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Investigating the Impact of Qard al-Hasna (Interest-Free Loan) Facilities on the Misery Index in Iran: An ARDL Approach

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Abstract

Rising inflation coupled with unemployment rates (the misery index) can lead to many economic and social costs. On the other hand, considering the emphasis of the Islamic religion on reviving the tradition of Qard Hasanah (benevolent loan) and the impact of these facilities on macroeconomic variables, the key goal of this paper is to investigate the impact of Qard al-Hasna (interest-free loan) facilities on the misery index in Iran, utilizing data from 1984 to 2021. The misery index serves as a comprehensive measure of economic well-being, incorporating indicators of inflation and unemployment. Employing the Autoregressive Distributed Lag (ARDL) model, the research analyzes both short-term and long-term relationships between the share of Qard al-Hasna facilities and the misery index. The findings reveal that a one-unit increase in the share of these facilities results in a 0.31% decrease in the misery index in the short term and a 0.52% decrease in the long term. Additionally, the error correction model indicates that 60% of short-term fluctuations adjust toward long-term equilibrium. The study also highlights the negative impact of government spending on the misery index and the positive effect of the real exchange rate. Based on these results, the paper recommends enhancing the monitoring of banking performance in allocating Qard al-Hasna facilities, directing government spending towards development projects, and managing exchange rate policies to mitigate adverse economic effects. This research underscores the significance of Qard al-Hasna facilities as a viable tool for alleviating poverty and improving economic conditions in Iran.

Highlights

- The study investigates the impact of Qard al-Hasna (interest-free loans) on Iran's misery index.
- Findings reveal that increasing Qard al-Hasna facilities by one unit decreases the misery index by 0.31% in the short term and 0.52% in the long term.
- Government spending negatively impacts the misery index, while the real exchange rate has a positive effect.

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1. Introduction

The misery index serves as a crucial metric for evaluating the economic well-being of nations, reflecting the interplay between inflation and unemployment rates. As articulated by Beja, this index provides a tangible measure of how economic distress manifests in society, indicating that rising inflation coupled with increasing unemployment can impose significant economic and social costs (Beja, 2014). Governments strive to achieve full employment and price stability by implementing appropriate monetary policies. Therefore, the success of monetary policy depends on the ability to control and reduce unemployment and inflation rates (Selim & Hassan, 2019). On the other hand, Islam believes that the survival and stability of any government depend on creating conditions for the expansion of justice in society. Eradicating poverty and discrimination and providing better living conditions for people are essential for progress and excellence (Curto, 2023). Paying special attention to the needy, the vulnerable, and the weaker segments of society can be considered one of the fundamental differences between the Islamic economic system and other systems. The Islamic economic system introduces Qard Hasanah (QH) as an effective method to reduce inequality in income distribution. By transferring money from the wealthy class to the low-income classes and changing the production pattern, increasing employment, and meeting the basic needs of this class, it can play an important role in a more equitable distribution of income and prevent the concentration of wealth (Lampman, 2016). The importance of GH facilities lies in the fact that it is a solution to counter the negative effects of interest rates (usury). The existence of usury has been one of the main factors in the emergence of economic crises in the world, the increase in unemployment, and the decrease in economic growth of countries (Sasongko & Bawono, 2020). Research shows a substantial relationship between the misery index, economic growth, and societal well-being. Research shows a long-term negative relationship between the misery index and economic growth in transition countries (Akay & Oskonbaeva, 2020). The misery index, composed of unemployment and inflation rates, has been shown to have a detrimental impact on economic growth and life satisfaction (Blanchflower, Bell, Montagnoli, & Moro, 2014). In European countries, unemployment was found to have a more substantial negative impact on well-being compared to inflation, with a 1 percentage point increase in unemployment lowering well-being five times more than a similar increase in inflation (Blanchflower et al., 2014). Furthermore, research in Nigeria suggests that the misery index is positively correlated with corruption levels, while economic growth tends to reduce corruption in the long run (Akinlo, 2024). These findings emphasize the importance of addressing unemployment and inflation to improve economic conditions and societal welfare.

The Phillips curve, which posits a trade-off between inflation and unemployment, has been subject to evolving interpretations and empirical scrutiny. While some argue for a trade-off between inflation and unemployment based on the Phillips curve, empirical evidence supports only a short-run

relationship (Ismael & Sadeq, 2016; Rahman & Mustafa, 2017; Vanitcharearnthum, 2010). Others question its stability and policy relevance (Ormerod, Rosewell, & Phelps, 2013). Ormerod et al. identified distinct inflation/unemployment regimes and found the relationship to be inherently unstable, even in the short term (Ormerod et al., 2013). Mustafa & Rahman confirmed the traditional Phillips curve for the long run in the USA but found it subdued in the short run (Rahman & Mustafa, 2017). Humphrey traced the evolution of the Phillips curve analysis, noting how theoretical innovations like the natural rate and rational expectations hypotheses have challenged its policy implications (Humphrey, 1985). These studies collectively suggest that while the Phillips curve may offer insights into short-term economic dynamics, its reliability for long-term policy decisions is limited and context-dependent.

A dynamic approach to decomposing the misery index, based on the expectations-augmented Phillips curve and Okun's law, offers an improved version that emphasizes on output, unemployment, and inflation. This new index considers both short-term and long-term factors, placing greater emphasis on output and unemployment than inflation (Cohen, Ferretti, & McIntosh, 2014). This refined index emphasizes output and unemployment over inflation, allowing for a more nuanced understanding of economic conditions (Cohen et al., 2014). The dynamic approach distinguishes between short-term fluctuations and long-term trends, weighting recessions more heavily than expansions (Cohen et al., 2014). Studies applying this method to Nigeria revealed significant economic distress and volatility between 2002 and 2016 (Tule, Egbuna, Dada, & Ebuh, 2017). Research on European data found that unemployment depresses well-being more than inflation, introducing the concept of a "misery ratio" to characterize this trade-off (Blanchflower et al., 2014). Additionally, a modified Phillips curve incorporating anchored inflation expectations and short-term unemployment has been shown to effectively explain U.S. inflation behavior since 2000, particularly when using weighted median inflation as a measure of core inflation (Ball & Mazumder, 2019).

Recent research highlights the importance of monetary policy in managing inflation and unemployment, key components of the Misery Index. Selim and Hassan found that interest-free monetary policies led to lower Misery Index scores compared to interest-based policies in developed countries (Selim & Hassan, 2019). Similarly, Selim proposed Qard-al-Hasan (QH) as an effective monetary tool for achieving full employment and price stability (Selim, 2019). In Nigeria, George-Anokwuru demonstrated that monetary policy rate and exchange rate significantly influence the Misery Index, though current policies have been ineffective in reducing it (George-Anokwuru, 2023). However, Asher et al. argue that the Misery Index alone is insufficient for evaluating economic performance, as it neglects distributional concerns (Asher, Defina, & Thanawala, 1993). They emphasize the need for a multi-faceted approach to assessing economic well-being, considering both macroeconomic indicators and measures of distributive justice to provide a more comprehensive understanding of economic conditions.

Governments, therefore, strive to implement effective monetary policies aimed at achieving full employment and price stability, as the success of these policies is intrinsically linked to their ability to manage and mitigate inflation and unemployment (Selim & Hassan, 2019).

In the context of Islamic economics, the promotion of social justice and the eradication of poverty are paramount. The Islamic economic framework emphasizes the importance of addressing the needs of the underprivileged and vulnerable segments of society (Siragelding, 2000). Key principles include Zakat, Infaq, and waqf, which contribute to equitable distribution and inclusive economic growth (Sulistiyo, Rasyid, & Saleh, 2024). One of the key instruments in this regard is QH, or interest-free loans, which are designed to facilitate equitable income distribution by transferring resources from wealthier individuals to those in need. Studies have shown its effectiveness in improving the economic status of recipients. In Bangladesh, the Fael Khair Waqf Program's Qard al-Hassan scheme significantly reduced poverty among cyclone victims, with participants 1.46 times less likely to be poor than non-participants (Muneer & Khan, 2019). Similarly, Akhuwat, an Islamic microfinance organization in Pakistan, successfully used QH to enhance social unity and cooperation (Iqbal & Shafiq, 2015). However, despite its potential, Islamic banks have not fully embraced Qard al-Hassan as a means of fulfilling their social function. A study in Surakarta, Indonesia, found that Islamic banks prioritize profit-oriented products over interest-free loans, limiting their role in poverty alleviation efforts (Lutfiah & Adnan, 2017).

The significance of QH becomes particularly evident when considering its potential to counteract the adverse effects of usury (Riba), which has been identified as a primary contributor to economic crises, rising unemployment, and stagnating economic growth (Shahar, Zan, & Hassin, 2016). QH can contribute to overcoming economic problems in society by empowering communities and supporting economic activities of the needy (Nugraheni & Muhammad, 2024). As an instrument of monetary policy, QH can positively influence real parts of the economy, increase output, and help achieve full employment and price stability (Selim, 2019). Islamic banks can optimize QH management by collaborating with charitable organizations to maximize its benefits for both providers and beneficiaries (Nugraheni & Muhammad, 2024). Overall, QH has the potential to make significant contributions to reducing unemployment, alleviating poverty, and supporting economic development, particularly in Muslim-dominated countries (Iqbal & Shafiq, 2015; Nugraheni & Muhammad, 2024). Despite the growing body of literature on the implications of Qard al-Hasna, there remains a gap in empirical research specifically examining its impact on the misery index in Iran.

The unemployment rate in Iran is significantly far from its natural rate, and when we compare inflation globally, it is observed that inflation in Iran is much higher than the global average. Only a small number of countries have a higher inflation rate than Iran. This increase in inflation and unemployment has led to a

rise in the misery index in Iran, and the increasing trend of this index indicates a stagflation situation in the Iranian economy.

The average inflation rate in the world over the past two decades has been 3.5%, while this rate has been 19.5% on average in Iran. This indicates a very unfavorable inflation situation in Iran compared to the global average. Also, the average unemployment rate in the world has been 8.3%, but unfortunately, this rate in Iran has been 9.4% in the last two decades, which shows the unfavorable unemployment situation in Iran compared to other countries in the world.

An examination of the data and inflation trend shows that in 2008, due to the global financial crisis and the implementation of expansionary fiscal policies to combat this crisis in most countries of the world, the average global inflation rate suddenly increased from 4.8% in 2007 to 8.9% in 2008. However, this trend stopped the following year, and inflation decreased significantly to 2.9%. In Iran, inflation reached 21.5% in 2011 due to the targeting of subsidies and the reform of energy prices. In subsequent years, with the intensification of sanctions and the implementation of inflationary policies such as the Mehr housing project, the upward trend of inflation continued, reaching 32.8% in 2013.

As expected, the high rate of inflation and unemployment in Iran compared to the global average has raised the misery index in Iran significantly. According to Table 1, an examination of the changes in the misery index shows that this index has always been significantly different in Iran compared to the world. The average misery index in the world over the past two decades has been only 11.4%, while this average in Iran has been 31%. Also, the misery index increased over five years from 19.3% in 2016 to 49.4% in 2021, which means a 155% increase in the index in this period alone and the highest amount in the past two decades.

Based on previous studies, the effect of QH on the misery index was examined. Since it is derived from the sum of the inflation rate and the unemployment rate, the effect of this policy on inflation and unemployment was first discussed, and ultimately its impact on the misery index was evaluated.

The theoretical foundations used in this research are derived from the study by Salim and Hasan (2019) and are as follows: In competitive markets, the price (P) equals marginal cost (MC): P=MC (Selim & Hassan, 2019).

In imperfect markets, price is more dependent on production costs, therefore, price is a function of cost (C): P=f(C)

Thus, in both competition, production costs play an important role in determining market prices. All else being equal, as production costs increase, prices will rise and vice versa.

Interest cost is a significant part of the cost of goods sold in terms of revenue. With QH, the cost of borrowing in various sectors of the economy will decrease, leading to a reduction in the interest cost component. With a decrease in interest costs, price levels will also decline, and vice versa. Therefore, a reduction in general price levels will lead to a reduction in the inflation rate.

Additionally, with QH, companies will be able to purchase extra capital goods, and the level of investment in the economy will rise. As investment rises,

collective demand in the economy will enhance, leading to higher balance income and employment, and consequently a reduction in the unemployment rate. Thus, through QH, there will be a simultaneous reduction in the rates of inflation and unemployment, resulting in a decrease in the discomfort index or misery index, and the Phillips curve will alteration near the origin. From the mentioned relation between Qard al-Hasan and the misery index (MI), we can hypothesize Theorem 1 as follows:

Theorem 1: Effects of QH on the Inflation Rate: In the case of QH, the marginal cost compared to other loans is lower, for example, (MCifmp)<(MCibmp), due to the relatively small financing costs across the economy under the loans of QH. MCifmp is final cost at the time of receiving QH facilities, and MCibmp is final cost at the time of receiving other facilities.

Theorem 2: Effects of QH on the Unemployment Rate: Similarly, with QH, the overall financial costs across the economy will decrease, leading to an increase in the level of investment (I). The total cost line (aef) will alteration, equilibrium income (Y^*) and employment (E^*) will rise, and the unemployment rate (UR) will decrease.

Theorems 1 and 2 clearly demonstrate that under the conditions of providing QH, the rates of unemployment and inflation will be lower compared to other types of loans (Selim & Hassan, 2019). Such theoretical claims will be re-examined through experimental tests in later sectors.

This study aims to fill this gap by exploring the relationship between the share of QH facilities and the misery index in Iran over the period from 1984 to 2021.

2. Methodology

This study employs the Autoregressive Distributed Lag (ARDL) model to investigate the relationship between the share of QH facilities and the misery index in Iran over the period from 1984 to 2021. The ARDL approach is particularly appropriate for this analysis as it allows for the simultaneous estimation of both short-term and long-term relationships between the dependent variable (misery index) and independent variables (share of QH facilities, government spending, and real exchange rate). The ARDL model is a versatile econometric technique for analyzing time series data. It is particularly useful for addressing spurious regression issues and does not require pretesting for unit roots, making it suitable for variables integrated of different orders (Ghouse, Khan, & Rehman, 2018; Nkoro & Uko, 2016). This method, which is presented for determining the single-equation cointegration relationship between variables, has special advantages over other methods such as Johansen's, as follows:

The ARDL model allows for the examination of long-run relationships among variables while accounting for short-run dynamics (Mills, 2019). It is robust for small sample sizes and can identify multiple cointegrating vectors (Nkoro & Uko, 2016). However, proper implementation is crucial to avoid model misspecification and unreliable estimates (Nkoro & Uko, 2016). Menegaki emphasizes the importance of following a comprehensive procedure when using

ARDL, including pre-ARDL steps and post-ARDL causality investigation (Menegaki, 2019). Despite its advantages, the ARDL model is not suitable for variables integrated of order I(2) (Nkoro & Uko, 2016).

2.1 Model Specification

The model is specified as follows:

Mis=f (Shfa, Gex, Exr, Dum1, Dum2)

Where:

- **Mis** represents the misery index,
- **Shfa** denotes the share of QH facilities,
- **Gex** indicates government expenditures,
- **Exr** refers to the real exchange rate,
- **Dum1** and **Dum2** are used as dummy variables because they represent significant economic events. Dum1 is the first dummy variable, representing the imposed war during the years (1984-1988). Dum2 is the second dummy variable, representing the economic sanctions during the years (2010-2013) and (2018-2021) due to the severity of the economic sanctions imposed.

The logarithmic transformation of the variables is applied to stabilize the variance and to interpret the coefficients in terms of elasticities.

2.2 Data Collection

Data for the variables included in the model were collected from various sources, including the Central Bank of Iran, the Statistical Center of Iran, and relevant academic publications. The time series data spans from 1984 to 2021, ensuring a comprehensive analysis of the economic conditions during this period.

2.3 Unit Root Test

Before estimating the ARDL model, the stationarity of the time series data is evaluated using the Augmented Dickey-Fuller (ADF) test. This test helps determine whether the series are stationary or require differencing. The null hypothesis of the ADF test states that the series has a unit root (i.e., it is non-stationary).

2.4 ARDL Model Estimation

After the stationarity of the variables is confirmed, the ARDL model is estimated. The optimal lag length for the model is determined using the Akaike Information Criterion (AIC) or the Schwarz Bayesian Criterion (SBC). The ARDL approach allows for the estimation of both short-term dynamics and long-term equilibrium relationships.

2.5 Error Correction Model (ECM)

To capture the short-term dynamics of the relationship, an Error Correction Model (ECM) is derived from the ARDL framework. The ECM provides insights into how quickly the variables return to equilibrium after a shock. The coefficient

of the error correction term shows the speed of adjustment towards long-term equilibrium.

2.6 Diagnostic Tests

To ensure the robustness of the model, several diagnostic tests are conducted, including:

- Tests for autocorrelation (using the Breusch-Godfrey test),
- Tests for heteroscedasticity (using the Breusch-Pagan test),
- Tests for normality of residuals (using the Jarque-Bera test).

These tests help validate the assumptions of the regression model and confirm the reliability of the results.

2.7 Interpretation of Results

The results from the ARDL model and ECM are interpreted in terms of their economic significance. The coefficients are analyzed to determine the impact of QH facilities on the misery index, as well as the influence of government spending and the real exchange rate.

3. The Study Model

The findings of this research show a significant relationship between the share of QH facilities and the misery index in Iran, based on data from 1984 to 2021. The analysis employed an Autoregressive Distributed Lag (ARDL) model to assess both short-term and long-term impacts.

3.1 Descriptive statistics for the model variables

Descriptive statistics for the model variables are provided in Table 1 for the years 1400-1363. The results of the table indicate that the standard deviation (a measure of dispersion that shows how much the data on average differs from the mean) for all variables, except for government expenditures, exchange rates, and economic growth, is low, and the data are close to their respective means with little dispersion. Additionally, the skewness (asymmetry of the probability distribution of the data around the mean) for most variables is positive (except for the logarithm of government expenditure and economic growth), which means the axis of symmetry is skewed to the right.

Table 1. Descriptive Statistics of Model Variables

Variable	Exr	Lexr	Lgex	Lshde	Lshfa	Lmis
Mean	2.32	9.12	11.09	2.09	1.71	43.3
Median	2.90	9.17	12.32	2.09	1.62	44.3
Maximum	14	12.81	15.81	3.23	2.44	07.4

Minimum	-9.8	-6.42	-8.05	1.56	1.14	9.2
Std. Dev.	4.5	1.63	2.46	0.31	0.34	28.0
Skewness	-0.19	0.36	-0.24	0.99	0.71	18.0
Kurtosis	3.07	2.69	1.76	5.38	2.5	15.2
Observations	38	38	38	38	38	38

***Source**: Authors*

3.2 Impact of Qard al-Hasna Facilities

The results reveal that each unit increase in the share of QH facilities leads to a decrease of 0.31% in the misery index in the short term and 0.52% in the long term (Table 2 & Table 3). This suggests that enhancing the provision of these facilities can effectively reduce poverty levels in Iran.

Table 2. Estimation of the short-term ARDL model results

Variable	Coefficients	Standard Deviation	t-Statistic	p-Value
Ln Shfa	-0.32	0.13	-2.36	0.0255
Ln Gex	0.28	0.17	1.67	0.1055
Ln Exr	0.66	0.13	4.76	0.0001
Egr	-0.008	0.005	-1.42	0.1666
C	2.38	0.37	6.41	0.0000

***Source**: Authors*

Table 3. Estimation of the long-term ARDL model results

Variable	Coefficients	Standard Deviation	t-Statistic	p-Value
Ln Shfa	-0.52	0.26	-2.01	0.05
Ln Gex	-0.16	0.05	-3.15	0.003
Ln Exr	0.22	0.09	2.54	0.016
Egr	-0.01	0.009	-1.48	0.14
C	3.9	0.33	11.74	0.00

***Source**: Authors*

3.3 Error Correction Mechanism

The error correction coefficient of the model indicates that 60% of the short-term fluctuations in the misery index are adjusted towards long-term equilibrium (Table 4). This highlights the stability of the relationship over time and the potential for QH facilities to contribute to sustained economic improvement.

Table 4. Error Correction Mechanism (ECM) model estimation results

Variable	Coefficients	Standard Deviation	t-Statistic	p-Value
D (LGex)	0.28	11	2.48	0.01
D (LExr)	0.66	0.1	6.5	0
Dum1	0.15	0.06	2.27	0.031
Dum2	0.33	0.07	4.5	0.0001
CointEq (-1*)	-0.6	0.07	-7.87	0

***Source**: Authors*

3.4 Government Spending

The findings also show that government spending has a negative and significant effect on the misery index in the long term. Specifically, an increase in government expenditures correlates with a reduction in the misery index, emphasizing the importance of directing financial resources towards productive and developmental activities (Table 5).

Table 5. Results of examining the stationarity of variables using the generalized Dickey-Fuller (ADF) test with first-order difference

Variable	Symbol	Dickey-Fuller Statistic	Critical Values at Different Confidence Levels	p-Value	Stationarity Status
Misery Index	LMsi	-5.5	-3.2 (10%)	-3.5 (5%)	-4.2 (1%)
Share of Qard al-Hasna Facilities	LShfa	-5.2	-3.2 (10%)	-3.5 (5%)	-4.2 (1%)
Government Expenditure	LGex	-4.3	-3.2 (10%)	-3.5 (5%)	-4.2 (1%)
Real Exchange Rate	LExr	-4.3	-3.2 (10%)	-3.5 (5%)	-4.2 (1%)
Economic Growth	Egr	-5.6	-3.2 (10%)	-3.5 (5%)	-4.2 (1%)

***Source**: Authors*

3.5 Real Exchange Rate

Conversely, the real exchange rate exhibits a positive and significant impact on the misery index (Table 4). A rise in the real exchange rate is related with a rise in the misery index, indicating that fluctuations in currency value can adversely affect economic well-being.

3.6 Policy Implications

Given the positive impact of QH facilities on reducing the misery index, it is recommended that the central bank enhance its oversight of the banking network's performance in allocating these loans. Additionally, the government should focus on construction and development spending to foster economic growth and job creation, while also managing exchange rate policies to mitigate adverse effects on the economy.

3.7 Unit Root Test for Determining Stationarity

The Unit Root Test is one of the most commonly used methods for determining the stability of a time series. This test is based on the assumption that if in an autoregressive process such as: $yt=\rho yt-1+ut$. The value of $\rho=1$, the series yt is not stationary. Therefore, if the coefficient ρ in the above equation is estimated using the Ordinary Least Squares (OLS) method and tested against the equality of one, the stationarity or non-stationarity of a time series can be determined. The problem with conducting this test is that the test provided by the OLS method, under the assumption $\rho=1$, does not follow the usual t-distribution, even in large samples, and thus t-values cannot be used for hypothesis testing. To address this issue, the Augmented Dickey-Fuller (ADF) test is utilized. To achieve an unbiased estimate among the model variables, it is necessary for the variables included in the regression to be stationary or for their combination to be stable. Levin et al. have shown that in panel data, using the unit root test for combined data has more power than conducting the unit root test for each cross-section separately (Levin, Lin, & Chu, 2002). The ADF test has been employed to examine the stationarity of the variables.

3.8 Augmented Dickey-Fuller Test (ADF)

To test non-stationarity, we initially assume that the time series in question follows a first-order autoregressive process and test the hypothesis ρ=1 based on this assumption. Now, if this assumption is incorrect and the time series under investigation follows a ρ-order autoregressive process, the relationship under investigation for testing ρ will not have the correct dynamic representation, which will cause the regression error terms to exhibit autocorrelation. When error terms exhibit autocorrelation, the Dickey-Fuller test can no longer be used to investigate stationarity because, in this case, the limiting distribution and the critical values obtained by Dickey-Fuller are no longer valid. However, Paparoditis & Politis showed that when the error terms have autocorrelation, if the augmented Dickey-

Fuller model is used, the limiting distribution and the critical values they provided will still be valid (Paparoditis & Politis, 2018).

$$\Delta yt=\gamma yt-1+\sum i=2m\beta i\Delta yt-i+1+ut \quad (1)$$

$$\Delta yt=\alpha 0+\alpha 2t+\gamma yt-1+\sum i=2m\beta i\Delta yt-i+1+ut \quad (2)$$

where *ut* is the disturbance term. In this case, the null hypothesis $\rho=1$ is equivalent to $\gamma=0$.

3.9 Unit Root Test for Determining Stationarity

Table 6 shows the results of the Augmented Dickey-Fuller unit root test for the stationarity of variables. Since the dependent variable and other variables become stationary after first differencing (I(1)), the results obtained from the Augmented Dickey-Fuller stationarity test make us more confident in using the Autoregressive Distributed Lag (ARDL) method.

Table 6. Results of Stationarity Testing of Variables Using the Augmented Dickey-Fuller (ADF) Test with First-Differencing

Variable	Symbol	Dickey-Fuller Statistic	Critical Values at Different Confidence Levels			Significance Level	Stationarity Status
			10 %	5 %	1 %		
Misery Index	LMsi	-5.5	-3.2	-3.5	-4.2	0.0004	I(1)
Share of Qard Al-Hasanah Loans	LShfa	-5.2	-3.2	-3.5	-4.2	0.0007	I(1)
Government Expenditures	LGex	-4.3	-3.2	-3.5	-4.2	0.0083	I(1)
Real Exchange Rate	LExr	-4.3	-3.2	-3.5	-4.2	0.0071	I(1)
Economic Growth	Egr	-5.6	-3.2			0.0002	I(1)

***Source**: Authors*

3.10 Classical Assumptions Test

Based on the results presented at the 5% significance level, the estimated model does not have issues such as autocorrelation of error terms and heteroscedasticity of variance (Table 7). Furthermore, the specified form is correct, and the residuals are normally distributed. In other words, the model under investigation meets all classical assumptions, and the null hypothesis related to the tests based on the absence of autocorrelation, homoscedasticity, lack of bias in specification, and normality of the error term cannot be rejected. As a result, the estimated model satisfies the conditions pertaining to the disturbance term.

Table 7. Results of Diagnostic Test for Classical Assumptions

Test	Statistical probability
Absence of Autocorrelation	0.33
Correct Specification of the Model Form	0.60
Normality of Residuals	0.68
Homoscedasticity of Variance	0.56

***Source**: Authors*

3.11 Cointegration (Bounds Testing)

The Table 8 presents the results obtained from the bounds test. The findings indicate that the F-statistic is superior than the upper and lower bounds at different confidence levels, both in the approximate sample and in the actual large sample. Therefore, the variables exhibit cointegration and a long-term relationship.

Table 8. Cointegration Results (Bounds Test)

Statistic	F-Statistic	Upper Bound I (1)	Lower Bound I (0)	Significance Levels
Approximate Sample of 1000 Observations	8.71	3.09	2.2	10%
		3.49	2.56	5%
		3.87	2.88	5.5%
		4.37	3.29	1%
Actual Sample of 37 Observations	8.71	3.39	2.42	10%
		4.00	2.89	5%
		5.45	3.96	1%

***Source**: Authors*

3.12 Stability Test of Coefficients

The following graphs illustrate the results of the CUSUM and CUSUMSQ tests for the model under investigation (Figure 1 & Figure 2).

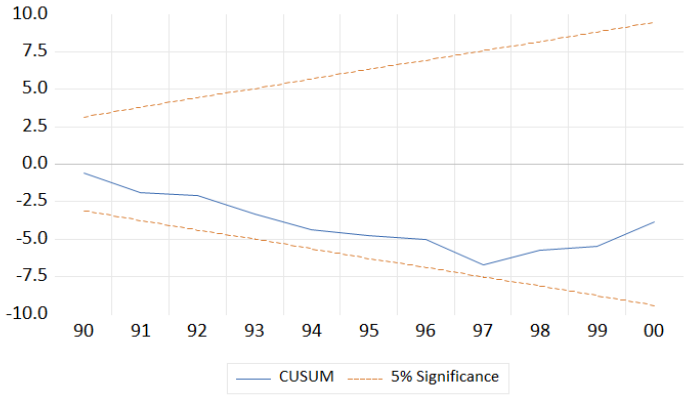

Figure 1. CUSUM Test for Cumulative Sum of Recursive Residuals
***Source**: Authors*

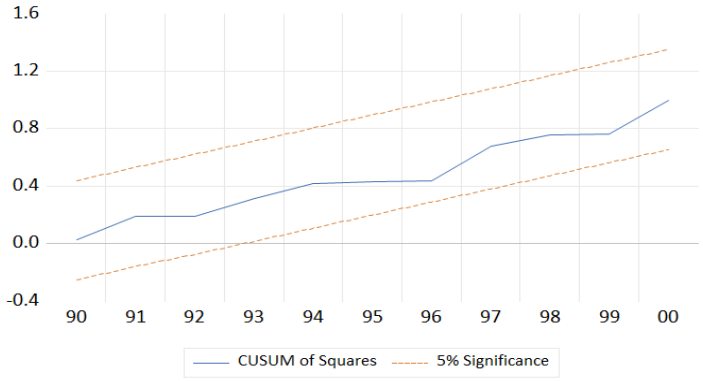

Figure 2. CUSUMSQ Test for Cumulative Sum of Squares of Recursive Residuals
***Source**: Authors*

The CUSUM and CUSUMSQ graphs fall within the area between the two critical lines at the 5% level. This result indicates that the model's long-term stability is confirmed, and the null hypothesis of the absence of structural breaks cannot be rejected, meaning the model exhibits structural stability.

These findings underscore the critical role of QH facilities in alleviating economic distress and highlight the need for strategic policy interventions to enhance their effectiveness in improving the overall economic conditions in Iran.

4. Discussion

The results of this paper provide significant insights into the impact of QH facilities on the misery index in Iran, highlighting both short-term and long-term effects. The results show that an increase in the share of QH facilities leads to a notable decrease in the misery index, with reductions of 0.31% in the short term and 0.52% in the long term for each unit increase in these facilities. This suggests

that QH, as an interest-free loan mechanism, plays a crucial role in alleviating economic distress among the population, particularly in a context where traditional interest-based lending may exacerbate financial burdens. QH, an interest-free loan mechanism, has shown positive impacts on reducing poverty and improving economic conditions in various contexts. In Iran, QH facilities have been implemented through the banking system, demonstrating potential for increasing per-capita income (Bakhtiari, 2009; Mojtahed & Hassanzadeh, 2009). Studies in Bangladesh reveal that QH programs significantly reduce multidimensional poverty, with participants 1.5 times less likely to be poor compared to non-participants (Muneer & Khan, 2022). The effectiveness of QH in empowering economic activities of the needy has been supported by religious leaders and economists (Widiyanto, Mutamimah, & Hendar, 2011). These findings suggest that QH, as an Islamic financial service, can be a valuable tool in poverty elimination programs, offering an alternative to traditional interest-based lending in addressing economic distress.

The negative relationship between QH facilities and the misery index aligns with the theoretical framework that emphasizes the importance of equitable financial distribution in enhancing social welfare. By facilitating access to interest-free loans, QH can effectively redistribute wealth from higher-income groups to lower-income individuals, thereby addressing income inequality and improving overall economic conditions. Studies in Bangladesh demonstrate that participants in Qard al-Hassan programs have a lower probability of being poor and can accumulate more assets, leading to improved economic status (Muneer & Khan, 2019, 2022). In Iran, the provision of interest-free loans has been associated with positive effects on per-capita income, serving as a proxy for poverty reduction (Mojtahed & Hassanzadeh, 2009). The case study of Akhuwat in Pakistan further illustrates the significant role of Qard al-Hassan in increasing social unity and cooperation, particularly in developing countries with large Muslim populations (Iqbal & Shafiq, 2015). These findings suggest that Qard al-Hassan can be an effective tool for redistributing wealth from higher-income groups to lower-income individuals, thereby addressing income inequality and improving overall economic conditions.

Moreover, the study reveals that government spending has a negative and significant impact on the misery index in the long term. This suggests that increased government expenditure, particularly when directed towards productive sectors, can contribute to economic growth and job creation, further reducing the misery index. However, the positive effect of the real exchange rate on the misery index indicates that fluctuations in currency value can adversely impact economic well-being, highlighting the need for effective monetary and fiscal policies to stabilize the economy. Recent studies have examined the relationship between government policies and economic well-being, as measured by the misery index. Research suggests that government spending, particularly capital expenditure, can reduce the misery index in Nigeria (Anaele & Nyenke, 2021). However, the effectiveness of monetary policy in reducing the misery index has been questioned

(George-Anokwuru, 2023). In Latin American economies, government investment has been found to depreciate the exchange rate, potentially stimulating growth without negative effects on the tradable sector (Cruz & Zavaleta, 2021). A study of transition countries revealed a long-run relationship between the misery index and economic growth, indicating that economic misery can hinder growth (Akay & Oskonbaeva, 2020). These findings highlight the importance of carefully managed fiscal and monetary policies in promoting economic well-being and growth, while considering the potential impacts on inflation, unemployment, and exchange rates.

The error correction model (ECM) coefficient of -0.60 indicates that approximately 60% of the short-term shocks to the misery index are corrected in the long run. This underscores the dynamic nature of the relationship between QH facilities and the misery index, suggesting that while immediate impacts may be observed, the long-term adjustments are crucial for sustained economic improvement. Studies have applied ECM to examine the effect of macroeconomic variables on Islamic stock indices in Indonesia, revealing significant short-term and long-term relationships (Fauzi, 2023; Wahyudi & Qoyum, 2023). The ECM coefficient indicates the speed at which short-term shocks are corrected in the long run, with higher absolute values suggesting faster adjustment. For instance, an ECM study on crime, poverty, and the misery index in Pakistan found that about 72% of disequilibrium in the crime rate is corrected annually (Shah, Khan, Saboor, & Iftikhar-ul-Husnain, 2022). This underscores the dynamic nature of economic relationships and the importance of considering both immediate impacts and long-term adjustments when analyzing economic phenomena and formulating policies.

These findings have important policy implications. Given the positive impact of QH facilities on reducing the misery index, it is essential for the Central Bank of Iran to enhance its oversight of the banking network's performance in allocating these facilities. By ensuring that QH loans are effectively distributed, the government can foster job creation and reduce unemployment, ultimately contributing to a lower misery index.

Furthermore, the government should consider redirecting financial resources towards construction and development projects that stimulate economic growth. This strategic allocation of resources can help alleviate the long-term negative impacts of government spending on the misery index.

5. Conclusion

In this research, emphasizing the importance of reviving the tradition of Qard Hasanah (benevolent loan), which is emphasized by the Holy Lawgiver, the effect of these facilities on the misery index has been investigated. On the other hand, by examining the misery index, a comprehensive understanding of the economic situation of the country can be achieved, because this index is obtained by simultaneously calculating the unemployment rate as a socio-economic indicator and the inflation rate as a main indicator in the economy. An increase in the misery

index indicates the unfavorable economic situation of households and the pressure that is exerted on members of society. In conclusion, this study highlights the critical role of QH facilities in improving economic well-being in Iran. The findings advocate for a more robust implementation of Islamic financial principles to address economic challenges, reduce poverty, and promote social equity. Future research should explore the mechanisms through which Qard al-Hasna can be optimized to maximize its impact on economic stability and growth, as well as investigate the broader implications of Islamic finance in different socio-economic contexts.

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Conflicts of Interest

The authors declare no conflict of interest.

Data Availability Statement

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