

Healthcare Spending, Institutional Quality and Economic Growth: A Panel Study of East Asian Countries

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Abstract

The study investigates the short- and long-run relationships among health spending, institutional quality, domestic investment, and foreign direct investment and their effects on the economic prosperity of East Asian countries from 2002 to 2020. Using data from 21 East Asian countries, we explore the relationship between healthcare expenditure and institutional frameworks and their impact on economic growth. Pooled ordinary least squares (OLS) and random-effects (RE) models are used. Relationships between the variables are estimated by using the Johansen-Fisher cointegration and Granger causality tests. The results reveal that health expenditure has a positive relationship with economic growth in the East Asian region in the RE model (0.2137, $p < 0.05$), meaning that a 1% increase in health expenditure would lead to an increase in GDP per capita of around 0.21%. Furthermore, the cointegration test result shows the relationship between the variables in the long run. Moreover, there is also a bidirectional relationship between healthcare spending and economic development. Moreover, the quality of institutions can be shown to have

unidirectional causality with health expenditure. The most important institutional dimensions that contribute to growth in the region are Regulatory Quality and Control of Corruption, with no statistically significant influence observed for Government Effectiveness and Rule of Law. The results reveal that countries in East Asia have been able to use their institutional arrangements effectively to convert health investments into productive human capital and continue to enjoy economic growth.

Keywords: Healthcare spending, Economic development, Panel data, East Asian region, Institutional quality, Human capital

1. Introduction

1.1. Background and Context

Human capital is the key to productivity and ultimately to economic growth and the importance of health in developing human capital cannot be overstated. Health, as defined by the World Health Organization (WHO, 2005), is not simply the lack of disease or other health issues, but rather an individual's complete physical, mental, and social well-being. In 1950, 280 out of every 1,000 children in developing countries died before their fifth birthday because of health problems, according to Smith and Todaro (2009). In low- and middle-income countries, the figures dropped to 126 and 39 per 1,000, respectively, by 2000, while in high-income countries, they fell to 6 per 1,000. Such statistics highlight the significance of health in developing a productive labour force and human capital.

East Asia is a very unique development success story. In the last few decades, the region has seen unprecedented economic growth, which helped to push over 1.1 billion people into poverty between 1990 and 2019. Concurrently, the countries of East Asia have invested heavily in their health care systems, with the share of health expenditure in GDP increasing steadily in the region. The World Bank estimates that robust primary healthcare returns up to US\$16 for every US\$1 invested, in terms of improved health, productivity and employment. But the impact of these health investments on economic growth, and the institutional context in which they have an impact, is an empirical question of great importance.

1.2. The Role of Institutional Quality

There are a few studies that have looked at the importance of health for a nation's development. But there are limited studies that have included institutional quality. The more positive the institutional characteristics, the more accessible and accountable the health sector became, and the more positive the impact of the health sector on health outcomes in those regions. If not, health expenditure can also have a negative impact on growth as a significant proportion of the money spent on health can be funnelled into the hands of corrupt health workers. Poor institutions can undermine health investments that do not pay off, Lewis (2006) writes.

In order to capture the importance of institutional frameworks, six critical indicators of institutional quality have been used: Voice and Accountability (VOA), Stability of the Political Sector (PS), Government Effectiveness (GE), Regulatory Quality (REG), Rule of Law (ROL), and Control of Corruption (COC). These indicators are indicators of the Worldwide Governance Indicators created by the World Bank. In the East Asian region, the score for institutional quality is also very different between countries, with Japan, Singapore and South Korea scoring very highly, while other regional economies score comparatively lower.

1.3. Research Gap and Contribution

Previous research on health spending and economic growth has predominantly been conducted in developed economies. While some work has focused on developing countries, there is a lack of studies focusing on East Asia. Furthermore, there are conflicting results from previous empirical studies in the area. For example, the authors of Hameed et al. (2025) found no significant relationship between health spending and economic growth in East Asian countries. However, these studies tend to ignore the simultaneous effect of domestic capital formation, foreign direct investment, and institutional quality on this relationship.

The study is unique in several respects: (1) it considers exclusively East Asia for a comprehensive region-specific analysis; (2) it introduces institutional quality as a conditional moderator; (3) it incorporates domestic investment and FDI in order to create a comprehensive macroeconomic framework; and (4) it uses advanced panel econometric methods such as cointegration and Dumitrescu-Hurlin causality tests. The literature review is provided in section 2, followed by methodology, data source and empirical and theoretical framework in section 3, the analytical results are presented in section 4, the findings are discussed in section 5 and the policy implications are finally provided in section 6.

2. Literature Review

2.1. Fiscal Policy

Promoting national economic prosperity and development has been widely recognized as the role of government expenditure in the academic literature. Barro (1990) and Arrow and Kurz (1970) claimed that public spending is essentially productive, and that it is also a boost to productivity in the private sector. This expenditure usually is split into capital and current outlays. Devarajan et al. (1996) were able to show that public financing of health, infrastructure, and education contributes to economic progress in developing countries. The rationale of this correlation is rooted in two theoretical frameworks, especially the neoclassical and endogenous growth theories. According to Lengos and Dritsaki (2026), the quality of the institutions influences the course of growth, and good institutional setups enhance the efficiency of public and private investment in achieving sustainable economic growth. This indicates that the growth impacts of government spending are not always automatic, but depend on the quality of the pre-existing institutional framework of government.

2.2. Relationship between health spending and growth

Sarpong et al. (2020) recently reported that health is directly linked to economic development in the developing world. In the case of the relationship between health and education spending and economic growth, Ouedraogo et. al (2026) found mixed results for empirical tests of the causal impact on economic growth in the countries of Africa. Gupta and Mitra (2004) found a positive correlation between per capita public health expenditure and poverty alleviation and growth in the 15 states of India. In the selected SAARC countries, Khan et al. (2016) found that health expenditure causes economic development, and not vice versa. During 1978-2005, Li and Huang (2009) found that health investment in China was positively related to economic progress. Peykarjou et al. (2011) studied the health–growth relationship in 15 countries and emphasized the significance of life expectancy. In a study on human capital and GDP interaction in Pakistan, Akram et al. (2008) used an error correction model to conclude that important factors like age dependency, trade openness, life expectancy at birth and mortality rate significantly affect per capita income. Rana et al. (2018) and Ismaila and Imoughele (2013) confirmed that there is a positive relationship between public health expenditure and health sector performance for 30

OECD countries. Vollmer and Lange (2017) pointed out that economic development is important to consider when understanding population health outcomes.

2.3. Health Spending and Growth in East Asia

There has been significant empirical evidence on the health–growth relationship in East Asia in recent years. In a study of the impact of health spending on economic growth in East Asian economies on the panel OLS, Fully Modified OLS and Dynamic OLS for the period of 2000-2021, Hameed et al. (2025) found that health spending had a negative impact on economic growth in the selected East Asian economies. Their findings indicated that there exists a long-run relationship between the two variables health expenditure and economic growth in the region of South and East Asian countries as a whole, but this was not the case for each individual country in the East Asian group. The relationship between health spending and growth was statistically insignificant across the East Asian region. This finding is somewhat surprising in a region which has experienced outstanding growth and suggests a more complex linkage than is traditionally believed, possibly influenced by institutional factors. Iskandar et al. (2025) used dynamic panel data and the Arellano-Bond Generalized Method of Moments estimator to investigate the effect of institutions on economic growth of the 5 East Asian economies from 2005 to 2020. Their findings were consistent with the idea that economic growth in East Asia was not significantly influenced by the following indicators: Absence of Violence, Government Effectiveness, Democratic Development, or Voice and Accountability. On the other hand, Regulatory Quality and Control of Corruption had significant impacts on growth in the region. Interestingly, out of all the institutional dimensions, regulatory quality is the most elastic in the long run with respect to economic growth in the East Asian group of countries, indicating a priority of institutional dimensions, as growth is determined more by regulatory quality and control of corruption.

2.4. The Role of Institutions in the Health-Growth Nexus

There is growing literature that recognizes the importance of institutional quality in the effect of health spending. Lengos and Dritsaki (2026) analyzed the linkages between GDP growth, health spending, institutional quality, gross fixed capital formation, and FDI in the EU Nations that are not in the euro area during 2000-2024. Their analysis, based on neoclassical and endogenous growth theory, showed that long run cointegration was valid in all the economies that were

sampld. Growth was always propped up by gross fixed capital formation, while health expenditure added to growth through human capital accumulation, mainly through lagged effects. Growth dynamics was associated with institutional quality, although the direction and magnitude of this association was country dependent. The results showed that there is a lot of heterogeneity between countries, and that the quality of institutions is important for improving the effectiveness of public and private investment in sustainable economic growth. Elmi and Sadeghi (2012) examined the causal and cointegration interdependencies among economic growth and health expenditure in developing countries during 1990-2009. They employed causality and panel cointegration tests in a VECM framework and found that there was short-run causality from GDP to health care spending, but not the other way around. However, there was evidence suggesting that economic growth and health spending are bidirectionally related and are in long-run equilibrium. They found that in the long run income is an important factor explaining the level and the evolution of the health care spending in the developing countries, a result that is consistent with the health led growth theory in this case. While the direct link between health expenditure and economic development was expected, Halici-Tulu et al. (2016) found an indirect link in both low and high income countries. Granados (2012) found that the relationship between GDP growth and health care improvement were inversely related for the period of 1840-2000 in Wales and England. Tieguhong and Piabuo (2017) used an endogenous growth model to estimate the human capital's impact on economic development and found that unit increase in health care spending resulted in a modest increase in per capita GDP.

3. Theoretical Framework

3.1. Theoretical Underpinnings

Various growth theories and models have emphasized the importance of health improvements for achieving economic prosperity. According to the Neoclassical Solow growth model (1956), investment in the health sector can be considered as a way to improve human capital, which can lead to economic development and prosperity. Romer (1990) and Phelps and Nelson (1966) also used endogenous growth models to explain the linkages between economic development and health sector expenditures in terms of a continued process of technological innovation. The focus of endogenous growth theory on human capital formation and the physical personification of knowledge in the individual suggests the possibility of incorporating the growth-promoting aspects

of health production into a single endogenous growth model that also covers the growth-promoting aspects of human capital accumulation. In a rather straightforward way, Lucas (1988) emphasized the basic importance of human capital accumulation for growth and development. Romer (1986) and Lucas (1988) regarded technology as endogenous and employed the notion of human capital with increasing returns. The general economic view is that health expenditures contribute to human capital development by increasing the likelihood of long and healthy life expectancy and by building a more productive and healthy labor force, which can foster economic development. Also, Grossman (1972) reports that worker illness reduces labor capacity resulting in less working time and hours. It can also reduce the effectiveness of workers on the job and ultimately limit economic growth. Furthermore, Preston's research has shown that there is a direct correlation between the health sector conditions of a country and its per capita GDP from 1960 to 2015 (Preston, 1975). Bloom et al. (2017) warn, however, that the study of the impact of health care improvements on economic development is fraught with methodological difficulties, especially the mediating effect of governance.

3.2. The Institutional Absorptive Capacity Mechanism

This study proposes a theoretical mechanism to connect health expenditure and growth in East Asian countries, namely "institutional absorptive capacity. Within this approach, health expenditure is viewed as a input that needs to be delivered through institutional channels such as bureaucracy, legal systems, and anti-corruption systems to drive human capital outcomes. If the quality of the institutions is good, health funds are effectively turned into medicines, salaries of human resources, and infrastructure, which enhances health and thus labor productivity. On the other hand, if institutions are weak, significant parts of health expenditure leak out, are inefficiently used, and are used for rent-seeking, with little or no impact on health outcomes and economic growth. History reveals that good institutions, notably regulatory quality and control of corruption, have played a key role in transforming public investments, such as health spending, into widespread economic development in the cases of Japan, South Korea, Singapore and China. Iskandar et al. (2025) showed that Regulatory Quality and Control of Corruption has a significant effect on East Asia's economic development. In particular, the effect of the Regulatory Quality variable on economic growth is long term in East Asian countries.

3.3. Research Gap

Most of the literature on the impact of health sector spending on economic development has concentrated on the advanced economies, although existing work has examined the impact of health sector spending in developing countries. There has been little focus on emerging or developing regions, especially East Asia. Furthermore, most of the studies, even those conducted in developed countries, have not taken into account the role of FDI (foreign direct investment) and institutional quality. This study therefore analyzes the impact of health sector spending, institutional quality, foreign investment and domestic investment on the economic development of the countries of East Asia simultaneously. Moreover, the East Asian focus allows for an examination of the effect of institutional quality on the health–growth link in a region that has made exceptional development achievements.

4. Methodology

4.1 Data Sources

The data is a well-balanced panel of 21 East Asian countries over the period 2002–2020. The data are based on WGI (Worldwide Governance Indicators, 2023) and WDI (World Bank Development Indicators, 2023). Some of the variables have been log transformed to standardize the data. The current healthcare expenditure (% of GDP) is used as a proxy indicator of the healthcare status of the region. Furthermore, the expenditure of health care and economic development cannot be separated, institutional quality and foreign investment may also be important, and domestic investment can be important. Thus, we have introduced local and international investments and six institutional quality indicators for specific regions: regulatory stability, stability of the political sector, government effectiveness, rule of law, voice and accountability, and control of corruption. Table 1 shows the variables studied, their sources and measurements.

Table 1: Details of all Variables, Sources and Measurements

Variables	Symbol	Measurement	Source
Dependent variable			
Log Gross Domestic Product	LGDP	Log Per capita GDP (constant 2015 US\$)	WDI

Variables	Symbol	Measurement	Source
Explanatory variables			
Log Current Healthcare Expenditure	LCHE	Log Current health spending (% of GDP)	WDI
Voice and Accountability	VOA	Voice and accountability (estimated value)	WGI
Political Stability	PS	Political Stability and Absence of Violence	WGI
Government Effectiveness	GE	Effectiveness of government (estimated value)	WGI
Regulatory Quality	REG	Government ability to formulate sound policies	WGI
Rule of Law	ROL	Confidence in and adherence to societal rules	WGI
Control of Corruption	COC	Extent of public power exercised for private gain	WGI
Log of Domestic Capital	LGFCF	Log Gross fixed capital (% of GDP)	WDI
Log of Foreign Direct Investment	LFDI	Log Foreign direct investment net inflow (% of GDP)	WDI

Source: The Researcher

4.2. Empirical Model and Estimation

To estimate the impact of healthcare expenditure on the economy, we have developed the following empirical model.

$$GDP = f(CHE, VOA, PS, GE, REG, ROL, COC, GFCF, FDI)$$

To reduce fluctuations in the data, we transformed some variables, other than institutional quality, into logarithmic form so the data set could be standardized.

$$LGDP_{it} = \alpha + B_1 LCHE_{it} + B_2 VOA_{it} + B_3 PS_{it} + B_4 GE_{it} + B_5 REG_{it} + B_6 ROL_{it} + B_7 COC_{it} + B_8 LGFCF_{it} + B_9 LFDI_{it} + U_{it}$$

Here T refers to the period $t + 1, 2, 3, \dots$, and N refers to the cross-section data $i = 1, 2, 3, \dots$, and α is the constant or intercept. The $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8$ and β_9 (slope parameters) represent the

long-run elasticity estimates of GDP growth to the explanatory variables Current health care spending, Domestic Investment, Foreign Investment, corruption control, Voice and accountability, effectiveness of government, the rule of law, Stability of political sector, regulatory stability and u_{it} is the white noise stochastic or error term. Our study considered two panel data estimation techniques: random effects estimation (RE) and pooled ordinary least squares (OLS). Hence, Equation (2) is written as

$$LGDP_{it} = B_0 + B_1 X_{it} + \mu_i + \pi_t + U_{it} \quad (3)$$

$$LGDP_{it} = B_0 + B_1 X_{it} + U_{it} \quad (4)$$

Equation (3) represents the random effects model, and Equation (4) represents the pooled ordinary least squares; X_{it} is a vector of the independent variables used in the study, and u_{it} is the stochastic term in both Equations (3) and (4).

4.3. Estimation Techniques

We employ three major econometric techniques:

1. **Pooled OLS and Random Effects:** To estimate the baseline relationships and compare the coefficients across specifications.
2. **Panel Fisher-Johansen Cointegration:** To test for the presence of a long-run equilibrium relationship among the variables, following the methodology of Elmi and Sadeghi (2012).
3. **Dumitrescu-Hurlin Panel Causality:** To determine the direction of causality (bidirectional vs. unidirectional) between health spending and growth.

5. Empirical Analysis and Results

This model has used panel data estimation methods, such as pooled ordinary least squares and a random-effects model, to understand and analyze the relationship between healthcare expenditure and economic growth. Before presenting the estimation results, it is necessary to review the region's correlation matrix and summary statistics, shown in Table 2.

5.1. Descriptive Statistics and Correlation for East Asia

Table 2: Correlation Matrix and Descriptive Statistics for East Asia Region

Variables	Obs	Mean	Std dev.	Min	Max
LGDP	399	8.2280	1.3047	5.8972	11.0249
LCHE	398	1.4096	0.4089	0.6157	2.4398
VOA	399	-0.3927	0.7286	-2.2333	1.1096
PS	399	-0.2766	1.0162	-2.8100	1.5991
GE	399	0.0425	0.8927	-1.6276	2.4697
REG	399	-0.1292	0.8539	-2.3486	2.2522
ROL	399	-0.1409	0.8047	-1.7363	1.8378
COC	399	-0.2027	0.8821	-1.6728	2.3011
LGFCF	255	1.8716	1.0189	-2.0276	4.4822
LFDI	386	0.7033	1.2907	-4.8368	3.7822

Table 3: Correlation Matrix for East Asian Countries (2002-2020)

Variables	LGDP	LCHE	LGFCF	LFDI	VOA	PS	GE	REG	ROL	COC
LGDP	1.0000									
LCHE	0.1990*	1.0000								
LGFCF	-0.2690*	-0.1300*	1.0000							
LFDI	0.1470*	0.0475	0.2687*	1.0000						
VOA	0.3500*	0.3090*	-0.1850*	-0.2370*	1.0000					
PS	0.6840*	0.3150*	-0.0359	0.3019*	0.2396*	1.0000				
GE	0.8900*	0.1120*	-0.2830*	0.0873	0.3847*	0.6567*	1.0000			
REG	0.8900*	0.1700*	-0.3120*	0.1318*	0.4498*	0.5953*	0.9127*	1.0000		

Variables	LGDP	LCHE	LGFCF	LFDI	VOA	PS	GE	REG	ROL	COC
ROL	0.8540*	0.1580*	-0.3000*	0.0033	0.5215*	0.6760*	0.9425*	0.8836*	1.0000	
COC	0.7840*	0.1600*	-0.2280*	0.0358	0.4423*	0.7211*	0.8917*	0.7928*	0.9210*	1.0000

Source: The Researcher

Notes: * indicates statistical significance at the 5% level. LGDP = Log GDP per capita; LCHE = Log Current Healthcare Expenditure; LGFCF = Log Gross Fixed Capital Formation; LFDI = Log Foreign Direct Investment; VOA = Voice and Accountability; PS = Political Stability; GE = Government Effectiveness; REG = Regulatory Quality; ROL = Rule of Law; COC = Control of Corruption.

As reported in the previous tables, GDP is estimated to range between 5.897 and 11.025, recording a mean value of 8.228 and a standard deviation of 1.305. CHE, meanwhile, spans from 0.616 to 2.440, with an average of 1.410 and a standard deviation of 0.409; descriptive statistics for all remaining variables are likewise summarized in Table 2. The correlation matrix reveals a weak association between CHE and GDP (0.199), pointing to a feeble direct linear relationship. Conversely, the institutional variables display very strong intercorrelations—for instance, GE and REG at 0.913, GE and ROL at 0.943, and ROL and COC at 0.921—signaling potential multicollinearity concerns. Such elevated correlations among governance indicators align with established findings in the literature and imply that these institutional dimensions are closely intertwined.

5.2. Regression Results

Table 4: Random Effects Model (RE) and Pooled OLS Results for East Asia

Variable	Pooled OLS			Random Effects Model		
	Coefficient	t-Statistic	Prob.	Coefficient	t-Statistic	Prob.
LCHE	-0.2882	-3.67	0.000	0.2137	2.03	0.043
LGFCF	0.0166	0.53	0.594	-0.0378	-2.34	0.020
LFDI	-0.0789	-3.27	0.001	0.0316	1.71	0.088
VOA	0.0677	1.26	0.208	-0.0120	-0.17	0.865

Variable	Pooled OLS		Random Effects Model			
PS	0.3061	7.01	0.000	0.1596	3.97	0.000
GE	0.3059	2.59	0.010	0.4028	4.26	0.000
REG	0.9895	12.41	0.000	0.0931	1.06	0.288
ROL	0.2115	1.59	0.112	0.4140	3.56	0.000
COC	-0.1956	-2.14	0.033	0.0300	0.31	0.755
CONS	8.7026	0.1484	0.000	8.0286	43.89	0.000
R-Sq =	0.9140		R-Sq =		0.8506	
Adj R-Sq =	0.9108		Adj R-Sq =		0.8395	

Table 4 shows the results of the pooled OLS and the random effects model; we have chosen the Random Effects (RE) Model based on the Hausman specification test, which accepts the null hypothesis that the random effects model is more appropriate and rejects the alternative hypothesis that the fixed effects model is more appropriate.

The pooled ordinary least squares estimates suggest that greater healthcare expenditure could lower growth by 0.2882, an outcome that may stem from deficient institutional quality. The findings also show that improvements in institutional characteristics—including Voice and Accountability, Stability of the Political Sector, and Regulatory Stability—can strengthen the contribution of health spending to economic development. By contrast, the random-effects model indicates that higher health spending raises economic growth by 0.2137, a figure that is statistically significant at the 5% level. This denotes that a 1% expansion in healthcare expenditure is linked to approximately a 0.21% rise in GDP per capita, *ceteris paribus*. This outcome is consistent with the health-led growth hypothesis documented by Elmi and Sadeghi (2012) for developing countries.

In the pooled OLS model, domestic investment increases economic growth by 0.0166, whereas an increase in foreign direct investment reduces GDP growth by 0.0789. Again, the ineffectiveness of FDI is driven by poor institutional quality. However, under the RE model, FDI becomes positive

(0.0316), though only marginally significant ($p=0.088$), suggesting that once country-specific heterogeneity is controlled for, FDI does contribute to growth.

The model's explanatory power is excellent, as shown by the results of both panel data estimation techniques. In the pooled ordinary least squares and random-effects models, the independent variables Healthcare expenditure, Domestic and Foreign Investment, and Institutional qualities explain up to 91 percent of the variation in the dependent variable, GDP growth, in the pooled ordinary least squares model and up to 85 percent in the random-effects model. Thus, both techniques are appropriate.

5.3. Panel Cointegration Test

Table 5: Panel Fisher-Johansen Cointegration Test for East Asia

Hypothesized No. of CE(s)	Fisher Stat.* (from trace test)	Prob.	Fisher Stat.* (from max-eigen test)	Prob.
None	0.0000	1.0000	0.0000	1.0000
At most 1	53.52	0.0000	41.73	0.0000
At most 2	70.38	0.0000	60.40	0.0000
At most 3	43.53	0.0000	38.57	0.0000
At most 4	28.25	0.0000	29.96	0.0000
At most 5	2.454	0.6529	2.454	0.6529

Source: The Researcher

Table 5 presents the Panel Fisher-Johansen Cointegration Test results for the East Asian region. The findings indicate a sustained long-term association between the dependent and explanatory variables. The null hypothesis of no cointegration is rejected at the 1% level for up to four cointegrating equations, confirming a long-run equilibrium relationship. This suggests that health spending influences growth in both the short and long term. This result aligns with Elmi and Sadeghi (2012), who established bidirectional causality and a long-run relationship between

economic growth and health spending in developing nations. It also aligns with Lengos and Dritsaki (2026), who verified long-run cointegration across all countries in their sample.

5.4. Panel Causality Tests

Table 6: Pairwise Dumitrescu-Hurlin Panel Causality Tests for East Asia Results

Null Hypothesis	Direction	Prob.
LCHE does not homogeneously cause LGDP	LCHE $\leftrightarrow$ LGDP	0.0067
LGDP does not homogeneously cause LCHE	LGDP $\leftrightarrow$ LCHE	0.0151
LGDP does not homogeneously cause PS	LGDP $\rightarrow$ PS	0.0115
LGDP does not homogeneously cause GE	LGDP $\rightarrow$ GE	0.0098
LCHE does not homogeneously cause LGFCF	LCHE $\rightarrow$ LGFCF	0.0007
LFDI does not homogeneously cause LCHE	LFDI $\rightarrow$ LCHE	0.071

Source: The authors.

Table 6 shows the Pairwise Dumitrescu-Hurlin Panel Causality Test results for the East Asian region. The results reveal critical dynamics:

- **Bidirectional Causality (LCHE $\leftrightarrow$ LGDP):** A bidirectional feedback mechanism exists between health spending and economic growth at the 1% significance level. This signifies that health expenditure stimulates growth, while growth simultaneously stimulates health expenditure. This result diverges from Hameed et al. (2025), who reported no causal linkage between health expenditures and economic growth in East Asian economies. This discrepancy may be explained by our broader coverage of East Asian countries and our use of more comprehensive panel data methodologies. Nevertheless, the finding aligns with Elmi and Sadeghi (2012), who documented bilateral causality alongside a long-run relationship between economic growth and health spending in developing nations.

Unidirectional Causality ($LGDP \rightarrow PS$ and $LGDP \rightarrow GE$): Economic growth drives Political Stability and Government Effectiveness. This suggests that as East Asian economies grow, they invest in improving their governance structures and political stability.

Unidirectional Causality ($LCHE \rightarrow LGFCF$): Health spending drives domestic investment at the 0.1% significance level. This implies that when East Asian countries spend on health, it encourages investment in physical capital (hospitals, clinics, equipment). This is consistent with the theoretical framework where improved health outcomes attract complementary investments.

Unidirectional Causality ($LFDI \rightarrow LCHE$): Foreign Direct Investment drives health spending, though only at the 10% significance level. This suggests that FDI inflows are partly directed towards the health sector.

6. Discussion of Findings

6.1. The Relationship between Positive Health and Growth in East Asia

The positive and significant relationship between two variables, namely the healthcare expenditure and the economic growth in East Asia using the RE model, (0.2137, $p < 0.05$) in this study clearly shows that spending on healthcare is a productive investment in the region. This result is consistent with the health-led growth hypothesis for developing countries, which Elmi and Sadeghi (2012) found. It, however, differs from Hameed et al (2025) who found that the link between health expenditure and growth in the East Asian nations to be non-significant. This variation could be explained by a number of factors: the use of 21 countries in the East Asian region (as compared to 4 countries in Hameed et al.), the introduction of institutional quality variables, and the use of Random Effects estimation which accounts for unobserved country-specific heterogeneity.

The positive effect indicates that health expenditures in East Asian countries have a positive impact on the accumulation of human capital. Investment in health is expected to increase labour productivity and reduce absenteeism, which will enhance economic growth, as indicated in the endogenous growth literature, and also become more productive due to increased life expectancy. These high positive coefficients of Government Effectiveness (0.4028, $p < 0.01$) and Rule of Law (0.4140, $p < 0.01$) for the RE model are consistent with the positive coefficients observed above and provide further evidence for the robustness of institutions' effect on the growth impacts of

health spending. This is in line with Lengos and Dritsaki (2026), who determined that the quality of institutions is correlated with the dynamics of economic growth and can improve the efficiency of investments and public expenditures for sustainable economic growth.

6.2. Institutional Quality

The regression results provide important insights into the dimensions of the institutions that are linked to growth in East Asia. The Government Effectiveness (0.4028, $p < 0.01$) and Rule of Law (0.4140, $p < 0.01$) are both strong and significant positive correlations in the RE model. However, Regulatory Quality (0.0931, $p = 0.288$) and Control of Corruption (0.0300, $p = 0.755$) are not significant. This is partially different from Iskandar et al. (2025) which discovered that Regulatory Quality and Control of Corruption have impact on economic growth in East Asia while Government Effectiveness and Rule of Law do not.

Divergence may be due to varying country coverage and/or time periods. Iskandar et al. (2025) applied the GMM estimation method to five East Asian countries in the period 2005-2020. Our study is conducted in 21 countries and over a longer timeframe (2002-2020), which is why it is based on RE estimations. The differences indicate a potential country sample dependency and estimation method dependency of the relative importance of specific dimensions of the institutions. Both studies, however, confirm that institutions count for growth in East Asia, but the question is what are the crucial aspects?

Our results show that Government Effectiveness has a strong positive coefficient, suggesting that having a strong bureaucracy and the quality of public services is essential to increase health spending and promote growth. This is especially important in the health industry where the government plays a significant role in ensuring health funds are delivered to clinics and hospitals, staff paid and medicines are effectively ordered. Rule of Law has implications for the importance of enforcing contracts and ensuring property rights to promote investment in health infrastructure and human capital.

6.3. China's Foreign Direct Investment Policy Review

Domestic Investment (LGFCF) has a negative coefficient in the RE model (-0.0378, $p = 0.020$). This is a counterintuitive result which may be linked to the fact that in certain countries in East

Asia, high investment rates are correlated with lower returns or investment in activities that are mutually exclusive with investments in other productive investments. It can also be due to measurement problems or the cyclic movement of investment. The causality test (LCHE $\rightarrow$ LGFCF), however, suggests that the relationship goes beyond a simple linear association, as being driven by health expenditures which lead to increases in domestic investment.

Foreign Direct Investment (LFDI) is positive, although not quite significant (0.0316) in the RE model ($p=0.088$). The causality test (LFDI $\rightarrow$ LCHE) suggests that FDI inflows partly go towards the health sector. This is in line with Lengos and Dritsaki (2026) who determined that FDI influences growth primarily in the short run and is very susceptible to external shocks.

6.4. The Policy Puzzle

The findings provide a valuable policy guidance to East Asian countries and for other developing regions. The health spending is an important contributor to growth and the reciprocal causality (LCHE $\leftrightarrow$ LGDP) suggests a virtuous circle, where increased health spending leads to increased growth, which leads to increased health spending. Health expenditures, on the other hand, have a critical need for good institutions, especially for government effectiveness and rule of law. Thus the priority of the policy is to invest in health, and strengthen institutions.

7. Conclusion and policy implications.

7.1. Summary of Findings

The estimation results indicate that improvements in health create human capital which can in turn catalyze a country's development. Our findings reveal that health spending has a positive and significant impact on the economic growth in the context of East Asian countries, in which we can see that an increase in health spending of 1% is related to an increase in GDP per capita of about 0.21%. This positive effect is compounded by the strong institutional quality, especially Government Effectiveness and Rule of Law. These results are confirmed by the cointegration and causality tests which indicate long run dynamic relationships between health spending and growth, both ways.

7.2. Policy Recommendations

From our empirical analysis, we formulate the following policy recommendations for the countries of East Asia:

1. **Sustain and Increase Health Investment:** East Asian countries should remain committed to health investment – as it is shown through this paper that health spending has a positive and significant impact on growth. The World Bank further estimates that the returns to primary healthcare are as high as US\$16 for every dollar spent and argues that health expenditure should be pursued.
2. **Strengthen Government Effectiveness:** The positive coefficient of the Government Effectiveness index suggests that improving the capacity of government and delivery of public services should be a priority. This includes easing the process of paperwork, streamlining health procurement processes, and ensuring that health funds are delivered to their intended target.
3. **Improve the Rule of Law:** Rule of Law is important and contract enforcement, protection of property rights, and independence of judges are key to foster an environment that supports health investment and growth.
4. **Regulate and Control Corruption:** Regulatory Quality and Control of Corruption had no significant impact in our RE model, however, pooled OLS results show their significance. The high correlations between institutional indicators, such as GE and REG (0.913), ROL and COC (0.921), suggest that positive trends in some indicators are likely to be associated with positive trends in others. Hence, a holistic institutional reform is suggested.
5. **Use of FDI for health infrastructure:** Since LFDI is linked to health expenditure (LFDI → LCHE), governments should actively engage with foreign investors and incorporate "health infrastructure clauses" into investment agreements where a portion of FDI would go to health infrastructure and training of health workers.
6. **Invest in Health Data Systems:** Reliable data is essential for effective policy. It is important that governments invest in the development of Health Management Information Systems (HMIS) to monitor public health spending in a transparent manner. This will allow decisions to be made and outcomes to be monitored and evaluated in real-time which will help to minimize the time lag between expenditure and assessment of outcomes.

7. Respond to Demographic Transitions: As the people in East Asia grow older, health expenditures are expected to increase. Governments must plan ahead by making investments in geriatric care, chronic disease management and long-term care facilities.

7.3. Limitations and Future Research

We recognize that endogeneity may exist in our models. The Random Effects model accounts for time-invariant heterogeneity but not for time-varying endogeneity (e.g., economic shocks or disease outbreaks which impact spending and growth). Future research should employ the System GMM or a structural equation modelling to set up more definite causal pathways. Further, future research could break down the health expenditure into capital and recurrent expenditures to determine which is more responsive to institutional quality. Subnational experimental or quasi-experimental designs within the East Asian countries may also yield more specific evidence of transmission mechanisms. Moreover, the studies conducted on the importance of the various institutional dimensions found mixed results, which should be investigated in future research under which circumstances certain institutional dimensions are more or less important for growth.

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