadan warship. The third information was worship cost and benefit increased according to non-Ramadan,

reasonable Ramadan, and realistic Ramadan worship stages. The fourth information was Ramadan cost increased constantly while God Ramadan reward increased multiply (See Table 2). Setting the worship

cost as the dividend and God reward as the divisor enabled the division to calculate the Ramadan worship relative price.

**Table 2. Muslim's Consideration on Worship**

Consideration Component	Worship Activity		
	Non-Ramadan	Reasonable Ramadan	Realistic Ramadan
Cost	1	2	3
God Reward	1	3	6

The Ramadan worship constraint line graphing stage performed by two activities. The first was setting the Ramadan worship constraint mathematical equation. The Second was drawing the Ramadan worship constraint line.

The essential information was the basic and the worship equations. The basic equation was provided by Equation 1 and the worship equations was expresses by Equation 2, 3, and 4. The worship Equations employed information in Table 1 and transformed 24 hours to 100%:

$$24=(p1*w)+(p2*g) \quad (1)$$

$$100\%=(p1*w)+(p2*66.67\%)+(p3*29.17\%) \quad (2)$$

$$100\%=(p1*w)+(p2*66.67\%)+(p3*16.67\%) \quad (3)$$

$$100\%+po=(p1*w)+(p2*66.67\%)+(p3*16.67\%) \quad (4)$$

Where p1 was the relative price of worship, p2 was the relative price of general activities, w was worshipping daily time consumption, and g was general activities daily time consumption, p3 was sleeping price, and po was physical capability exploitation.

Three essential information incorporated the constraint line graphing. The first was the information to draw the indifference curve as explained in the indifference curve drawing stage. The second was worship relative price as explained in the relative worship price setting stage. The third was mathematical expressions above. Combining all information enabled this stage to draw a constraint line that corresponded to the indifference curve.

The Ramadan worship rational choice equilibrium graphing stage develops worship satisfaction graphically. The activity was combining the Ramadan worship indifference curve and constraint line so that the indifference curve was tangent to the constraint line. The Ramadan worship indifference curve established in the first stage and the Ramadan worship constraint line established in the third stage served as the information for the Ramadan worship equilibrium development.

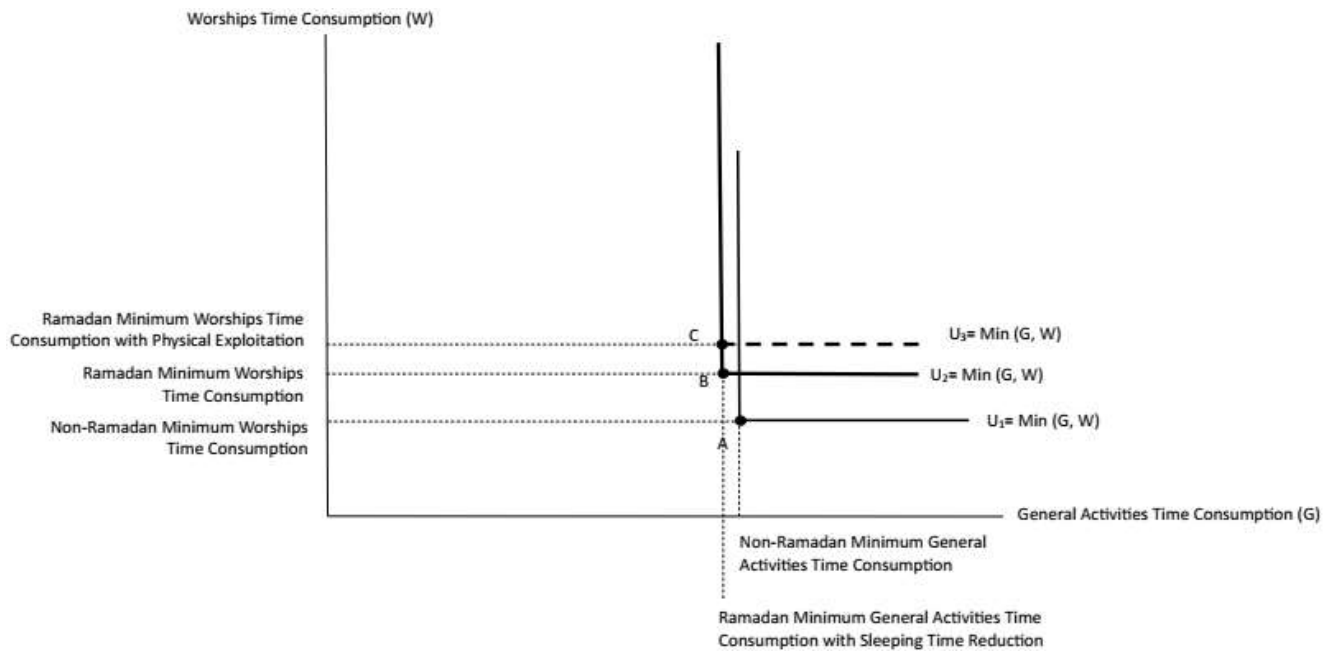
### 3. RESULTS AND DISCUSSION

#### 3.1. Research Results

The results consist of the Ramadan perfect complementary indifference curve, decreasing worship relative price, time constraint line, human adjustments to physical overusing, and equilibrium and positive effects. The Ramadan perfect complementary indifference curve is the part of Ramadan and Non-Ramadan perfect complementary indifference curves. They are similar because they reveal that the best alternative is in the elbow of each curve. However, they are different because the Ramadan curve describes worship and general activities preference combination in the Ramadan month.

Figure 2 demonstrates the Ramadan and Non-Ramadan indifference curves. The tick lines show the Ramadan perfect complementary indifference curves. B and C points that placed in the elbow of the curves reveals the best preference. The dotted thick curve shows that physical capability exploitation accommodates hard worship performing. Time to do general activities cannot be further reduced. As a consequence, an additional time to perform more worship is not available and the only way to increase worship is by the physical exploitation. The thin curve demonstrates non-Ramadan perfect complementary curve. The best choice for worship and general activities combination is in the point A that placed in the elbow of the non-Ramadan curve.

Note:  $U_1 = \text{Min}(G, W)$  is non-Ramadan Perfect Complement Indifference Curve of Worships-General Activities Time Consumption,  $U_2 = \text{Min}(G, W)$  is Ramadan Perfect Complement Indifference Curve of Worships-General Activities Time Consumption, and  $U_3 = \text{Min}(G, W)$  Ramadan Perfect Complement Indifference Curve of Worships-General Activities Time Consumption with Physical Exploitation



**Figure 2. The Ramadan and Non-Ramadan Perfect Complementary Indifference Curve**

Worship relative price is decreased overtime. Non-Ramadan worship relative price is expensive, Ramadan worship relative price is cheap, and Ramadan hard worship relative price is the cheapest. The decreasing is caused by different change on the worship cost and benefit. The worship cost increases from Non-Ramadan to Ramadan due to the increasing worship quantity. However, the marginal increasing of God reward from non-Ramadan to Ramadan is greater. This process also happens from Ramadan worship to Ramadan hard worship. As a result, the worship relative price decreases from non-Ramadan to Ramadan hard worship.

Table 3 illustrates the decreasing worship relative price from non-Ramadan to realistic Ramadan hard worship. The non-Ramadan, reasonable, and realistic Ramadan worship relative price is respectively 1, 0.67, and 0.5. The reason is worship God Reward increasing is greater than cost increasing. Comparing to the non-Ramadan, greater God reward in the reasonable Ramadan caused by increasing worship quantity, whilst in the realistic Ramadan, it is caused by increasing worship quantity and physical exploitation.

**Table 3. Worship Relative Price**

Worship	Relative Price
Non-Ramadan	1
Reasonable Ramadan	0.67
Realistic Ramadan	0.50

The Ramadan time constraint line is daily time that is not used for general activities, consider sleeping time reducing, physical capability overusing, and varies based on the Ramadan worship price. The mathematical expressions are

$$29.67 = p_1 \cdot w \quad (5)$$

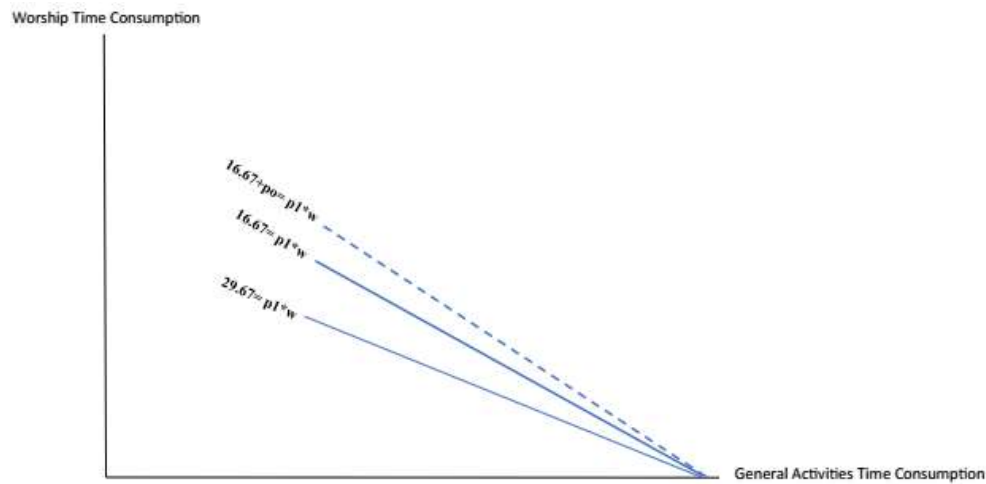
$$16.67 = p_1 \cdot w \quad (6)$$

$$16.67 + p_o = p_1 \cdot w \quad (7)$$

Where  $p_o$  is Ramadan daily time physical overusing,  $p_1$  is worship price, and  $w$  is Ramadan worship time consumption.

Equation 5 represents time constraint for non-Ramadan worship. Equation 6 is similar to Equation 7. They reflect that the daily total time is 100% and the daily total time for Ramadan worship is 16.67%. However, Equation 7 accommodates implicit time consumption from physical capability overusing that causes Equation 7 likely to have longer time limitation than Equation 6.

Figure 3 illustrates three lines that reflect Equation 5, 6 and 7. The thin line represents Equation 5, the thick line represents Equation 6, and the dotted thick line represents Equation 7. All lines illustrate that time is constrained by 100% or available time for worship is 16.67%. However, explicit additional time converted from physical capability exploitation places the dotted thick line is upper than the thick line.

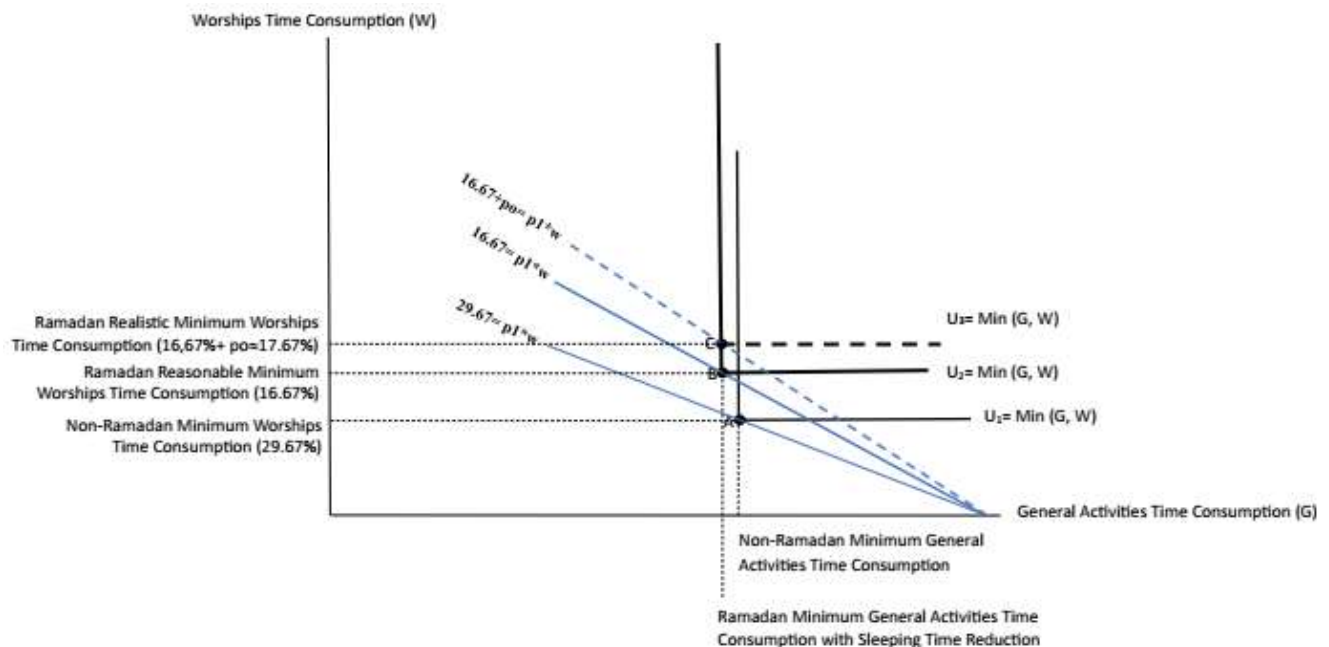


**Figure 3. Ramadan Worship Constraint Line**

Ramadan shows a rational hard worship expression. The best choice during Ramadan is performs worship without any general activity reduction. The low Ramadan relative price causes Muslims enjoy hard worship and fixed general activity by physical capability overusing.

Figure 4 demonstrates the Ramadan rational expression. The  $16.67+ po= 0.5*w$  constraint line reveals an implicit longer time caused by decreasing

relative price and physical capability exploitation. The implicit longer time attracts Muslims to perform more worship so that their worship time increases from 16.67% to 17.67%. Therefore, as shown by C point, responding to the worship relative price decreasing, physical capability is exploited so that 100% time is enjoyed for 66% working-nonworking activity time, 16.67% sleeping time, and 17,67% hard worship time.



**Figure 4. Ramadan Worship Equilibrium**

The C point is different from B and A points. They are in the elbow of each perfect complementary indifference curves indicating the most suitable choice. However, B point reveals Ramadan satisfaction point without any physical overusing and A point demonstrates non-Ramadan satisfaction combination. Therefore, the appropriate point is C that responds relative price decreasing by physical

capability exploitation when worship time cannot be down adjusted.

### 3.2. Discussion

All findings support that Ramadan worships are rational activities. The Ramadan perfect complementary indifference curve supports implicitly that motivation behind the hard worships is individual commitment and sacrifice (Aksoy and Gambetta, 2022), social support such as religion market role

(Ridwan and Zain, 2021; Aksoy and Gambetta, 2022), and society welcomes and tolerance (Idris et al., 2016; Nafisi, 2018; Husna, Maqfirah and Alsounusi, 2023). In addition, this finding does not conflict to the rational choice approach critiques (Sharot, 2002; Reda, 2018; Gauthier and Spickard, 2022). The reason is this study observes Ramadan hard worship as religious action, assumed worship maximization that does not related to profit maximization, and appreciates rational Ramadan hard worship.

The Ramadan decreasing worship relative price finding is different from and better than Aksoy & Gambetta (2022) finding. This finding is different from Aksoy & Gambetta's finding because this finding employs relative price. This finding is better than Aksoy & Gambetta's finding because this finding can reveal the demand law.

The Ramadan time constraint line indicates human adjustments to physical overusing caused by hard worship (Al-Fairusy et al., 2022; Buckley & Carland, 2023; Najjiyya, 2018; Saad, 2021). Human adjustment consists of food and time adjustments. Food adjustment supports Muslim healthy during Ramadan. However, Muslims should increase their cares to healthy food. (Z. Ali & Abizari, 2018; Barakat et al., 2020; Shadman et al., 2014; Sulaiman et al., 2022). Time adjustment is to encounter sleepy condition during Ramadan daytime that influences work productivity and safety driving. (Alsofayan et al., 2022; Faris et al., 2020; Khan et al., 2023; Trabelsi et al., 2022).

The Ramadan equilibrium provides positive effects that consist of spirit values, good health status, and business-economic return. Ramadan increases social values and decreases anti-social values (Hodler et al., 2023; Islamy, 2021; Nurani et al., 2022; Shalihin et al., 2020; Waston et al., 2024). Individual health is stable during Ramadan (Baynouna AlKetbi et al., 2022; Lee et al., 2020; Sulaiman et al., 2022). In addition, business and economy run normal during Ramadan (I. Ali et al., 2023; Eyerci et al., 2021; Munusamy, 2019; Possamai et al., 2022; Rehman & Zeb, 2023; Rosmelia et al., 2019)

#### 4. CONCLUSION

Applying the rational choice approach on Ramadan wordships, three important things are found. Firstly, the satisfied preference during Ramadan is hard worship and general activity perfect complementary combination. Secondly, this

combination has maximized preference that does not interfere the general activity and provides positive effects. Thirdly, the ways to achieve this combination is relative price decreasing, physical capability exploitation, and human adjustment.

The conclusions above mean that Ramadan stakeholders should care to Ramadan hard worship that do not interfere general activity by human adjustment and positive effect developments. In the same time, investigation to Ramadan as a rational religion should be done sustainably. The essential study is to model mathematically the Ramadan rational choice. Another challenging study is to examine empirically the Ramadan rational choice and its characteristics based on quantitative methods.

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