The Impact of the Economic Condition on Entrepreneurial Development in the Kingdom of Saudi Arabia

Dr. Sulaiman Abdullah Saif Alnasser Mohammed
University of Ha'il,
Saudi Arabia

Dr. Saqib Muneer
University of Ha'il,
Saudi Arabia
(Corresponding author)

Dr. Mohiddin Grada
University of Ha'il,
Saudi Arabia

Dr. Mohammed Salamah Zaid
Isra University,
Jordan

Abstract

Objective: The study is aimed at examining the impact of the economic condition on entrepreneurial development in the kingdom of Saudi Arabia. In particular, the study has examined the impact of economic growth, physical capital, human capital, poverty, and income inequality on entrepreneurial development.

Data and methodology: Data is based on 13 different provinces over the period of 21 years from 2000 to 2020. The Panel data method is employed. OLS and fixed effect estimates are employed as the most robust estimates to achieve the objectives of the current study.

Results: The findings of the study have revealed that the impact of economic growth, physical capital, human capital, poverty, and income inequality on entrepreneurial development is significant.

Significance: The study is among the pioneering study on the KSA where, self-employment, small firms, firm start-ups, , young enterprises, SMEss, and patents are indicators of entrepreneurship. There is a high rate of income inequalities in KSA, which are similar to the high rate of economic growth. When a crisis begins in the economy, income inequalities start decreasing.

Practical Implication: The study will be helpful for policymakers, practitioners, and researchers in developing and understanding on the issues related to economic conditions on entrepreneurial development in the kingdom of SaudiArabia.

Keywords: economic growth, physical capital, human capital, poverty, income inequality, entrepreneurial development, KSA

Background

Based on the claim that employment and GDP growth increase with the development of new businesses, it was contended by Prieger, Bampoky, and Blanco (2016)that a key role is played by entrepreneurship in influencing the evolution of capitalist societies. The set targets of GDP growth can be achieved through entrepreneurship (Cooley & Prescott,

2021). Entrepreneurship supports the development and GDP growth of a country (Aparicio, Urbano, & Audretsch, 2016). Thus, it can be regarded as the key accelerator in the development of an economy, creation of new jobs, and bringing prosperity, promoting by creating new jobs (Hussain, Batool, & Akbar, 2021). Along with these impacts, entrepreneurship improves the development and growth of the region as well as job satisfaction. Increase in productivity results in GDP growth. Entrepreneurship brings innovation and business reforms that increase competition and structural changes in the economy. A significant variable enabling the growth and development of an economy is entrepreneurship (Mihaela, 2016). Therefore, it has significance in the GDP growth and growth in a specific region.

Entrepreneurship is a crucial variable in initiating GDP growth and several measurements can be adopted as its indicators. For instance, self-employment, small firms, firm start-ups, , young enterprises, small and medium enterprises, and patents are indicators of entrepreneurship. There is a high rate of income inequalities in KSA, which are similar to the high rate of GDP growth. When a crisis begins in the economy, income inequalities start decreasing. Currently, income inequality is consistently high (Bourouaha & Maliki, 2021).

Irrespective of the significance of entrepreneurship in bringing GDP growth and development, there are inconclusive studies related to the association between entrepreneurship and GDP growth in developing countries. The studies based on developed countries such as America and Europe have taken into consideration the internal factors influencing entrepreneurial activities (Amorós, Cristi, & Naudé, 2021; Nicotra, Romano, & Schillaci, 2018). However, there is a scarcity of research studies based on entrepreneurship and GDP growth within developing countries (Basheer, Raoof, Jabeen, & Hassan, 2021). It was argued byRaoof, Basheer, Shabbir, Ghulam Hassan, and Jabeen (2021) that little knowledge is possessed by economists related to the contribution of entrepreneurship to GDP growth in developing countries.

Several contributions are expected to be made by this research study to the literation on the association between entrepreneurship, GDP growth, and growth. an empirical test has been provided by this study on the association of entrepreneurship, GDP growth, and growth with reference to a developing country, i.e., KSA. The research will contribute to the existing knowledge related to the role of entrepreneurship in the GDP growth of KSA. Considering these analyses, it is expected that the study will serve as a foundation for improving the role of entrepreneurship in the GDP growth of KSA. Some of the important questions are needed to be addressed to understand the role of entrepreneurship in GDP growth, which are as below:

1. Is there any contribution of GDP growthto entrepreneurial development?
2. Is income inequality encourageentrepreneurship?

Literature Review

Entrepreneurship and physical capital (PHC)

The services of a community and basic facilities including communication systems, waterworks, transportation, power plants, schools, police, waste disposal facilities, and prisons are considered as infrastructure (Raoof et al., 2021). Infrastructure and PHC is required to provide new jobs, goods, and services for the revitalization of the economy. There is a lack of infrastructure, services, and resources in developing economies, which becomes a hurdle in the development of new firms. When the infrastructure is not satisfactory for entrepreneurs, they look for another place (Basheer et al., 2021). According to Song and Li (2021), the rate of establishment of new firms is lower in the developing regions as compared with the developed regions. There is a need for improved competitiveness in developing countries for the existing firms for initiation of entrepreneurial activities, as a crucial role is played by entrepreneurship in the economy. It is suggested by this evidence that there is a need for importing resources to developing areas for improving infrastructure and related facilities. Better infrastructure can help in the creation of new ventures by attracting entrepreneurs.

It was argued by Acs, Estrin, and Mickiewicz (2018)that the formation of new firms is likely to be influenced and encouraged by the existence of services, transportation, good living conditions, and facilities (in terms of static

elements of current infrastructure). Locations with higher educational opportunities, telecommunication access, and quality of labor, quality of life, and government attract entrepreneurs for investment (Cleave, Arku, & Chatwin, 2017). A knowledge base is provided by such locations, which can spill over for the creation of new ventures. Entrepreneurs are directed to develop businesses by availability in specific regions. Infrastructure is the key requirement for entrepreneurs to operate and work in a region. Considering that, it was argued by Lazzarini (2015) that the creation of new firms is based on the level of infrastructure resources and in a region, as proposed by Prasetyo (2019). Thus, several locations are likely to attract firms because of good infrastructure and facilities. A good infrastructure encourages entrepreneurs to create new ventures in a given region.

Investments in a region improve the facilities. Thus, the region becomes attractive for developing new businesses and firms. The knowledge base of the region increases as well. It was suggested by Karlsson, Rickardsson, and Wincent (2019) that competitive advantage can be achieved by firms in a region with improvements in infrastructure. This notion was supported by Ernawati, Sanders, and Dowling (2017), who claimed that local and national governments must do investments in the core infrastructure. Incentives are provided for new firms with such improvements in the infrastructure that make the region profitable for investors. Researchers suggest that a system of facilities must be developed by a region, which enables the development of new firms. It was explained by Alkaraan (2021) that a higher level of manufacturing activities are opportunities for new businesses. The association between PHC and entrepreneurship will be investigated in this research study.

Entrepreneurship and Human capital (HMC)

The significance of education in a specific region was argued byLyu, Sun, and Huang (2019). Researchers found a positive association between establishment rates of firms and college graduates. Resultantly, it was found that several demographic factors have a positive impact on the new firms' development.

It was mentioned by Dutta and Sobel (2018)that the success of new firms is influenced by the level of school education as well as the knowledge spillover that are important components of the HMC specific to a location. This notion is supported by Brush, Kelley, and Greene (2017), who emphasized that the surviving rate of firms is higher when there is a high rate of educational attainment in a specific region. Findings reveal that the low level of success and survival rate of a firm may not be linked with the low level of literacy in a region. Sutter, Bruton, and Chen (2019) explained the significance of education for establishing and sustaining start-up knowledge for new firms and spillover. A supported environment is created by educated people, which is constituted of HMC. HMC was considered by Radaelli, Dell'Era, and Frattini (2018) to be measured by the educational achievements of entrepreneurs. Thus, HMC is important for the success and survival of new firms.

Moreover, the level of HMC in a region is indicated by the level of education, which is important for carrying out the activities of entrepreneurship. It is claimed by the supporters of the endogenous growth model that GDP growth and growth are generated by knowledge in a specific region (Karlsson & Gråsjö, 2019). The use of existing knowledge in a region is done by individuals to increase production and capacity. Growth is enabled by the activities that are conducted by individuals to maximize profits in a region. It was argued byDana, Demartini, and Schiuma (2019) that the success and feasibility of new ventures are dependent on skilled labor. Skilled labor is the HMC with technical skills suitable for a specific job in establishing a new business within an economy.

It is suggested by empirical results that the intentions among the individuals for entrepreneurship are accelerated by the attainment of a college degree. Individuals are inclined to self-employment and establish new businesses (Karlsson & Gråsjö, 2019). There is a positive link between the level of educational attainment and the formation of new businesses. In addition, a significant association was found between having a college education and establishing new firms. It was found by Juric, Has, and Koprivnjak (2019)that there is a significant association between the attainment of a college education and the development of new firms. It was also reported by Radaelli et al. (2018) that

a significant relationship exists between college education and the establishment of firms.

Individuals can experience an increase in their productivity because of improvement in their skills and knowledge. It was suggested by Lyu et al. (2019) that knowledge can be received by an individual with entrepreneurial intention from others possessing knowledge (spillover). The use of existing knowledge can be helpful in the creation of new firms. Best opportunities are offered by an adequate level of skills in a region for the creation of new knowledge and enabling economic activities, i.e. new firm development (Basheer et al., 2021). It is suggested by empirical evidence that the availability of skilled labor results in new knowledge, which indicates that skillful individuals can yield distinct benefits in terms of knowledge circulation. It is also indicated by evidence from other countries that businesses can be organized by talented people using their skills, which can further result in opening new firms. It is suggested by Dana, Demartini, and Ramadani (2019) that a crucial role is played by HMC in the development of new firms and dynamics. Educated populations provide the stock of HMC that is incorporated in their specific and general skills. Innovative ideas come from knowledge and skills for establishing and sustaining new businesses.

Similarly, it is important to create an environment that is rich in knowledge spillover. Such an environment is supportive in starting up activities. Knowledge also results in a breakthrough innovation, which is used in the competition of smaller firms with other similar or larger firms. The researcher also claims that most of the revolutionary ideas over the last two centuries have been developed by individual entrepreneurs in the market.

Poverty and Entrepreneurship

There is extensive research literature on poverty and entrepreneurship. With respect to developing countries, a few research studies have found the association between poverty and entrepreneurship (Cleave et al., 2017). It is believed that the association between poverty and entrepreneurship refers to that a high level of entrepreneurship can be consistent with a high level of poverty. According to Dutta and Sobel (2018) the capital can be raised by a major fraction of the poor acting as entrepreneurs. Earnings are the resultant outcome of entrepreneurs being the full residual claimants. Moreover, it was argued by Dutta and Sobel (2018) that South America and Africa being poor countries are considered to be full of entrepreneurs. It is recommended to go there for fining a lot of entrepreneurs.

The types of entrepreneurships have been defined and explained Prieger et al. (2016)as entrepreneurial activities that contribute to the growth of an economy. However, it does not influence poverty to any reduced level. The classification of entrepreneurship can be done in two types, i.e. opportunity-based and necessity. These two types cannot be regarded as successful or unsuccessful. Entrepreneurs based on necessity may not be successful, as claimed by Dutta and Sobel (2018). In a similar way, not all entrepreneurs based on opportunity are able to create successful business enterprises and job creation for GDP growth. It was insisted by Raoof et al. (2021) that push or pull factors are behind an individual's start a new business. Some opportunity based entrepreneurs can be classified using a simple approach. In several cases, productive small-size businesses are behind the relevance of GDP growth and necessity entrepreneurship. Raoof et al. (2021) supported the claim that GDP growth is aided through necessity-based entrepreneurship, as it represents the fullness of human resources.

Social contributions and poverty reductions can be made by necessity-based entrepreneurship but they may not significantly influence GDP growth. The poor people are supported for earning income and restricting poverty to increase by entrepreneurship (Basheer et al., 2021). Basheer et al. (2021) support this notion in the development of entrepreneurs who survived informally. These are important irrespective of their unproductiveness.

Bourouaha and Maliki (2021) stated that a crucial role is played by entrepreneurship in developing countries related to policy implications. However, it was argued by Bourouaha and Maliki (2021) that low-income countries should not use entrepreneurship as a policy for promoting the development of new firms. Thus, it is crucial to take into consideration the association between poverty and entrepreneurship in this research study.

Income Inequality and Entrepreneurship

The inverted-U hypothesis of Sharma and Gupta (2021) is supported by literature on entrepreneurship and income inequality. According to the hypothesis, income inequality rises between the initial development levels and later it starts decreasing (Touitou, 2021). It was concluded by Asamoah, Figari, and Vezzulli (2021) using a cross-country data analysis that some effects are created by income composition of different sources on the association of income inequality and development. This was explained by using the Kuznets curve, which is because of the increasing significance of labor wages and the income from entrepreneurship.

Korber and McNaughton (2017) analyzed the association between income distribution, entrepreneurship, and GDP growth based on the ideas of Schumpeter. Using data based on 25 countries over years 200-2006, it was found by researchers that there is an indirect and positive influence of entrepreneurship on GDP growth. It was suggested by Quadrini (1999) based on US-based empirical evidence higher savings of entrepreneurs result in wealth concentration. The theoretical models of Bruton, Sutter, and Lenz (2021) and Parker (2018) are supported by this claim. It was stated by Bruton et al. (2021) in their research that entrepreneurship can be encouraged by income equality in developing countries. However, there are not many pieces of evidence on the opposite association. Bruton et al. (2021) conducted a study based on inequality and entrepreneurship in southern Ethiopia. It was found that per capita household income inequality is reduced by a uniform increase in entrepreneurial income. However, the overall inequality is not affected by the increased number of entrepreneurs.

Entrepreneurship and Growth

The growth accounting model of Solow has two explicit factors, i.e. labor and PHC. The technology change is termed as an implicit factor. The technological change in the growth accounting model of Solow is regarded as an unexplained residual, which has some influences on the growth of an economy. Public policy is regarded as a constant factor. The growth accounting framework of Solow has been used by Audretsch (2017) for making a comparison with a key emphasis on the growth policy. Moreover, it has been used as a theoretical lens for focusing on the association between GDP growth and entrepreneurship by creating knowledge spillover. Thus, a considerable contribution is made by entrepreneurs in GDP growth (Junoha et al., 2019; Raoof et al., 2021; Basheer et al., 2021).

Knowledge filter was introduced by Korber and McNaughton (2017) and Bourouaha and Maliki (2021), which is a hurdle to spillover of knowledge for commercialization from the original firm by third-party firms. Public policy instruments may not sufficiently generate GDP growth that can be used for improving investment in knowledge. Considering entrepreneurship as a conduit for spillover of knowledge, the missing link between investment in new knowledge and GDP growth is entrepreneurship Bourouaha and Maliki (2021). The residual factor is considered by the Solow model as a variable explaining the variations by other factors in the GDP growth, i.e. labor and PHC. Audretsch (2017) considered it a mistake to not include knowledge variables to analyze the influence on GDP growth. The findings that in neoclassical variables, the difference of productivity among the firms cannot be accounted for. The significance of knowledge has been added in the endogenous growth models by assuming automatic spillover of knowledge from the original firm to other firms for commercialization (Prieger et al., 2016).

It was mentioned by Audretsch (2017) in the Growth accounting model that the level of required entrepreneurial policies help in encouraging entrepreneurship through the influencing the regional economy entrepreneurship behavior among individuals. Audretsch (2017) adopted the startup rates of new firms as a mesurmeent. The high level of developing new firms reflects that there is a high level of entrepreneurship capital. In the 1990s, Audretsch (2017) collectively determined PHC, labor, entrepreneurship capital, knowledge capital, for analyzing a production function for Germany.

Researchers found that there is a positive association between output and labor, and output and PHC. These findings are consistent with the Yerznkyan, Gataullin, and

Gataullin (2021). A positive association was found between output and knowledge capital by the Etro (2019). Moreover, a positive relationship was determined between GDP growth and entrepreneurship capital. By setting knowledge capital PHC, and labor at a constant level, the findings still revealed a positive relationship between GDP growth and entrepreneurship capital in the regions of Germany.

The relationship between entrepreneurship and GDP growth was investigated Ijieh (2021). The researchers used the 1990s data of regions in the United States. By controlling the agglomeration effect, it was found by the study that a higher level of entrepreneurship reflected the high GDP growth of an economy. Ijieh (2021) made efforts to determine the relationship between entrepreneurship and GDP growth at the country level by using 1990s data of OECD countries. The results reflected that a high rate of GDP growth was linked with a high rate of entrepreneurship in OECD countries.

Thus, knowledge spillover can be accelerated by entrepreneurship, which is a critical mechanism. It also leads to an increase in GDP growth. With respect to policy formulation for increasing GDP growth, entrepreneurship can be used for generation entrepreneurship capital to increase the development of new firms. Knowledge filter was translated by Audretsch (2017) and Ijieh (2021) as the difference between knowledge with a possible changes in the value of commercialization and the actually commercialized knowledge.

Methodology and Data

In the panel data, there is the representation of two types of information((Song et al., 2021; Basheer et al., 2021;bin Hidthiir et al., 2021). The differences among the variables are revealed by the cross-sectional type of information. Over time, changes within variables are reflected by the time series data. The different kinds of information obtained through regression techniques of panel data can give an advantage to researchers.

The bias coming from the omission of a variable can have some influence on the dependent variable, which makes it insufficient to apply the ordinary multiple regression approach. The use of panel data can help in controlling the omitted variables without observation. The changes occurring with time in the dependent variable are observed. There is a difference in the variables that are omitted in different cases. However, these variables are constant over time but vary with time. The use of panel data can help in controlling these variables. The panel data can have N number of cases for T (time). The total observations can be obtained by of N × T. By ignoring the existence of effects specific to individuals in panel data settings, an estimation can be done in a simple manner.

$$Y_{it} = \alpha + \beta_{1X_{1it}} + \beta_{2X_{2it}} + \cdots \beta_{KX_{Kit}} + \varepsilon_{it} \ldots\ldots\ldots(1)$$

The equation is standard model of pooled OLS. The basic assumptions of CLRM related to it (no autocorrelation, constant variance and zero mean) make it suitable to use Pooled OLS model, where iis treated as a constant. The estimator has desirable properties and effects specific to individual variables are not important. The presence of i is assumed in both Fixed Effects and Random Effects models.

A few assumptions should be possessed by the pooled model. There should be no correlation between the error terms and the regressors (explanatory variables). Error term has a constant variance, which means there is no heteroskadasticity. Error terms do not correlate. Individual heterogeneity does not exist, which is known as individual-specific effects in this case. Any two error terms have no correlation, which refers to no autocorrelation. Individual heterogeneity does not exist. The data's panel structure is ignored while making these assumptions.

It has been mentioned earlier that data is based on 13 different provinces over the period of 21 years from 2000 to 2020. It is not justified to believe about no unobservable heterogeneity in the data, as every province has individual characteristics. Thus, the model cannot be estimated using the pooled OLS method. As per the theories defined earlier, there are two parts of the error term in the panel data model. One part is not correlated with the other explanatory variables. The other part is called the individual-specific effect.

The properties of the panel data are characterized by the individual-specific effect because of the ability to capture the variations in the data. The data is based on seventy-six provinces and does not have variations with time. for instance, the cultural elements or size of the provinces can

be regarded as an individual-specific effect. Researchers can employ two conventional methods (fixed effects and random effects model) for the model estimation after identifying the need to control effects specific to the province. The use of the random effects model can be done when it is assumed that there is no correlation between the independent variables and effects specific to the province. This approach is suitable only if it is assumed that GDP growth and entrepreneurship are not affected by the individual province's characteristics. This assumption is very strong. The fixed effects method is used by most empirical researchers.

For choosing between pooled OLS and Fixed effect model, We have followed an assumption that that there is no individual effect in the pooled OLS. In the FE model, it is assumed that there is an individual effect. Thus, the use of a restricted F-test can be done. For selecting between Random Effect model and Pooled OLS model, BP LM statistical test (Bresusch-Pagan Lagrange Multiplier) can be conducted.

When the random effects model is appropriate for the data, the method of fixed effects is consistent but not efficient. The researcher can conduct a common test Saygili, Arslan, and Birkan (2021) to choose between these two approaches. When fixed effects estimation is suitable for the data and model, it is checked by the Hausman test whether random effects estimation is good or not. In the case of fixed effects, the test is done against the following hypothesis.

H0: random effects are efficient and consistent

It is important to note that the fixed effects are surely consistent. When the test yields a large value, the hypothesis is rejected, and it is recommended to use fixed effects. In the case of a small statistic value, the hypothesis is accepted, and the researcher can use the random effects estimation approach.

Econometric Model

The econometric model of the current study is given below

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$$[ENT]_t = \alpha + \delta[lnGDP]_t + \alpha[lnP\dot{H}C]_t + \alpha[lnH\dot{M}C]_t + \alpha[lnL\dot{a}b]_t + \alpha[lnH\dot{C}P]_t \ldots\ldots\ldots(2)$$

Where,

$[ENT]_t$= is the number of new firms from the time 0 to t.

$[GDP]_t$= is proxy of the growth rate which is measured as rate of change in GPP from the time 0 to t.

$[P\dot{H}C]_t$= is proxy of the PHC which is measured as rate of change in PHC from the time 0 to t.

$[H\dot{M}C]_t$= is proxy of the HMC which is measured as rate of change in PHC from the time 0 to t.

$[L\dot{a}b]_t$= is the rate of change of amount of labor from the time 0 to t.

$[H\dot{C}P]_t$= is the rate of change of amount of labor from the time 0 to t.

The descriptive statistics of the currents study is shown in the table 1.

Table1. Descriptive statistics

Variables	Max	Min	Mean	S.D.
lnGDP	6.9415	1.2119	-3.39291	0.82639
lnENT	4.995155	2.173254	3.12093	1.220154
lnPHC	-0.65273	-3.05518	-2.92466	0.282122
lnHMC	2.715925	2.233617	2.443199	0.154227
lnLab	2.22314	-4.14202	0.793212	0.722108
lnHCP	2.02111	0.21010	1.20310	1.200121

The results of the correlation analysis are shown in the table 2As expected, the log of new firm establishment, log of GDP growth, log of HMC, rate of change of labor, PHC and rate of poverty are significantly positively correlated.

Table 2.Correlations

Variables		1	2	3	4	5	6
lnGDP	**1**	1					
lnENT	**2**	0.1361	1.00				
lnPHC	**3**	0.1090	0.3088	1.00			
lnHMC	**4**	0.1569	0.0104	0.4533	1.00		
lnLab	**5**	0.0139	0.2107	0.2195	-0.1154	1.00	
lnHCP	**6**	0.0425	0.2254	0.0501	0.0552	0.1007	1.00

* Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Results

A standard growth regression model has been used for analyzing the association between GDP growth and entrepreneurship. Ahmad and Zhao (2018) proposed this regression model. In the current study, the data is based on the new firms' establishment in the 76 provinces of KSA. This data has been used as a proxy of entrepreneurship that is available for years 1995 to 2008. The proxy of PHC investment used in this study is the saving of commercial banks per GPP (annual data of 1996-2008). The proxy of HMC is the gross rate of enrolment (data for years 2000 and 2005). The annual data of 1995-2008 for population growth has been used as well. The model estimation begins with the estimator of pooled OLS as the regression quantifies the impact of regressors on the gross provincial product. The sample involves 76 provinces of KSA. It has been analyzed in the study that whether there is a significant impact of entrepreneurship on the gross provincial product in KSA. Entrepreneurship has been measured by the number of new firms established in KSA.

Table 3. Regression Results

	OLS	RE	Fixed Affect
lnGDP	0.2430***	0.2210**	0.2710***
lnPHC	0.2111	0.3190**	0.2211**
lnHMC	0.1231	0.0257	0.1231***
lnLab	0.2512**	0.3262**	0.2212**
lnHCP	- 0.7811***	-0.9039**	-0.7231***
R-square	0.782	0.681	0.881

*Significant at 10%

**Significant at 5%

***Significant at 1%

The provincial heterogeneity has not been considered in the OLS estimation; the findings may not be reliable. The data has been changed into a panel structure for considering the provincial heterogeneity. For estimation, the panel approaches, i.e. Fixed Effect, Random Effect, and Pooled OLS have been used. The results of the estimation have been presented in Table 3. the regressing results of log of GDP on the log of gross enrolment rate, the log of saving per real GPP, the log of the number of new firm establishment, and the log of population growth. The key variable is entrepreneurship (number of new firms established).

It is shown by the OLS estimation in that the log of PHC coefficient has a positive sign. However, the coefficient is insignificant at 0.01 level of significance. The coefficient of entrepreneurship is positive and significant at 0.01 level of significance. The findings suggest that there is a positive influence of entrepreneurship on per capita income level. However, unfavorable results related to the log of GDP coefficients plague them.

Table 3 shows the results of regression done using the OLS method. The log of the GDP was regressed on the entrepreneurial development, the log of population growth, the log of gross enrollment rate, and the log of the number of new firms established. It is evident that PHC determined by the log of saving per real GDP has the expected sign. However, it is not significant. The coefficient of HMC is significant at 0.01 level. Meanwhile, the population growth has come out with unexpected sign even at 0.01 level. The coefficient of entrepreneurship is positive and significant at 0.01 level. Thus, results reveal that when there is 1 percent increase in the number of new firms established, there will be 0.24 unit increase in the GPP of KSA.

It has been found by the study that GDP growth influences the entrepreneurship. There is evidence of entrepreneurship positively contributing to GDP growth. When there is 1 percent increase in the number of new firms established, the GPP increases by 0.27 percent. In the given set of data, the average increase in new firms' establishment is 13 percent per year in all provinces of KSA. It shows that almost 24% of GPP growth is contributed by entrepreneurship every year.

The results of Opute, Kalu, and Adeola (2021) are in line with these findings, given that a high level of entrepreneurship activities results in a higher GDP growth rate. Therefore, for improving and sustaining growth in the economy of KSA, entrepreneurship development has a key role. Following the economic crisis of KSA in 2018, the speedy recovery has been attributed to the role of entrepreneurship. It is interesting to know that growth and entrepreneurship have one-way causality. Growth is caused by entrepreneurship. However, entrepreneurship is not caused by GDP growth. The results of impulse response and variance decomposition tests are in the same direction.

The investigation of the impact of entrepreneurship on income inequality revealed that there is no influence of entrepreneurship on the Gini coefficient (initially adopted measure of income inequality). For ensuring the result, the income quintile was used as an alternative measure of inequality. It was interesting to know that the results were similar even by using the alternative measure of income inequality. Therefore, the study did not provide evidence about the positive influence of entrepreneurship on the distribution of income (using income of poor and Gini coefficient). It reflects that there has been a high level of entrepreneurship activities in KSA but income inequality has not been reduced. Similarly, income inequality in the population has not been reduced by the Gini coefficient for the establishment of entrepreneurship.

Considering the influence of poverty onentrepreneurship, it has been found that there is a negative association between growth in the headcount ratio and entrepreneurship. The headcount ratio is the most common measure of poverty. The findings show that a significant role is played by entrepreneurship in eliminating poverty within the country. The results are in line with the findings of Afreh, Rodgers, and Vershinina (2019). The researcher found a significant influence of entrepreneurship on the elimination of poverty. The observed recovery of the country post-crisis has been enabled by the positive effect of entrepreneurship on poverty. When there is 1 percent increase in entrepreneurship, the level of poverty is reduced by 0.03 percent. It has been mentioned earlier that there is an average 13 percent annual growth in the establishment of new firms in all provinces of KSA. It indicates that 70 percent annual reduction in poverty is caused by entrepreneurship.Further, it was found that the association between inequality and entrepreneurship is significant. It is considered by some economists that the relationship between inequality and entrepreneurship is not direct. Using conventional wisdom, the relationship between inequality and entrepreneurship is highly positive.

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