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Unemployment in the Palestinian Territories: Testing How External Funding Makes a Difference Using ARDL Methodology

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Abstract

Unemployment in the Palestinian Territories has reached a critical level due to political instability, economic fragmentation, and restrictions imposed by Israel. This study examines the effects of external funding on unemployment, considering variables such as foreign grants and aid, foreign direct investment, compensation of workers in Israel, private sector transfers from abroad, and trade openness as a control variable. Utilizing quarterly data from 2000 to 2023, this analysis employs the ARDL model to explore the short- and long-term relationships between these variables and unemployment rates. The results show that foreign grants and aid, foreign direct investment, and trade openness significantly reduce unemployment in the long run, indicating that these factors can stimulate employment and economic activity. Conversely, foreign private-sector transfers increase unemployment, suggesting a failure to channel remittances into productive investments. The marginal effects reveal a short-term decrease in unemployment due to foreign grants, while private transfers cause a temporary shock. The error correction model (ECM) indicates a relatively fast convergence towards equilibrium, with approximately 45.7% of each disequilibrium corrected every quarter. These findings underscore the need to align external funding with development priorities, promote the productive use of remittances, and enhance trade openness. Targeted investments, transparency, and economic stability are crucial for maximizing the impact of external funding on reducing unemployment and achieving sustainable development in the Palestinian Territories.

Keywords

Unemployment, External Funding, Foreign Direct Investment, Development Aid, Worker Remittances, Trade Openness, Palestinian Economy, ARDL Model

1. Introduction

Unemployment remains a critical economic issue globally, particularly affecting social stability, economic growth, and political cohesion. In the Palestinian Territories, this challenge is exacerbated by prolonged political instability, economic fragmentation, and restrictive measures imposed by Israel, creating a highly constrained labor market [1]. The Palestinian economy relies heavily on external funding while facing structural deficiencies that limit employment opportunities [2]. Understanding the role of external financial flows—including foreign grants and aid (FGA), foreign direct

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investment (FDI), compensation of workers in Israel (CWI), and private sector transfers from abroad (PTA)—in mitigating unemployment is crucial for designing effective economic policies [3, 4].

Existing literature highlights the significance of external funding in developing economies, where domestic resources are often insufficient [5]. FDI contributes to job creation, technology transfer, and productivity gains [6, 7]. However, the effectiveness of these financial flows depends on their alignment with national development priorities and their productive utilization [8]. In the Palestinian context, geopolitical constraints, including trade and labor mobility restrictions, further complicate the relationship between external funding and unemployment [9]. While studies have examined the effects of foreign aid and remittances on economic indicators such as gross national income and poverty alleviation, few have specifically analyzed their direct impact on unemployment dynamics in Palestine [10]. Given the Palestinian economy's unique economic and political conditions, a targeted approach is necessary to assess the sustainable role of external funding in reducing unemployment [11].

This study addresses this gap by employing the ARDL methodology to conduct a rigorous econometric analysis of the effects of foreign grants and aid, FDI, worker compensation from Israel, and private sector transfers from abroad on unemployment. Unlike previous studies, this research incorporates trade openness as a control variable, offering a more comprehensive understanding of unemployment trends in a conflict-affected economy [12].

The novelty of this study lies in its use of high-frequency quarterly data and its methodological precision in simultaneously examining short- and long-run relationships. While previous studies primarily relied on annual data or fundamental correlation analyses, this research applies advanced econometric techniques to capture both the immediate and long-term effects of external financial inflows on unemployment. Notably, the findings reveal a counterintuitive relationship between foreign private-sector transfers and unemployment, suggesting that such transfers may contribute to its persistence instead of alleviating joblessness. This challenges conventional economic assumptions regarding remittances and underscores the need for policy interventions to direct these funds toward productive investments rather than consumption.

This study contributes to policy discussions on optimizing financial inflows for economic development by providing empirical evidence on the diverse effects of different external funding sources on unemployment. The results offer critical insights for policymakers, international donors, and economic planners seeking to enhance the effectiveness of foreign aid, attract sustainable FDI, and develop trade policies that foster employment generation.

The findings indicate that, In the long run, foreign grants, FDI, and trade openness significantly reduce unemployment by fostering job creation and economic activity. Conversely, private sector transfers from abroad tend to increase unemployment, reflecting inefficiencies in channeling these funds toward investment opportunities. In the short run, foreign grants marginally reduce unemployment. At the same time, private-sector transfers exhibit a positive short-run effect, highlighting the importance of aligning external funding with national development priorities and promoting the productive use of remittances. Additionally, greater trade openness is essential to maximizing the impact of financial inflows on employment. By examining these dynamics, this study provides valuable policy recommendations for leveraging external financial flows to achieve sustainable economic development and improve labor market outcomes in the Palestinian Territories.

2. Literature Review

This section reviews related literature from a theoretical and empirical perspective to establish the research gap and relevance of the current study.

2.1. Theoretical Literature

Unemployment is a problem worldwide and is closely interlinked with economic stability, social equity, and political harmony. Theories of unemployment do present valuable insights into the causes and remedies for unemployment. According to classical economic theory, propounded by early economists such as Adam Smith and David Ricardo, unemployment arises because of rigidities in the labor market. The neoclassical framework maintains that wages will equilibrate supply and demand in a perfectly competitive market to reach full employment. Smith [13] and Ricardo [14] expressed that the labor market creates an equilibrium wage rate that eventually leads to full employment. Fundamental labor markets, however, are not perfect; instead, they have minimum wage laws and unionization that result in wage stickiness and unemployment. Marshall [15] provides one such critical analysis. The theory also neglects the essential role of aggregate demand, especially in a recession, where even wage flexibility cannot stimulate hiring.

Key to Keynesian economics is its alternative perspective, wherein emphasis is placed on the ineffectiveness of aggregate demand as the source of unemployment [16]. Keynes further claims that in phases of recession, when household and firm expenditures are lowered, their respective productions follow and, therefore, decrease employment. With such an argument, this theory suggests interventions from the government in increasing the demand and through those jobs would increase, to be undertaken with fiscal and monetary policies. To this date, it has worked for these policies so far as control of unemployment was concerned in periods of crisis. However, as noted by Friedman [17], excessive dependency on such actions would create more issues, such as inflation and fiscal deficit.

Another critical concept is structural unemployment, which emanates from a mismatch in the skills of workers and the demand for work. Indeed, this incidence is driven by changes in technology and globalization, among other changes in consumer tastes and preferences in goods and services. For instance, the decrease in the manufacturing sectors in the developed countries rendered some workers' skills obsolete, making it necessary to train and policies on incentives to make investments in emerging sectors, according to Autor [18]. On the other hand, frictional unemployment is the transition between jobs and, therefore, an inescapable fact of dynamic labor markets. Policy measures that help reduce frictional unemployment try to increase efficiency in matching job vacancies with job seekers while workers' mobility should be improved. Building upon these, other modern theories like the natural unemployment rate and hysteresis give further dimensions. First coined by Milton Friedman [17] and Edmund Phelps [19], the theory of the natural unemployment rate means a stable economy's supply and demand balance in creating unemployment. It is essential to realize that efforts to lower unemployment below this threshold through expansionary policy result only in temporary gains in employment at the expense of inflation. The hysteresis theory, however, suggests that it is the natural rate itself that is increased as unemployment continuously causes erosion of skills and motivation among workers. It, therefore, requires early intervention to prevent structural unemployment from taking hold.

The fight against unemployment is, therefore, aided by external funding. Thus, external funding becomes crucial in developing economies where domestic savings are inadequately generated since it bridges the gap between the investment requirements and the available resources in which governments can carry out employment-generating projects [2, 20]. External funding comes in several forms, including grants, loans, Foreign Direct Investment, and remittances. Grants and development aid, for instance, are typically non-repayable resources meant for economic development. According to the explanation given by the OECD, it is the aid provided for economic prosperity and has to conform to specific concessional criteria [21, 5]. Development assistance includes needs essential for employment, such as infrastructure, education, and health [4, 11].

Loans, concessional and non-concessional, are another primary external source of financing. Concessionary loans, by definition, carry sweet deals like interest rates and often a longer paying period, while concessional loans transfer the heavy financial burden to the recipient economy. Strategic investments such as loan finance projects in infrastructure developmental projects have maximized employee benefits and profits to the economic cycle, as commented by Sachs [22] and supported by empirical evidence from various developing economies [2, 20].

FDI has been an essential source of job creation by infusing capital, technology, and expertise into host economies. FDI promotes industrial growth and productivity enhancement, allowing economies to integrate into global markets. Resource-seeking investments in extractive industries or efficiency-seeking investments in manufacturing can create considerable employment opportunities. However, the real value of FDI depends on the host country's regulatory framework and ability to attract investment in high-impact sectors [7].

Worker remittances also indirectly reduce unemployment by supporting household incomes and fostering local consumption. Remittances have been the lifeline of families for investment in education, healthcare, and small businesses. From a macro perspective, they strengthen financial development through increased liquidity in local economic systems and access to improved credit facilities. However, it has been noted that over-reliance on remittances brings along potential vulnerabilities, dependency, and reduced labor force participation in recipient countries [23, 24].

In the Palestinian context, external funding has become essential in addressing chronic unemployment, further exacerbated by political instability, economic fragmentation, and structural constraints. Many infrastructures and social development projects have been made possible through grants and development assistance, especially in Gaza and the West Bank [28]. FDI, however, has remained limited due to regulatory uncertainties and the high-risk environment associated with prolonged conflict [29]. Worker remittances have provided vital income support for many Palestinian families, cushioning poverty and stimulating local economies [10, 30].

While external funding indeed had specific positive impacts, systemic challenges constrained its effectiveness in reducing unemployment in Palestine. These include foreign aid dependence, a low labor market absorption capacity, and inadequate coordination between funding sources and national development priorities. It will be paramount that any external funding be matched with targeted investments in strategic, high-impact sectors like renewable energy, technology, and export-oriented industries for sustainable job creation.

2.2. Empirical Literature

The relationship between external funding sources and unemployment has been a significant focus of economic research, especially for developing and conflict-affected areas. Different studies analyzed the impact of foreign direct investments, grants, aids, remittances, and employee compensations on unemployment. These also highlight the reasons for such complicated dynamics. Although various studies provide an overview of using external funding as an unemployment tool, critical evaluation tends to find both the pros and cons.

Research on FDI indicates that the latter plays a twofold role in promoting economic growth and giving rise to employment opportunities. For example, Daoudi [25] investigated the impact of FDI on unemployment in Algeria and

showed that FDI has a scant effect on reducing unemployment in the short and long run. For instance, Nazeer and Masih [26] also pointed out political instability in weakening FDI inflations, constraining its capacity to reduce unemployment in Malaysia. However, other research has identified the optimistic potentiality of FDI in unemployment reduction. Irpan et al. [27] highlighted that FDI significantly reduced unemployment in Malaysia over the long term, especially when coupled with government-supportive policies. The ARDL model was estimated in the study, and from the results, it was observed that a 1% increase in FDI inflows decreased unemployment by 0.255%, showing the significant role FDI can play in job creation when the investment climate is conducive. These findings suggest that although FDI can positively influence employment, success will depend on political and economic stability and alignment of investment strategies with local labor market needs.

Grants and aid are some of the most important modes of unemployment reduction in developing economies. Abu Jamie et al. [11] studied how European aid influenced the economy of Palestine. It was found that even as the aid achieved its intended consequences of stimulating the local economy, its effects had been mainly weakened by blockades imposed by Israeli and internal inefficiencies. Moreover, while critiquing, Wildeman [8] lamented that such foreign aid in the Occupied Palestinian Territory has not effectively ensured that unemployment could be qualitatively reduced to the bare minimum. To him, the reason could be a lack of qualitative analysis or contextually inappropriate aid models. However, Badwan & Atta [31] advanced a discussion over aspects of dependency created by foreign aid toward the Palestinian Authority: it helps the economy by bringing stability while placing several constraints on independent economic policies. These studies underline that aligning aid programs with local development priorities is paramount for the highest possible impact of such programs on the labor markets.

They have tended to become unrivaled sources of foreign finance in particular regions that suffer from a lack of local employment opportunities. Ekanayake et al. [32] explored the impacts of remittances on economic growth and poverty reduction in Latin America. They found they contributed much to the long-term stability of economies and employment generation within the region. Chea [33] talks about remittances in Cambodia, which he identifies have been serving the function of poverty reduction but simultaneously noted an associated rise in income inequality. In the Palestinian context, Saad [30] and Eljafari [10] indicated how remittances were vital in sustaining the economy during political turmoil. While these studies show positive impacts on household income and poverty alleviation, they suggest that the challenge of channeling the remittances into productive investments is yet to be surmounted if long-term unemployment reduction must be guaranteed.

Other essential components of the Palestinian economy are worker compensations from employment in Israel, which also directly affects unemployment dynamics. In this respect, Miaari et al. [9] investigated the effects of Israeli-imposed restrictions on the access of Palestinians to the Israeli labor market on the labor market itself. They established that such restrictions significantly raise unemployment and instability of household income. Bawatneh [35] inquired into the broader impacts of international aid and worker compensation. He has pointed out that though these sources take away the immediate burdens of financiers, they have developed structural dependencies that impede sustainable economic development. Again, findings indicate the direction of reducing dependence on external labor markets by generating opportunities within the domestic economy through indigenous industries.

While the empirical literature underlines the potential of external sources of funding to address unemployment, the critical evaluation shows several limitations and challenges. The impact of external funding on unemployment reduction is often dependent on the recipient country's ability to provide an enabling environment for investment, good governance, and linking up funding with national development priorities. Political instability, restrictive policies, and fiscal independence within regions like Palestine in conflict situations further compound all these. It is a fact that, ultimately, such factors weaken the fuller impact that can be achieved from external funding sources concerning unemployment and economic growth.

3. Data and Methodology

3.1. Data and Variables

The study analyzes quarterly data from the first quarter of 2000 to the third quarter of 2023. While annual data for all variables are available from 1994 to 2023, providing 30 observations since the establishment of the Palestinian National Authority, quarterly data analysis was preferred due to the limited number of annual observations. Quarterly data for all variables is directly available from 2011 to 2023, resulting in 52 observations. To further enhance the dataset, the Denton methodology was utilized to disaggregate annual data into quarterly frequencies starting from 2000, increasing the number of observations to 96 for each variable included in the study.

3.1.1. Dependent Variables

The unemployment rate (UEMR) is the proportion of the labor force ready and willing to work but unable to find work [34]. In this study, the definition of the unemployment rate was adopted as defined by the Palestinian Central Bureau of Statistics, which described it as the percentage of individuals aged 15 years and over who were unemployed during the reporting period but who were willing to work and actively searched for work during the previous four weeks. For the specified period. Data for this indicator were obtained from

the Palestinian Central Bureau of Statistics (PCBS).

3.1.2. Independent Variables

1) *Foreign Grants and Aid (FGA)* Grants and foreign aid are financial support donor countries and international organizations provide to promote economic and social development. This assistance can be provided directly to the recipient country or through intermediaries such as the World Bank or the United Nations [36]. This study defined grants and foreign aid as financial flows from donors, including grants, loans, and technical assistance from the Palestinian Central Bureau of Statistics and the Organization for Economic Cooperation and Development (OECD).

2) *Foreign Direct Investment (FDI)* is defined as the establishment of a lasting interest by a foreign investor in a domestic enterprise, evidenced by ownership of at least 10% of the voting power in the company [37]. This study measures FDI as total foreign investment flows into the Palestinian territories. It is obtained from International Investment Position (IIP) data, specifically Section 91, issued by the Palestinian Central Bureau of Statistics (PCBS) and the Palestinian Monetary Authority (PMA).

3) *Compensation of Employees in Israel (COE)* refers to the total income earned by Palestinian workers working in Israel. This income includes wages, salaries, and other forms of compensation that workers receive as part of their employment in Israeli companies or institutions. This source of income plays an essential role in the economic well-being of Palestinian families and serves as a vital component of external financing for the Palestinian economy.

4) In this study, workers' compensation from Israel was measured as the total flow of wages, salaries, and employment benefits those Palestinian workers receive from Israel. Data for this variable were obtained from the Palestinian Balance of Payments report issued by the Palestinian Central Bureau of Statistics and the Palestinian Monetary Authority. The variable is extracted from official financial flow records and classified under workers' compensation under item 15 in the sixth edition of the balance of payments report [38].

5) *Private Sector Transfers from Abroad (PTA)* Private sector transfers are financial flows sent by individuals or private institutions abroad to individuals or entities in the home country. These remittances are primarily for personal use or consumption and are not linked to labor income [39]. This study defines private sector remittances as remittances from diaspora and other private remittances. Data are obtained from the Palestinian Balance of Payments report, precisely item 23, according to data issued by the Palestinian Central Bureau of Statistics and the Palestine Monetary Authority.

3.1.3. Control Variable

Trade Openness implies no restraint on the movements of goods, services, and factors of production within an economy. It is highly documented that open economies attract more FDI than closed economies because openness in the economy augments efficiency and reduces trade imbalance. Open markets and productive factors are a source of attraction for foreign investors because these foreign investors aim at maximum profit with a priority on efficiency and minimum constraint. The variable trade openness can be quantified as the ratio of total exports and imports against GDP, for instance, Demirhan & Masca [40] and Asiedu [41]. Trade openness indirectly affects unemployment and interacts with the other independent variables by affecting the structure of the local economy, the demand for labor, and the level of market competition. Including trade openness as a control allows us to wash out its effect when examining the relationships between unemployment and the three external funding sources: FDI, foreign grants, and remittances.

In addition, the more open the trade, the better its effect on all the other variables of FDI and remittances, as most relatively open economies will have more significant foreign investment and capital inflows. Incorporating this openness variable allows testing of the described relationships above, thus reducing the possibility of specification bias and potential multicollinearity issues.

Given the unique economic context in which Palestine faces enormous, albeit significant, Israeli-imposed restrictions on trade openness, it is critically warranted to incorporate this variable within the analysis. Controlling trade openness provides more consistent and feasible results in dealing with a significant macroeconomic variable that otherwise would confound the findings and create blurred insights into the unemployment dynamics.

3.2. Empirical Methodology

This paper explores the impact of various types of external funding on unemployment in Palestinian territories. The study uses high-quality time-series data and employs the ARDL model, which deals with mixed integration orders, namely I(0) and I(1), in analyzing both short- and long-run variable relationships. The ARDL approach has been used to overcome the limitations of traditional cointegration methods, thus ensuring robust results in the peculiar context of the Palestinian territories [12].

The approach in this study follows an econometric approach in meeting its objectives. Stability ensures the regression results are reliable since most economic variables have instability because of the unit root problem, making the series non-stationary and dependent on the time for their mean and variances [42]. High R^2 values, Durbin-Watson (DW) statistics, serial correlation in the residuals, and inflated significance of parameters are considered indicators of spurious regressions [43]. The stationarity series has a constant mean,

variance, and covariance, which depends upon the time lags rather than any particular point in time. Stability and order of integration for the variables are checked through Dickey-Fuller (DF), Augmented Dickey-Fuller (ADF), and Phillips-Perron (PP) tests [44]. The main equations are those for autoregressive since stability depends upon the coefficients less than zero. The augmentation models add lagged differences to eliminate serial correlation or autocorrelation.

Optimal lags ensure valid results and are chosen based on the Akaike Information Criterion Akaike [45] and Schwarz Criterion [46], which balance model fit and complexity while penalizing excessive lags. Essentially, cointegration OLS presumes a long-run equilibrium relationship of variables. Traditional bounds test techniques, such as those of Engle-Granger [47] and Johansen [48], demand all variables to underlie the same order of integration. This critical limitation of traditional methods is easily overcome by ARDL, which lets the variables have mixed orders of integration.

Then, the ARDL bounds testing approach will be used according to the following formula:

$$\Delta y_{t=} \beta_0 + \sum_{i=1}^{n} \beta_i \Delta y_{t-i} + \sum_{i=0}^{n} \delta_i \Delta x_{t-i} + \varphi_1 y_{t-1} + \varphi_2 x_{t-1} + \mu_1$$

When looking at the equation, it is essential to consider the different components involved. The first difference operator (Δ), drift components (β_0), and the error term (μ) play crucial roles. The error term is expected to exhibit characteristics such as being serially independent, homoscedastic, and normally distributed. All β and δ coefficients are non-zero, with φ_1 also being negative and significant, representing the speed of adjustment. The parameters β_i and δ_i are short-run dynamic coefficients, whereas φ_1 and φ_2 are long-run coefficients.

The subsequent phase will confirm the existence of a durable association between the variables through the utilization of the bounds test, as per the F-test methodology proposed by Pesaran et al. [12]. The cointegration is examined in the preceding equation by comparing the outcomes of the null hypothesis, which posits the absence of cointegration, with the alternative hypothesis, which acknowledges the existence of cointegration. The decision is made by comparing the computed F value with the critical values proposed by Pesaran et al. [12] within the required bounds. The null hypothesis is rejected in favor of the alternative hypothesis if the calculated F value exceeds the tabulated value. In the event of cointegration among the variables, the subsequent stage entails the estimation of the long-term equation utilizing the following formula:

$$y_t = \beta_0 + \sum_{i=1}^{p} \partial_i y_{t-i} + \sum_{i=0}^{q} \theta_i x_{t-1} + \epsilon_t$$

Where ∂, θ represents the variable's coefficients, p and q refer to the lag periods for those variables, while ε represents the random error term.

Then, specifications of the ARDL autoregressive distributed lag model for short-run dynamics and Error Correction Model are derived by constructing the following equation (ECM):

$$ECM: \Delta y_t = c + \sum_{i=1}^{p} \partial_i \Delta y_{t-1} + \sum_{i=0}^{q} \theta_i \Delta x_{t-1} + \omega ECT_{t-1} + v_t$$

ECTt-1 is the error correction term, and all the coefficients in the short-run equation relate to the dynamics of the short run to converge the model to equilibrium, representing ω as the error correction coefficient measuring the speed of adjustment that brings the imbalance in the short run towards long-run equilibrium. It is expected that the value of ω should be negative and significant as a condition for accepting the model estimates in the short term.

Before the adoption of ARDL results, diagnostic tests for serial correlation, heteroskedasticity, normality of residuals, and functional form verification were done through the Ramsey RESET test [49]. The variance inflation factor is checked for multicollinearity problems [50]. CUSUM and CUSUMSQ tests were performed to check stability in the model parameters, which detect structural changes and instability amongst the parameters [51].

3.3. Model Specifications

The equation formula below will be used to measure the impact of external funding and trade openness on the unemployment rate in the Palestinian territories according to the ARDL methodology.

$$\Delta LUEMR_t = + \sum_{i=1}^{p} \beta_{1i} \Delta LUEMR_{t-i} + \sum_{i=0}^{q} \beta_{2i} \Delta LFDI_{t-1} + \sum_{i=0}^{q} \beta_{3i} \Delta LFGA_{t-1}$$

$$+ \sum_{i=0}^{q} \beta_{4i} \Delta LCWI_{t-1} + \sum_{i=0}^{q} \beta_{5i} \Delta LPTA_{t-1} + \sum_{i=0}^{q} \beta_{6i} \Delta LOPNT_{t-1} +$$

$$\lambda_1 LUEMR_{t-1} + \lambda_2 LFDI_{t-1} + \lambda_3 LFGA_{t-1} + \lambda_4 LCWI_{t-1} + \lambda_5 LPTA_{t-1} + \lambda_6 LOPNT_{t-1} + \varepsilon_t$$

Explanation of Variables:
1) $\Delta LUEMR_t$: First differences between the log-transformed dependent variables at a time t for unemployment rate.
2) $\Delta LFDI_t, \Delta LFGA_t, \Delta LCWI_t, \Delta LPTA_t, \Delta LOPNT_t$: The first difference of the log-transformed independent variables at time t for Foreign Direct Investment, Foreign Grants and Aid, Compensation of Workers in Israel, Private Sector Transfers from Abroad, and Trade Openness (as control variable), respectively.

3) $LUEMR_{t-1}$: Lagged log-transformed dependent variables at time t -1 for Unemployment Rate.
4) $LFDI_{t-1}, LFGA_{t-1}, LCWI_{t-1}, LPTA_{t-1}, LOPNT_{t-1}$: Lagged log-transformed independent variables at time t -1 for Foreign Direct Investment, Foreign Grants and Aid, Compensation of Workers in Israel, Private Sector Transfers from Abroad, and Trade Openness (as control variable), respectively.
5) α: Intercept term.
6) $\beta_{1i}, \beta_{2i}, \beta_{3i}, \beta_{4i}, \beta_{5i}, \beta_{6i}$: Coefficients represent the short-term effects of the independent variables on the dependent variable.
7) $\lambda_1, \lambda_2, \lambda_3, \lambda_4, \lambda_5, \lambda_6$: Coefficients represent the long-term effects of the independent variables on the dependent variable.

8) εt: Error is a term that captures stochastic disturbances at time t.

3.4. Empirical Results and Discussion

3.4.1. Unit Root Test

Before conducting the ARDL bounds test, it is essential to assess the stationarity status of all variables to determine their level of integration. It is necessary to confirm that the variable's level of stationarity is not I(2) to avoid unreliable outcomes. Fosu and Magnus [52] argue that the F-statistics calculated for I(2) by Pesaran et al. [12] have been regarded as invalid due to the concept made by the bounds test, which assumes that the variables being evaluated are either I(0) or I(1).

Table 1. Unit Root Test.

| Variable | Formula | Augmented Dickey-Fuller (ADF) | | Phillip-Perron | | Conclusion |
		Levels	1ˢᵗ difference	Levels	1ˢᵗ difference	
LUEMR	Intercept	-4.065***	---	-5.261***	---	I(0)
	Intercept & trend	-4.178***	---	-5.058***	---	
LFGA	Intercept	-2.723*	-11.329***	-8.106***	-53.303***	I(1)
	Intercept & trend	-2.700	-11.340***	-9.130***	-73.681***	
LFDI	Intercept	-1.368	-4.598***	-1.645	-4.582***	I(1)
	Intercept & trend	-2.274	-4.583***	-2.059	-4.578***	
LCWI	Intercept	0.406	-8.518***	-1.348	-8.625***	I(1)
	Intercept & trend	-4.293***	-8.751***	0.269	-8.839***	
LPTA	Intercept	-1.509	-6.530***	-1.366	-6.552***	I(1)
	Intercept & trend	-3.219*	-6.500***	-2.679	-6.510***	
LOPNT	Intercept	-2.110	-10.574***	-2.031	-10.625***	I(1)
	Intercept & trend	-1.657	-10.736***	-1.511	-11.032***	
Notes:	***,**, and * denote rejecting the null hypothesis of unit root existence at the 1%, 5%, and 10% significance levels, respectively. The lag length selection was based on the Schwarz information criterion (SIC) for the ADF test, and the bandwidth selection was based on Newey-West using Bartlett Kernel for the PP tests.					

Hence, performing unit root tests in the ARDL procedure is crucial to confirm that none of the variables has an integration order of I(2) or higher. The Dickey-Fuller test (ADF) and the Phillips-Perron test (P.P) are commonly used to determine a unit root's existence in a time series. This study utilizes both tests that measure the stationarity of the time series in the model and confirm that the variables of concern do not demonstrate stationarity in their second differences or I(2), as shown in Table 1.

3.4.2. Cointegration Tests

Table 2 presents the long-run cointegration results, essential in explaining the equilibrium relationship between the variables under study. The results are based on two tests: the Trace statistic and the Maximum Eigenvalue statistic. Both are employed in determining the presence of cointegration. Cointegration implies a long-term relationship among the variables and gives insight into their behavior toward each other.

Hypothesized No. of CE(s)	Trace			Maximum Eigenvalue		
	Tace statistic	0.05 Critical Value	*p*-value**	Max-Eigen Statistic	0.05 Critical Value	*p*-value**
None *	127.094	95.754	0.000	45.512	40.078	0.011
At most 1 *	81.582	69.819	0.004	35.901	33.877	0.028
At most 2	45.680	47.856	0.079	23.314	27.584	0.161
At most, 3	22.366	29.797	0.279	17.128	21.1316	0.166
At most 4	5.239	15.495	0.783	5.149	14.265	0.723
At most 5	0.0897	3.841	0.765	0.090	3.841	0.765

The max-eigenvalue test indicates two cointegrating equation(s) at the 0.05 level. * Denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values.

The Trace statistic indicates that the null hypothesis of no cointegration is rejected at the (5%) significance level for the first two hypotheses, "None" and "At most 1," respectively. Such a scenario indicates that at least two cointegrating equations could exist among the variables. The calculated values of the trace statistic, (127.094) and (81.582), are more significant than their respective critical values of (95.754) and (69.819), respectively, and thus indicate strong evidence of cointegration.

Similarly, the maximum eigenvalue supports the presence of cointegration. The null of the first two hypotheses is again rejected since the Max-Eigen statistic values, (45.512) and (35.901), exceed the tabulated critical values of (40.078) and (33.877), respectively. Thus, we affirm that at least two cointegrating vectors may support the previous inferences obtained under the Trace statistic. The results indicate that the variables in the model are cointegrated; thus, there is a stable long-run relationship among them.

3.4.3. Autoregressive Distributed Lag Model (ARDL) and Bound Test

Table 3 presents the results of the ARDL Bounds Test for a long-run relationship between the unemployment rate and independent variables of external funding sources and trade openness. In this context, this test is especially relevant since it admits some integration order mixture and is thus adapted to the special conditions of Palestinian territories' economies.

The estimated F-statistic is (5.4106), compared to the critical values of Pesaran et al. [12] for the bounds test. At the 5% level, the critical lower bound is (2.550), and the upper bound is (3.606). Since the F-statistic has exceeded the upper crucial value at all significance levels, i.e., 10%, 5%, and 1%, the null hypothesis of no long-run relationship is rejected. This, therefore, provides strong evidence of the long-run cointegrating relationship between the unemployment rate and the independent variables: foreign grants and aid, FDI, compensation of workers in Israel, private sector transfers, and trade openness.

In line with the above assertion, the test result confirms that all the variables are cointegrated, and thus, a steady long-run equilibrium relation exists between the variables under analysis. It is significant, as this already justifies using the ARDL model in an analysis for both short-term dynamics and long-term effects. Moreover, it manifests that external funding sources and trade openness bear their impact significantly and long-term unemployment in the Palestinian territories.

Table 3. Autoregressive Distributed Lag Bounds Test.

Null Hypothesis: No Long-Run Relationships Exist		
Test Statistics	Value	
F-statistics	5.410570	
Critical Value Bounds		
Significance	Lower Bound I(0)	Upper Bound I(1)
10%	2.303	3.154
5%	2.550	3.606
1%	3.351	4.587

Source: Author Calculations (EViews 14)

3.4.4. Estimated Long-run Coefficients

Table 4 presents the estimated long-run coefficients from the ARDL(2,2,0,3,4,0) model. This model captures the long-term relationships of the dependent variable (unem-

ployment rate) with the independent variables (foreign grants and aid, foreign direct investment, compensation of workers in Israel, private sector transfers from abroad, and trade openness). These coefficients stress these variables' contribution or impact on unemployment in the Palestinian territories over the long term.

The coefficient for foreign grants and aids is (-0.090), with a p-value of (0.0016), showing that the negative relationship is significant. It explains that increased foreign grants and aid have reduced unemployment by enabling economic activities and thus creating jobs. Similarly, FDI shows (-0.149) with a p-value of (0.0115), confirming that its role in lowering unemployment through job creation and technology transfer also enhances productivity within the Palestinian economy.

The coefficient of workers' compensation in Israel is (-0.004) with a p-value of (0.8240), showing no significant impact on unemployment. This, therefore, implies that income accruable to Palestinian workers in Israel does not significantly contribute to long-term unemployment, possibly because such earnings may not be widely integrated into the local labor market. On the other hand, private sector transfers from abroad yield a coefficient of (0.152) with a p-value of (0.0005) and thus are positively related. This result, therefore, postulates that in the fact of reduced labor force participation and non-productive investment, remittances may increase unemployment in the long run.

The results show that the coefficient for trade openness is (-0.320), with a p-value of (0.0004); thus, it significantly negatively influences unemployment. Increased trade openness tends to reduce the rate of unemployment by increasing economic activities, providing wider access to the international market, and enhancing competitiveness. The constant term is (1.465), with a p-value of (0.0000), indicating that this is significant in the model.

The long-run coefficients reveal the pivotal roles of foreign grants, FDI, and trade openness in mitigating unemployment in the Palestinian territories. These results align with the study's objective of assessing the potential of external funding to address unemployment in a conflict-affected and politically unstable environment. However, the positive impact of private sector transfers on unemployment underlines the need for policies channeling remittances into productive investments that generate employment opportunities.

Table 4. *Estimated Long-Run Coefficient Using: ARDL(2,2,0,3,4,0) Model.*

Dependent Variable: LUEMR				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFGA(-1)	-0.090	0.027	-3.288	0.0016
LFDI	-0.149	0.057	-2.591	0.0115
LCWI(-1)	-0.004	0.018	-0.223	0.8240

Dependent Variable: LUEMR				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LPTA(-1)	0.152	0.042	3.617	0.0005
LOPNT	-0.320	0.087	-3.678	0.0004
C	1.465	0.290	5.043	0.0000

3.4.5. Error Correction Estimation Results

Table 5 presents the estimation of Error Correction for the ARDL(2,2,0,3,4,0) model, comprising both short-run dynamics and the speed with which the system adjusts toward long-run equilibrium between the unemployment rate and its independent variables. This model's error correction mechanism is important since it addresses the speed at which the return to equilibrium is made after a shock in the system.

The error-correction term, ECM(-1), has a coefficient of (-0.457) with a p-value of (0.0000), showing a highly significant and negative relationship. This means that about 45.7% of any disequilibrium is corrected every quarter, reflecting a relatively rapid adjustment process. This adjustment speed indicates that the Palestinian economy's unemployment rate returns to its long-term equilibrium relatively fast after disturbances.

The short-run dynamics exhibit interesting relationships between the independent variables and unemployment. Foreign grants and aids have a coefficient of (-0.019) and a p-value of (0.081), implying a marginally significant adverse effect in the short run. This means that increased foreign grants and aid will decrease unemployment in the short run. However, workers' compensation in Israel has an insignificant short-run effect, with a coefficient of (-0.0163) and a p-value of (0.756). On the contrary, private sector transfers from abroad significantly positively impact unemployment in the short run, with a coefficient of (0.160) and a p-value of (0.001). It shows that remittances increase unemployment in the short run; the reason is probably a fall in labor force participation or utilizing remittances for consumption purposes, not for any productive investment.

Lagged variables also play an essential role in influencing the rate of unemployment. For instance, past differences in workers' compensation in Israel, D(LCWI(-1)), have a coefficient of (-0.180) with a p-value of (0.002), which shows that past income earned by Palestinian workers in Israel reduces unemployment after a time lag. Other lagged differences, such as D(LCFGA(-1)), are significant in their effects, with historical values playing an essential role in determining the current unemployment trend.

The model has a firm overall fit, with an R-squared of (0.693), explaining about 69.3% of the variation in the unemployment rate. The model's overall statistical significance is confirmed by the F-statistic of (16.241) and a p-value of (0.000), showing its reliability in capturing unemployment

dynamics in the Palestinian territories.

Table 5. Error-Correction Estimation for Estimated ARDL(2,2,0,3,4,0) Model.

Cointegrating Form				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(LCFGA)	-0.019	0.010	-1.766	0.081
D(LCFGA(-1))	0.032	0.012	2.637	0.010
D(LCWI)	-0.0163	0.053	-0.312	0.756
D(LCWI(-1))	-0.180	0.057	-3.169	0.002
D(LCWI(-2))	0.151	0.050	3.013	0.004
D(LPTA)	0.160	0.044	3.655	0.001
D(LPTA(-1))	0.022	0.062	0.355	0.724
D(LPTA(-2))	-0.065	0.043	-1.526	0.131
D(LPTA(-3))	-0.134	0.054	-2.486	0.015
DUMEXT	0.047	0.011	4.333	0.000
ECM(-1)	-0.457	0.082	-5.581	0.0000
R-squared		0.693	Mean dependent var	0.002
Adjusted R-squared		0.651	S.D. dependent var	0.050
S.E. of regression		0.0296	Akaike info criterion	-4.083
Sum squared resid		0.069	Schwarz criterion	-3.751
Log-likelihood		197.758	Hannan-Quinn criteria.	-3.949
F-statistic		16.241	Durbin-Watson stat	1.793
Prob(F-statistic)		0.000		

3.4.6. Discussion

The results presented herein give critical meaning to the relationship between unemployment levels and sources of external funding in the Palestinian territories, highlighting the dual role external funding plays in mitigating and, at times, exacerbating unemployment. Therefore, these findings align with prior research but provide nuanced perspectives peculiar to the conflict-affected and politically unstable Palestinian economy.

The long-run negative effect of FGA on unemployment is quite significant, which again aligns with previous studies such as Abu Jamie et al. [11] since development assistance can spur economic activity in practice where this assistance is well linked with national development priorities. However, the limited short-term impact of FGA revealed in this study highlighted the role of institutional capacity and governance in ensuring that aid achieves its intended outcomes. Similarly, Wildeman [8] observed in 2019 that too many aid programs in the Palestinian

territories were still qualitatively inconsistent with the needs of the local people and, hence, cannot do much for substantial unemployment reduction therein. This paper confirms that higher-level policies now require specific interventions targeted at well-picked key sectors for effectively sustainable employment: renewable energy, technology, and infrastructure.

Foreign direct investment is a crucial factor in decreasing unemployment, which is contributed through sheer capital investment and the transfer of technology, which has a long-term impact on export-oriented industries and other industrial sectors. This result confirms the research of Muhd Irpan et al. [27]. The researcher established that the FDI drastically reduced the rates of jobless people in Malaysia, mainly when supported by government policies that properly reappraise them. However, the scant inflows of FDI in the Palestinian Territory are attributed to political instability and regulatory uncertainty, which agrees with Nazeer and Masih [26], who found instability weakening the role of FDI in unemployment reduction. These obstacles can be eliminated

through a stable investment climate with fewer restrictions and incentives given to foreign investors. This has been necessary to reap any potential benefit of FDI in Palestine.

Private sector transfers from abroad (PTA), often considered a stabilizing force for economies, exhibit a counterintuitive positive relationship with unemployment in the long run. This aligns with the findings of Chea [33] in Cambodia, where remittances were linked to reduced labor force participation and income inequality. The short-term results of this study reinforce the argument that remittances may primarily fuel consumption rather than productive investment. This is also corroborated by Saad [30] and Eljafari [10], who witnessed the consumption of remittances by Palestinian families during periods of instability in the political environment. Remittances must, therefore, be spent on building either SMEs or skills, which could later be transformed into employment.

These findings suggest that workers' compensation in Israel CWI appears to influence unemployment in the short run insignificantly; instead, marginal effects were observed in lagged periods. This shows that Palestinian workers structurally depend on the Israeli labor market and that the earnings were not reinvested in the local economy. This corroborates previous research by Miaari et al. [9], where labor restrictions imposed by Israel had negative, destabilizing impacts on Palestinian employment. Policymakers have a considerable job to reduce dependency on labor markets outside their national border. It has been indicated that trade openness reduces unemployment considerably in the long run, which supports Demirhan and Masca [40] on how economic integration positively contributes to labor markets within developing nations. Greater openness to the world markets may promote economic activities, competitiveness, and employment opportunities. According to Arnon et al. [1], these benefits still face hindrances due to Israeli policies imposed on Palestinian trade that are very restrictive. More favorable trade policies, fewer barriers, and increased international trade relations could magnify the impact of openness to trade on employment in Palestine.

However, this study indicates that while external funding can reduce unemployment, it depends on political stability, institutional governance, and alignment with national development goals. These findings point to targeting high-impact sectors, good governance of foreign aid, promoting FDI, and encouraging productive use of remittances as actionable areas for policymakers. These could also trigger trade openness and reduction of external dependency, which thus may lead to sustainable economic growth and improvement of labor market performances in the Palestinian territories. This study builds on existing research while offering context-specific recommendations to meet the peculiar challenge of unemployment within a conflict-affected environment.

3.4.7. Diagnostic and Stability Testing

Table 6. ARDL model diagnostic tests. These are essential tests for the validity and reliability of the estimated econometric framework. The tests check the fundamental assumptions that any model underestimation using the classical linear regression meets; therefore, the results are robust and do not suffer from any statistical problem that may impair their interpretation.

The heteroscedasticity test yields a statistic of (1.490) with a p-value of (0.123). Since the p-value is more significant than (0.05), the null hypothesis of no heteroscedasticity cannot be rejected. This implies that the variance of the error terms is constant for all observations; therefore, the model does not suffer from heteroscedasticity. Such consistency in variance is essential to ensure that the estimated coefficients are efficient and that the model's predictions are reliable.

The serial correlation test provides a statistic of (1.550) with a p-value of (0.219). The p-value being more significant than (0.05) does not reject the null hypothesis of no serial correlation. It proves that the error terms are not serially correlated; hence, residuals are independent, and thus, statistical inferences based on the model are appropriate.

The kurtosis-based normality test provides a statistic of (0.033) with a p-value of (0.984). This high p-value confirms that the residuals are normally distributed, a key assumption for valid hypothesis testing and the construction of confidence intervals. This result further reinforces the model's reliability by confirming that the error terms follow the normal distribution.

These diagnostic test results prove that the ARDL model is well specified with no significant statistical problem. No heteroscedasticity implies constant variance of error terms, while no serial correlation means residuals are uncorrelated. Besides, the normality of residuals supports the validity of statistical inference.

Table 6. *Diagnostic test results.*

Test	Statistics	Probability	Decision
Heteroscedasticity	1.490	0.123	No heteroscedasticity
Serial correlation	1.550	0.219	No serial correlation
Normality (Kurtosis)	0.033	0.984	Residuals are normally distributed.

Source: Author Calculations (EViews 14)

3.4.8. Testing the Structural Stability of the Model

The CUSUM and CUSUM of Squares tests are applied to determine the stability of coefficients and variance over time as regards the reliability of the estimated relationships between unemployment and sources of external funding. The CUSUM test checks for the cumulative sum of recursive residuals, while the CUSUM of Squares test looks at squared residuals to detect structural breaks or instability.

Results from the CUSUM test for Figure 1 indicate that the cumulated sum line did not violate the critical boundaries at a 5% significance level during the sample period. Hence, there is reasonable testimony to stability in coefficients in the estimated model's parameters. Further, in Figure 2, the sum of squares of residuals stayed within their critical boundaries, supporting a belief of variance stability with slight significant structural instability present.
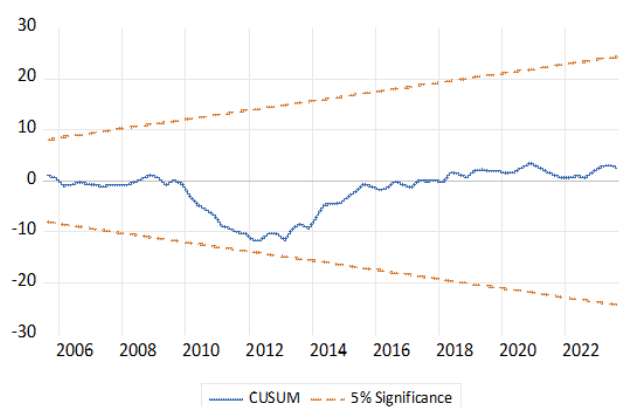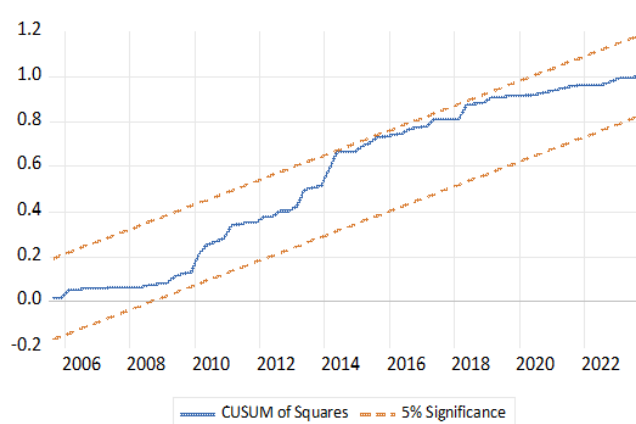

Figure 1. CUSUM.

Figure 2. CUSUM Squares.

These results assure the stability and robustness of the ARDL model in this research context, providing an avenue to examine what impact foreign grants, FDI, and remittances will have on the unemployment rate within the Palestinian

territories. Stability guarantees reliability in findings and is not affected by any time shift or break. This provides essential background regarding economic analysis amidst a conflict that has affected political processes for many years.

Precisely, the stability from this series of tests several times more credibly verifies the results through CUSUM and CUSUM of Squares; therefore, such a result would be trusted by policymakers and researchers to design proper strategies that should be implemented effectively for the external funding sources to help decrease joblessness and contribute to ensuring sustainable economic growth in Palestine. The diagnostic tests carried out here have demonstrated the suitability of the ARDL model in modeling complex regional economic dynamics where the relationships between the variables hold consistently over time.

4. Conclusion

This study investigates the effect of external funding on unemployment in the Palestinian territories using the ARDL model in the short and long run. According to the results obtained, external funding- for instance, foreign grants and aid and FDI- significantly negatively impacts unemployment in the long term. This suggests that these funding sources contribute to creating jobs and economic stability and hence fall in line with the purpose of this study, which investigates ways external financial flows could help mitigate unemployment in a conflict-affected and politically unstable environment. Trade openness is another crucial determinant with a strong negative association with unemployment, implying that greater integration into global markets enhances economic activity and decreases joblessness. On the other hand, in the long run, PTA from abroad shows a positive relationship with unemployment, insinuating that remittances are not being translated effectively into productive investment that creates employment opportunities. Instead, they could reduce labor force participation or use it merely for consumption. This indicates that policies must make remittances orient themselves toward job-creating activities.

The ECM indicates an adjustment speed of about 45.7% per quarter in the short run, meaning deviations from the long-run equilibrium are corrected relatively fast. This underlines the responsiveness of the Palestinian labor market to external shocks. While foreign grants and aid show a marginally negative impact on unemployment in the short run, private-sector transfers have a significant positive effect, further emphasizing remittances' complex and sometimes counterintuitive role in the labor market. Compensation of workers in Israel (CWI) does not significantly impact unemployment in the short run. However, past differences in workers' compensation, $D(LCWI(-1))$, have a coefficient of -0.180 with a p-value of 0.002, indicating that past income earned by Palestinian workers in Israel reduces unemployment over time. This delayed effect highlights the importance of income from this

source as a stabilizing factor for the labor market.

The stability of these coefficients and constant error variance of the model were confirmed by diagnostic tests, such as the CUSUM and the CUSUM of Squares; hence, the results presented are reliable. No heteroscedasticity, series correlation, and nonnormality of the residuals further establish the validity of the adopted model. At this juncture, therefore, the foregoing results become a good index upon which concrete policy recommendations can be made to, among other aspects, attract extra funding towards leveraging sustainable economic developments and job creation in the territories.

Policymakers should maximize the positive impact of foreign funds by directing investments toward high-impact sectors such as renewable energy, technology, and export-oriented industries. Aligning foreign aid and grants with national development priorities is essential to ensuring their efficient and transparent utilization. While external funding is key in addressing unemployment, effective policy implementation is crucial to maximizing its benefits. Optimizing remittances can significantly enhance economic growth, and governments and financial institutions should establish structured investment programs that encourage their productive utilization. Matched savings schemes and incentive-based investment vehicles can help direct remittances toward economic activities that generate employment and foster long-term stability.

Another critical strategy is supporting the development of SMEs. Policies should facilitate the flow of remittances and foreign aid into SMEs through targeted microfinance programs, startup grants, and low-interest loans tailored to Palestinian entrepreneurs. Strengthening the private sector by improving access to capital will enhance job creation and contribute to economic resilience.

Ensuring transparency in foreign aid allocation is essential to maximizing its effectiveness. Establishing a centralized monitoring framework for aid disbursement can help direct funds toward employment-generating sectors while reducing inefficiencies and potential leakages. By increasing oversight and accountability, policymakers can ensure that financial inflows contribute meaningfully to economic development and labor market improvements.

Attracting foreign direct investment (FDI) through well-structured incentives can stimulate job creation and economic stability. The Palestinian government should introduce tax incentives, streamlined regulatory procedures, and investment protection agreements to encourage sustainable foreign investments. Creating a more business-friendly environment will lead to long-term economic stability and employment opportunities.

Strengthening trade facilitation policies can also enhance labor market outcomes and economic resilience. Expanding trade openness by negotiating trade agreements, reducing export barriers, and investing in logistics infrastructure will improve market access and competitiveness. By fostering a more open trade environment, the economy can integrate more effectively into global markets, broadening employment opportunities and enhancing overall economic performance.

These recommendations provide a comprehensive framework for ensuring that external funding sources effectively contribute to sustainable economic development and job creation in the Palestinian territories. By implementing structured financial mechanisms and targeted policies, policymakers can optimize the impact of external funding, fostering a more resilient and inclusive labor market.

Abbreviations

FGA	Foreign Grants and Aid
FDI	Foreign Direct Investment
CWI	Compensation of Workers in Israel
PTA	Private Sector Transfer from Abroad
UEMR	Unemployment Rate
OPNT	Trade Openness

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