economies

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Public Spending, Income Inequality and Economic Growth in Asian Countries: A Panel GMM Approach

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Received: 5 June 2019; Accepted: 14 November 2019; Published: 22 November 2019

Abstract: This paper offers an empirical examination of the relationship between government spending's, income inequality, and economic growth by using the case of 19 Asian countries from 2002 to 2017. For this purpose, the paper uses robust difference-GMM estimation and panel granger causality test. We found that gross domestic investment and regulatory quality are the main variables that contribute to these countries' economic growth. While current government consumption reduces economic growth. Also, government expenditure on education and regulatory quality granger cause economic growth in these countries. However, the effect of government expenditure on education on economic growth is not significant. So, to increase their economic growth, this study recommends these countries' governments to encourage gross domestic investment, maintain regulatory quality and reduce their current consumption. This study also concludes that income inequality has no impact on these countries' economic growth for this period.

Keywords: public spending; income inequality; economic growth; Asian countries; panel data

JEL Classification: C23; C26; H52; O53

1. Introduction

In recent decades, Asia has become a region of extremes: China is now home to two companies (Alibaba and Tencent) which are valued at more than $1 trillion; while four of the world's five most expensive cities are in Asia, with Hong Kong topping the list. In contrast, a wealth gap has opened up, driven largely by wage disparity and differing levels of access to education. "Highly skilled workers with more education see their incomes rise, while low-skilled workers see their wages reduced," noted a recent report by the Asian Development Bank.

This gap is at its highest level in decades for developed economies, while the inequality trend has been rising in many developing countries. In Asia, despite recent economic growth, income distribution has been worsening as well.

However, according to the World Bank's World Development Report 2017, public policy implementations have to generate development outcomes such as security, growth, and equity. Hence, public policies through spending and tax influence economic growth and income inequality.

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Following these analyses, our work attempts to describe the link between the Asian government's spending components, inequality, and economic growth.

According to the socio-political instability approach (Alesina et al. 1996) a highly skewed distribution of resources induces people to engage in social activities outside the normal markets, such as crime, revolutions, and violent protests. This, in turn, introduces uncertainty and distrust towards the economic system and discourages investments and capital accumulation. In the long run, it slows down the process of economic growth. Barro (1991); Grossman and Helpman (1991); Rebelo (1991); Michaelowa (2000); Benhabib and Spiegel (1994); Krueger and Lindahl (2001); Afzal et al. (2010); Lin et al. (2003); Tamang et al. (2011); Baldacci et al. (2004) demonstrated that economic growth and education are positively related. While Devarajan et al. (1996) showed in their analysis a negative correlation between education spending and economic growth. Galor and Zang (1997) formalized the link between fertility and schooling decisions and their impact on growth. Given the distribution of income, a higher rate of fertility means that the family has fewer resources to invest in education, with a contracting effect on growth.

A theoretical model where the trade-off between inequality and growth works through the channel of fertility decisions demonstrates that economies with a less equitable income distribution experience higher fertility differentials, invest less in human capital, which in turn weakens the process of development (De la Croix and Doepke 2003).

Galor and Moav (2004) provided a unified theory in which the relationship between the distribution of income and growth is not stable over time, but depends on the stage of development in a country. The positive impact of inequality upon growth reflects the situation of an economy during its early stages of industrialization.

In this phase, the accumulation of physical capital is the principal engine of growth and it is promoted by disparities among individuals. Once the economy has passed over this initial phase, the accumulation of human capital becomes the prime engine of growth and a more equalitarian distribution of resources allows more people to invest in education. In this stage, in the presence of credit constraints, access to education is easier if wealth is evenly spread among individuals, and hence policy decisions have to be directed towards inequality-reducing strategies. Their conclusions are particularly relevant for less developed countries (LDCs).

Persson and Tabellini (1994) focused on the political economy approach, by considering welfare transfers on a small sample of 13 OECD countries for which data were available, to find non-significant results about the prediction that inequality increases redistribution and that redistribution reduces growth. As noted before, other authors support a different relationship between inequalities and redistributive policies.

The significance of institutions on economic growth was initially highlighted by North (1987, 1991) and was empirically asserted by several studies (Acemoglu et al. 2002; Rodrik et al. 2004; Berggren and Jordahl 2005; Glaeser et al. 2004).

According to International Monetary Fund (2015), endogenous growth theory identifies four main mechanisms through which government expenditure and tax reforms may increase long-run growth, as follows: physical capital (Nourzad and Vrieze 1995; Sanchez-Robles 1998), human capital (Lucas 1988; Mankiw et al. 1992; Barro 2001), total factor productivity (Barro 1990; Glomm and Ravikumar 1994; Turnovsky and Fisher 1995), labor supply (Devereux and Love 1994; Turnovsky 2000). Marlow (1986) studied a sample of 19 developed countries over the period 1960–1980, controlling only for the level and growth of government expenditure and argued that a larger public sector harms long term growth.

A dataset of 23 OECD countries, as well as a more representative sample of 60 countries was examined by Gwartney et al. (1998) who provided evidence on the existence of a robust negative effect of government expenditure on economic growth, even after the effects of education, investment, institutional quality, and macroeconomic stability were taken into account.

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Turning our attention to more recent studies, Bleaney et al. (2001), reported that government consumption expenditure and spending on social welfare do not affect the rate of growth, whereas public investment has positive effects.

On the government revenues side, Easterly and Rebelo (1993a, 1993b) suggested that only income tax rates have a negative relationship with long term growth, while other tax measures have no significant effect.

Kneller et al. (1999) argued that the reinforcing effect of government investment expenditure is significant only when financed by non-distorting taxes and at the relatively small size of government, while a rise in distorting taxes is associated with lower levels of long term growth.

Similar findings that direct, rather than indirect, taxation alleviates economic growth have been reported in more recent studies, such as these by Padovano and Galli (2002a, 2002b); Widmalm (2001); Lee and Gordon (2005); Bergh and Öhrn (2011).

2. Methodology

This section presents the database and methods we used to estimate the causal relationship between education spending, income inequality, and economic growth.

2.1. Database

To make this analysis, we use panel data of *19 Asian countries* listed in Appendix A from 2002 to 2017. The main data sources are provided by the *World Development Indicators 2018* ((World Bank 2018a) 2018), the *World Governance Indicators 2017* (World Bank 2018b) of the World Bank, and *Standardized World Inequality Indicators Database 2018* (Standardized World Inequality Indicators Database 2018).

2.2. Model

This study seeks to investigate the level and nature of relationship between government spending components, governance indicators, inequality and economic growth. To do this, we will use the Barro (1990) economic growth model which is an endogenous model highlighting the relationship between government policy and the rate of economic growth. Its empirical specification is a panel data form presented as:

$$\gamma_{it} = \psi_1^J X_{it}^1 + e_{it} \quad (1)$$

where i characterize each country, t the time period (with t = 1, 2, … T) and growth rate, γ_{it}, is the annual log-difference of the per capita GDP for country i during period t.

$X_{it}^1 = [edu_{it}, inv_{it}, cons_{it}, ineq_{it}]$ is the vector of J covariates of government spending components, expressed as a share of GDP, and $ineq_{it}$ an index of inequality which is measured by Gini index.

The government spending components are:

- Government expenditure into education edu_{it}; which consists of current and capital public expenditure on education including government spending on educational institutions (both public and private), education administration as well as subsidies for private entities (students/households and other privates entities). It also includes expenditure funded by transfers from international sources to the government.
- Gross domestic investment (i.e., gross fixed capital formation) inv_{it}; shows how much of the new value -added in the economy is invested rather than consumed.
- Current government consumption, (i.e., gross national expenditure) in GDP $cons_{it}$.

It is the sum of private consumption, general government final consumption expenditure, and gross capital formation.

These explanatory variables are potentially endogenous in the sense that they are likely to be correlated with e_{it}.

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As Mankiw et al. (1992) points out, if countries have permanent differences in their production functions, for example, based on different initial technological development, these would enter as part of the error term and would be positively correlated with initial per capita income growth, i.e., $e_{it} = f(A)$. To deal with this, A is modeled as $A = \psi_2 \gamma_{t-1} + e^*_{it}$ and included in Equation (1).

Note that the specification of lagged growth in the annual panel regressions is analogous (but not identical) to the inclusion of initial income in cross-section or static panel regressions, as discussed by Bleaney et al. (2001). We obtain:

$$\gamma_{it} = \psi_1^J X_{it}^1 + \psi_2 \gamma_{it-1} + \mu_{it} \quad (2)$$

where μ_{it} is the error term, a combination of e_{it} and e^*_{it}.

A number of control variables and regional time-trends were added, giving the final extended model:

$$\gamma_{it} = \psi_1^J X_{it}^1 + \psi_2 \gamma_{it-1} + \psi_3^k X_{it}^2 + \mu_{it} \quad (3)$$

where $X_{it}^2 = [regulation_{it}; stability_{it}; trade_{it}]$ is the vector of k covariates that potentially influence economic growth.

This choice of controls arises from a preliminary analysis of the correlation of a large set of socio-political variables derived from the World Bank dataset with the growth rate.

Firstly, regulatory quality reflects the fact that in most economies the effectiveness of regulatory institutions is a major determinant of how well markets function. In fact, this indicator measures the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Thus the quality of regulatory governance can affect regulatory outcomes, which in turn can be expected to impact on economic growth (Jalilian et al. 2007; Kraay and Kaufmann 2002).

The variable $regulation_{it}$ is measured by the *World Bank's World Governance Indicators* (World Bank 2018b), where the index is measured on a scale from 0 to 100, with 100 the highest quality of government regulation.

Second, political stability measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. So it can influence growth, through its effect on the size and composition of government spending. To measure political stability, an indicator ($stability_{it}$) is taken from the *World Bank's World Governance Indicators* (World Bank 2018b) which takes values between 0 and 100, where the maximum degree of stability is 100.

Third, the trade openness ($trade_{it}$) refers to the outward or inward orientation of a given country's economy. Outward orientation refers to economies that take significant advantage of the opportunities to trade with other countries. Inward orientation refers to economies that overlook taking or are unable to take advantage of the opportunities to trade with other countries.

The regression of Equation (3) is dynamic in the sense that it includes the lagged level of per-capita income growth as an independent variable, which means that an endogeneity bias can arise if the individual fixed effects and the lagged dependent variable are correlated. This source of endogeneity bias is addressed in the literature by building a set of orthogonality conditions and estimating the model using the generalized method of moments (GMM).

Additionally, the GMM estimation with panel data is advantageous in a number of ways. First, the pooled cross-sectional and time-series data allow us to estimate the relationship over a long period of time for several countries. The GMM is a simple estimator compare to the maximum likelihood estimator. Second, any country-specific effect can be controlled using an appropriate GMM procedure. The GMM estimator provides robust empirical results without having information for accurate distribution of the error term. Third, to ensure the quality of the estimation, we must use the approach introduced by Arellano and Bond (1991), which can solve the problem by first differentiation.

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3. Results

In this part, we will statistically describe the data, and then highlight long-run relationship and causality between these variables by using difference generalized methods of moments (GMM) estimation and Dumitrescu and Hurlin (2012) panel causality test.

3.1. Descriptive Statistics

3.1.1. Correlation Table

The correlation relationship between the different variables is presented in Table 1. In this table, regulatory quality is significant and negatively correlated with economic growth (γ_{it}). Other variables such as government expenditure, gross domestic investment, and income inequality are significant and positively correlated with economic growth (γ_{it}).

Table 1. Correlation table.

Correlation Prob	GDP/K	EDU	EXP	GFCF	DGDP/K	INEQ	QUAL	STAB	TRADE
GDP/K	1000								
EDU	−0.074 (0.250)	1000							
EXP	0.151 ** (0.019)	−0.080 (0.212)	1000						
GFCF	0.205 *** (0.001)	−0.062 (0.332)	−0.199 *** (0.002)	1000					
DGDP/K	0.415 *** (0.000)	−0.044 (0.490)	0.180 *** (0.01)	0.233 (0.000)	1.000				
INEQ	0.109 * (0.089)	0.067 (0.299)	−0.095 (0.141)	−0.016 (0.802)	0.129 (0.043)	1000			
QUAL	−0.133 ** (0.04)	0.032 (0.620)	−0.476 *** (0.000)	−0.072 (0.266)	−0.128 ** (0.047)	−0.045 (0.487)	1000		
STAB	0.054 (0.404)	−0.063 (0.324)	−0.356 *** (0.000)	0.272 *** (0.000)	0.090 (0.162)	−0.145 * (0.024)	0.671 (0.000)	1000	
TRADE	−0.082 (0.201)	−0.404 (0.555)	−0.203 *** (0.001)	−0.037 (0.568)	−0.114 * (0.076)	0.059 (0.362)	0.215 *** (0.001)	0.179 *** (0.005)	1000

Note: ***, **, * denote the rejection of the null hypothesis at the 1%, 5% and 10% significance levels, respectively. Source: Authors.

3.1.2. Graphs

These figures below attempt to show that these countries government expenditure into education and income inequality are globally correlated to their economic growth.

- In Figure 1, we see the evolution of economic growth from 2002 to 2017. The X-axis represents years while Y-axis represents economic growth for each country.

The graphs show that from 2002 to 2017, economic growth (measured by GDP/K) in Bangladesh, India, Indonesia, Laos, and Tajikistan is positive. Economic growth increased in this period for all of these countries except Tajikistan. The different graphs showed that economic growth in some Asian countries is not stable and negative while in the others it is constant and positive. It can mean that the growth determinants are different from one country to another.

- In Figure 2, we see the evolution of education spending (in the percentage of GDP) from 2002 to 2017. The X-axis represents years while Y-axis represents education spending for each country.

The graphs show that globally the trend of education spending is different for each country. Less or equal to 4% in the case of Bangladesh, India, Indonesia and Laos, this level of education spending, firstly highlighting that these countries' investments in education are small. Secondly, the link between economic growth and education spending is not clear.

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- In Figure 3, we see the evolution of inequality from 2002 to 2017. The X-axis represents years while Y-axis represents inequality for each country.

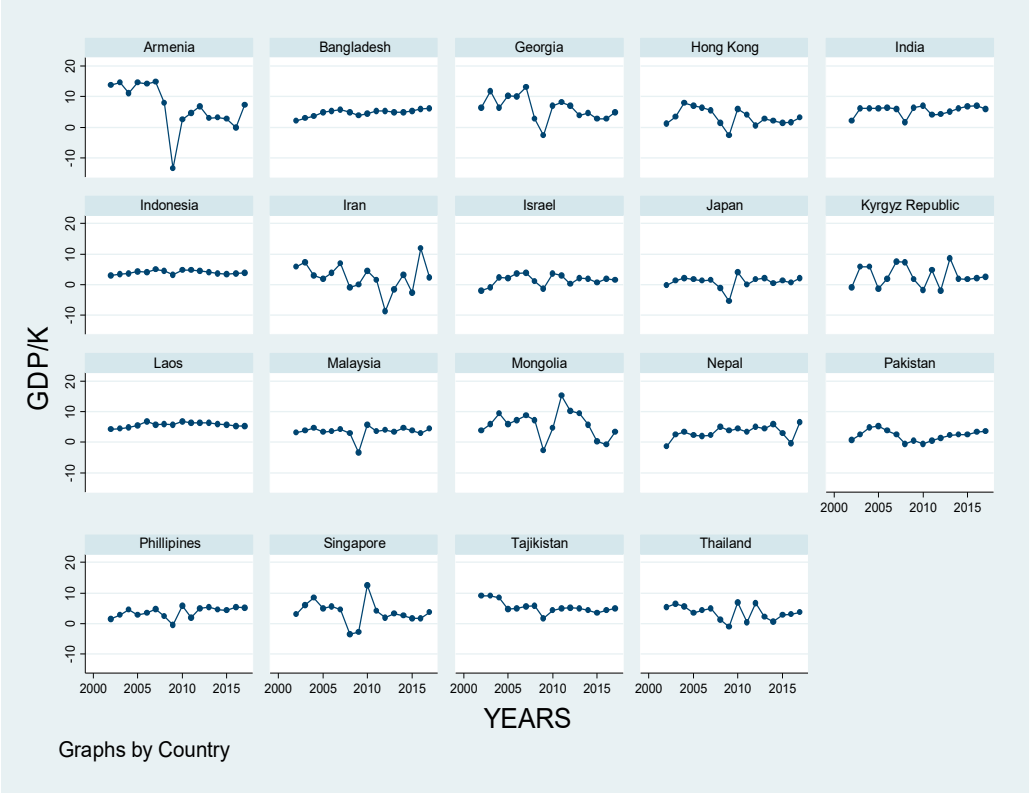

Figure 1. Evolution of economic growth by country.

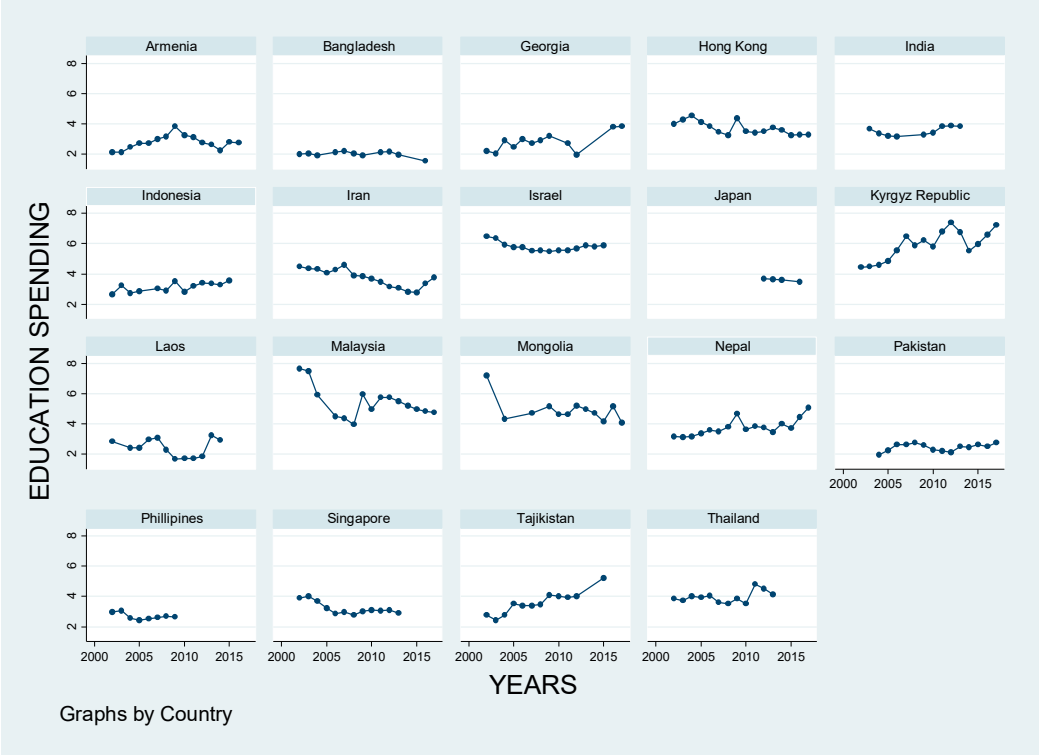

Figure 2. Evolution of government expenditure into education by country.

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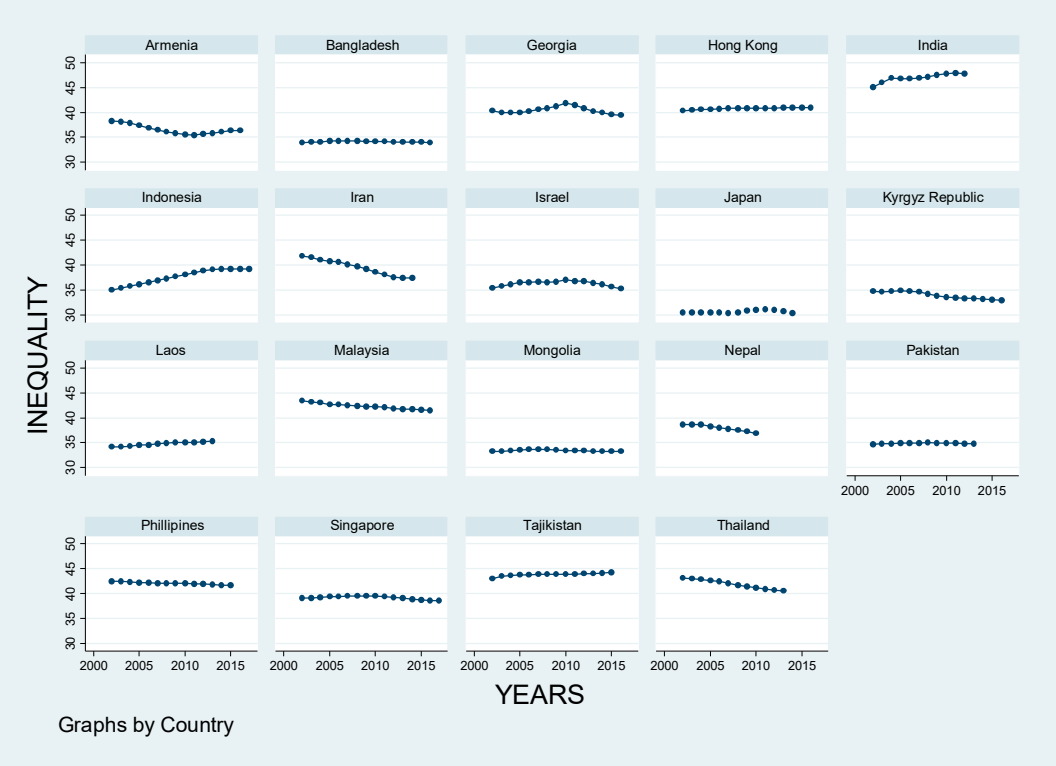

Figure 3. Evolution of income inequality by country.

In this period, the level of inequality is high for India, Malaysia, Tajikistan, Indonesia, and Iran. The most inequality level is high, the less is good. Compared to other countries, inequality for Nepal is good. Income inequality as measured by the Gini coefficient, reduced from 38.7 in 2002 to 36.9 in 2010.

3.2. Generalized Methods of Moments

In this case, following Arellano and Bond (1991), we used the difference GMM but we used the robust form of difference GMM to correct the autocorrelation problem. We report the different results in the following table.

The estimates indicate a positive relationship between gross domestic investment (GFCF) and economic growth, regulatory quality and economic growth, a negative relationship between current government consumption and economic growth, and a negative relationship between economic growth of the previous period and actual economic growth.

According to the estimates reported, government expenditure on education and income inequality do not influence Asian countries' economic growth. Also, gross domestic investment, regulatory quality and public investment are the variables that lead these countries' economic growth for this period.

Applying the generalized method of moments model, in our specific case the robust difference generalized method of moments (GMM) model, we need to apply two post-estimation tests to determine that an appropriate econometric model is applied. These tests are the Hansen J test; and the Arellano-Bond test for first-order and second-order correlation.

The Hansen J-statistic reports the *p*-value for the null hypothesis that the instruments are valid. In all the results reported in Table 2, the Hansen J-statistics fail to reject the null hypothesis. Also, the *p*-values reported for AR (1) indicate that there is a high first-order correlation in each specification, but the *p*-value for AR (2) shows no evidence of second-order correlation. In sum, these tests statistics indicate a proper specification for the robust difference GMM.

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Table 2. Difference GMM estimates.

Dependent Variable: Economic Growth GDP/K				
Robust				
Variables	**Coef.**	**Std err.**	**z-Statistic**	***p*-Value**
Education expenditure	0.676	0.696846	−1.44	0.150
GFCF	1.230	0.4980865	2.47	0.014
Expenditure	−0.3395	0.2002961	−1.70	0.090
DGDP/K	−0.3562	0.0558764	−6.37	0.000
Inequality	−0.0089	0.0496283	−0.18	0.857
Quality	21.5733	7.981728	2.70	0.007
Stability	−3.3348	2.849309	−1.17	0.242
Trade	−0.0005	0.0016543	−0.27	0.786
Hansen test (*p*-value)	12.43 (0.983)			
AR1 test (*p*-value)	−2.72 (0.007)			
AR2 test (*p*-value)	−1.64 (0.102)			

Source: Authors.

These results indicate that it is not government expenditure into education and income inequality that lead these countries economic growth, but gross domestic investment (GFCF), regulatory quality and current government consumption, so governments have to encourage gross domestic investment and regulatory quality and reduce current government expenditure on their policies to increase economic growth.

The robust difference GMM estimates also indicate that political stability does not contribute to these countries' economic growth.

3.3. Panel Unit Root Tests

The first step, before analyzing the causality relationship between variables, is to determine whether all the variables are integrated of the same order. Several panel unit root tests have been developed to determine the order of integration of panel variables.

We performed the panel unit root tests proposed by Levin et al. (2002) and Im et al. (2003). Levin et al. (2002) test assume that there is a common unit root process so that ρ_i is identical across cross-sections. The test employs a null hypothesis of a unit root. LLC test considers the following basic ADF specification:

$$\Delta y_{it} = \alpha y_{it-1} + \sum_{j}^{P_i} \beta_{ij} \Delta y_{it-j} + X_{it}\delta + \varepsilon_{it}$$

where we assume a common $\alpha = \rho - 1$, but allow the lag order for the different terms, p_i to vary across cross-sections. The H_0 is $\alpha = 1$ (there is a unit root) and the alternative H_1 is $\alpha < 0$ (there is no unit root). Im et al. (2003) test allow for individual unit root processes so that ρ_i may vary across cross-section.

The null hypothesis may be written as $H_0 : \alpha_i = 0$, for all i, while the alternative hypothesis is given by:

$$\begin{cases} \alpha_i < 0, \ i = 1, 2, \ldots, N_1 \\ \alpha_i = 0, \ i = N+1, N+2, \ldots, N \end{cases}$$

where the i may be reordered as necessary, which may be interpreted as a non-zero fraction of the individual processes is stationary. Rejection of the null hypothesis does not necessarily imply that the unit root null is rejected for all i.

The tests are all characterized by the combining of individual unit root tests to derive a panel-specific result. The tests have the null hypothesis of unit root, whereas the alternative hypothesis of some cross-sections does not contain a unit root.

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We performed nine different statistics described above. The results of the LLC and IPS panel unit root tests for each of the variables are shown in Table 3. We perform each test for the level and the first difference of variables. In the case of the level of variables the null hypothesis that variables assume common and individual unit root process cannot be rejected. However, after applying the first difference, all of the variables meet the requirements of the study. So, we can acknowledge their stationarity for the 95% confidence interval.

Table 3. Test results for panel unit roots.

Variables	**Method**	
	Levin, Lin and Chu	**Im, Pesaran and Shin**
	t *	**W-Stat**
Levels		
GDP/K		
Statistic	−11.2743	−48.83512
Prob.	0.000	0.000
EDU		
Statistic	−0.43792	−0.84773
Prob.	0.3307	0.1983
GFCF		
Statistic	−0.48289	−0.37954
Prob.	0.3146	0.3521
EXP		
Statistic	−2.26292	−1.66095
	0.0118	0.0484
Prob.		
DGDP/K	−9.93266	−7.65233
Statistic	0.000	0.000
Prob.	−4.64969	−0.82472
INEQ	0.0000	0.2048
Statistic		
Prob.	−481.991	−119.532
TRADE	0.0000	0.0000
Statistic		
Prob.	−3.58048	2.72558
	0.0002	0.0032
QUAL		
Statistic	−5.13001	−2.68411
	0.0000	0.0036
Prob.		
STAB		
Statistic		

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Table 3. *Cont.*

Variables	Method	
	Levin, Lin and Chu	Im, Pesaran and Shin
	t *	W-Stat
Prob.		
First differences		
GDP/K		
Statistic	−12.6726	−11.6579
Prob.	0.0000	0.0000
EDU		
Statistic	−11.1007	−10.3215
Prob.	0.0000	0.0000
GFCF		
Statistic	7.68336	−6.59442
Prob.	0.0000	0.0000
EXP		
Statistic	−12.5187	−9.15777
Prob.	0.0000	0.0000
DGDP/K		
Statistic	−13.1043	−11.0041
Prob.	0.0000	0.0057
INE		
Statistic	−3.19943	−2.59115
Prob.	0.0007	0.0048
TRADE		
Statistic	6.97214	−20.5656
	1.0000	0.0000
Prob.		
QUAL		
Statistic	−15.3506	−12.5313
Prob.	0.0000	0.0000
STAB		
Statistic	−15.5234	−12.8721
Prob.	0.0000	0.0000

Note: * denote the rejection of the null hypothesis at the 10% significance level. Source: Authors.

3.4. Panel Causality Test

In this step, we determine the direction of the causality relationship between the variables in this panel framework; to achieve this goal, we apply the panel Granger causality test based on the model developed by Dumitrescu and Hurlin (2012). This model allows for heterogeneity across the cross-sections, while the conventional Granger-causality test (Granger 1969) ignores this property.

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The Dumitrescu-Hurlin panel Granger causality test is based on the individual Wald statistics of Granger non-causality averaged across the cross-section units. This test uses the following model to test for Granger causality:

$$y_{i,t} - \alpha_i + \sum_{k\ \ 1}^{K} \gamma_i^{(k)} y_{i,t-k} + \sum_{k\ \ 1}^{K} \beta_i^{(k)} x_{i,t-k} + \varepsilon_{i,t}$$

where α_i denotes the individual effects, K represents lag orders which are identical for all cross-sectional units of the panel, and $\gamma_i^{(k)}$ and $\beta_i^{(k)}$ are group-specific parameters. The null hypothesis assumes no causality exists in any cross-section, while the alternative hypothesis suggests that there is causality at least for some cross-sections. The null and alternative hypotheses are defined as:

$$H_0 : \beta_i^k = 0 \quad \forall i = 1, \ldots N$$

$$H_1 : \begin{cases} \beta_i = 0,\ i = 1, 2, \ldots\ldots N \\ \beta_i^k \neq 0,\ i = N+1, \ldots\ldots N \end{cases}$$

We use the first difference of the data series as the test requires the variables to be stationary. Table 4 presents the results of the Dumitrescu and Hurlin (2012) homogeneous panel causality test.

Table 4. The Dumitrescu and Hurlin (2012) panel causality test.

Null Hypothesis	Zbar−Stat	Prob
EDU does not homogeneously cause GDP/K	3.03699	0024 ***
GDP/K does not homogeneously cause EDU	0.48483	0.6278
EXP does not homogeneously cause GDP/K	−0.83736	0.4024
GDP/k does not homogeneously cause EXP	−1.81497	0.0695 *
GFCF does not homogeneously cause GDP/k	1.10840	0.2677
GDP/k does not homogeneously cause GFCF	5.05260	4×10^7 ***
INEQUALITY does not homogeneously cause GDP/k	0.46454	0.6423
GDP/k does not homogeneously cause INEQUALITY	−1.03456	0.43009
TRADE does not homogeneously cause GDP/k	0.99337	0.3205
GDP/k does not homogeneously cause TRADE	2.63220	0.0085 ***
QUALITY does not homogeneously cause GDP/k	2.00298	0.0452 **
GDP/k does not homogeneously cause QUALITY	1.27258	0.2032
STABILITY does not homogeneously cause GDP/k	−0.01308	0.9896
GDP/k does not homogeneously cause STABILITY	2.	0.0396 **

Note: ***, **, * denote the rejection of the null hypothesis at the 1%, 5% and 10% significance levels, respectively. Source: Authors.

They indicate that there is a causal relationship between GDP/k (economic growth) and EDU (government expenditure into education). The result suggests that government expenditure on education granger cause economic growth in Asian countries.

The findings also show evidence of a relationship between GDP/k (economic growth and QUAL (regulatory quality). This implies that regulatory quality has an effect on economic growth in these countries.

However, no evidence of a homogeneous causality is found between GDP/k (economic growth) and income inequality, which may reflect that inequality does not effect on these countries economic growth and vice versa.

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In sum, the panel causality test results indicate that: government expenditure into education, regulatory quality has an effect on economic growth for these countries.

4. Discussion

This paper analyzed the issue of economic policies especially the impact of government expenditure and income inequality on economic growth, focusing on Asian countries. This work is highly relevant to the existing literature on this topic.

Because, firstly it shows that gross domestic investment, regulatory quality and current government consumption are the main variables that influence these countries' economic growth. Secondly, the variable government expenditure on education does not affect these economies' growth rates.

Hence, in this case, government expenditure on education is not a driver of economic growth. This result shows that even government expenditure is an instrument of economic policy; this variable has no direct effect on economic growth. Also, it permits us to wonder if government expenditure on education influences economic growth through another variable like human capital. Besides, like the work of (Hajamini et al. 2014), this study shows a negative impact of government consumption on the growth rate of per capita GDP.

5. Conclusions

To conclude, we can say that our results, instead of inequality or expenditure on education highlightednewcontributors to economic growth, in particular private investment (gross domestic investment) and governance indicator (regulatoryquality). So, it will be important for researchers, especially those focused on economic issues to pay attention to these variables in their analysis of economic growthdeterminants.

Besides, we recommend to Asian governments to enhance gross domestic investment and regulatory quality and reduce government consumption policies to improve their countries' economic growth. However, it is important to consider that the 2007 world financial crisis which happened during our period of analysis, and the fiscal and monetary policies implemented by Asian countries to contribute to a quick rebound of these economies (*ADB South Asia Working Paper Series 2011* https://www.adb.org/publications/series/south-asia-working-papers (accessed on 20 September 2019)) can influence our results.

Author Contributions: Conceptualization, Y.T.B.G.; Data curation, A.J.E.; Formal analysis, G.A.; Methodology, Y.T.B.G.; Project administration, L.D.; Software, D.F.K.; Supervision, L.D.; Writing—original draft, Y.T.B.G.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflicts of interest.

Appendix A

Country List

The 19 Asian countries used in this analysis consist on: Armenia, Bangladesh, Georgia, Hong Kong (China), India, Indonesia, Iran, Israel, Japan, Kyrgyz Republic, Laos, Malaysia, Mongolia, Nepal, Pakistan, Philippines, Singapore, Tajikistan, Thailand.

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