Iranian Economic Review,29(3), 1040-1067
DOI: 10.22059/IER.2025.390349.1008194

RESEARCH PAPER

Microfinance as a Catalyst for Change: Evaluating the Success of Iran's Rural Employment Program from 2017 to 2022

Monire Pourmohammadi[*,a], **Ali Taiebnia**[a], **Kowsar Yousefi**[b]

a. Faculty of Economics, University of Tehran, Tehran, Iran.
b. Department of Economics, Institute for Management and Planning Studies (IMPS), Tehran, Iran.
* Corresponding author

Received: 24 February 2025, Revised: 18 August 2025, Accepted: 15 September 2025, Published: 30 September 2025
Publisher: The University of Tehran Press.

Abstract

The Iranian economy has long been challenged by elevated unemployment rates, a situation further complicated by enduring inflation, as illustrated by the Phillips curve, which highlights the inherent trade-off between these two economic variables. The severity of unemployment, being underscored by public policy debates about employment objectives and inaccurately estimating job creation costs. Despite the implementation of numerous plans over decades to reduce the unemployment, including Rural Employment Plan (REP), their causal effects are rarely identified. The REP, a notable microfinance initiative, was launched from 2017 to 2022. In the present paper we use instrumented GMM, AB GMM, BB GMM, ARDL, and FE to examines the program's impact and present findings that challenge conventional academic expectations. Our results indicate that lagged logarithmic payments exert a consistently positive and significant effect, particularly in areas with higher employment rates, thereby suggesting enhanced benefits in regions with more robust economic activity. Furthermore, microfinance initiatives have proven instrumental in supporting impoverished areas by providing essential financial resources, enabling individuals to establish or maintain micro-enterprises, thus facilitating income generation and promoting local economic growth. Overall, one of our keys finding is that the cost of job creation in this plan is 214 million Tomans at a fixed price for year 2022, as we clearly demonstrate.

Keywords: Entrepreneurship, Job Creation Program, Microfinance, Panel Data Models, Rural Employment in Iran.
JEL Classification: C23, C32, G21, J680, O170.

1. Introduction

Unemployment is one of the key indicators in analyzing the economic and social status of any society. It not only reflects the dynamism of the labor market and the

economy's capacity to absorb human resources but also has profound impacts on social structures, cultural norms, and even the psychological well-being of individuals and households. This phenomenon, as a multifaceted problem, arises from the complex interaction of economic factors such as the structure of production, fiscal and monetary policies, and labor market developments, with social variables like inequality, poverty, and migration in developing economies like Iran, particularly in rural areas, unemployment has become a chronic challenge rooted in issues such as insufficient investment, weak infrastructure, and a lack of productive employment opportunities. From an economic perspective, this situation not only leads to a reduction in the productivity of all production factors but also imposes significant social and welfare costs on governments, thereby weakening the potential for long-term economic growth (Behnia et al., 2021; Mankiw, 2024; Pourmohammadi and Yousefi, 2021).

Small and medium-sized enterprises, SME, with own account workers, account for a staggering 70% of employment worldwide (ILO, 2023), acting as both direct and indirect job creators. Directly, they hire employees to fulfill various roles within their operations, from production and sales to administration and management. The number of employees hired varies greatly depending on the size and nature of the business. Indirectly, small businesses stimulate employment by creating demand for goods and services from other businesses, leading to further job creation in related industries like manufacturing, transportation, and professional services. This ripple effect amplifies their employment impact, contributing to a broader and more diversified employment landscape. Furthermore, small businesses often provide flexible work arrangements and opportunities for entrepreneurship, increasing participation in the workforce and fostering economic dynamism.

Many small businesses, such as rural businesses, lack the initial capital or reserves to cover invest in equipment or inventory, or weather unexpected downturns. Loans provide the necessary financial bridge to cover these needs, enabling small businesses to launch, expand operations, hire employees, and contribute to economic growth. Without access to credit, many promising ventures would fail, limiting job creation and hindering overall economic development. Therefore, facilitating access to appropriate and affordable loans is essential for fostering a vibrant and dynamic small business sector.

However, many rural residents and small business owners lack access to bank loans. Microfinance fills a critical gap in the financial landscape by providing loans specifically tailored to the needs of small businesses or enterprises who lack

access to traditional banking systems. Because traditional lenders often hesitate to work with businesses lacking extensive collateral or credit history, microfinance institutions play a vital role in bridging this financial divide, enabling small business or enterprises to build their businesses and contribute to economic growth at a grassroots level.

In 2006, Mohammad Yunus and Grameen Bank won the Nobel Peace Prize for expressing and proving the importance of microfinance in reducing global poverty. The Nobel Committee acknowledged that perpetual peace would not happen except by eliminating global poverty (Banerjee et al., 2019; Esther et al., 2013). One of the best ways to reduce poverty is microfinance, which credits applicants who do not have physical collateral to receive loans. Thenceforth, Policymakers have considered microfinance as a poverty alleviation policy, and many financial institutions were established for this purpose.

The 1990s saw growing interest in the link between financial development and economic growth. Studies (King and Levine, 1993; Levine and Zervos, 1998) established a significant relationship, although causality remained unclear due to a lack of experimental evidence. Research further demonstrated that financial intermediary development positively impacts total factor productivity and GDP growth (Levine et al., 2000; Levine and Loayza, 2000). These findings contributed to the widespread adoption of microfinance as a poverty reduction and welfare-enhancing policy, culminating in the 2006 Nobel Prize (Banerjee et al., 2015).

However, the effectiveness of microfinance remains a subject of ongoing debate. Empirical studies examining microfinance programs for low-income households and firms have yielded mixed results, highlighting the need for further research to definitively assess the impact of these initiatives.

Early studies on microcredit impact often showed insignificant results. However, more recent research increasingly demonstrates positive economic effects. These studies have examined micro-level impacts (income, consumption, savings, investment) and macro-level impacts (GDP growth, aggregate consumption and investment) (Ayyagari et al., 2021).

Although many articles have worked on the effects of financial development on economic growth, few have addressed the effects of financial development on the labor market. The effect of increasing facilities on the labor market and employment is not apparent. By increasing the facilities, the firm invests and increases its production without increasing the labor demand. On, some articles admit that the labor force that needs training and hiring also has a fixed cost for the

company, in which case the increase in facilities can affect the company's decision to demand labor, that has the positive effect on employment rate.

There is clear evidence for the importance of microfinance in the labor market. During the Great Recession in 2007-2009, the financial crisis caused an employment crisis. In other words, there is a significant relationship between financial changes and the labor market.

If microfinance is not viewed as consumer loans and is considered commercial investment, it will increase the demand for labor. Investing in a firm significantly impacts employment through job creation and economic growth (Bloom et al., 2006). An influx of capital from investments allows a firm to expand operations and infrastructure, necessitating the hiring of additional staff across various roles, from manufacturing to administrative functions. This expansion enhances productivity by enabling the acquisition of advanced equipment and technology. Furthermore, the increase in employment fuels the local economy through a multiplier effect, as employees' disposable income leads to higher overall spending. Given the relative neglect of labor market impacts in recent microfinance research, further investigation into this area is crucial for informing effective policymaking. This research area presents a significant opportunity for contribution.

The current research focuses on the impact of Rural Employment Plan, REP, as a microfinance policy on Iran's employment rate. It aims to reduce unemployment by analyzing data to evaluate the effectiveness of these programs and suggest improvements in supportive policies. Theoretical perspectives on the labor market will be discussed, followed by an in-depth examination of labor market policies, mechanisms of unemployment in Iran, and a review of relevant data including the Labor Force Survey (LFS). The research progresses through sections discussing the theoretical framework, data analysis, model examination, findings, and concludes with policy recommendations.

2. Theoretical Framework

Unemployment exhibits significant heterogeneity across different groups of people. Unemployment is commonly categorized into short-term and long-term unemployment. Short-term employment, includes seasonal unemployment, frictional unemployment (due to job transitions), and structural unemployment (unemployment that happens because of economic restructuring, often impacting low-skilled workers due to technological advancements). Long-term unemployment (lasting more than six months, for example), sometimes considered

permanent, is particularly detrimental to the economy, leading to financial hardship and decreased job-seeking motivation.

All these types of unemployment can be classified by their origin: demand-side and supply-side. Demand-side unemployment arises when there's a drop in the demand for goods and services, leading to fewer labor requirements, often influenced by economic recessions or technological changes (Hamermesh, 2021). Supply-side unemployment, however, is related to the labor supply, such as changes due to immigration, education, or retirement, and mismatches in skills or geographic locations relative to job opportunities. Effective policy responses for these types vary, with demand-side solutions focusing on stimulating economic activity and supply-side measures aimed at enhancing labor market flexibility and aligning skills with job market needs (Farajnia et al., 2020).

Governments must carefully consider the specific type of unemployment occurring and then choose the most appropriate policies to effectively address and mitigate it. Macroeconomic stabilization, including monetary policies (whose effects on employment are described by the Phillips curve) and fiscal policies, improves labor market conditions. Labor market policies are further categorized into structural reforms (affecting the business environment), active policies and passive labor market policies. All types of policies can aim to reduce unemployment or achieve redistributive goals; reforms generally impact unemployment rates, active policies often focus on income redistribution and welfare improvements, while passive policies include Income Support Programs for unemployment. These categories are presented in Figure 1.

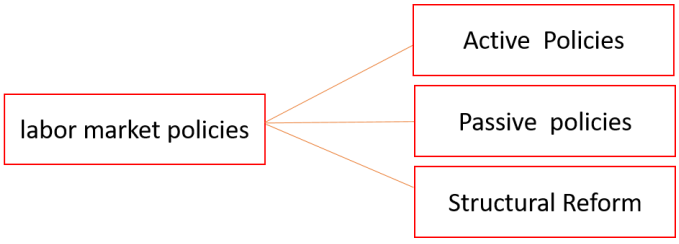

Figure 1. Labor Market Policies
Source: Research finding.

Active policies include fiscal measures (government spending, taxation, and subsidies) and monetary actions (interest rates and money supply management), both of which influence employment by adjusting economic levers. For example, fiscal policies stimulate labor demand through initiatives like increased public

spending and tax incentives for hiring, as demonstrated by the U.S. Paycheck Protection Program, which supported businesses in retaining employees (Granja et al., 2022). Monetary policies, managed by central banks, influence employment by affecting borrowing costs and credit availability (Bernanke, 2020).

Passive labor market policies provide financial relief primarily through income support to stabilize individuals during periods of unemployment, focusing on social protection rather than skills development or job placement.

Structural policies aim to reshape the labor market through labor law reforms, tax system adjustments, and enhanced access to labor markets, thereby improving labor market efficiency and workforce quality (Aiginger and Rodrik, 2020).

Active labor market policies further enhance job opportunities by improving worker employability through job training, search assistance, wage subsidies, and tax incentives (Mckenzie, 2017).

By strategically combining these diverse policy approaches, effective solutions to unemployment can be crafted, ensuring both immediate relief and long-term labor market stability. Such initiatives are particularly relevant in the context of Iranian labor market policies, which encompass a range of strategies designed to address these challenges (Behnia et al., 2021; Escudero, 2018; Martin, 2015).

- minimum wage regulation;
- unemployment benefits and job search assistance;
- youth employment programs;
- employer subsidies;
- a labor market information system;
- support for labor unions and guilds;
- active labor market policies (e.g., training and skills development);
- targeted employment programs for people with disabilities and veterans;
- job mobility and transfer programs;
- measures to improve working conditions;
- microfinance as REP.

As discussed, microfinance refers to the provision of small-scale financial services to low-income individuals or groups who lack access to traditional banking systems. The mechanism through which microfinance influence employment operates primarily through household-level and microenterprise investment. Recipients of microfinance typically use the funds to establish or

expand small-scale businesses, often in informal sectors. This leads to direct self-employment and, in some cases, the involvement of family labor, as highlighted by (Morduch, 2000), who notes that microfinance primarily enables self-employment rather than generating wage jobs (Hulme, 2000), further emphasizes that when loans are used for productive investments—such as tools, inventory, or market expansion—they can improve business returns and support modest employment gains, particularly within the household. The effect of microfinance on employment largely depends on the scale of investment and the extent of enterprise growth, with more substantial impacts observed when businesses are able to expand beyond subsistence levels. The findings also indicate that while microfinance can play a crucial role in enhancing employment, the magnitude of its impact depends not only on the strategy for selecting target regions and economic activities, but also on the amount of financial allocation.

After implementing a labor market program, a critical step is assessing its effectiveness through data modeling to identify the specific impacts of each policy on employment. It is essential to capture the temporal dynamics in employment modeling to ensure the accuracy of these effects. Factors such as existing labor contracts, adjustment costs, and employer and employee expectations often cause historical employment levels to influence current figures. Including previous employment rates as a lagged independent variable helps account for this persistence in the labor market. Additionally, it is crucial to consider unobserved individual heterogeneity related to variables such as city, which can provide valuable information, as well as the presence of time dummy variables (Arulampalam et al., 1998).

We investigate the effect of REP by using General Method of Moments (GMM) and Fixed Effect (FE). The core principle of the GMM is to estimate model parameters by exploiting moment conditions, that is, expectations based on theoretical relationships between variables and their instruments. In dynamic panel data models, higher-order lags of the dependent variable (typically lags 2 or 3) are commonly used as instruments, as they are assumed to be correlated with the endogenous regressors but uncorrelated with the error term. These valid instruments satisfy the orthogonality conditions required for consistent estimation. GMM identifies the parameter vector θ by minimizing the distance between the sample moments and their theoretical counterparts, thereby ensuring that the empirical moment conditions are as close to zero as possible. The basic GMM estimator minimizes the quadratic form:

$$\hat{\theta}_{GMM} = arg\,min[\frac{1}{n}\Sigma_{i=1}^{n}\, Z_i'.\epsilon_i(\theta)]'W[\frac{1}{n}\Sigma_{i=1}^{n} Z_i'.\epsilon_i(\theta)] \quad (1)$$

where W is a weighting matrix, Z_i are instruments, and $\epsilon_i(\theta)$ are residuals (Arellano and Bond, 1991).

For the sake of simplicity, we assume a balanced longitudinal data set of i units and t time periods with no missing data. For each unit i at time t, we observe the outcome variable Y_{it} and the treatment variable X_{it}. The most basic linear regression model with unit fixed effects is based on the following linear specification (Imai and Kim, 2021):

$$Y_{it} = \alpha_i + X_{it}\beta + \epsilon_{it} \quad (1)$$

where Y_{it} represents the dependent variable for entity i at time t. α_i is the unique intercept for each entity, capturing all unobservable individual-specific effects, X_{it} is a vector of explanatory variables that may change over time, β is the coefficient vector, ϵ_{it} is the error term, assumed to be idiosyncratic. Formally, we assume $\epsilon_{it} \perp \{X_i, \alpha_i\}$. The least squares estimate of β is obtained by regressing the deviation of the outcome variable from its mean on the deviation of the treatment variable from its mean (Ramos and Herrara, 2023):

$$\hat{\beta}_{FE} = argmin \sum_{1}^{i}\sum_{1}^{t}\{(Y_{it} - Y_i) - \beta(X_{it} - X_i)\} \quad (2)$$

In Section 5, we will develop our model using the FE model outlined here.

3. Unemployment Dynamics and Underlying Mechanisms in Iran

Iran's economy has struggled with persistently high unemployment, exceeding 10% in recent decades, as it is shown in Figure 2. Several factors contribute to this challenge, including the effects of Dutch Disease, extensive labor protections (Labor law), international sanctions, and the COVID-19 pandemic. These issues have been compounded by population growth and intensified sanctions.

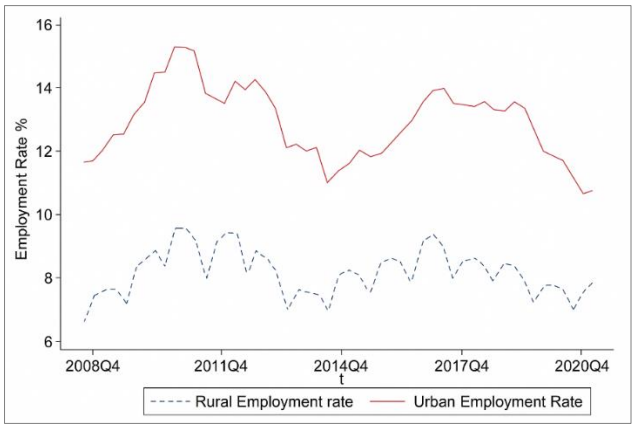

Figure 2. Moving Average of Urban and Rural Unemployment Rates, Seasonally Adjusted
Source: Research finding.

Dutch Disease, stemming from substantial oil exports, negatively impacts the Iranian economy in several ways. First, it concentrates economic activity in the capital-intensive oil sector, limiting job creation. Second, it leads to real exchange rate appreciation, increasing imports and contributing to deindustrialization. Third, it raises reservation wages in other sectors, hindering employment growth. The Dutch disease negatively impacts the structural integrity of the economy, disrupting the channels through which different sectors should function effectively (Dadgar and Orooji, 2020; Kulish et al., 2024).

Labor market regulations, such as those emphasizing worker redistribution and union representation, have set a minimum wage above market equilibrium, which discourages hiring and contributes to higher unemployment rates. This situation was exacerbated by the COVID-19 pandemic, which severely disrupted economic activity, particularly within the service sector, affecting small businesses that form a substantial portion of the Iranian workforce. Moreover, international sanctions, mainly targeting the industrial sector, have further reduced employment opportunities. These combined forces have led to a significant decline in overall employment, with heightened sanctions during the pandemic amplifying these negative impacts (Heckman and Pages, 2003; Pourmohammadi and Yousefi, 2021).

Rural unemployment in Iran is also a significant concern. The agricultural sector, a primary source of rural employment, has been negatively impacted by sanctions, increasing production costs and limiting market access. This has led many rural workers to seek alternative employment, often in poorly-paid or less

stable jobs. While rural unemployment rates may be lower than urban rates, seasonal fluctuations in rural employment, coinciding with agricultural cycles, create considerable income variability. Limited access to financial resources further exacerbates this income instability, motivating rural-to-urban migration, which also strains urban employment markets. This migration negatively impacts the overall economy, as rural production declines, and exacerbates the overall unemployment trend. The REP represents a crucial government initiative to address this issue and promote sustainable rural employment.

4. Dataset Description and Model Specification

4.1 Rural Employment Plan

The REP, initiative was born to eliminate severe poverty in rural areas, improve villagers' level and quality of life, create employment and increase their productivity. In Iran, the REP provided low-interest loans to low-income individuals in villages and small towns who lacked the collateral typically required for conventional loans. The REP operated on the principle of job creation in exchange for funding. Instead of traditional collateral, the program used a combination of low-value assets and a commitment to generate a specified number of jobs, thereby functioning as a form of microfinance.

Welfare goals and poverty reduction are generally considered in microfinance payments. The REP regards employment and its increases. However, to reduce poverty, it is necessary to increase income and employment. Therefore, although the REP was primarily aimed at increasing employment, it can also be said to encompass welfare objectives.

In the REP, facilities were given at average rate of 10% for each project to manufacturing unit located in rural areas and cities with fewer than 10,000 people. The rate of mentioned facilities for projects in rural border areas and border nomads is 4% and in non-border villages and non-border nomads is 6%.

Information about the funds disbursed for implementing the REP is recorded on the KARA website.1 KARA contains 157,392 observations which report 51 variables for each observation. These variables include the requested amount, amount of payment, time of payment, occupation, city of the recipient of the facility, and the number of job creations pledged.

In Table 1, we summarized the statistical information related to the payment of facilities in implementing the REP based on the information recorded in the

[1]. which is managed by the Ministry of Cooperatives, Labor, and Social Welfare.

KARA. As you can see, the REP has been implemented since 2017 and continues until 2022, but most payments were made in 2017 and 2018. However, the average payment in 2021 was very higher than in 2018.

Table 1. Summary Statistics of Microfinance Payment (Million Toman)

t	#	Sum	Mean	Max	Min	sd
Q4 2017	13	9.9	761	8700	9	2390
Q1 2018	174	44.4	255	2500	5.7	547
Q2 2018	4439	483	109	6000	0.00001	329
Q3 2018	27417	2310	84.2	15000	1.18	327
Q4 2018	27344	2270	82.9	27300	0.1	391
Q1 2019	26287	1970	74.9	21000	E-071	351
Q2 2019	10493	909	86.7	93000	0.01	988
Q3 2019	12154	1060	87.3	15000	1	452
Q4 2019	11149	919	82.4	15000	2.2	440
Q1 2020	14041	1320	94.3	45500	3.2	622
Q2 2020	2072	296	143	10000	0.25	565
Q3 2020	2199	343	156	15000	5	676
Q4 2020	2280	316	138	13000	2	626
Q1 2021	4034	533	132	15000	1.2	650
Q2 2021	2586	301	116	12000	3.2	577
Q3 2021	1732	285	164	15000	0.01	763
Q4 2021	982	208	212	15000	10	803
Q1 2022	23	0.828	36	200	8	38.8

Source: Research finding.

Therefore, total payments in 2018 and 2021 are almost the same. Between January 2018 and April 2020, 1500 million dollars (9,752 billion Toman) was paid to 145,041 borrowers. The distribution of REP payments is shown in Figure 3. Our investigation shows that cities with a higher number of loans also tend to have more valuable loans. The observed high correlation between payment amounts per capita and payment count per capita reveals a significant pattern in the distribution of loans across different cities. This strong positive relationship indicates that cities with higher per capita loan amounts also tend to exhibit a greater number of loans per capita, and vice-versa. In other words, the data suggests that loan allocation is not merely a matter of distributing funds widely; rather, it appears that certain cities receive both a larger volume of loans and a greater amount of loan capital per

resident. This implies that financial resources are not evenly dispersed but rather concentrated in specific geographic areas. This concentration could arise due to a variety of factors, including variations in economic activity, investment opportunities, or lending practices across different cities. Understanding the drivers of this correlation is crucial for policy makers who intend to promote more inclusive and equitable distribution of resources.

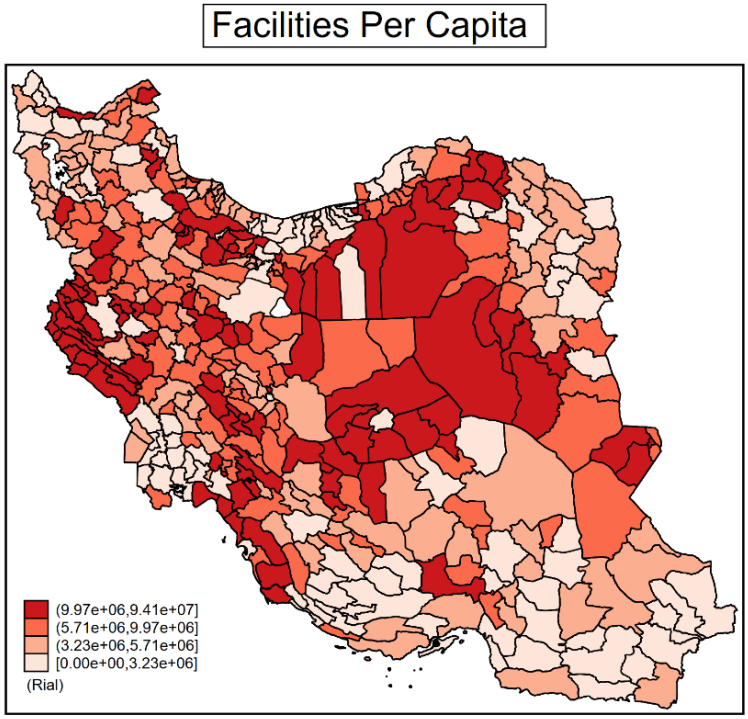

Figure 3. The Distribution of Average Payment Amounts per Capita by City
Source: Research finding.

Table 2. Ratio of Payment by Section

Target Section	Number of Facilities	Ratio
Agriculture and Natural Resources	92250	59.15
Small industries and mines	18512	11.86
Service and IT	15121	9.7
Tourism	2743	1.76
Handicrafts (e.g., carpet)	25255	16.2

Source: Research finding.

A policymaker selected the series of activities with the most capacity to create added value and employment simultaneously. In Table 2, we report the ratio of payment in each section.

4.2 Labor Force Survey

Information on Iran's labor force is obtained from a quarterly survey. The Iran Labor Force Survey (LFS), is conducted by the Statistical Center of Iran to collect information on employment, unemployment, and other characteristics of the country's labor market. The survey is conducted in all cities of Iran and covers all individuals aged 15 years and older. The survey provides information on the number of active and inactive labor forces, employed and unemployed, the sectors in which individuals are or were employed, the occupational structure of the labor force, the types of contracts in which individuals are employed, and the insurance status of individuals. It also provides data on the characteristics of the unemployed, the duration of unemployment, and the sector in which individuals are looking for work.

Table 3. Summary Statistics of Employment Rate

t	#	Mean	Max	Min	sd
Q2 2017	11821	41.04	68.71	14.68	7.94
Q3 2017	11821	41.74	71.31	13.50	8.20
Q4 2017	11821	40.55	67.30	15.86	7.78
Q1 2018	11731	39.51	59.68	24.14	6.79
Q2 2018	12661	42.12	74.95	0.00	8.16
Q3 2018	12721	42.15	71.05	10.18	7.99
Q4 2018	12721	41.57	8.07	15.85	70.43
Q1 2019	12751	39.59	69.63	14.57	6.86
Q2 2019	12751	42.12	73.96	10.41	7.87
Q3 2019	12751	42.36	78.79	6.31	7.73
Q4 2019	12751	41.84	72.04	13.15	7.61
Q1 2020	12751	39.30	61.56	19.86	6.51
Q2 2020	12751	38.80	75.26	9.37	7.50
Q3 2020	12721	39.62	7.24	8.04	69.60
Q4 2020	13291	38.96	7.58	12.90	71.85
Q1 2021	930	37.48	3.36	31.21	43.71
Q2 2021	930	38.23	3.65	31.29	44.03

Source: Research finding.

The Iran LFS is used to understand the state of the country's labor market and inform policy decisions.

In this study, data from the LFS between 2017 and 2021, as shown in Table3, are used to test the research hypothesis that microcredit payments to the population living in villages and small towns have an impact on employment rates.

The provincial employment rates, calculated as the number of employed individuals relative to the total population aged 15 years and older within each province, Tehran, Isfahan, Golestan, Alborz, and Kerman exhibit the highest employment rates relative to their respective populations over 15 years of age.

By comparing the payment structural and employment rate, pattern suggests a potential strategic direction in the allocation of resources and infrastructure. Specifically, it implies that infrastructure and facilities might have been targeted toward provinces with comparatively lower employment rates, potentially as a means to stimulate local economies and create employment opportunities. These findings raise important questions about the effectiveness of current rural employment policies and highlight the need for further analysis. Future research could investigate whether these targeted investments effectively translated into increased employment and assess the mechanisms through which facility deployment impacts job creation, thereby providing valuable insights for evidence-based policy refinement. A quantitative causal assessment of these results is needed to establish which factors are contributing most to employment in these regions. This, in turn, will enable a more robust policy design.

4.3 Setting

This research analyzes the impact of the REP on employment rates, using two independent datasets: the LFS and KARA data sources. Early studies on microfinance, suggested a lack of long-term macroeconomic effects. However, subsequent research presented a more nuanced view and found a positive and long-run but insignificant effect of microfinance. Ongoing research has progressively established a long-run positive impact on the economy. Building on these findings, our study aims to investigate whether the REP, as a form of microfinance, demonstrates similar effects on Iranian employment. The analysis will consider the findings of prior microfinance studies and their evolving conclusions on the subject to interpret the results obtained using LFS and KARA data (Esther et al., 2013; Banerjee et al., 2015).

As Banerjee et al. (2019) result for find a long run effect of microfinance, it seems that Autoregressive Distributed Lag (ARDL) models offer a simultaneous

analysis of short-run and long-run relationships between variables. (Nkoro and Uko, 2016) In applied econometrics, the ARDL approach, including the bound testing procedure for cointegration (B. Pesaran and Pesaran, 2009; M. H. Pesaran, 2021), offers a solution for investigating long-run relationships among non-stationary time series. This approach allows reparameterization into an Error Correction Model (ECM), offering advantages over other cointegration techniques such as the Johamen-Jtiselius method (Johamen and Jtiselius, 1990) .

Another method, which is commonly used to address panel data with dynamic endogeneity bias, is the Generalized Method of Moments (GMM), a robust econometric technique effective for analyzing employment impacts. (Arellano and Bond, 1991). Theoretically, it is well established that using second or third lags of the dependent variable as instruments in GMM estimations effectively addresses the endogeneity introduced by including the first lag of the dependent variable as a regressor. In basic GMM, a wide variety of potential IVs can be used, selected based on theoretical justification and exogeneity. Meanwhile, Arellano-Bond GMM (AB GMM) primarily utilizes lagged differences of the dependent variable to eliminate unobserved effects and address autoregressive structures. Blundell-Bond GMM (BB GMM) extends this by combining both lagged differences and levels, aiming to both eliminate fixed effects and enhance the strength and efficiency of instruments in the presence of persistent data. (Baum et al., 2003; Blundell et al., 2000; Zsohar, 2012) As mentioned earlier, these methods are well-established in analyzing panel datasets, especially in macro-level analysis.

Ayyagari et al. (2021), among others, have successfully used the introduction of credit bureaus as an instrumental variable to analyze microfinance's effects on employment, where the credit bureaus introduce a positive shock to credit supply. They analyzed the impact of access to finance on job growth in a sample of 50,000 firms across 70 developing countries. The findings indicate that increased access to finance positively correlates with employment growth, particularly for small and medium-sized enterprises (SMEs).

However, the overall effect of financial interventions is complex and not always straightforward, as seen in the analysis by (Dizikes, 2012) and (Kaboski and Townsend, 2012) on the Thai government's Million Baht program. They result that consumption grew, incomes for those in agriculture and other forms of business increased, and wages for workers rose. These are signs of economic growth, but the overall growth of assets in villages slowed down.

To see other side of the story, (Breza and Kinnan, 2021) using data from the state of Andhra Pradesh which resource allocation was suddenly stopped in 2010 and

comparing it with other states that microfinance program continued. The results of this study indicate that consumption, income, and employment in general equilibrium in the rural labor market have decreased.

Our analysis seeks to elucidate the complex relationship between financial access and employment, a question with significant policy implications. To rigorously investigate this relationship, we employ econometric techniques that account for heterogeneity across activities, cities, and time periods. Motivated by Banerjee et al. (2019), which suggest that microfinance impacts manifest with a time lag, our models incorporate lagged payment terms to capture these dynamics. The panel data, spanning quarterly observations from 2017 to 2022, 426 cities, and activities classified by 2-digit ASIC codes, necessitate a flexible and robust modeling framework. beside GMM models which is most popular in this context (Ullah et al., 2018), we adopt a Fixed Effects (FE) regression approach (Mroua and Trabelsi, 2020). City-specific fixed effects control for unobserved heterogeneity across cities, ensuring that estimated coefficients are robust to time-invariant city characteristics. To account for Iran's high inflation, we include time dummies to capture inflationary effects.

The general form of a panel data linear regression FE model with a large number of group-specific fixed effects can be expressed as follows:

$$emp.rate_{t.c.a} = \alpha + \beta.emp.rate_{t-1.c.a} + \gamma.log.Payment_{t-3.c.a} + \phi_{city} + \sum \theta_i Year\_Dummy_i + \epsilon_{t.c.a} \quad (3)$$

where $emp.rate_{t.c.a}$ is employment rate at time t, city c and activity a. $log.Payment_{t-3.c.a}$ is natural logarithm of microfinance payment in REP at time $t-3$, city c and activity a. The terms ϕ_{city} are characteristics representing the fixed effect for city c, allowing for city-specific time-invariant unobserved heterogeneity. $Year\_Dummy_i$ is dummy for year time controlling for individual-specific effects and other time-varying covariates. $\epsilon_{t.c.a}$ is the error term at time t, city c and activity a, capturing the unobserved factors affecting the employment rate for a given city-time combination?

The corresponding GMM models is representing by equation (4), where we use lags of the employment rate as IVs in all GMM models—GMM, AB GMM, BB GMM—to address endogeneity issues associated with using the employment rate's lag as an explanatory variable with different lag formats level or difference.

$$emp.rate_{t.c.a} = \alpha + \beta.emp.rate_{t-1.c.a} + \gamma.log.Payment_{t-3.c.a} + \phi_{city} + \lambda_{time} + IV + \epsilon_{t.c.a} \quad (4)$$

where all notations are the same as in the FE specification, except that λ_{time} is dummy for year time controlling for individual-specific effects and other time-varying covariates. The instruments used in the GMM models include lags of the dependent variable (lags(2/.), lags(2/4), lags(2/3) employment rate) as well as first differences of the employment rate.

Specifically, α is the model's intercept, and β is the coefficient on the first lag of the employment rate. This coefficient measures the extent to which past employment levels influence current employment rates. γ is the coefficient for the lagged log-payment variable. It represents the effect of a change in the corresponding lagged variable on employment rate at the current time period, that quantify the effect of log-payments, where 3 denotes 3 period lags from the current period. θ is the coefficient for the $Year\_Dummy$ which provides a measure of the effect that specific year has on the employment rate.

5. Result

To ensure the robustness of our findings, we explore a range of econometric approaches, including GMM, AB GMM, BB GMM, and ARDL models. However, due to the unbalanced structure of the panel data and the limited number of groups, the ARDL model is not applicable in this context. While each of these methods offers unique advantages, they also come with specific assumptions and requirements regarding instrument validity or cross-sectional heterogeneity. Table 4 presents result of the FE and GMM models, including standard GMM, AB GMM, BB GMM, revealing significant coefficient, robust standard errors and reliable estimates for the REP effect on Iranian employment. the REP coefficient ranges in all models, reflecting differences in model assumptions and estimation. while FE and GMMs models consistently pass validity tests for heteroskedasticity, serial correlation, and cross-sectional dependence, ensuring robust and reliable estimates; In contrast, the ARDL model is unsuitable for our unbalanced panel data, requiring restrictive assumptions that undermine result validity.

The log-payment variable exhibits positive and statistically significant coefficients in all models, indicating a positive association between previous payments and current employment rates. To assess the validity of our models We teste for multicollinearity using Variance Inflation Factors (VIFs), finding an average VIF of 1.00, indicating a no correlation between independent variables, does not any significant concern to the analysis. The R_squared, indicating that the overall FE model is highly significant. The overall models F-statistic indicates that

the predictors are statistically significant. Additionally, the fixed effects F-test confirms that the city fixed effects are jointly significant.

Prior to regression, we confirmed the stationarity of key variables using Augmented Dickey-Fuller (ADF) tests. These tests strongly indicate stationarity for both employment rates and log-payments, which is crucial for the valid estimation of our dynamic model. Further, inclusion of the robust option in the command suggests heteroscedasticity is likely not a significant concern in this model.[1]

Our analysis, based on a dynamic panel-data model, reveals significant insights into the impact of microfinance payments on employment rates. The summary statistics indicate that the average employment rate across observed periods is approximately 40.94%, with payments averaging around 27.4 billion Tomans per city, quarter and activity. (The reported averages are calculated by disaggregating the data across individual cities, quarters (Q42017, …, Q12022), and economic activity. For each combination of city, quarter, and activity sector, the employment rate and total payments were computed, and then averaged across all observations. The figure of 27.4 billion Tomans refers to the mean payment value per sector, per city, per quarter, not the aggregate across all sectors.) The model results demonstrate that microfinance payments have a positive and statistically significant effect on employment rates, particularly when considering the lagged log-payment at period 3.

Specifically, our findings show that an increase in average sum of payment per city, quarter, and activity, by 1 billion Tomans is associated with an approximate increase of 1.6 percentage points in the employment rate. This effect, while modest, underscores the potential of microfinance to stimulate economic activity and employment.

[1]. As requested by referees of this paper, we run the Sargan test for instrument validity, while we believe that the AB GMM is well established and using the 2nd lagged of macro variable as the instrument for the 1st variables are conceptually accepted. This concept is consistent with the assumption of an AR(1) distribution for most macro variables, unless other evidence exists. Thought, the Sargent tests reject the null hypothesis of valid IVs, but this does not conclusively invalidate the underlying GMM models as explained above. As noted by (Baum et al., 2003), the Hansen–Sargan test reflects the joint validity of instruments and its rejection may result from issues such as instrument proliferation or non-homogeneous errors, rather than necessarily indicating a flawed model structure.

Table 4. Comparison of Regression Results Across Different Model Specifications and Time Dummies.

	GMM		**AB GMM**		**BB GMM**		**FE**	
Dependent Var.	Employment_Rate(t,city,activity)							
IV (emp_rate)	L(2/4)		L(2/3)		L(2/4)		N/A	
	Year Quarter Dummy							
Constant	-363.3***	(10.54)	-21.97***	(4.197)	15.87***	(0.987)	35.23***	(0.495)
L.emp_rate	0.967***	(0.01)	0.346***	(0.005)	0.365***	(0.004)	0.120***	(0.003)
L3.log_payment	8.830***	(0.44)	2.190***	(0.172)	0.361***	(0.002)	0.103***	(0.016)
Observations	70,680		85,440		85,440		85,440	
GMM Test	760		3,597		7,937		N/A	
P_Value	0.00		0.00		0.00		0.00	
R-squared	N/A		N/A		N/A		0.6874	
	Year Dummy							
Constant	-2,219***	(10.96)	-18.10***	(0.919)	9.148***	(0.524)	28.62***	(0.481)
L.emp_rate	0.948***	(0.010)	0.325***	(0.005)	0.332***	(0.004)	0.108***	(0.003)
L3.log_payment	9.393***	(0.458)	2.103***	(0.037)	0.841***	(0.019)	0.438***	(0.015)
Observations	70,680		85,440		85,440		85,440	
GMM Test	693		5,426		11,126		N/A	
P_Value	0.00		0.00		0.00		0.00	
R-squared	N/A		N/A		N/A		0.664	

Source: Research finding.

Note: Standard errors are reported in parentheses below each coefficient. Statistical significance is denoted as follows: * p<0.05, ** p<0.01, *** p<0.001. The city effects are observed in all models.

To further explore the heterogeneity in our findings, we conduct a quantile regression analysis, allowing us to examine the effect of our key variables across different levels of the employment rate and expenditure distribution. In Table 5, we present the results of this quantile analysis alongside one of our baseline models, comparing the estimated coefficients and standard errors. We select the cities exhibiting the highest and lowest average employment rates to represent the extremes of our distribution and perform the quantile regression model using these subsamples, alongside running the model for the entire sample. We similarly select cities with the highest and lowest total expenditures to verify if the effects are driven by the cities with the highest activity. This method enables us to assess if the impact of lagged employment rates and log-payments varies systematically across cities with varying performance. This procedure will allow us to see how the explanatory variables influence the dependent variable at different quantiles of its distribution. The quantile regression results are presented in Table 5, with columns 1 through 5 representing the base model, highest employment, lowest Employment, highest expenditure, lowest expenditure, respectively. We report the estimated coefficients for each explanatory variable within these subgroups and conduct tests for coefficient equality across different quantiles to determine if these effects are statistically consistent or vary significantly across the distribution.

Table 5. Quantile Models

	1	2	3	4	5
Dependent Var.	Employment_Rate(t,city,activity)				
L.emp_rate	0.108***	0.0358***	0.0689***	0.127***	0.0445***
	(0.003)	(0.005)	(0.004)	(0.007)	(0.008)
L3.log_payment	0.438***	0.477***	-0.00971	0.275***	0.553***
	(0.015)	(0.03)	(0.019)	(0.025)	(0.042)
year_dummy1	-4.828***	N/A	0.991	N/A	N/A
	(0.904)	N/A	()	N/A	N/A
year_dummy2	-3.064***	-0.13	-0.162	-5.696***	1.188***
	(0.345)	(0.112)	(0.522)	(0.393)	(0.158)
year_dummy3	-2.046***	1.246***	0.407	-4.402***	1.967***
	(-0.346)	(-0.075)	(-0.519)	(-0.395)	(-0.105)
year_dummy4	-3.598***	N/A	-1.057**	-4.891***	N/A
	(0.345)	N/A	(0.516)	(0.393)	N/A
Constant	28.62***	37.97***	29.13***	33.47***	23.08***
	(0.481)	(0.748)	(0.696)	(0.715)	(1.031)
Observations	85440	16200	17460	17969	16560
R-squared	0.664	0.576	0.702	0.699	0.604

Source: Research finding.

Note: The results are presented for five models in the following order: 1-Base model. 2-Highest Employment. 3-Lowest Employment. 4-Highest Expenditure. 5-Lowest Expenditure. The coefficient of dummy for year 1400 can't release because of low observation in that year. Standard errors are reported in parentheses below each coefficient. Statistical significance is denoted as follows: * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

The quantile regression results, present in Table 5, reveal several important patterns across the distribution of employment rates. First, we observe that the impact of lagged employment rates remains consistently positive and statistically significant across all quantiles, indicating that past employment levels are a robust predictor of current employment, regardless of a city's The quantile regression results, present in Table 5, reveal several important patterns across the distribution of employment rates. First, we observe that the impact of lagged employment rates remains consistently positive and statistically significant across all quantiles, indicating that past employment levels are a robust predictor of current employment, regardless of a city's employment performance. Second, the effects of lagged logarithm of payments present an interesting pattern. The effect of lag logarithm of payments is always positive and highly significant. Although, our

analysis reveals that the impact of microfinance payments is more pronounce in cities with higher employment rates. This finding suggests that microfinance initiatives yield greater benefits in areas where economic activity is already robust. One plausible explanation for this phenomenon is the presence of more productive activities in these cities. Higher employment rates often indicate a more dynamic and diversified economy, where businesses and entrepreneurs can leverage microfinance to expand operations, invest in new opportunities, and create additional jobs. Consequently, the infusion of microfinance payments in such environments amplifies economic growth and employment, highlighting the synergistic relationship between microfinance and existing economic growth.

Interestingly, our findings also indicate that the effect of microfinance is significant in the poorest cities, although the mechanisms differ. In these areas, microfinance can play a crucial role in alleviating poverty by providing essential financial services to underserved populations. By offering small loans and financial support, microfinance enable individuals to start or sustain micro-enterprises, which can generate income and contribute to local economic development. This dual impact of microfinance, enhancing growth in economically vibrant cities and reducing poverty in the poorest areas, underscores its versatility and importance as a tool for inclusive economic development.

Following the omission of outlier observations—defined as firms with a payment and commitment to generate a job exceeding the 99th percentile and corresponding to six companies, namely Rojin Tak Kermanshah, Novin Safran, Safran Mostafavi, Tabarok, Kafsh Azar Sharghi and Dehkade Khormaye Bam—and accounting for a negligible 0.67% of the total sample, as shown in Figuer 4, the analysis reveals that the estimated average cost of creating one job within the REP is approximately 214 million Tomans at a fixed price for the year 2022. This finding, based on the remaining 99.33% of the observations, provides a more robust estimate of the typical cost associated with job creation in the REP, as it mitigates the influence of extreme values that could skew the overall average. This estimate suggests that the average cost is a substantial investment.

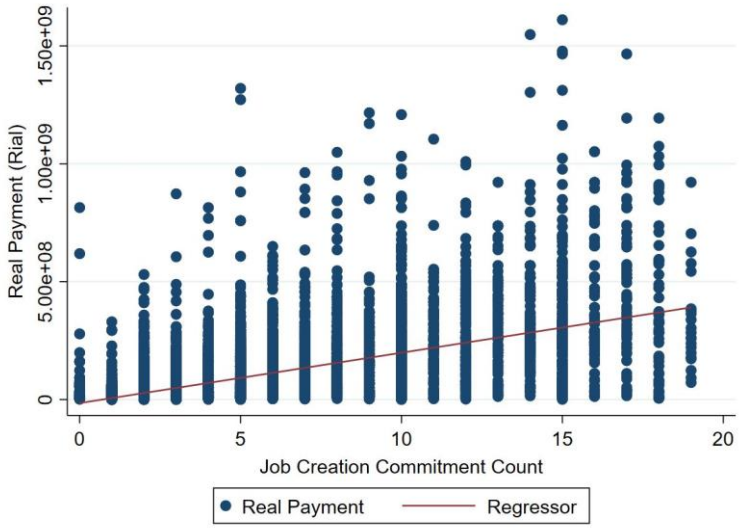

Figure 4. Job Creation Cost
Source: Research finding.

6. Conclusion

Microfinance is widely recognized as a crucial tool in welfare policies, significantly impacting various economic outcomes. In Iran, the REP was implemented to enhance rural employment rates. The REP provided low-interest loans to low-income individuals in villages and small towns who lacked the collateral typically required for conventional loans. The REP operated on the principle of job creation in exchange for funding. Instead of traditional collateral, the program used a combination of low-value assets and a commitment to generate a specified number of jobs. This paper investigates the effect of REP payments on the employment rate. Our analysis, using a linear regression with city fixed effects, confirms that REP payments have a significant impact on employment rate. While the immediate, short-run effect is limited, the cumulative impact over the following three quarters leads to a substantial increase in the employment rate. The results indicate that by increasing the average sum of payment per city, quarter, and activity by 1 billion Tomans, we can observe an increase in the employment rate by 1.6%.

Policymakers should consider the potential of the REP to generate increases in employment. However, it is essential to note that the program's effects do not manifest immediately and are more of a long-term solution to increasing employment rates. Furthermore, our estimations suggest that the impact of the REP is amplified by robust previous economic activity, and it plays a crucial role in alleviating poverty

by providing essential financial services to underserved populations. These results, demonstrate through quantile regression, indicate that the REP has a more significant effect on the employment rate in cities with higher employment rates or in cities with lower expenditures.

REP investigating results are robust and carry important policy implications that the cost of creating a job is 214 million Tomans at a fixed price of 2022, highlighting the substantial financial investment required for each employment opportunity.

This study is limited by the availability of data. As discussed, the microfinance effect has a long-run impact, which is better realized over time. However, the LFS has not been released quarterly since 2022 and is now only available annually. Therefore, we cannot observe its long-run effect over.

Future research should focus on longitudinal studies comparing various microfinance policies in Iran to determine which are most effective at boosting employment and other economic outcomes. Despite these challenges, our study contributes to the understanding of microfinance efficacy and underscores the necessity of carefully designing interventions to maximize their impact and ensure sustainable employment growth in Iran. Additionally, a valuable research topic would be to explore the differential effects of microfinance across various cities or activities, examining how local conditions or specific industries influence the effectiveness of these financial interventions.

Moreover, our results challenge the prevailing academic view in Iran that such programs have limited effects on economic variables. We provide robust evidence that the REP has a positive and significant impact on employment rates, persisting even amidst the adverse economic conditions imposed by sanctions and the COVID-19 pandemic. Policymakers must, therefore, ensure the transparent and effective allocation of financial resources and maintain consistent program implementation over time to optimize these impacts.

The observed link between loan volume and loan size in cities also suggests a reinforcing cycle where regions already benefiting from more loans receive larger financial infusions. This pattern necessitates a careful evaluation and possibly the formulation of policies that ensure broader access to finance across all regions to avoid reinforcing regional disparities.

Statements and Declarations

- Funding: This work does not receive any funding.
- Conflict of interest: The authors declare that there is no conflict of interest.

- Acknowledgements: The authors acknowledge Dr. MohammadHosein Rahmati for providing data access and Dr. Mohsen Mehraara, Dean of the Faculty, for his guidance in econometrics and his support during the defense.

References

Aiginger, K., & Rodrik, D. (2020). Rebirth of Industrial Policy and an Agenda for the Twenty-First Century. *Journal of Industry, Competition and Trade*, *20*(2), 189–207. Retrieved from https://doi.org/10.1007/s10842-019-00322-3

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Review of Economic Studies*, *58*(2), 277–297. Retrieved from https://doi.org/10.2307/2297968

Arulampalam, W., Booth, A., & Taylor, M. (1998). Unemployment persistence. *Oxford Economic Papers*. Retrieved from https://www.researchgate.net/

Ayyagari, M., Juarros, P., Peria, M. S. M., & Singh, S. (2021). Access to finance and job growth: Firm-level evidence across developing countries. *Review of Finance*, *25*(5), 1473–1496. Retrieved from https://doi.org/10.1093/rof/rfab003

Banerjee, A., Breza, E., Duflo, E., & Kinnan, C. (2019). Can microfinance unlock a poverty trap for some entrepreneurs? *NBER Working Paper*, 1–23. Retrieved from https://www.nber.org/papers/w26346

Banerjee, A., Karlan, D., & Zinman, J. (2015). Six randomized evaluations of microcredit: Introduction and further steps. *American Economic Journal: Applied Economics*, *7*(1), 1–21. Retrieved from https://doi.org/10.1257/app.20140287

Baum, C. F., Schaffer, M. E., & Stillman, S. (2003). Instrumental variables and GMM: Estimation and testing. *The Stata Journal*, *3*(1), 1–31. Retrieved from https://doi.org/10.1177/1536867x0300300101

Behnia, M., Pourmohammadi, M., & Azizkhani, F. (2021). Iranian labor market policies and regulations. *Majlis Research Center*.

Bernanke, B. S. (2020). The new tools of monetary policy: American Economic Association presidential address. *American Economic Review*, *110*(4), 943–983. Retrieved from https://doi.org/10.1257/aer.110.4.943

Bloom, N., Bond, S., & Van Reenen, J. (2006). Uncertainty and investment dynamics. *The Review of Economic Studies*, *74*(2), 391–415. Retrieved from https://www.nber.org/system/files/working_papers/w12383/w12383.pdf

Blundell, R., Bond, S., & Windmeijer, F. (2000). Estimation in dynamic panel data models: Improving on the performance of the standard GMM estimator. *Advances in Econometrics*, *15*, 53–91. Retrieved from https://doi.org/10.1016/S0731-9053(00)15003-0

Breza, E., & Kinnan, C. (2021). Measuring the equilibrium impacts of credit: Evidence from the Indian microfinance crisis. *SSRN*. Retrieved from https://doi.org/10.3386/w24329

Dadgar, Y., & Orooji, Z. (2020). Dutch disease, rentier state, and resource curse: A characteristic triangle and ultra challenge in the Iranian economy. *Iranian Economic Review, 24*(1), 129–157. Retrieved from https://doi.org/10.22059/ier.2020.74477

Dizikes, P. (2012). Taking credit. *MIT News*.

Escudero, V. (2018). Are active labour market policies effective in activating and integrating low-skilled individuals? An international comparison. *IZA Journal of Labor Policy, 7*(1). Retrieved from https://doi.org/10.1186/s40173-018-0097-5

Esther, D., Banerjee, A., Glennerster, R., & Kinnan, C. (2013). The miracle of microfinance? Evidence from a randomized evaluation. *NBER Working Paper*. Retrieved from https://www.nber.org/system/files/working_papers/w18950/w18950.pdf

Farajnia, S., Yousefi, K., & Fadaee, M. (2020). Modeling the unemployment rate of Iran: Structural unemployment, sectoral changes and unanticipated monetary policy. *Economic Research*, Retrieved from https://joer.atu.ac.ir/article_12365_en.html

Granja, J., Makridis, C., Yannelis, C., & Zwick, E. (2022). Did the paycheck protection program hit the target? *Journal of Financial Economics, 119*(4), 361–416. Retrieved from https://www.sciencedirect.com/science/article/pii/S0304405X22001131

Hamermesh, D. S. (2021). Labor demand. In *Labor Demand*. Retrieved from https://doi.org/10.2307/j.ctv17ppcqn

Heckman, J., & Pages, C. (2003). Law and employment: Lessons from Latin America and the Caribbean. *National Bureau of Economic Research*, 55(1), 242–245. Retrieved from https://www.nber.org/system/files/working_papers/w10129/w10129.pdf

Hulme, D. (2000). Impact assessment methodologies for microfinance: Theory, experience and better practice. *World Development, 28*(1), 79–98. Retrieved from https://www.sciencedirect.com/science/article/pii/S0305750X99001199

ILO. (2023). *World and Social Outlook: Employment Trends 2023*. International Labour Organization. Retrieved from https://www.ilo.org/publications/flagship-reports/world-employment-and-social-outlook-trends-2023

Imai, K., & Kim, I. S. (2021). On the use of two-way fixed effects regression models for causal inference with panel data. *Political Analysis, 29*(3), 405–415. Retrieved from https://doi.org/10.1017/pan.2020.33

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration: With applications to the demand for money. *Oxford Bulletin of Economics and Statistics, 52*(2), 169–210. Retrieved from https://digilander.libero.it/rocco.mosconi/JohansenJuselius1990.pdf

Kaboski, J. P., & Townsend, R. M. (2012). The impact of credit on village economies. *American Economic Journal: Applied Economics*, *4*(2), 98–133. Retrieved from https://doi.org/10.1257/app.4.2.98

King, R. G., & Levine, R. (1993). Finance, entrepreneurship, and growth: Theory and evidence. *Journal of Monetary Economics*, *32*, 513–542. Retrieved from https://www.academia.edu/download/32906194/9c9605206518fb6846.pdf

Kulish, M., Morley, J., Yamout, N., & Zanetti, F. (2024). Unemployment in a commodity-rich economy: How relevant is Dutch Disease? *SSRN Electronic Journal*. Retrieved from https://doi.org/10.2139/ssrn.4820839

Levine, R., & Loayza, N. (2000). Finance and the sources of growth. *Journal of Financial Economics*, *58*(1–2), 261–300. Retrieved from https://doi.org/10.1016/s0304-405x(00)00072-6

Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. *Journal of Monetary Economics*, *46*(1), 31–77. Retrieved from https://doi.org/10.1016/S0304-3932(00)00017-9

Levine, R., & Zervos, S. (1998). Stock markets, banks, and economic growth. *American Economic Review*, *88*(3), 537–558. Retrieved from https://doi.org/10.2307/116848

Mankiw, N. G. (2024). *Principles of Macroeconomics* (4). Instructor's Manual with Solutions Manual. Retrieved from https://www.academia.edu/download/53871586/solutions_of_book.pdf

Martin, J. P. (2015). Activation and active labour market policies in OECD countries: Stylised facts and evidence on their effectiveness. *IZA Journal of Labor Policy*, *4*(1). Retrieved from https://doi.org/10.1186/s40173-015-0032-y

Mckenzie, D. (2017). How effective are active labor market policies in developing countries? A critical review of recent evidence. *World Bank Research Observer*, *32*(2), 127–154. Retrieved from https://doi.org/10.1093/wbro/lkx001

Morduch, J. (2000). The microfinance schism. *World Development*, *28*(4), 617–629. Retrieved from https://doi.org/10.1016/S0305-750X(99)00151-5

Mroua, M., & Trabelsi, L. (2020). Causality and dynamic relationships between exchange rate and stock market indices in BRICS countries. *Journal of Economics, Finance and Administrative Science*, *25*(50), 395–412. Retrieved from https://doi.org/10.1108/JEFAS-04-2019-0054

Nkoro, E., & Uko, A. K. (2016). Autoregressive distributed lag (ARDL) cointegration technique: Application and interpretation. *Journal of Statistical and Econometric Methods*, *5*(4), 63–91. Retrieved from https://www.researchgate.net/

Pesaran, B., & Pesaran, M. H. (2009). *Time series econometrics: Using Microfit 5.0*. Oxford: Oxford University Press.

Pesaran, M. H. (2021). General diagnostic tests for cross-section dependence in panels. *SSRN Electronic Journal*. Retrieved from https://doi.org/10.2139/ssrn.572504

Pourmohammadi, M., & Yousefi, K. (2021). Pandemic in labor market: Evidence from Iran. *The Journal of Planning and Budgeting*. Retrieved from http://jpbud.ir/browse.php?a_code=A-10-1072-3&sid=1&slc_lang=fa&ftxt=1&pure_pdf=1

Ramos-Herrera, M. D. C. (2023). The effects of minimum wage on unemployment for OECD countries: A dynamic fixed effects panel threshold model perspective. *Economic Research-Ekonomska Istraživanja, 36*(3), 1–17. Retrieved from https://hrcak.srce.hr/file/455045

Ullah, S., Akhtar, P., & Zaefarian, G. (2018). Dealing with endogeneity bias: The generalized method of moments (GMM) for panel data. *Industrial Marketing Management, 71*(November), 69–78. Retrieved from https://doi.org/10.1016/j.indmarman.2017.11.010

Zsohar, P. (2012). Short introduction to the generalized method of moments. *Hungarian Statistical Review, 16*, 1–15. Retrieved from https://www.ksh.hu/statszemle_archive/2012/2012_K16/2012_K16_150.pdf

Ramos-Herrera, M. D. C. (2023). The effects of minimum wage on unemployment for OECD countries: a dynamic fixed effects panel threshold model perspective. *Economic research-Ekonomska istraživanja, 36*(3). Retrieved from https://hrcak.srce.hr/file/455045

Cite this article: Pourmohammadi, M., Taiebnia, A., & Yousefi, K. (2025). Microfinance as a Catalyst for Change: Evaluating the Success of Iran's Rural Employment Program from 2017 to 2022. *Iranian Economic Review*, *29*(3), 1040-1067.