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Research Article

Impact of Inflation, Information, Communication and Technology on Unemployment: An Analysis from Developing Countries

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Abstract

Unemployment has been observed as a major issue among the developing and developed economies. Economists and policymakers have provided several choices to deal with this major problem, but economies are still experiencing this problem. Labor force participation rate, industrialization, and information and communication technology seem to be affecting the unemployment rate among the developing economies. Considering the significance, the existing work has focused on the role of these factors affecting the unemployment rate. We have used the unemployment rate as the dependent variable. However, exports, inflation, labor force participation rate, industrialization, and information and communication technology have been used as independent variables. The random effect result showed that labor force participation rate affected the unemployment rate significantly. Moreover, exports, industrialization, and information, communication, and technology seemed to be decreasing the unemployment rate in developing economies. The study findings recommend more technical education and skills for labor to be absorbed in jobs and industries. Moreover, the Government should focus on the provision of information, communication, and technology to achieve high economic growth and lower unemployment.

Keywords: Unemployment; Information, Communication and technology, Industrialization, Developing countries.

Introduction

Unemployment is a multidimensional phenomenon because it has an effect on the economic activity of an economy, along with the social structure of societies. Both dimensions create difficulty and oblige adopting a wide-ranging examination to resolve the current issue. The major aim of every policy formulator, whether from fiscal policy or monetary policy, is to achieve increasing growth. There are a lot of factors for having a high growth rate of an economy, including unemployment. As per Okun's law, there is a negative link between economic growth and unemployment rate (Sahoo & Sahoo, 2019). Information and communication technology is gradually being focused on all sides of human attempts, and the adequacy of Asians to the knowledge and usage of information, communication, and technology remains low. Existing studies indicate that the use of information and communication technology has full-grown in every sector of the economy (Yakovleva & Goltsova, 2016). Youth unemployment has been observed as rising in numerous nations around the globe in spite of efforts that have been made by diverse governments to improve the financial welfare of

the youth, persons aged 15–24 years (ILO, 2011).

Information, communication, and technology are described as any technology that makes possible communication and aids in incarcerating, dealing out, and conveying information by electronic means. It comprises radio, television, and print media. According to Pradhan et al. (2018), 'Information, communication and technology infrastructure is defined as the digital telephone system, mobile phones, internet capability, and internet servers, fixed broadband and further technologies'. In addition, in reference to Toader et al. (2018), it contains hardware, software, networks, media, collected works, storage, processing change, and arrangement of the data. The effect of modern technologies on job opportunities has been taken into account as one of the advanced issues that has acquired a considerable debate in modern and weak nations. Followers of information communication and technology state that electronic technology increases effectiveness, provides a way to get towards novel marketplaces and services, provides job chances, builds original activities, and successively makes improved work probabilities (Vivarelli & Pianta, 2000). Inflation and unemployment equally fluctuate from country to country (Slesnick, 1993). Several nations have experienced high inflation linked to high unemployment. A number of nations have initiated high inflation, reasonably concerned with unemployment, and others have elevated inflation with low unemployment (Blank, 1993).

We have focused on reviewing a few of the vital important studies affecting the unemployment rate in developing and developed nations of the world. Meyer-Krahmer (1992) examined how information and communication technology affected the employment level in different nations of the world by improving job chances. By using data of 51 sectors, it was found that employment was improved by the utilization of better technology and implying complete labor-saving influences. Though purchased research and development concerns, work losses were found in the textile, clothing, and electronic equipment industries. Furthermore, in-house research and development led to an increase in the labor requirement in the chemicals sector and computer industries. Dutt et al. (2009) found a relationship between trade liberalization and unemployment. Fixed effect and GMM results showed that trade openness resulted in decreased unemployment in the economy.

Gordon (2011) found that gross fixed capital formation affected unemployment. It was found that gross fixed capital formation as a share of the GDP had a negative elasticity in the long run, which indicated that increased gross fixed capital formation resulted unemployment rate to be decreased in the long run. The inflation rate has also reduced unemployment in both the short-run and long-run. As the increased inflation rate caused for reduction unemployment rate. The finding was in conformity with the hypothesis explained by Arthur Phillip, which affirmed that a steady inverse association existed between inflation rate and unemployment rate (Gordon, 2011). Núñez and Levanos (2010) also found the factors of unemployment across Europe. The result showed that an academic degree effectively as more effectively reduced short-term unemployment. Ebaidalla (2014) used data from 1995 to 2010 and analyzed the impact of information and communication technologies on youth unemployment in Sub-Saharan Africa. The study findings indicated that mobile subscriptions had a positive the unemployment rate in the African economy. The study suggested employment chances and private foreign direct investment with information and communication technology. Lavrinovicha et al. (2015) emphasized the role of education on the unemployment rate in Latvia by utilizing data from 2002 to 2013. It was found that education level and social and institutional relations improved the employment level of the nation.

By using data from 2001 to 2013, Jelilov et al. (2016) focused on the role of inflation in unemployment. The regression result showed that inflation negatively affected unemployment. It was concluded that a focus should be made to reduce unemployment in the economy. Abiona and Osu (2016) also analyzed the role of information and communication technology skills in affecting youth unemployment reduction by using primary data. The study result highlighted that information and communication skills had positive effects on the socio-economic well-being of youths regarding employment generation, relation, better knowledge, enhanced financial status, and superior resource sharing with youths. Sever and İğdeli (2018) examined the causes of youth unemployment in Turkey by using panel data from 1988 to 2016. The result highlighted that

foreign direct investment had a negative impact the youth unemployment. Mayom (2015) focused on how foreign direct investment may influence unemployment by using data from 1991 to 2009. The author has used the regression technique. The result highlighted that foreign direct investment led to a decrease unemployment rate.

Onanuga and Onanuga (2018) focused on the role of government policy on unemployment and the labor market. Findings pointed out that the net inflow of foreign direct investment negatively affected unemployment. It was also suggested that foreign investment was a better source of job generation in the economy. Molefhi (2019) highlighted the role of financial inclusion in unemployment. The authors have used data from 2004 to 2016 in Botswana. It was found that ownership of bank accounts, availability of bank branches, and borrowing from the commercial bank led to enhanced job chances in Botswana. Postuła et al. (2021) used data from 2009 to 2019 and emphasized on the role of information, communication, and technology on unemployment and poverty. The result revealed that information, communication, and technology led to an increase in the unemployment rate in European economies. Wu et al. (2023) focused on the effect of financial inclusion and remittances on employment levels in Asian nations. The GMM result showed that automated teller machines, remittances, internet users, GDP, and financial globalization had decreased the unemployment level. Success (2024) used data from 1991 to 2022 and checked the effect of foreign direct investment on unemployment in West Africa. The fixed effect result showed that foreign direct investment led to a decrease in unemployment in the economy. Shavvalpour et al. (2024) used data from 1990 to 2020 and found the causes for unemployment in oil-exporting countries. It was found that positive oil price shocks increased unemployment. In addition, positive exchange rate changes led to a decrease in unemployment.

Keeping in view the significance of this issue, this research makes an effort to highlight the major factors such as exports, inflation, labor force participation rate, industrialization, and information and communication technology affecting the unemployment rate in developing economies.

Objectives of the study

Our research highlights the role of exports, inflation, labor force participation, industrialization, and information, communication, and technology in affecting the unemployment rate in a few developing economies. The existing work will provide a novel plan for strategists to provide important policy factors for curbing unemployment.

Research Questions

1. How do exports make reduction in unemployment in developing countries?
2. How does labor force participation affect unemployment in developing nations?
3. What is the effect of inflation on unemployment in some underdeveloped nations?
4. How does industrialization reduce unemployment in developing economies?
5. What is the influence of information, communication, and technology on the unemployment rate?

Significance of the Study

Studies demonstrate major factors such as investment, education, foreign aid, and financial development influencing unemployment and employment in rich and underdeveloped countries. However, our research reveals how inflation, exports, labor force participation, industrialization, and information, communication, and technology affect unemployment in developing countries.

Hypothesis

Important hypotheses are given as:

H1: There is a negative link between exports and the unemployment rate.

H2: The Higher the inflation, the lower the unemployment rate.

H3: Labor force participation rate and unemployment rate are positively associated.

H 4: The Higher the industrialization, the lower the unemployment rate.

H5: There is a positive relationship between information, communication, and technology and the unemployment rate.

Methodology

Here, we have checked the influence of inflation, exports, labor force participation rate, industrialization, and information and communication technology in several developing countries. We have used data from 10 developing economies, such as (i.e., Pakistan, Bangladesh, India, Sri Lanka, Indonesia, the Philippines, Malaysia, Iran, Jordan, and China) from 2011 to 2020, taking into consideration major factors like inflation, exports, industrialization, and information communication and technology. The unemployment rate was taken as a dependent factor. Data on all factors have been drawn from the website of the World Development Indicators. We have used the random effect method to check the relationship between dependent and independent variables in the developing world.

Model Specification

The research points out how inflation, exports, labor force participation rate, industrialization, and information, communication, and technology affect unemployment in developing economies.

Model

$$UNEMPit = \beta_0 + \beta_1 EXPOit + \beta_2 CPINit + \beta_3 LFPRAit + \beta_4 INDSit + \beta_5 ICTINDit + uit \quad (1)$$

Where the subscript "i" indicates certain nations (i = 1...10 for chosen developing economies), though, "t" points out the time requirement. Where UNEMPit reveals the unemployment rate. EXPOit is the exports as a % of GDP. CPINit is the consumer price index. LFPRAit is the labor force participation rate. INDSit is the manufacturing value added % of GDP. Finally, ICTINDit is the information, communication, and technology index (i.e., fixed telephone subscriptions (per 100 people plus mobile cellular subscriptions (per 100 people) in the developing nations.

Results and Discussion

In this section, we have analyzed how exports, labor force participation rate, industrialization, and information, communication, and technology affected unemployment in a few developing economies.

Stationarity Tests

Table 1 shows the unit root test by using Levin, Lin, and Chu, I P, Shin W-stat, ADF - Fisher Chi-square, and PP - Fisher Chi-square. Test statistics for EXPO and LFPRA, INDS and ICTIND at the level form have been observed as insignificant, which reveals data as non-stationary at the level form. Although these are significant at 1st difference. Besides it, factors as UNE and CPIN are stationary at the level.

Table 2 highlights summary statistics of causes for unemployment in developing economies. We have found large differences in the data for the study. In case of unemployment, on average, we found it 05.5013 percent. Regarding the consumer price index, the sample covers countries ranging from 103.1745 per cent to 339.231 per cent. Though, range of ICTIND was observed from -0.7179 to 2.24360 percent. It was also found that industrialization across economies was experienced as 17.7154 over the time period 2011 to 2020. Similarly, variations were observed in exports from 8.2354 to 85.2554 percent. On average, the labor force participation rate was seen as 63.2565 percent in the concerned economies.

Table 1. Results of Panel unit methods.

Variables	probability	Levin, Lin & Chu t*	IP & Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square
UNE	At level	0.0000	0.0394	0.0205	0.0047
CPIN	At level	0.0000	0.0284	0.0174	0.0000
EXPO	At level	0.0184	0.6159	0.6837	0.0104
	At Ist difference	0.0000	0.0000	0.0000	0.0000
LFPRA	At level	0.0001	0.4360	0.4128	0.0004
	At Ist difference	0.0000	0.0000	0.0000	00000
INDS	At level	0.0122	0.8981	0.8724	0.9972
	At Ist difference	0.0000	0.0000	0.0000	0.0000
ICTIND	At level	0.8106	0.9662	0.8802	0.0362
	At first difference	0.0000	0.0000	0.0000	0.0000

Table 2. Descriptive statistics.

Variables	Observations	Mean	Standard deviation	Minimum	Maximum
UNE	90	05.6013	4.0563	0.796	15.567
CPIN	90	146.137	53.6561	103.1745	339.231
EXPO	90	28.9033	17.8065	8.2354	85.2554
LFPRA	90	63.2565	6.6411	53.717	76.567
INDS	90	17.7154	3.1804	11.2109	23.3202
ICTIND	90	0.72479	0.6297	-0.3179	2.2436

Table 3 points out the results of the random effect technique. As the probability value of chi-square is 0.85, which indicates the random effect results.

The role of exports is very significant in reducing the unemployment rate of the economies. The study result indicated that a one percent increase in exports will result in a decreased unemployment rate by 0.0649 percent in developing economies. As much focus on export will lead to increased production, specialization, which ultimately results in more employment and less unemployment. Our result is favored by Bayar (2014). Inflation affects the unemployment rate in developing economies. Due to increased inflation, there may be a chance to decrease unemployment among the nations of the world. Industrialization also has a good influence on the unemployment rate in economies. More industrialization will lead to increased investments and more job earnings. All this will enhance employment, assets, earnings, and profits, and will decrease the unemployment rate among economies. The findings showed that a one percent increase in industrialization will result in a decreased unemployment rate by 0.1499 units. The finding is consistent with Singh et al. (2023). Higher labor force participation rates considerably affect the growth and development of the economy. It led to enhanced labor supply and a nation's production potential. Labor force participation may have positive

effects on the unemployment rate in the economy. The result showed that a one unit increase in labor force participation rate will cause for increase in unemployment rate by 0.2117 units.

Table 3. Random effect results, dependent variable is unemployment rate.

Variables	Coefficients, Standard Errors and Z-values
EXPO	-0.0649** 0.0247 (-2.63)
CPIN	0.0002 0.0031 (0.08)
LFPRA	0.2117** 0.0798 (2.65)
INDS	-0.1499** 0.0693 (-2.16)
ICTIND	-0.7349** 0.2654 (-2.77)
C	-2.7746 5.0912 (-0.54)
A Wald chi2 Probability R2 Within R2 Between R2 Overall	228.36 0.000 0.51 0.53 0.56

Note: t-values are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Information, communication, and technology contribute much to reducing the unemployment rate of the nations of the world. Using information, communication, and technology, people can earn more and make more investments. All this enhances employment and decreases unemployment in developing economies. The finding showed that one unit of increased information, communication, and technology will lead for reduced unemployment by 0.7349 percent. The result is favored by Abiona and Osu (2016).

Conclusions and Recommendations

The unemployment rate has been observed as influencing the economic growth and development of economies. Highlighting the significance of the existing problem of the unemployment rate, our research work shows the major causes of unemployment in developing economies. The dependent variable was the

unemployment rate. By using data of 10 developing economies, we have found that factors such as inflation, exports, labor force participation rate, industrialization, and information, communication, and technology seem to be affecting the unemployment rate in the concerned nations of the world. The random effect result pointed out that exports have led to a decrease unemployment rate among the developing economies. However, labor force participation has increased the unemployment rate. Moreover, industrialization and information, communication, and technology contributed much to reducing the unemployment rate in developing economies. Finally, the inflation rate also affected the unemployment rate among these countries. In the light of the findings, the study recommended that the Government must play a contributing part in reducing the unemployment rate in the developing economies. There is a dire need to offer more employment chances to the general public in developing nations. Technical education and skills should be provided to labor to participate more in the production process. The chances to utilize more information and communication technology should be provided to the people. Finally, there should be fewer energy crises as it will increase industrialization and less unemployment. All this will result in more economic growth and development.

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