Impact of public wellness, competitiveness, and government effectiveness on quality of education in Asian countries.

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Abstract

The present study attempts to examine the impact of Public wellness, competitiveness and government effectiveness along with Literacy rate and Population growth on quality of education. For this research, the panel data has been collected over the period of 25 years for 10 Asian countries including World Bank and Global Economy data base. The data is specific to employed variables. Different statistical tests like Heteroskedasticity, Autocorrelation, Cross-section dependence and Multicollinearity, and the estimation of static and dynamic GMM were applied on the valid data. The results show that, public wellness, Government effectiveness, literacy rate and population growth significantly impact the quality of education in Asian Countries. Whereas the insignificant impact of competiveness was evidenced from outcomes of the research. This study is associated with all type of key implications in terms of theoretical, methodological, and practical perspectives as well. Lastly, various limitations have been given along with the recommendations for In-depth findings by the future researchers.

Keywords: public wellness, competitiveness, government effectiveness, quality of education, Asian countries.;

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1. Introduction

It is believed that education is the backbone of a country's prosperity, wellbeing of individual and a source of income. Nowadays, education is not only required but in addition focus is given to the quality of education. Among other regions, Asia is the largest and the most populated continent on this planet. It is accompanied by diverse situations of quality education in the region. In high income countries like China, Turkey, Maldives, the situation of literacy is much better as their literacy is above 90%. In Middle-income countries like Pakistan, India and central Asian countries however, the situation of literacy is average and much more is needed be done. The situation of literacy is worst in low-income countries like Afghanistan and Iraq (Park, 2020). The literacy rate of Afghanistan is critically low (37%) and girl-child education gives alarming statistics of 17%, as per Transparency International Reports in 2018. The key factors that can influence the quality of education in any country are public wellness, competitiveness, and government effectiveness. Public wellness includes variety of other socioeconomic and health factors (Wilson-Anstey, Lambert, & Krog, 2019; Burgos & Bocco, 2020; Carranza Romero et al., 2020; Abulela & Marwell, 2020; Akpur, 2020; Barkhuizen et al,. 2020; Bello & John-Langba, 2020). The health of students is very critical as they spend almost 2 to 5 hours at their educational institutions. If the health of the student is not good then there will be increased chances of less attendance and lack of interest in their studies. Socioeconomic factors also contribute, since the students with better backgrounds will be able to focus more on their health and have regular check-ups than students with lesser income (Garg, Homer, & Dworkin, 2019; Govender & Govender, 2019; Hotar, 2020; Habanabakize, 2020; Kimanzi & Gamede, 2020; Bello & John-Langba, 2020; David & Grobler, 2020; Hornung, 2020; Janssen, 2020;). Another factor is competitiveness, which does not only motivate the student to achieve more but also motivates the institution as well. Competition among students and schools make the quality of education more effective and better(Al-Sartawi et al., 2019; Davis & Wilson, 2019). The third factor that is critical for the quality education is the government effectiveness. Better education polices, implementation of those polices and the generation education funds ensure government effectiveness (Chiena, Linb, & Chauc, 2020). It is the task of government to ensure the wellbeing of the students and families so that there will be no hurdle in gaining quality education (Gorczynski & Aron, 2020). In developing countries, the drop out ratio of students after primary education is very common. Government should make policies in this regard and provide scholarships to ensure the enrolment of the students in the schools (Borda-Masa, et al. 2020; Codina et al., 2020). For higher education, funds for the research project should be generated so that the students can peruse their project without compromising on the quality (Rapacha, 2018; Sabbagh, Gedawy, Alshikhabobakr, & Razak, 2017; Dalle et al., 2017)).
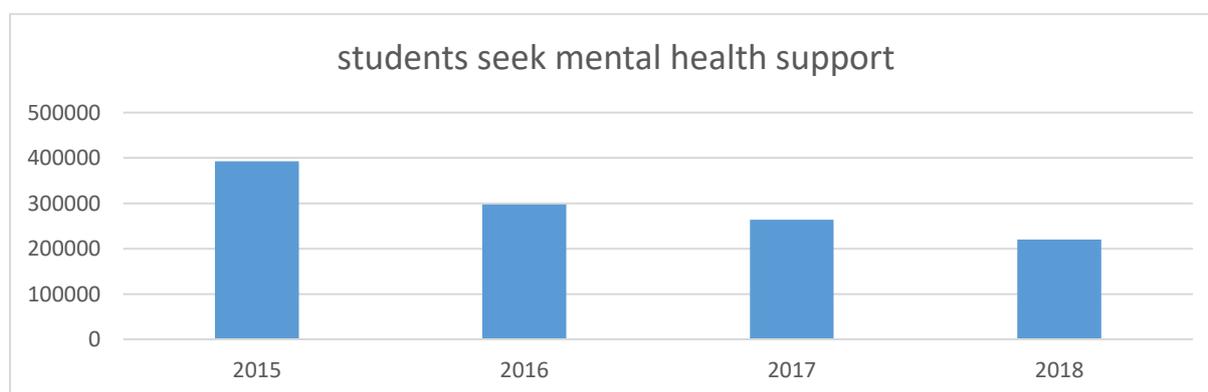
Figure 1. shows more students seek mental health support in 2016-2017

1.1 Impact of public wellness on the quality of education

The learning crisis in Asia especially in South East Asia is very critical. The factors that affect the quality of education in this region is poverty accompanied by the declined level of public wellness (Aytaç Demirçivi, 2020). According to The World Bank reports in 2015, the majority of the children in the

South East Asia are malnourished and the root cause is poverty. Increasing enrolment in schools should not only be the concern by the government but also wellbeing of the child (Baharuddin & Dalle, 2019). Zodpey et al., (2012) studied that due to immerse educational syllabus, economic pressure and keeping pace with the new scientific performances the health of the medical student's declined (Pfeffer, 2015; Zeichner & Conklin, 2017). This study was conducted in five Asian countries including India, Bangladesh, Vietnam, China and Thailand (Olasupo & Idemudia, 2017; Rai, Dua, & Yadav, 2019). The results of the survey suggested that the decline in health of the student is directly proportional to the quality of education (Zodpey et al., 2018). Zhou, Xin, & Du et al. (2019), Suggested that in the past three decades, the migration of individuals from rural to urban areas is evident. This brings a lot stress to the students including mental and physical decline of health (Zhou, Xin, & Du, 2019; Ozbey, 2020). Due to this, the children belonging to low-income backgrounds are gaining low quality of education and facing cognitive developmental issues. Decline in the mental and physical health decrease concentration in education (Dinç Aydemir & Aren, 2017; Gong & Yi, 2018; Muda, 2017; Muhle, 2020).

Patwa, Peverly et al. (2019), suggested that there should be a psychologist in every school to ensure the mental wellbeing of the children. In India, one third of the students live in the slums. These students got various diseases from their environment. These illnesses are hindrances in the quality of education (Patwa, Peverly, Maykel, & Kapoor, 2019). Kok & Low (2019) performed a study in Malaysia to evaluate the decline in mental health due to academic and economic stress. The results of the study reveal that the increased curriculum and increased expectation from the institution declines the health of the student. And later this factor contributes in the decline in the quality of education (Kok & Low, 2019). The same situation was studied in Korea as well (Phosaly, Olympia, & Goldman, 2019). Special children like the ones dealing with Autism, due to unavailability of educational institutes in the developing countries are factors that lead to the decline in the quality of education in the region (Sağıroğlu & Uzunboylu, 2018; Phosaly et al., 2019; Elsayed & Salama, 2020). The first hypothesis is:

H1: Public wellbeing has positive impact on the quality of education.

1.2 Impact of competitiveness on the quality of education

Sulisworo (2016) studied the role of competitiveness in the quality of higher education in the East Asian countries. The study found out that, the competitiveness in the educational sector in the South Korea, Hong Kong and Singapore have invited various prestigious institutes of the world to open campuses in their country (Sulisworo, 2016; Udokang & Odeyemi, 2020). Istvan et al. (2016), suggested that the more competitive the institution, the more students will apply for their programs. Lack of competitiveness decreases the quality of education and this will later result in the shortfall in applying students as happened in the developing countries of the Asia (Istvan, Darabos, & Orsolya, 2016). Keser et al., (2012) suggested that the incorporation of new technology in the education sector is due to competition of educational institutes (Dalle & Ariffin, 2018). This technology will further help in raising the economy. According to the study, tertiary education produces employees for both private and public-sector jobs in the country (Keser, 2015). According to the study, tertiary education produces both private and public-sector jobs. Quality of higher education has an impact on the competitiveness of both people and organizations from the point of view of the public domain. This will influence the students to get in to entrepreneurship leading to the economic progress of the country (Altuntepe & Güner, 2013).

H2: Competitiveness has significant impact on the quality of education.

1.3 Impact of government effectiveness on the quality of education

Siddique et al. (2016), assessed the impact of government effectiveness and impact of its polices in the SAARC countries (Siddique, Shehzadi, & Shaheen, 2016; Alvi & Rehan, 2020). The outcome of the study suggests that lack of government polices' effectiveness is declining the quality of education in South Asia. Sen et al. (2015), in the World bank report of the year 2014 suggested that higher

education is highly influenced by the polices made by the government (Sen, 2015). The empirical findings of their study imply that after the completion of technical courses, teachers' confidences and pedagogical skills increased significantly and 70 percent teachers found the course useful for improving their pedagogical skills. The empirical studies also support the importance of technical training and technical courses in inculcating the technical skills in teachers to meet the dynamics of education standards. According to Dar, Jabeen, Jadoon, and Dar, (2016) faculty development programs and technical training of teachers raise the abilities and technical skills of the teachers. They used the survey data of 95 faculty members of various public sector universities. The study employed thematic analysis to analyse the results, which illustrates that faculty development programs, by providing technical training to teachers, improves the overall quality of learning in higher education (Isik & Jallad, 2019). The third hypothesis is:

H3: Government effectiveness has significant impact on the quality of education.

1.4. Objective

Despite the various affords done by the governments of Asian countries, level of quality of education is declining in developing countries in Asia. To increase the quality of education, government of Asian countries are working on public wellness, competitiveness, and government effectiveness. This study has tried to fill lacunas in literature by conducting empirical research using panel data of Asian countries to explore the link between educational quality with government scholarship, technical training, and R&D. A lot of work is done, and much more is needed in these factors to improve the quality of education. Based on the above material, the following are the key objectives as observed under current research.

1. Determining the public wellness on the quality of education in the selected Asian economies.

2. Analysing the impact of competitiveness on the quality of education in the selected Asian economies.

3. Investigating the impact of and government effectiveness on the quality of education in the selected Asian economies.

2. Methodology

2.1 Data

The collection of data is the foremost and vital step in the process of research as it enables the author to initiate the research. For determining the authentic results, the collection of accurate data is essential. Considering the significance of accurate and reliable data, the data of 10 Asian countries including Indonesia, India, Thailand, South Korea, Sri Lanka, Vietnam, Malaysia, Japan, china, and Bahrain over the period of 25 years has been collected by the current study from trustworthy and authentic sources. The database of World Bank and Global Economy Portal was utilized for gathering the information about the incorporated variables. The reliability of the collected data has been ensured as it effects the authenticity of the obtained results. The key variables of the study comprised of Public Wellness, Competitiveness, Government Effectiveness and Quality of Education.

2.2 Model Specification

The model specification is another vital step in the research process once the data has been collected. Firstly, the categorization of variables in terms of dependent, independent and control variables is done along with their units of measurement. The current study incorporated Quality of Education (QE) as the dependent variables, whereas Public Wellness (PW), Competitiveness (CO), and Government Effectiveness (GE) are included as independent variables. Similarly, the present study involves two control variables that is: Population Growth (PG) and Literacy Rate (LR). The mentioned variables are

measured with different units as follows: The Government effectiveness is measured with the Government effectiveness index on a scale ranging from -2.5 to 2.5. The variable Competitiveness is measured by world economic forum index ranges form 1-7. The literacy rate is measured with the percentage of educated citizens and the population growth is measured in terms of annual percentage change. Likewise, the quality of education is measured by global competitiveness index on quality of education system with a scale of 1 -7. The following regression equation is formulated with the incorporation of the above-mentioned units and notations,

$$QE_{it} = \alpha + \beta_1 PW_{it} + \beta_2 GE_{it} + \beta_3 CO_{it} + \beta_4 LR_{it} + \beta_5 PG_{it} + \varepsilon_{it}$$

In the above equation, QE shows quality of education, PW shoes public wellness, GE shows Government effectiveness, CO shows competitiveness. While LR denoted Literacy rate and PG denotes Population growth. ε_{it} is representing the error term.

Authors	Country/Group	Period	Variables	Methodology	Results
(Kalim, Arshed, & Shaheen, 2019)	15 low-income counties	2006-2015	Inclusive growth, and competitiveness,	Panel GMM moderator model	Strong Statistical association between inclusive economic growth and competitiveness was found. It is indicated that competitiveness helped the institutions to become more productive.
(Afonso & Jalles, 2016)	140 countries	40 years	Government effectiveness, institutions growth, government size.	GMM panel data approach, common correlated effects	The results show the positive impact of government effectiveness on institutional growth of education sector.
(Afolabi, 2019)	West African countries	2002-2016	Governance, , regulatory quality, government effectiveness and institutional development,	System GMM approach	The results show that government effectiveness is positively related to development.

2.3 Estimation Procedure

The details of the applied estimations and procedures and approaches are discussed in this section. The applied test comprises of unit root test and General Methods of Movement (GMM) estimations.

2.3.1 Application of Unit root test

For the confirmation of stochastic attributes of the variables, in addition with their integration orders, the unit root tests of "Levin–Lin–Chu (LLC)" (Breitung & Das, 2005)is applied in the current study. In comparison to the time series unit root tests, these tests have advantages of overcoming the problem related to size and power of technique of individual time series. Also, it is mentioned in the literature that for a standard normal distribution, the panel root test statistics is convenient. This test is the

extended form of Dickey-Fuller unit root tests utilized in time series approach. The identification of null hypothesis is done based on unit root and non-stationary property of data. The rejection and acceptance of these hypothesis determines the result of unit root tests. In addition, it is assumed that, across the cross sections, the similar autoregressive process was followed. The following equation represents the structure of the unit root test:

$$\Delta y_{it} = \alpha_i + p y_{i,t-1} + \sum_{j=1}^{p_i} \alpha j \Delta y_{i,t-j} + \in_{i,t}$$

2.3.2 Application of Diagnostic tests

In order to address various issues in the data set and the model, this study has utilized "modified Wald and Breusch-Pegan/Cook Weisberg Heteroskedasticity test, Wooldridge test for autocorrelation, VIF test for multicollinearity and cross-section dependence test" of (Pesaran, 2004). In addition, for checking the possibility of any multicollinearity bias, the results of correlations among variables are examined.

2.3.3 Application of system-GMM approach

The generalized methods of moments are the general framework utilized for deriving estimators. It is based on the assumptions about the random variable moments to determine objective function (Blundell & Bond, 2000). It is used for the estimation of dynamic models of panel data. The "GMM-SYS estimator" is the system which contains the level and first difference equations. Which is the alternative of "standard first difference GMM estimator" (Arellano & Bond, 1991). It is evidenced in the literature that the regression models of panel data are exposed to problems of heteroskedasticity, autocorrelation and cross section dependence along with multicollinearity. To address these problems of cross section dependence, autocorrelation, and heteroskedasticity, the model is tested for "modified Wald and Breusch-Pegan/Cook Weisberg heteroskedasticity test, Wooldridge test for autocorrelation, VIF test for multicollinearity and cross-section dependence test" of (Pesaran, 2004). Also, the correlation among variables is examined for determining the relationship among variables. Thus, the following equation has been incorporated for the application of GMM model:

$$\vartheta_{it} = \alpha_i + y_{i,t} + \sum_{p=1}^{p} B + \sum_{q=1}^{q} B + \sum_{r=1}^{r} B + E_{i,t}$$

In the mentioned model, the quality of education of 10 Asian countries is represented with ϑ_{it}, the constant term is represented with αi. $\gamma \vartheta_{i,t-1}$ denotes the lag value of quality of education, Z_{it} represents the predictor variables, while $\in_{it}$ is the error term. In addition, the unobserved factors of quality of education are represented with v_{it} and e_{it} shows the idiosyncratic errors.

3. Results

3.1 Results of Unit Root Test

This study has applied the LLC test to test the null hypotheses of unit root against the presence of unit root in the series. When LLC test was applied, as shown from table 1 all the variables in the level series were found to be stationary except PG and LR which are non-stationary. But when the 1st difference is applied, all of them become stationary. So, all these facts and results show that all the variables that are included in this study are stationary.

Table 1. LLC unit root

Constructs	Level	1st difference
PW	-2.633	-5.498**
CO	-3.983	-4.393***
GE	-.359	-6.298***
PG	-4.237*	-7.583***
LR	-3.483*	-5.548***
QE	-2.485	-9.348**

3.2 Results of Diagnostic tests

Various tests are applied under the present study. The results are presented in table 2 and 3. The results show the significant heteroskedasticity levels among the variables, and also the cross-section dependence is observed.

Table 2. Diagnostic checks

HSK	MW. Breusch-Pagan/Cook-Weisberg	$\chi2$-value: 9.13**/ $\chi2$-value: 4.98*
AUTOCOR	Wooldridge	F-test 6.93*
CD dependence	Pesaran	Test scores: 2.042*
Multicollinearity	VIF	VIF Mean: 2.94

Note: HSK means Heteroskedasticity, AUTOCOR: Autocorrelation

Table 3. Correlation Matrix

Variables	PW	CO	GE	PG	LR	QE
PW	1					
CO	.548	1				
GE	.502	.582	1			
PG	.395	.344	.284	1		
LR	.492	.394	.399	.283	1	
QE	.234	.542	.362	.583	.582	1

3.3 PCSE estimation Results

The literature emphasized the importance of "first-differenced GMM and "system GMM" approach (Blundell & Bond, 2000). It is identified that the 1st differentiated model is not effective in providing the accurate results in the presence of small sample size. And it is highlighted by Bond & Windmeijer, 2002 that the system GMM application provides the accurate results with the high accuracy, due to the utilization of large number of instruments, and the connection in the levels of regression, with the regression in first-difference. In addition, the system GMM model is applied as it addressed the sample size bias along with the improved precision of the model. The two major techniques (static estimation and dynamic estimation) were estimated by the current study to mitigate the issues of cross section dependence, heteroskedasticity and determination of robust standard errors.

 The static estimation by using "Prais-Winsten regression" was performed with "correlated PCSE and dynamic estimation" by utilizing the "one step system GMM estimation". It is required to incorporate the dynamic and static estimation in order to ensure that the findings are robust. The country and time fixed effects are applied for capturing the heterogeneity which is unobserved. The assumption

of "PCSE estimation" is that across the panels, the disturbances are contemporaneously correlated and possess heteroskedasticity and have the ability to handle the panel which is unbalanced

Table 4 represents the GMM estimations both dynamic and static. It is indicated from the results that PW is significant in both dynamic and static estimations and indicating that public wellness has significant impact on quality of education. Similarly, it is shown that (GE) Government effectiveness also had a significant impact on the quality of education in Asian countries according to dynamic and static estimations. In the same way, dynamic and static estimations show that the variable (PG) Population growth and (LR), literacy rate have a significant impact on quality of education in selected countries of Asia. On the contrary, no significant impact of competitiveness level on the quality of education is observed from the results of both the estimations.

Table 4. Results from PCSE estimation

Dependent Variable = QE	PCSE estimation	Sys-GMM estimation
PW	0.219**	0.201**
	(0.582)	(0.282)
CO	0.103	0.104
	(0.891)	(0.768)
GE	0.294**	0.284**
	(0.745)	(0.683)
PG	0. 139*	0.140*
	(0.931)	(0.485)
LR	0.194**	0.183**
	(0.438)	(0.344)
Constant	0.482**	0.492**
	(0.632)	(0.759)
R^2	0.638**	-
	(0.841)	
N	250	-
N of Instruments	-	248
N	-	248
Arellano-Bond test for AR (1) (Pr W z)	-	0.074
Arellano-Bond test for AR (2) (Pr W z)	-	0.438
Hansen test of overid restrictions	-	1.018

N means number of observations.

4. Discussion

This study is implemented in Asian economies and for this purpose, the impact of Public wellness, competitiveness, and Government effectiveness on the quality of education. Also, the impact of control variables, that is Literacy rate and Population growth is also analysed. Multiple hypotheses have been formulated to investigate the relationships. For hypothesis testing system GMM approach was applied. It was assumed that the level of public wellness possessed by the citizens Asian countries have its positive and significant influence on the quality of education. This hypothesis was accepted as the wellness levels in terms of health, way of living and satisfaction with current human development policies, the quality of education system will be improved. The results are consistent with the findings of (Sun et al., 2017).

The author has tested hypothesis 2 and 3 and declared them as accepted since the effective governmental policies in the educational decisions like education budget, educational investment,

development of educational institutes, expenditures on education infrastructure of a country determines the quality of the education system (Odhiambo, 2011). The results are consistent with the findings of (Solihin, Mursinto, & Sugiharti, 2017). As the high literacy rate leads towards educated citizens and human capital and led to the overall improved education system of the country, the effective mechanism for increasing the literacy rate should be devised. These results are also in accordance with the previous studies (Dufera,2017; Yıldız, F. Ülkü, Cagdas & Kayili, 2020)

5. Conclusion

The motive of the study is the investigation of factors that impact the quality of education in Asian countries. For this research, the panel data has been collected over the period of 25 years for 10 Asian countries from World Bank and Global Economic data base. The data is specific to employed variables. After the completion of data collection, several tests were applied in order to test the hypotheses using the system GMM approach. The tests include LLC unit root test, diagnostic tests of Heteroskedasticity, Autocorrelation, Cross-section dependence and Multicollinearity, and the estimation of static and dynamic GMM. The purpose of these tests were to examine the impact of incorporated variables on the quality of education.

5.1. Implications

The quality of education is the vital component for the growth of country as it determines the competitiveness of its citizens and enhances the chances of development of a country. In this study the determinants of educational quality in the region of Asia which was observed through the incorporation of public wellness, Government effectiveness and competitiveness level, literacy rate and population growth. Based on the research objective, the study embraces several theoretical, practical and policy making implications that will improve the education quality in the examined countries of Asia with the participation of citizens with high degree of wellness, effectiveness of government in educational policies and enhancement of literacy rate. The study will help future researchers in understanding the determinants for judging the quality of education throughout the world. Also, the study will guide the governmental authorities to revaluate their governance systems effectively for the education sector along with the focus on wellness of the citizens as their satisfaction with their wellbeing determines the smooth functioning of the overall education system. In addition, it is indicated that literacy rate determines the quality of education, it is suggested to devise policies for upgrading the education system and enhancing the literacy rate of the country.

5.2. Limitations and Future research indications

Like many other studies, this study is also not free from certain limitations and loopholes, which can be effectively filled by future researchers to improve the quality of their researches. The sample size of data can be increased to determine more comprehensive results. The study is concentrated on Asian countries only. The specific tests that were used in this study limits the scope of the study. For covering the stated limitations, the researchers can increase the sample size of the collected data. Any other region, Other than Asia can also be used along with panel data approach for increasing the study scope.

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