Do Broadband Usage and Telecommunications Competition Support Employment and Poverty Reduction Efforts? Arab and EU Comparison

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Abstract

This study aims to measure the impact of using fixed and mobile broadband telecommunications services on employment and poverty reduction, the study uses the actual volume of data used to measure the broadband usage and the ICT regulatory tracker index as a proxy to measure the competition level in telecommunications sector. The study used two econometric models, the first one to measure the impact on employment and the second to measure the impact on poverty reduction, and were applied to two groups of samples: Group 1 represents EU countries, and Group 2 represents Arab countries; a generalized least squares method is used to estimate the model's parameters. The results show that using broadband services has positive and significant impacts on employment and poverty reduction in both groups, but the effect in EU countries was higher than in Arab. Competition level in the telecommunications sector has a contradicted and inconclusive impact on both groups. Based on the results, the study recommends adopting policies that may enhance fixed and broadband usage. Such as actions to be taken with regard to universal service policies and national broadband plans.

Keywords: broadband, poverty, employment, competition, Arab and EU Countries.
JEL classification codes: O10, I30, J21, L96, L20**.**

هل استخدام خدمات الاتصالات عريضة النطاق ومستوى المنافسة في خدمات الاتصالات يدعم جهود التوظيف ومكافحة الفقر؟ مقارنة بين الدول العربية والأوروبية

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الملخص:

تهدف هذه الدراسة إلى قياس أثر استخدام خدمات الاتصالات الثابتة والمتنقلة عريضة النطاق ومستوى المنافسة في خدمات الاتصالات على التوظيف ومكافحة الفقر، استخدمت الدراسة لقياس أثر استخدام خدمات الاتصالات عريضة النطاق مؤشر حجم البيانات المستخدمة، ومؤشر التتبع التنظيمي لقياس مستوى المنافسة، واستخدمت الدراسة نموذجان قياسيان الأول لقياس الأثر على التوظيف والثاني لقياس الأثر على مكافحة الفقر، وتم تطبيق هذه النماذج على مجموعتين من الدول هما مجموعة من الدول العربية ومجموعة من الدول الأوروبية. تم تقدير معلمات النماذج القياسية باستخدام طريقة المربعات الصغرى المعممة، وأظهرت نتائج التقدير بأن استخدام خدمات الاتصالات عريضة النطاق لها أثر إيجابي وذو دلالة إحصائية على زيادة التوظيف ومكافحة الفقر في كلا المجموعتين، لكن الأثر في الدول الأوروبية كان أعلى من الدول العربية، كما أظهرت النتائج أن أثر المنافسة كان متعارض بين المجموعتين. وعليه، اقترحت الدراسة عدد من التوصيات هدفت لتعزيز استخدام خدمات الاتصالات الثابتة والمتنقلة عريضة النطاق مثل مراجعة سياسات الخدمة الشمولية وتبني خطط لنشر خدمات الاتصالات عريضة النطاق.

الكلمات المفتاحية: عريض النطاق، فقر، توظيف، منافسة، دول عربية وأوروبية.

تصنيف JEL: O10, I30, J21, L96, L20

Introduction

Poverty and unemployment considered persitent economic problems in any country where the governments always used it is available policies to mitigate the effect of these problems; telecommunications sector has a role also since it contributes to achieve economic growth (Chattegri, 2020; Mayer, 2020; De clreq, 2023, Warrad, 2024; Pradhan, 2017;shabban,2023, Naseralseed & Abdelrahman, 2023), through its spillover effect to other economic sectors mainly education, agriculture, manufactory, health and trade. (Kelley et al., 2016). Moreover, the telecommunications sector contributes to job creation, new markets and technologies (Hyoung-Seon et al., 2023). Many pieces of evidence collected from countries support that economic growth leads to reduced poverty (Goudie & Ladd,1999); with regards to employment, Okun's law implies that economic growth reduces unemployment, but many studies raise the issues of jobless growth, which imply that economic growth will not increase employment (Herman,2011).

The global unemployment rate reached 5.4% in 2022, down from 6.6% in 2020, and extreme poverty reached 8.8% in 2021, down from 9.3% in 2020 (SDG indicators,2023). As a result of broadband network deployment, around 64% of the world's population used the Internet in 2021, while in 2015, only 40% of the world's population used the Internet (ITU, 2023).

Since telecommunications broadband services are important to the rest of the economic sectors and given the increasing usage of fixed and mobile broadband services over the last years and countries achievements in poverty and unemployment reductions, this study aimed to study the impact of the use of broadband telecommunication services on employment and poverty reduction in some Arab countries and European Union countries (EU) and compare the effect between two groups.

The rest of the paper is organized as follows: a quick introduction to telecommunication broadband, a brief theoretical framework, and a literature review about the impact of telecommunication broadband usage on employment and poverty reduction. Then, the methodology and data source are presented, followed by an econometric analysis and discussion of the results. Finally, a proposal for policy recommendations is made.

Theoretical framework and literature review :

Broadband telecommunications

In general, communication is a process of data transmission between two parties or from one party to multi-parties, according to international telecommunication Union telecommunications is defined as the process of ' *Any transmission, emission or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems'* (ITU,2012), the definition focus on the media for data transmission or the telecommunications network which can be fixed or mobile network, these networks have developed significantly over the last years, the core of the development is the speed of data transmission, the high-speed network is known as the mobile or fixed broadband network. ITU set a standard for broadband services where fixed and mobile services transmit the data with a speed exceeding 256 Kbps (ITU,2020). asymmetric digital subscription line (ADSL), which provides speeds reaching 100 Mbps (TRC,2011) and fibre optics speed reach 1 Gbps and is expected to reach 100 Gbps in 2040 (OFCOM,2023) is an example of fixed broadband, 3G,4G, 5G technologies with speed reach of 14.4 to 20 Gbps, are examples of Mobile broadband services (GSMA,2024) (ETSI,2024)

Broadband Usage and Employment:

Employment decisions in any firm depend on three criteria: the profit maximization objective, the status of the labour market, and wages determined in the labour market (Ehrenberg& Hallock, 2021, pp. 61-63). The generic efficiency wage model shows that the employment decision also depends on the capacities of labour, their knowledge, and their ability to make an effort (Roamer, 2021, pp. 523-524). ICT usage is considered a tool to provide labour with more knowledge, giving the labour more opportunities to find jobs, especially when enhancing digital skills (Ohei & Mantzaris, 2023) and creating a new market (Evangelista et al., 2014). ICT usage may have an adverse impact on employment when the decision is made to substitute labour with new technologies. However, since it contributes to more innovation, job creation is larger than job loss (Falk & Hagsten,2018), especially in firms that concentrate on research and development in their work (Vergara & Feldman,2018). Another channel for the impact of ICT usage on employment is facilitating job searches, working remotely, and involving women in the labour market (Biedny,2023).

Since ICT usage has an impact on employment, Wu & Yang (2022) studied such impact on China during 2014-2020 and found that internet usage, fixed penetration and mobile penetration have a positive impact on employment in the sectors that depend on ICT while having a negative impact on the industry does not depend on ICT. In the USA, Atasoy (2013) explored the impact of broadband on the labour market from 1999 to 2007 and found a positive impact on employment, which became larger in rural areas. Similarly, Nadiri et al. (2018) investigated the impact of ICT on input factors and productivity in 41 sectors during (1987-2008). They found that ICT usage enhances productivity

and increases the demand for capital but reduces the demand for labour. In EU countries, Falk & Hagsten (2018) examined the impact on employment in 14 countries during 2001-2010 and found that the demand for labour increases if the labour uses the Internet. Basol et al. (2022) also found that broadband penetration will contribute to more employment among youth.

Broadband and Poverty:

Poverty is the one main economic problem for all countries. Poverty is generally defined as the deprivation of essential living needs; the concept of poverty is related to income. The World Bank has defined two poverty lines for the purpose of country comparison (3.65 $ per day) and (6.85 $ per day) (Worldbank, 2023). Poverty has several measures, for example, the headcount index or people below the poverty line to population, the poverty gap, which is the difference between the poverty line and the actual income, and the multi-dimensional index developed by (UNDP) which considers the deperivment from food, house, education and access to infrastructure (Fawaz,2021). Another example of poverty measures is the human development index, which is considered a multi-dimension index (income, education, health) (Biry & Noura,2023; Barakat, 2020). Using telecommunication services contributes to poverty reduction by supporting the poor to access education, discover new opportunities, and enhance their productivity, which then increases their income (Altayb, 2008; Ahmad & Alroubaie, 2013; Richmond & Triplet, 2018) and minimizes the information asymmetry, and allows people experiencing poverty to sell their products online and facilitate communication channel with their society (Xie et al., 2023).

Richmond and Triplet (2018) studied the impact of internet usage, mobile penetration and fixed penetration on income inequality in 109 countries during 2001-2014 and found that fixed penetration increases income inequality; Internet usage has a neutral impact, while mobile penetration decreases income inequality. Afzal et al. (2022) found that internet usage reduces poverty in their study of 86 countries from 2005 to 2020 but also increases income inequality. Nguyen et al. (2022) examined the impact of Internet use in Thailand based on household surveys. They found that using the Internet positively and significantly impacts household income. Patria and Erumban (2020) found a U-shape relationship between ICT usage indicators and income inequality in their study of 33 Indonesian cities during 2012-2016. In South Africa, Horn (2014) found that the poverty rate is lower in areas with extensive ICT usage. Several studies found that ICT usage contributes to an increase in labour wage, reflecting a poverty reduction in Ecuador (Galperin et al., 2022), Tanzania and Nigeria (Bahia et al., 2021)

Competition and employment and poverty reduction:

The government's role is to adopt a competition policy to facilitate market transactions and ensure information symmetry through antitrust laws, market liberalization, and mergers and acquisition regulation (Lowe & Held,2005). In the telecommunications sector, competition reduces prices and provides better quality, diverse products, and innovation (Szczepanski,2019).

(Rodrigues-caselan et al., 2022) explored the impact of competition in the telecommunications sector on Ethiopia's economic welfare and poverty reduction. In their simulation model, they expect that reducing the market share from 100% to 45% due to new entry in the telecommunication sector will reduce poverty by 0.3%. Pekarskiene et al. (2018)explored the impact of competition on economic development in Latvia and Lithuania from 2005-2015 and found a positive relationship between competition indicators and economic development indicators, which include human development. Ghazzai et al. (2023) investigated the impact of competition on poverty reduction in 80 countries between 1991 and 2017. They found that the impact depends on the level of poverty in the country and the level of market concentration. Additionally, (West & Tari, 2013) argued that competition policies support entrepreneurs in entering the market, which enhances their income and living standards.

Methodologies and the models:

The study will use a balanced panel data for ten Arab countries (UAE, Oman, Kuwait, Jordan, Tunis, Saudi Arabia, Egypt, Bahrain, Algeria and Qatar) called group 1 and ten EU countries (Serbia, Albania, Turkeyia, Slovakm Romania, Portugal, Hungary, Croatia, Greece and Latvia) called group 2 covering the Period from 2015 to 2021. These countries were chosen to be compared with the Arab and EU areas. Where these countries adopt liberalization and open market policies, besides plans for broadband deployments to foster digital inclusions. Two econometrics models were used and estimated for each group.

The first model, as shown in equation 1, has been used to assess the impact of broadband usage and telecommunication market competition level on employment. The model is proposed by Evangelista et al. (2014) and used in this study:

Model 1: $LnEMP_{it} = \beta_0 + \beta_1 LnBB_{it} + \beta_2 LnCOMP_{it} + \beta_3 \mathrm{Ln}LC_{it} + \varepsilon_{it}$.....*1*

Where the variables are defined as follows:

- **EMP**: (Dependent variable) reflects the level of employment in the country I in time t
- **BB**: usage of broadband measured by the volume of data used in exabytes in country I in time t
- **COMP**: level of telecom market competition measured by ICT regulatory tracker in country I in time t
- **LC:** Labor cost in the country I in time t measured by labour compensation

- $\boldsymbol{\beta i}$: coefficients that will be estimated
- $\boldsymbol{\varepsilon}$: error term

The second model shown in equation 2 was used To assess the impact of broadband usage and telecommunication market competition level on poverty reduction; the model is proposed by Richmond & Triplet (2017):

Model 4: $LN\ POV_{it} = \theta_0 + \theta_1 LnbB_{it} + \theta_2 LnCOMP_{it} + \theta_3 LnEDU_{it} + \theta_4 \text{LnRGDPC}_{it} + v_{it} \ldots\ldots 2$

Where the variables are defined as follows:

- **POV:** (dependent variable) reflects the level of poverty in the country I in time t measured by the Human Development Index (HDI)
- **BB**: usage of broadband measured by the volume of data used in exabytes in country I in time t
- **COMP**: level of telecom market competition measured by ICT regulatory tracker in country I in time t
- **EDU:** education level in the country at the time t measured by government spending on education
- **RGDPC**: Real GDP per capita in the country at the time t in United States dollar
- $\boldsymbol{v}$it: error term
- $\boldsymbol{\theta i}$: coefficients that will be estimated

The data used was collected from different sources. Table 1 summarises the definition of the variable and the data source.

Table 1.

Variables descriptions and data source

Variable	Description	source Data
BB	The volume of broadband data used in exabyte	World Telecommunication/ICT Indicators Database
Comp	countries' score in ICT regulatory trackers	International Telecommunication Union (ITU)- ICT Regulatory tracker
HDI	countries' rank in the Human Development Index	United Nations Development Program -HDI report
EMP	Number of employees	World Bank development database
EDU	government spending on education	World Bank development database
RGDPC	GDP per capita	World Bank development database
LC	Labour cost measured by labour compensation ($)	World Bank development database

The model estimation method followed a panel data estimation approach. A unit root test was conducted to assess the stationary of data. Then, the pooled model, fixed effect model, and random

effects model were estimated for all models and assessed based on the Lagrange multiplier test and Hausman test for both groups to decide about the best estimation method. Moreover, to ensure the most consistent estimation, the models were tested for multicollinearity and autocorrelation, heteroscedasticity, and cross-section dependence.

Empirical analysis

Checking the stationarity of variables is necessary before estimating the models and to avoid spurious regression. A unit root test was conducted based on the Levin, Lin, and Chu Test for panel data. His null hypothesis is that the unit root exists. In contrast, the alternative hypothesis is that the unit root does not exist (Yousef &Warrad, 2020). The result of this Test for all variables in each group is shown in Table 2.

Table 2.

Unit root panel data test for all variables.

		unit root test for group 2 (EU Sample)		Unit root test for Group 1 (Arab Sample)	
		level Prob	first difference prob	level Prob	first difference prob
common variable	BB	0.00	-	0.000	-
	COMP	0.00	-	0.0000	-
Model 1- Employment	EMP	0.00	0.00	0.79	0.001
	Lc	0.38	0.02	0.00	-
Model2 – Poverty	POV	0.00	-	0.00	-
	EDU	0.00	-	0.00	-
	RGDPc	0.00	-	0.035	-

Source: Calculated by using Eviews

The test result shows that some variables are not stationary at level I(0), and the majority of variables are stationary but become stationary at the first difference I(1). To test for multicollinearity (i.e., correlation among the model's dependent variable), a variance inflation factor test was used for each model and each sample (Maddala, 2001). The results for all models represent that multicollinearity does not exist since the VIF for all models is below 10, as shown in Table 3.

Table 3.

Variance inflation factors test.

Model 1- Employment		
	Group 2 (EU countries)	Group 1 (Arab countries)
BB	5.1	1.65
Comp	2.4	1.03
L	1.9	2.01
lc	1.75	1.28
Model 2- Poverty		
	Group 2 (EU countries)	Group 1 (Arab countries)
BB	2.02	1.06
Comp	2.16	1.02
EDU	1.17	1.38
RGDP	1.43	1.37

Source: Calculated by using EViews.

Ordinary least squares are not valid since all the model has autocorrelation according to (the Breusch-Pagan- pagan Test) and heteroscedasticity according to the Breusch-Pagan-Godfrey Test). Pooled data estimation for all models which deal with data without considering the effect of cross-section or time (Qudah & Bakir,2018) was estimated, but the result of the Breusch -pagan Lagrange multiplier does not support pooled data estimation shown in Table 4; the result shows that the p-Value for all models below 5% which mean there are cross-section and time differences.

Table 4.

Breusch -pagan Lagrange multiplier test

Model	Test	Group 2 (EU countries)			Group 1 (Arab countries)		
		Cross section	Time	Both	Cross section	Time	Both
Model 1-Employment	Breusch-Pagan statistic	71.27	4.163	75.43	173	3.26	176
	P-value	0.000	0.000	0.000	0.000	0.070	0.000
Model 2 Poverty	Breusch-Pagan statistic	64.06	10.72	74.79	174.9	1.75	176.74
	P-value	0.000	0.001	0.000	0.000	0.185	0.000

Source: Calculated by using EViews.

Such differences may be captured by fixed-effect models, which consider the time and cross-section differences in the intercept (Alsoukhni & Alshyab,2019), or by random-effect models, which also consider the difference as a random coefficient and capture it by composite error terms (Gujarati & Porter,2009).

Regression Results:

The impact of broadband usage and competition level on employment is estimated using model 1. Table 5 shows the results of the fixed and random effects for both groups. The results of the Hausman test show that the appropriate model for group 2 is the fixed effect, while the random effect is valid for group 1. The prob of the Hausman test is above 5%, which indicates the acceptance of the null hypothesis of the Test.

Table 5.

Broadband usage and competition level effect on Employment estimation results.

	Group 2 (EU countries)				Group 1(Arab countries)			
Model 1	Fixed effect	Prob	Random effect	Prob	Fixed Effect	Prob	Random Effect	Prob
constant	0.739	0.86	0.681	0.49	8.26	0.00	7.7	0.00
LN (LC)	-0.011	0.32	0.049	0.00	0.017	0.34	0.011	0.53
LN(L)	0.622	0.00	0.937	0.00	0.44	0.00	0.487	0.00
LN(BB)	0.441	0.00	0.022	0.00	0.03	0.00	0.011	0.05
LN(COMP)	1.07	0.19	-0.18	0.22	0.012	0.61	0.01	0.65
R-square	0.97		0.8		0.99		0.55	
F-statistic	236		66.01		7799		20.13	
DW	0.18		0.543		1.05		0.87	
Hausman test	Chi - statistic	37.449	Prob	0.00	Chi - statistic	4.64	Prob	0.33

Source: Calculated by using EViews.

To estimate the effect on poverty reduction, equation 2 (Model 2) was used. Table 6 shows the results of fixed and random effects. The Hausman test indicates that the appropriate model for group 1 and group 2 is the random effect model.

Table 6.

Broadband usage and competition level effect on Poverty reduction estimation results.

	Group 2 (EU countries)				Group 1(Arab countries)			
Model 2	Fixed Effect	Prob	Random Effect	Prob	Fixed effect	Prob	Random effect	Prob
Constant	-0.289	0.105	-0.549	0.00	-1.418	0.00	-1.052	0.00
LN (GDPC)	0.07	0.00	0.0615	0.00	0.1195	0.00	0.082	0.00
LN(EDU)	-0.022	0.01	-0.001	0.87	0.023	0.00	0.024	0.00
LN(BB)	-0.005	0.00	0.001	0.233	0.008	0.00	0.007	0.00
LN(COMP)	-0.17	0.01	-0.044	0.27	0.0008	0.93	-0.124	0.65
R-square	0.91		0.6		0.99		0.61	
F-statistic	229		25		571		26.18	
DW	0.233		0.88		1.098		1.01	
Hausman test	Chi - statistic	6.56	Prob	0.16	Chi - statistic	2.1	Prob	0.715

Source: Calculated by using EViews.

Although the Hausman test helps to choose between fixed effect and random effect, the selected model was checked for the existence of residual cross-section dependence; a Breusch -pagan LM test was used where the null hypothesis for this Test is that there is no cross-section dependence (Alhassaneen, 2023). Table 7 shows the result of this Test, which indicates that all the chosen models suffer from residual cross-section dependence where the p-value is below 5%, which means rejecting the null hypotheses. Accordingly, the chosen models have to be remedied to solve this issue. The available tool for handling the cross dependence is to use the generalized least Squares (GLS) method.

Table 7.

Results of cross-section dependence test for Group 1 and 2 models.

Residual cross-section dependence test				
Model	Group 2 (EU countries)		Group 1 (Arab countries)	
	Breusch-Pagan LM statistic	P-value	Breusch-Pagan LM statistic	P-value
Model 1-Employment	149.195	0	89.31	0
Model 2 Poverty	138.12	0	82.18	0

Source: Calculated by using EViews.

Tables 8 and 9 show the estimation for all models according to the GLS method. To ensure the consistency of the new estimation, Table 10 reports the residual cross-dependence test, which shows that all models are free of cross-section dependence.

Table 8.

GLS estimations for model 1– impact on employment

	Group 2 EU countries		Group1 Arab Countries	
Model	GLS Fixed effect	Prob	GLS Pooled	Prob
Constant	1.175	0.02	14.577	0.00
LN (LC)	0.003	0.62	-0.103	0.00
LN(L)	0.677	0.00	0.492	0.00
LN(BB)	0.372	0.00	0.138	0.00
LN(COMP)	0.729	0.00	-1	0.00
R-square	0.973		0.93	
F-statistic	213.95		284.34	
DW	1.92		2.12	

Source: Calculated by using EViews.

Equation 1 (Model 1) was used to estimate the impact on employment in Arab countries. A GLS pooled data model was used to avoid cross-dependence instead of random impact. The result in Table 13 shows that broadband usage has a significant and positive impact on employment in both EU countries and Arab countries, where a 1% increase in broadband usage will lead to a 0.37% increase

in employment in EU countries and 0.13% in Arab countries, the result is in line with previous studies (WU & Yang, 2022; Atasoy, 2013; Falk & Hagsten,2018).

The competition level in telecommunications has a positive and significant impact on EU countries, similar to Dierx et al. (2017). The result of Arab countries is not as expected. It contradicts previous studies but may be justified as that the employment level in Arab countries is declining, especially in 2020 and 2021, due to different factors affecting the employment level, such as production cost reduction policies in private sectors. The impact of the labour force on employment is positive and significant. The labour cost, which reflects the wage in Arab countries, aligns with the theory, while it is not substantial and insignificant in EU countries.

Table 9.

GLS estimations for model 2 – impact on poverty reduction

	Group2 EU countries		Group 1 Arab Countries	
Model	GLS pooled	Prob	GLS pooled	Prob
Constant	-0.415	0.00	-1.05	0.00
LN (GDPC)	0.062	0.00	0.081	0.00
LN(EDU)	-0.013	0.00	0.025	0.00
LN(BB)	0.002	0.00	0.004	0.00
LN(COMP)	-0.069	0.00	-0.0005	0.86
R-square	0.85		0.84	
F-statistic	98		86.386	
DW	1.82		1.98	

Source: Calculated by using EViews.

Equation 2 (Model 2) is used to estimate the impact on poverty reduction. The results show that the impact of broadband usage has a positive and negative impact on poverty reduction, but this effect is small; a 1% increase in broadband usage will increase the HDI index by 0.002% in EU countries and 0.001% in Arab countries. Such results are similar to those found by Alderete (2017), Richmond and Triplet (2018), and Jeremiah (2020).

Competition level in telecommunications doesn't have an impact on poverty in Arab countries, but it does have a negative impact on EU countries. Próchniak (2018) shows that the impact of competition in any country depends on the level of poverty in that country, which may increase or decrease poverty; the contradiction between EU countries and Arab regarding the level of telecommunications competition's role against poverty aligns with (Ghazzai et al.,2023) findings.

Table 10.

Residual cross-section test after GLS estimation for all models

Residual cross-section dependence test for GLS Models				
Model	Group 2: EU countries		Group 2: Arab Countries	
	Breusch-Pagan LM statistic	P-value	Breusch-Pagan LM statistic	P-value
Model 1-Employment	30.575	0.95	29.48	0.96
Model 2 Poverty	32.78	0.91	27.05	0.98

Source: Calculated by using EViews.

Discussion:

Based on the results, fixed and mobile telecommunications broadband services usage has a positive impact on employment in both groups, but the impact on EU countries is larger than on Arab countries. These imply that the impact of adopting new technologies does not necessarily lead to labour-technology substitution, but there is still a need for professionals and specialized workers to deal with the latest technologies thus working to build ICT skilled workers is necessary (Ohei & Mantzaris, 2023)

Fixed and mobile broadband services usage has a minimal and positive impact on poverty reduction efforts in EU and Arab countries; this implies the need for more broadband utilization by different types of economic activities to support government efforts against poverty (Bahia et al., 2021).

It is noteworthy to discuss the negative and significant impact of telecommunications market competition on employment in Arab countries where the government of these countries shall work to facilitate the adoption of new technologies that encourage labour market competition effect,and empowerment effect (Li et al., 2021). Another issue regarding the impact of telecommunications market competition is the balance in competition level with other sectors since the expected gain from competition on employment and poverty requires an equivalent level of competition among all sectors.

Conclusions and recommendations

The study aligns with several studies that support the positive impact of using broadband on employment and poverty reduction; the impact of competition level in the telecommunications market is inconclusive and ambiguous in Arab and EU countries. However, competition has a spillover effect and should not be neglected since it supports economic growth (Romano,2015; Man, 2017). therfore, the study recommends increasing broadband usage by focusing on adopting policies that target digital inclusion such as including broadband under the scope of universal service also adopting the broadband national plan with affordability and nationwide coverage for broadband networks dimensions. State aid is very important and can be by supporting service providers to develop

broadband networks or support the users to own ICT equipment, also improving digital skills through training and education for all population levels. Since there are differences in the impact between the EU and Arab areas, member states, especially in Arab countries, should assess the type and the pattern of broadband usage in order to take the necessary action to direct the usage for pro-economic welfare activity instead of entertainment usage.

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