Globalization and Population Health: New Evidence from ASEAN Economies

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Abstract

This study intends to highlight the impact of globalization on population health in the context of ASEAN economies which is limited but indeed an interesting area in the research literature. The data is collected from World Development Indicators, Penn World Tables, and KOF Swiss Economic Institute for the period 2000-2020 to examine the relationship between globalization and population health. Suitable econometric tools such as ordinary least squares, fixed effects, two stages least squares, and generalized least squares are used for the estimation purpose. The results showed that globalization has a positive influence on population health and a negative impact on the infant mortality rate. Urbanization and income level have also a positive impact on the health of the population in ASEAN economies. Besides, health expenditures have decelerated population health. Moreover, inflation has no significant effect on population health. Overall, the results are unique and interesting and could help the ASEAN policymakers in policy formulation.

Keywords: Globalization, Population Health, ASEAN Economies, Panel Data

Introduction

Globalization has increased worldwide tremendously in recent years. The value of global trade which is one of the leading indicators of globalization has reached a record level of US $ 28.5 trillion in 2021 which is 25 per cent higher as compared to 2020 and 13 percent higher than the pre-pandemic level (UNCTAD, 2022). Trade of developing countries outperformed that of developed countries in Q4 2021. South-South trade growth was above the global average. Foreign direct investment (FDI, hereafter) has also shown an increasing trend in recent decades. For instance, global FDI flows have increased by 77 percent in 2021 reaching 1.65 trillion US $ against 929 billion US $ in 2020 (UNCTAD, 2022). The

observed increasing trend both in trade and FDI inflows is quite encouraging and promising as these flows have helped many economies to achieve higher economic growth in the long run. Both FDI and trade flows are the main components of globalization (Abdulsalam et al., 2021; Raza et al., 2021; Tahir and Azid, 2015).

The implications of globalization for overall economic growth are well known as they are extensively researched over the years by many researchers. For instance, in a recent study, Hasan (2019) provided strong evidence regarding the positive impacts of globalization on the long-run economic growth of South Asian economies using data from 1971 to 2014. Similarly, based on the empirical analysis of ASEAN *economies,* Sardiyo and Dhasman (2019) showed that globalization has helped the ASEAN economies in achieving higher economic growth. Moreover, using data from OIC member economies, Shamimi and Jenatabadi (2014) also endorsed a positive and significant impact of globalization on economic growth. Besides the empirical literature, the growth experiences of countries in East Asia can be explained by their more globalized regimes as compared to Sub-Saharan African (SSA) countries which have not embraced the process of globalization yet (Tahir and Azid, 2015). It is also a fact that the benefits of globalization for economic growth may be dependent on some other important complementary policies (Jan et al., 2022a; Jan et al., 2022b). The study of Barry (2010) reflected that globalization has positively but insignificantly impacted the economic growth of Sub-Saharan African economies due to their huge dependence on natural resources. The study further advised that SSA economies need to ensure the implementation of better macroeconomic policies to enjoy the full benefits associated with globalization. It seems that the relationship between globalization is not straightforward. Zahonogo (2018) rightly endorsed that globalization and economic growth are related non-linearly. Better infrastructure, improved human capital, and a strong institutional framework are the prerequisites for reaping the maximum benefits of the process (Jan et al., 2021a; Jan et al., 2021b).

Likewise, this paper deviates from the conventional literature on the globalization-growth nexus and tries to explore whether the increased globalization process in recent years has any implication for population health or not. However, the available empirical literature is scant on the potential impacts of globalization on population health. Herzer (2017) documented that econometric research on globalization and population is very rare. There are sound logical reasons to believe that globalization impacts population health. On one side, the process of globalization enhances health outcomes through the diffusion of advanced knowledge, cheaper health technologies, and human rights (Labonte, 2015). On the other side, globalization also poses various threats to population health as well. For instance, Woodward et al., (2001) commented that globalization is a big hurdle to public health, however its relationship with public health is not straight forward. Labonte (2015) endorsed that globalization which is based on neoliberal models of trade and investment with marginal regulations of the government has created several risks for population health. In terms of sample selection, we have focused on the members of the Association of Southeast Asian Nations (ASEAN, hereafter). The primary reason behind focusing on ASEAN economies is that these economies have done well in improving population health by increasing life expectancy and decreasing infant mortality rates recently. At the same time, the ASEAN economies are generally more globalized as compared to other economies. Therefore, it is appealing to figure out whether the increased globalization process has helped the ASEAN economies in improving population health.

This paper contributes in several ways to the literature. The relationship between globalization and population health is rarely researched and hence the current study attempts to provide comprehensive fresh evidence. Secondly, rather than using the components of globalization such as trade or FDI, this study uses the comprehensive globalization index developed by Dreher et al., (2006). Trade openness is one of the essential components of globalization. The potential impact of globalization on population health is important to be investigated as improved population health is the end objective of all economic activities in the modern globalized world. Thirdly, the current study contributes to the literature in the ASEAN context as this region is largely ignored by researchers while highlighting the role of globalization in improving population health. Therefore, the current study would be of enormous

importance for ASEAN's policymakers and potential researchers.

The remaining segments are arranged as follows. Section two includes extensive commentary on the previous relevant literature on the relationship between globalization and population health. Data description and historical trends are shown in section three while the designing of the model along with estimation tools are presented in section 4. The penultimate section of this article is devoted to the presentation and discussion of the results. Conclusions and implications in light of the results are presented in the last section.

Literature Review

Globalization and its potential impacts on population health are researched recently by several researchers. In a recent paper, Tahir (2020) provided significant and comprehensive evidence about the positive influence of trade openness on life expectancy which is one of the leading indicators of improved population health by focusing on the Chinese economy. On the other hand, Bahadur (2001) studied the influence of globalization on human development by focusing on 124 countries and his findings show that globalization reduces poverty and positively impacts both gender and human development. Similarly, Bergh and Nilsson (2010) carried out a comprehensive study to explore the impact of globalization openness on life expectancy for a sample of 92 countries by using data from 1970-2005. Their findings strongly supported the hypothesis which assumes that globalization is responsible for the improvement in life expectancy. The mentioned study empirically demonstrated that economic globalization has improved life expectancy significantly and further this relationship is robust. Therefore, globalization appears to be a blessing, particularly for developing countries as it gives them access to advanced medical technologies which are bound to influence population health positively.

Byaro et al., (2021) have focused on 33 SSA economies for the period 2000-2016 to study the linkages between trade openness and population health by employing the GMM estimator. They demonstrated a positive relationship between trade openness and population health. Trade openness impacts population health through multiple channels such as an increase in income, access to various goods and services, insecurity, aid, and unemployment (Herzer, 2017). The recent study by Tahir (2020) and Herzer (2017) showed that trade openness has improved life expectancy significantly.

There are also some individual case studies where researchers have focused on specific economies to examine the linkages between globalization and population health. For example, Timothy (2018) analyzed the Nigerian economy for the period 1986-2016 and observed the positive influence of economic globalization on life expectancy which is consistent with prior studies (Bergh and Nilsson, 2010). Similarly, Alam et al., (2016) have focused on the economy of Pakistan and showed that both FDI and trade openness which are the main aspects of economic globalization have positively contributed to population health in the long run. Economic globalization, which is mainly concerned with FDI, and trade flows need to be encouraged as both have the capability to enhance the health of the population which is indeed desirable.

Particularly in the ASEAN context, there is a lack of research on the relationship between globalization and population health. The ASEAN member economies are relatively more open and globalized as compared to other economies as evident from recent statistics. At the same time, the ASEAN economies have also improved the level of their population health by increasing life expectancy and decreasing infant mortality rates over the years. However, empirical research on the linkages between globalization and population health is indeed lacking. This lack of research is the prime motivation behind the current study. We expect that the current study will contribute to the literature on globalization and population health, particularly in the ASEAN context.

3. Data Description and Historical Trends

In this section, some useful information about the variables chosen for the study is described along with historical behavior. Data is averaged for the years 2000 and 2020 for all ASEAN economies. Percentage change for all variables from 2000 to 2020 is also calculated to show the historical trends. Statistics are

presented in Table 1. Life expectancy and infant mortality rate (per 1,000 live births) are the two indicators of population health used in this study. While for globalization, the KOF index is used which is based on three aspects such as economic, political, and social indicators.

Table 1 Statistics on Selected Variables

Variables	2000	2020	Percentage Change
LIFEE	67.886	73.589	8.400848 %
INFANT	35.290	18.070	-48.7957 %
GLOB	53	64.457	21.61698 %

Note: Authors' own calculation using data

Table 1 shows that life expectancy has been raised by more than 8 percent during 2000-2020 for the ASEAN region which is quite satisfactory. More importantly, the infant mortality rate which is the second indicator of population health has decreased by more than 48 percent during the study period. Improvement in life expectancy and the reduction in infant mortality rates in the ASEAN region are clear indications of improved population health. On the other hand, the index of globalization has increased by 21.616 percent approximately from 2000-2020 which shows that the ASEAN region has embraced the globalization process wholeheartedly. The observed improvement in population health confirmed by both the indicators and a significant increase in the globalization index may be the reflection of a relationship between them.

To provide a more detailed analysis of the status and behavior of life expectancy, infant mortality rate, and globalization, we have provided country-wise statistics in the following Table 2. In terms of life expectancy, all ASEAN economies have achieved remarkable improvement. Life expectancy has increased by 19.494 percent for Cambodia, 15.509 percent for LAOS PDR, and 11.772 percent for Myanmar. Similarly, Thailand, Indonesia, and Singapore have also shown significant improvement in life expectancy during the study period. Moreover, Malaysia and Brunei Darussalam have also increased life expectancy by more than 4 percent. The economy of Vietnam has witnessed the lowest increase in life expectancy among the ASEAN region economies. Current statistics (2020) show that life expectancy is more than 83 years for Singaporeans which is the highest among the ASEAN economies. Thailand has a life expectancy of more than 77 years followed by Malaysia with a life expectancy of 76.156 years. Brunei Darussalam and Vietnam have a life expectancy of more than 75 years while in the Philippines and Indonesia, the life expectancy is more than 71 years. Finally, Lao PDR and Myanmar have the lowest life expectancy currently in among the ASEAN member economies. Overall, the current life expectancy figures for ASEAN economies are reasonable as compared to other developing economies.

The infant mortality rate has decreased significantly in all ASEAN economies except Brunei Darussalam. Infant mortality has decreased by more than 71.085 percent for Cambodia, 58.823 percent for Thailand, 52.287 percent for Lao PDR, 50.731 percent for Indonesia and 44.801 percent for Myanmar during the period 2000-2020. Singapore has reduced its infant mortality rate from 3 to 2 showing a net decrease of more than 33 percent followed by Vietnam where infant mortality is decreased by more than 28 percent. The economies of the Philippine and Malaysia have also shown significant improvement in population health as infant mortality rates have decreased in both economies significantly. Infant mortality has slightly raised in Brunei Darussalam from 8.2 in 2000 to 9.6 in 2020. According to current statistics, infant mortality is lowest in Singapore which is just 2 followed by Malaysia and Thailand where infant mortality rates are 7.3 and 7.7 respectively. Lao PDR and Myanmar have still the highest infant mortality rates of more than 36 among the ASEAN economies. Infant mortality is 22.9 in Cambodia currently even though it has achieved a remarkable decline of more than 71 percent in infant mortality rate. In Indonesia, the Philippines, and Vietnam, infant mortality rates are still a concern for policymakers even though these economies have done well in reducing the infant mortality rates during 2000-2020.

In terms of globalization, the ASEAN economies have performed better over the years. The globalization index has increased by 62.252 percent for Cambodia, 53.062 percent for Vietnam, 37.913 percent for Myanmar, 22.888 percent for Brunei Darussalam, 21.706 percent for Lao PDR and 18.220 for Thailand during 2000-2020. All other economies in the ASEAN region have shown slight improvement in the overall globalization index. Current statistics show that Singapore and Malaysia are the most globalized economies in the ASEAN region as their scores of the globalization index are 83.465 and 81.304 respectively. Thailand and the Philippines are also highly globalized economies as evidenced by their statistics presented in Table 2. Brunei Darussalam and Indonesia have relatively satisfactory and similar scores of the globalization index. Finally, Lao PDR and Myanmar are relatively closed economies among the ASEAN economies as their scores on the globalization index are not satisfactory among the ASEAN region economies.

Table 2 Behaviour of Variables (Country-Wise)

Country	Variables	2000	2020	Percentage Change
Brunei Darussalam	LIFEE	72.809	75.860	4.190416
	INFANT	8.2	9.600	17.07317
	GLOB	52	63.902	22.88846
Cambodia	LIFEE	58.432	69.823	19.49446
	INFANT	79.2	22.9	-71.0859
	GLOB	35.941	58.315	62.25202
Indonesia	LIFEE	65.772	71.716	9.03728
	INFANT	41	20.2	-50.7317
	GLOB	59.404	63.028	6.100599
LAOS PDR	LIFEE	58.803	67.923	15.50941
	INFANT	76.50	36.5	-52.2876
	GLOB	37.256	45.343	21.70657
Malaysia	LIFEE	72.594	76.156	4.906742
	INFANT	8.700	7.300	-16.092
	GLOB	70.921	81.304	14.64023
Myanmar	LIFEE	60.063	67.134	11.77264
	INFANT	65.400	36.100	-44.8012
	GLOB	32.324	44.579	37.91301
Philippine	LIFEE	68.793	71.231	3.543965
	INFANT	28.7	21.5	-25.0871
	GLOB	62	66.078	6.577419
Singapore	LIFEE	77.951	83.497	7.114726
	INFANT	3	2	-33.3333
	GLOB	78.161	83.465	6.785993
Thailand	LIFEE	70.623	77.150	9.242032
	INFANT	18.7	7.7	-58.8235
	GLOB	62	73.297	18.22097
Vietnam	LIFEE	73.025	75.400	3.252311
	INFANT	23.500	16.900	-28.0851
	GLOB	42.633	65.255	53.06218

Econometric Modelling

Model designing is an important step in all empirical studies specifically in economics (Tahir et al., 2020; Jan et al., 2020; Hamad et al., 2020; Jan et al., 2022c). This section specifies the model to investigate the relationship between globalization and population health which is the prime objective of this article. Thus, population health is the dependent while globalization is an independent variable of

the study. Looking into population health from a broad perspective, it appears that it could be impacted by several other factors. Previous literature has provided evidence about the role of CO2 emissions, economic growth, and globalization on population health. Health expenditures are also an important determinant of population health, however previous literature has produced contradictory findings (van del Heuvel and Olaroiu, 2017). Lawal et al., (2021) endorsed the importance of the inflation rate for population health. Finally, urbanization is also included in the model as previous literature has provided comprehensive evidence about its potential impact on population health (Shahbaz et al., 2016). Therefore, in light of previous studies, we specify the empirical model as follows.

$$\text{lnphealth}_{it} = \beta_0 + \beta_1 \text{lnglob}_{it} + \beta_2 \text{lnpgdp}_{it} + \beta_3 \text{lnhexp}_{it} + \beta_4 \text{lnurb}_{it} + \beta_5 \text{inf}_{it} + U_{it} \qquad (1)$$

Model 1 indicates that population health is explained by globalization, economic growth, health expenditures, urbanization, and inflation rate. Population health is measured by life expectancy and infant mortality rate (per 1,000 live births). For globalization, this study has utilized the KOF index which has three dimensions such as economic, social, and political. Health expenditures are measured in (current US $) while urbanization is computed by urban population as a percent of the total population. Finally, for inflation, the growth of the consumer price index is employed.

Data Source and Sample
The sampling frame of the study includes all countries in the ASEAN region. Data is gathered from 2000 to 2020. The data is obtained from the World Bank and Swiss Economic Institute.

Methods Estimation, Potential Problems and Solutions
Panel data poses several econometric challenges in estimation owing to its complex structure. For the estimation of panel data models, researchers have consistently employed the fixed effects (FE) and random effects (RE) estimators (Shah et al., 2022; Jan et al., 2019; Ali et al., 2021; Tahir and Azid, 2015; Tahir et al., 2019; Tahir and Alam, 2022). There are several benefits linked with the FE and RE estimators. The FE estimator is quite capable to handle serial correlation among the regressors and error term while it is incapable to account for time-invariant characteristics. Likewise, the RE estimator is unable to work well in a situation where serial correlation is present among the regressors and error terms. In this regard, the RE estimator can account for the impact of time-invariant characteristics. However, it is a fact that the serial correlation problem among the regressors and error term is quite common and hence the use of FE estimator is more appropriate for the estimation of panel data models (Shahzad et al., 2022; Shah et al., 2022a; Hill et al., 2007). The current study has also employed the FE estimator based on the outcome of the Hausman test (Shah et al., 2018, Shah et al., 2021). Similarly, we have also used the pooled least square method (POLS) to see the analysis without having any cross-sectional effects in the presence of time-constant attributes. For sensitivity purposes, the generalized least square (GLS) is used (Shah et al., 2022b; Chen and Gupta, 2009). For addressing the potential endogeneity, the two-stage least square is used in the study (Shah et al., 2022b; Tahir and Alam, 2022).

RESULTS AND ANALAYSIS
Descriptive Statistics
Descriptive statistics for the selected variables are depicted in Table 3. Life expectancy takes an average value of 70.988 years while its standard deviation (S.D) is 5.772. The maximum value of life expectancy is 83.497 while the minimum value is 58.432. On the other hand, infant mortality for the ASEAN economies on average is 25.131 while its S.D is 19.417. The minimum value of infant mortality is 2.00 while the maximum value is 79.200. The mean value of globalization is 59.348 and its S.D is slightly above 14. The maximum value of globalization is 84.468 and the minimum value is 32.048. The average per capita income of ASEAN economies is 10463.140 US $ while its S.D is relatively on the higher side.

The Maximum and minimum values are 61173.390 and 309.965 which shows severe disparities in ASEAN economies. Health expenditures in ASEAN economies are relatively low as they are slightly above 306.536 US $ (current prices). The minimum value is 4.335 while the maximum value is 2667.675 which is again the reflection of significant variation in ASEAN economies. Urbanization is quite high in ASEAN economies as the mean value of urbanization is almost 50 percent. The highest value of urbanization is observed for Singapore as it is a fully urbanized economy. The lowest value of urbanization is 18.586. Inflation is relatively on the low side in ASEAN economies during the last couple of decades as the average value of inflation is slightly above 4 percent. The maximum value of inflation is 57.074 percent while the minimum value is -2.314 percent.

Table 3 Descriptive Statistics

Description	LIFE	MORT	GLOB	PGDP	HEXC	URB	INF
Mean	70.988	25.131	59.348	10463.14	306.536	49.118	4.142
Maximum	83.497	79.200	84.468	61173.90	2667.675	100.000	57.074
Minimum	58.432	2.000	32.048	309.965	4.335	18.586	-2.314
Std. Dev.	5.772	19.417	14.672	15773.50	520.036	24.178	6.610
Observations	200	200	200	200	200	200	200

Discussion on Regression Findings

This section presents regression results. The POLS results are shown in columns 2 and 3 of Table 4. According to results based on POLS, globalization has improved population health as it has significantly impacted life expectancy positively and infant mortality negatively. Health expenditures have also positively impacted population health as their impact is positive on life expectancy and negative on infant mortality. Per capita income has expectedly but insignificantly improved life expectancy and reduced infant mortality significantly which implies that increased per capita income is a necessary condition for improved population health. Urbanization appeared to be not important for improving population health as entered into the models insignificantly. Finally, the inflation rate is found to be detrimental to population health as it is negatively and significantly associated with life expectancy.

Table 4 Regression Findings

Variables	POLS	POLS	FE	FE
	Life Expectancy	Infant Mortality	Life Expectancy	Infant Mortality
$lnglob_{it}$	0.132*** (0.017)	-1.078*** (0.158)	0.054*** (0.011)	-0.213* (0.120)
$lnpgdp_{it}$	0.009 (0.008)	-0.336*** (0.082)	0.088*** (0.007)	-0.552*** (0.071)
$lnhexp_{it}$	0.023*** (0.006)	-0.164*** (0.060)	-0.033*** (0.005)	0.086** (0.033)
$lnurb_{it}$	-0.011 (0.016)	-0.004 (0.151)	0.041*** (0.005)	-0.852*** (0.092)
inf_{it}	-0.0009** (0.0004)	-0.002 (0.003)	-0.0001 (0.0002)	-0.0009 (0.001)
Constant	3.579 (0.059)	10.796 (0.554)	3.307 (0.046)	11.094 (0.351)
Diagnostics	R^2: 0.845 R^2(Adj):0.841 S.E.R: 0.032 F-Test: 211.984 Hausman Test: 23.763***	R^2: 0.803 R^2(Adj):0.901 S.E.R: 0.304 F-Test: 363.844 Hausman Test: 10.221*	R^2: 0.982 R^2(Adj):0.979 S.E.R: 0.011 F-Test: 285.137 Prob (F-Test): 0.000	R^2: 0.991 R^2(Adj):0.989 S.E.R: 0.099 F-Test: 563.105 Prob (F-Test): 0.000

Note: The asterisks (*),(**) and (***) represents 10 %, 5% and 1% significance level.

The results based on the FE provided in the final two columns of Table 3 showed that globalization has influenced population health positively and significantly. Globalization is positively and significantly related to life expectancy and negatively and significantly to infant mortality. To put it differently, life expectancy is increased while infant mortality is reduced owing to the globalization process adopted by the ASEAN economies. The positive relationship observed between globalization and population health is consistent with the view of Labonté (2015) who endorsed that globalization enhances the health of the population through the channel of new health knowledge diffusion, human rights and cheaper health-related technologies. The process of globalization, therefore, must be enhanced by the ASEAN economies to accelerate not only economic growth but also improve the health of the population which is the end objective of all economic activities in the modern globalized world.

Increased per capita income appeared to be a necessary condition for improving the health of the population. It is impacting on life expectancy is both positive and significant while on infant mortality, its impact is both negative and significant. It implies that the ASEAN economies must grow their economies using appropriate policies to positively impact population health in terms of increased life expectancy and reduced infant mortality rate. Previous literature has also demonstrated that higher income is responsible for improving population health such as life expectancy (Chetty et al., 2016). The recent study of Walczak et al., (2021) and Rahman et al., (2022) also showed that life expectancy which is the indicator of population health has increased owing to higher economic growth.

In the FE results, a positive role of urbanization in improving population health is observed. According to the results, urbanization has cast a positive influence on life expectancy and a negative on the infant mortality rate. Urbanization is important from the perspective of improved population health as urban areas are full of facilities such as hospitals, educational institutes, better infrastructure, and sanitation facilities. Particularly, the problem of infant mortality which is usually higher in rural areas due to a lack of health facilities could be addressed by planned and monitored urbanization. Shahbaz et al., (2016) also provided evidence about the positive impact that urbanization has on the population health.

Interestingly, health expenditures have not played their expected role in improving the population health of ASEAN economies. According to the results, health expenditures have reduced life expectancy and increased infant mortality rate which is indeed unexpected. This finding is against conventional wisdom as it is hard to believe that high health expenditures are negatively linked with improved population health. Previous research also confirmed the positive impact of health expenditures on population health (Shahbaz et al., 2016; Rahman et al., 2022). Therefore, it is hard to explain the negative impact of health expenditures on population health. One of the possible reasons maybe is that the current health expenditures may not be sufficient for improving population health. Similarly, other factors such as income per capita may be more important for improving population health as compared to health expenditures. van del Heuvel and Olaroiu (2017) utilizing data from 31 European economies, endorsed that health expenditures are not an important determinant of life expectancy. They further argued that instead of health expenditures, policymakers must invest in social protection expenditures to improve life expectancy. Following the lesson learned from the study of van del Heuvel and Olaroiu (2017), the ASEAN member economies must also pay attention to investing in social protection expenditures which would ultimately improve the overall health of the population.

Inflation appeared not to be a crucial factor for influencing population health as its impact is insignificant on life expectancy as well as on infant mortality rate. Inflation is generally believed to be harmful to population health as it decreases the purchasing power of people. However, it is also a fact that inflation may accelerate the increased income of the people due to its positive impact on overall economic activities which increases real output. Therefore, in the results, we could not find a strong influence of inflation on the health of the population. It may also be a case that other factors may have a more prominent impact on population health instead of the inflation rate.

In terms of fitness and explanatory powers, the estimated models are excellent. The explanatory power

of the models ranges from 0.803 to 0.991 which is desirable. Similarly, the overall fitness of models is also validated by the significance of the F-test.

Sensitivity Analysis

A sensitivity exercise or robustness testing for the findings discussed in the previous section is carried out in this section. As mentioned in the methodology section, GLS and two stage least squares (TSLS) are employed for identifying whether the results provided based on FE are sensitive or not. Researchers have recommended TSLS for robustness testing to overcome the unobserved endogeneity issues (Shah et al., 2022a). The findings of GLS and TSLS are provided in Table 5. The findings obtained using GLS show that globalization appeared to be a significant factor in improving life as it has increased life expectancy and reduced infant mortality. The final two columns showing the findings of TSLS have also validated the earlier findings regarding the positive impact of globalization on population health.

The positive and negative impacts of GDP per capita on life expectancy and infant mortality respectively also remained the same both in the GLS as well as in TSLS estimation. Similarly, urbanization has also maintained its positive role in improving population health both in the GLS and TSLS estimations. In the GLS, the coefficient of health expenditures in the infant mortality equation turned negative and significant which is different from the FE results. However, in TSLS results, the impact of health expenditures remained the same.

Table 5 Sensitivity Findings

Variables	GLS	GLS	TSLS	TSLS
	Life Expectancy	Infant Mortality	Life Expectancy	Infant Mortality
$lnglob_{it}$	0.080*** (0.010)	-1.240*** (0.068)	0.137*** (0.032)	-0.021 (0.190)
$lnpgdp_{it}$	0.047*** (0.004)	-0.274*** (0.018)	0.015 (0.013)	-0.647*** (0.120)
$lnhexp_{it}$	-0.0005 (0.002)	-0.174*** (0.010)	-0.0005 (0.155)	0.101*** (0.028)
$lnurb_{it}$	0.106*** (0.008)	-0.149** (0.068)	0.118*** (0.014)	-0.843*** (0.076)
inf_{it}	-0.0001** (8.64E-05)	0.001 (0.002)	-0.003*** (0.001)	-0.004 (0.005)
Constant	3.146 (0.046)	11.509 (0.165)	3.150 (0.069)	11.005 (0.390)
Diagnostics	R^2: 0.993 R^2(Adj):0.992 S.E.R: 0.011 F-Test: 1916.361 Prob (F-Test): 0.000	R^2: 0.959 R^2(Adj):0.958 S.E.R: 0.287 F-Test: 917.727 Prob (F-Test): 0.000	R^2: 0.971 R^2(Adj):0.969 S.E.R: 0.020 F-Test: 3134.944 Prob (F-Test): 0.000	R^2: 0.991 R^2(Adj):0.990 S.E.R: 0.094 F-Test: 1514.544 Prob (F-Test): 0.000

CONCLUSION

This paper has focused on an interesting but relatively least explored area by empirically examining the relationship between globalization and population health. The ASEAN economies are taken as a sample and panel data is collected from reliable sources for the period 2000-2020. Panel econometric techniques relevant to panel data are employed.

The results highlighted the positive role played by globalization in improving population health in ASEAN economies. Globalization has increased life expectancy and decreased infant mortality rates which are used as indicators of population health. Likewise, the policymakers must gear up the globalization process with the global economy to not only accelerate economic growth but also improve the health of the population which is considered the end objective of all economic activities in the modern

globalized world. Per capita GDP and urbanization also appeared to be responsible for improved population health in ASEAN economies. Interestingly, health expenditures have not had their expected positive impact on population health in ASEAN economies which is indeed surprising. Lastly, the inflation rate is found not to be an important factor as for as population health is concerned.

Policy Implications

1) Policymakers must embrace the process of globalization wholeheartedly for improving both economic growth and population health which is rightly considered as the end objective of all activities in the modern world.
2) Higher economic growth must be ensured by policymakers as it is directly connected with higher per capita income which ultimately enhances the health of the population.
3) Urbanization has improved population health as evidenced by the findings. Therefore, the ASEAN economies are required to flourish at the speed of urbanization as urban areas are equipped with all necessary facilities such as hospitals, and educational institutions required for improved population health.
4) Although the results did not disclose a positive impact of health expenditures on population health. However, increased health expenditures are indeed needed for improved population health as documented by prior literature.

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