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Mapping causal relationships between migration and economic growth: A visual and empirical approach

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ABSTRACT

The focus of this study is to identify whether causal relationships exist between migration and economic growth across countries in the Asian continent. Real GDP per capita and net migration per capita were used to measure economic growth and net migration, respectively. A dataset comprising panel data from 1994 to 2023, covering 41 countries, was utilised. The Bootstrap Dumitrescu and Hurlin Granger non-causality test was conducted for a continental analysis of Asia. Further, the Granger causality Wald test was undertaken for in-depth country-level analysis. The empirical results indicate a unidirectional causality in Asian continent, and Eastern, and Western Asian sub reigns while other sub reigns indicated no causality. Additionally, while majority of the countries indicated no causality, seven countries namely, Saudi Arabia, Turkmenistan, Viet Nam, Sri Lanka, Macao SAR China, Malaysia and Rep. Korea indicated unidirectional causalities. Based on these findings, implications were made for policymakers when developing economic policies that leverage the economic potential of net migration.

1. Introduction

As the largest contributor to a migration population of approximately 115 million people and accounting for nearly 40 % of international migrants, Asia contributes to and is one of the central hubs for migration (IOM, 2022; Raymer, 2023). Such a context, coupled with some of the world's most rapidly emerging countries, such as China and India, and high levels of intracontinental migration, reveals the need to study whether there is a significant relationship between migration and economic growth in Asia and its sub-regions.

Examining Asia on a deeper scale, migratory patterns significantly differ across the five regions of Southern Asia, South-Eastern Asia, Eastern Asia, Central Asia and Western Asia. Southern Asia and South-Eastern Asia, primarily consisting of developing countries, are among the most densely populated parts of Asia, wherein the main economic outputs rely on agriculture and the rapid growth of IT industries (Morita, 2021). However, migration in this region is mainly displacement driven by climate changes and emigration. Additionally, the regions are recipients of a substantial amount of remittances (Ramanayake & Wijetunga, 2018), mostly from countries like Pakistan, receiving US$ 26 billion in 2023 (IOM, 2024), and India, receiving US$ 125 billion, making it the largest remittance recipient in 2023 (World Bank, 2023).

Eastern Asia has some relatively stronger economies like China, Japan and South Korea and has some of the largest diasporas worldwide (Ahn, 2024). Coupled with high emigration rates, many East Asian countries face ageing populations and diminishing birthrates (Kim, 2021; Okamoto, 2021). This situation poses a possible dependency on incoming remittances and the need to implement programs to attract foreign labourers to crucial industries. Contrary to most other sub-regions, Western Asia consists mainly Gulf countries like Saudi Arabia, Qatar and UAE, which are characterised by well-performing economies (mainly due to natural reserves) and high rates of immigration from South and South-Eastern Asia (Wagle, 2024). Consequently, such countries are significant sources of remittance outflows (IOM, 2022; Khan et al., 2019; Wagle, 2024). Finally, Central Asia's smallest sub-region, mainly consists of economically weak countries like Tajikistan, Kyrgyzstan and Uzbekistan. Political instability and conflicts between Central Asian countries have led to high emigration levels (Agadjanian & Gorina, 2019; Kluczewska & Korneev, 2022) mainly towards Russia. This has made Central Asia greatly reliant on remittances

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from Russia.

Such diverse economic characteristics and migration patterns of the various Asian sub-regions, imply variations in the relationship between migration and economic growth. Therefore, this study aims to unearth such relationships in the afore-mentioned regions and their respective countries.

The study enriches extant literature in five main ways. First, this study covers causal relationships for each of the five Asian regions and a further country-level analysis for a more in-depth outlook on the nexus, since existing studies frequently examine data in a specific region, without accounting for country-level variations.

Second, this study incorporates the latest data available (1994–2023) from a reputed source such as the World Bank. Our analysis reveals findings that reflect more recent developments and changes in the relationships as migration dynamics migration and economic growth evolve. Furthermore, along with per capita GDP (PGDP), this study shifts the limiting perspective of one specific type of migration. A more inclusive measure of per capita net migration (PNM) is used, considering immigration and emigration.

This study also utilises an extension of existing graphical visualisations, namely the Lucius Jesper Chloe heatmap (LJC heatmap). Finally, this study considers the dual impact of migration and economic growth by examining the effects of the relationship in both host and source countries, thereby allowing practical policy recommendations. These findings, therefore, are beneficial for policy-making regarding countries' attitudes towards receiving and sending migrants and transforming the net movement of people into economic gains.

2. Theoretical framework and literature review

The following sections establishes the linkages between migration and economic growth, through analysing fundamental migration-economic growth theories, as well as its applicability to Asia and its sub regions. Based upon this key theoretical framework, a comprehensive critical literature review is conducted, highlighting the gaps in literature.

2.1. Theoretical framework

The nuanced relationship between migration and economic growth have been studied through various theoretical perspectives. Macroeconomic theories, analyse the large -scale impacts of economic variables (mainly wages or GDP per capita) on migration. The neoclassical economic theory (Harris & Todaro, 1970; Hicks, 1933) implied that labour migration, mainly in developing regions, is driven by wage differentials across various countries. Therefore, a reduction in income disparities would cause a reduction in incentives to migrate and vice versa. This is applicable to the Asian contexts, where wage differentials between high income countries in Eastern and Western Asia (for example Japan, Korea, Qatar) attracts substantial migration flows from lower income regions in Southern Asia.

Expanding on labour migration, the Dual Labour Market Theory (Piore, 1979) states that many developed countries face significant labour shortages in secondary markets (characterised by less desirability and poor wages) and depend on low skilled labour migrants to fill such critical gaps. This phenomenon can be observed in regions of Western Asia, focusing on Gulf countries such as UAE, Saudi Arabia and Qatar, that heavily depend on labour expats to substantiate the level of economic growth.

Furthermore, the Human Capital Theory (Borjas, 1999) highlights that migration is commonly driven by education and self-development opportunities. Countries that excel and show potential for economic growth often attract skilled individuals. This however causes a negative relationship with economic growth for developing Asian countries (due to brain drain) and positive relationship with economic growth for more developed Asian countries (due to brain gain).

Fig. 1 illustrates the above theoretical relationships between migration and economic growth, indicating that inflow of skilled migrants and low-cost labour can stimulate economic growth in receiving countries, while, conversely, economic growth may enhance migratory motives due to opportunities of higher income.

2.2. Literature review

A systematic literature search was conducted, as depicted in Fig. 2, to gauge the existing knowledge related to migration and economic growth in Asia and sub regions of Asia. Reputed sources such as Science Direct, Wiley Online Library and Springer Link were referred to gather forty-one suitable highly - ranked articles, reports, and book chapters.

The income differences between the host and source countries are mainly known to cause migration in Asia (Soto Nishimura & Czaika, 2024; Velez et al., 2024). Therefore, people are more likely to move out of their countries in search of better education and better job opportunities (Nguyen et al., 2024). Moreover, due to the large variety of skills and qualifications gained, the migrants of Asia can be seen working in various sectors. Whereas well-qualified migrants are more likely to serve positively towards both host and source countries (Abel et al., 2019; Deng et al., 2021; Fong & Shibuya, 2020; Fong et al., 2020; Huynh & Vo, 2023; Mehdi Chowdhury, 2018; Reza et al., 2019; Yoshino et al., 2020). However, depending on the regions and the characteristics of the countries, the impact of migration on per capita GDP can differ, and vice versa. Moreover, even though migrants emigrate in terms of better opportunities and living conditions, there can be other challenges they may face in terms of adapting to different work cultures and economic conditions.

Countries that belong to Central Asia, such as Kazakhstan, Kyrgyzstan, and Tajikistan, are known to be heavily dependent on migrant remittances. This is mainly due to low wages and poor economic conditions within the source countries (Abdurakhmonov & Kurbanova, 2025; Sugözü & Talantbekova, 2024). Therefore, it leads these countries' per capita GDP to heavily rely on remittances, especially from people who have migrated to Russia (Agadjanian & Gorina, 2019; Becker et al., 2005; Hofmann, 2018; Kakhkharov et al., 2021; Kluczewska & Korneev, 2022; Marat, 2009; Zhumashbekova et al., 2024). However, even though remittances has a positive impact on per capita GDP, people leaving in search of new job opportunities are likely to find jobs that are not suitable for their qualifications. Similarly, migrants returning after completing their education face the same issue due to some source countries having restrictions against some academic qualifications. However, these return migrants can contribute more towards economic growth in terms of utilising new ideas and technological advances for the betterment of the countries, compared to the labour force who is sending remittances only for household consumption.

Migrants from Eastern Asian countries such as China, Japan, and South Korea, are known for having a significant influence on the economy by acting as both source and host economies. Moreover, immigration is considered a critical driver of economic growth if the proper policy implications are applied and based on other benefits such as an increase in labour supply and population growth. Furthermore, even though there are benefits that can support boosting the economy, there are negative consequences, such as the brain drain, especially in terms of emigration from Eastern Asian countries (Ha et al., 2016; Kim, 2021; Ma et al., 2025; Okamoto, 2021). However, when considering immigration, there can be instances where cultural barriers can be created, leading to most of the immigrants considering temporary instead of permanent migration. Moreover, immigrants coming into countries and emigrants who believe that returning to the host countries in Eastern Asia bring in remittances, knowledge and foreign aid that can benefit the economy in the long term.

South – Eastern Asia consists of both source and host countries, and most of these host countries, such as Singapore, Malaysia, and Thailand, are destinations of intra-regional migrants (Chung et al., 2023; Potdar,

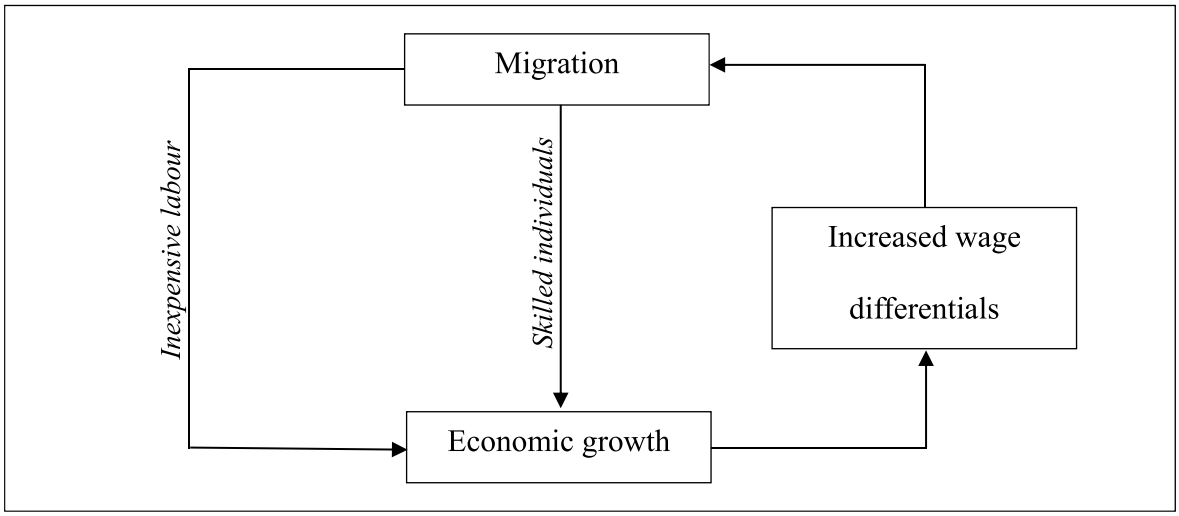

Fig. 1. Theoretical framework.
Source: Authors' composition.

2025; Sri et al., 2025; Zhang, 2024). Countries that belong to South–Eastern Asia depend mainly on labour from countries within the region and remittances from migrants within the region and outside the region. Therefore, per capita GDP and economic performance are highly influenced by migration (Bhula-or, 2021; Pholphirul, 2012, 2019, Tipayalai, 2020). However, for benefits associated with migration to improve economic growth or to impact positively economic growth, the countries must be able to accommodate the necessary facilities and resources that need to utilise skills and knowledge from labour migration and returns from remittances.

Concerning Southern Asia, it can be considered as the region consisting of the countries that depend mainly on remittances, compared to countries that belong to the other regions of Asia (Nasrin et al., 2024). Especially countries such as India, Sri Lanka, and Bangladesh are primarily known as countries with the highest number of immigrants and that receive the highest amounts of remittances in the region.

Various studies conducted based on Southern Asian countries state that migration has a positive impact on economic growth in terms of both host and source countries. This is mainly as a result of migrants from countries such as Sri Lanka and India filling labour shortages in countries that require skilled labour (Jayasooriya et al., 2025). Furthermore, they fill-in for positions that require fewer skills, such as household jobs, especially in Middle East and European countries (Cooray, 2012; Lim & Basnet, 2017; Ramanayake & Wijetunga, 2018; Sahoo et al., 2020). However, depending highly on remittances, these countries face the brain drain more than other countries within other Asian regions. Furthermore, these countries are more vulnerable to economic shocks in the host countries. Such uncertainties can even lead some people to return to their source countries because they cannot secure their jobs in the host countries.

The Western Asian region consists of the countries that belong to the Gulf Cooperation Council (GCC), which has created many employment opportunities for migrants within and outside the region. Moreover, this region is also home to the number of countries that have the highest number of refugees. Due to the countries of GCC, the Western Asia region can also be identified as the region which is highly dependent on foreign labour to fill gaps and improve per capita GDP. Therefore, due to this situation, the remittance outflow within this region is high(Agbahey et al., 2021; Khan et al., 2019; Malit Jr & Tsourapas, 2021; Soyer et al., 2020; Wagle, 2024). However, depending on foreign labour can lead to a more competitive environment for the locals and foreigners entering countries as refugees from the region itself. This will also lead many foreigners to be unemployed or even the existing employees may lose their jobs due to the increase in labour migrants. The increase in the foreign population within the countries can also lead to ethnic disputes due to cultural clashes that can take place.

When considering past literature, most of the studies have examined immigration, emigration or return migration along with economic growth independently. This indicates that less studies have explored the net effect between migration and economic growth. Furthermore, majority of the studies have incorporated datasets with 5-year intervals, which limits their ability to analyse both short term and long-term relationships along with different trends and patterns in migration. Additionally, these studies are done based on the assumption that definite causal relationships exist without considering the possibility of no causal relationships.

3. Data and methodology

The following section highlights the secondary sources of data used, and the analytical technique of Granger causality applied to establish a causality between migration and economic growth.

3.1. Data

This study employs a quantitative analysis, which utilised secondary data in terms of net migration per capita (migration) and real GDP per capita (economic growth). The dataset in Appendix A spans for a duration of 30 years from 1994 to 2023 for 41 countries that belong to the Asian continent, sourced from World Development Indicators (WDI) published by the World Bank (World Bank, 2025a, 2025b; 2025c). Then based on United Nations Statistics Division (UNSD), the countries classifies into five sub-regions (United Nations, 2025).

3.2. Methodological analysis

The data analysis process employed in this study is presented in Fig. 3. The STATA 15 software was used to conduct the analysis (StataCorp LLC, 2025).

Initially, the stationarity of the panel and time series datasets were assessed using relevant unit root tests. Then, the variables that became non-stationary were differentiated up to two differences accordingly, to achieve stationarity. Moreover, to ensure robustness of the findings, the Pesaran cross-sectional dependence test was conducted. Thereafter, considering the existence of cross-sectional dependencies, the bootstrap Dumitrescu and Hurlin Granger non-causality test and the Wald test

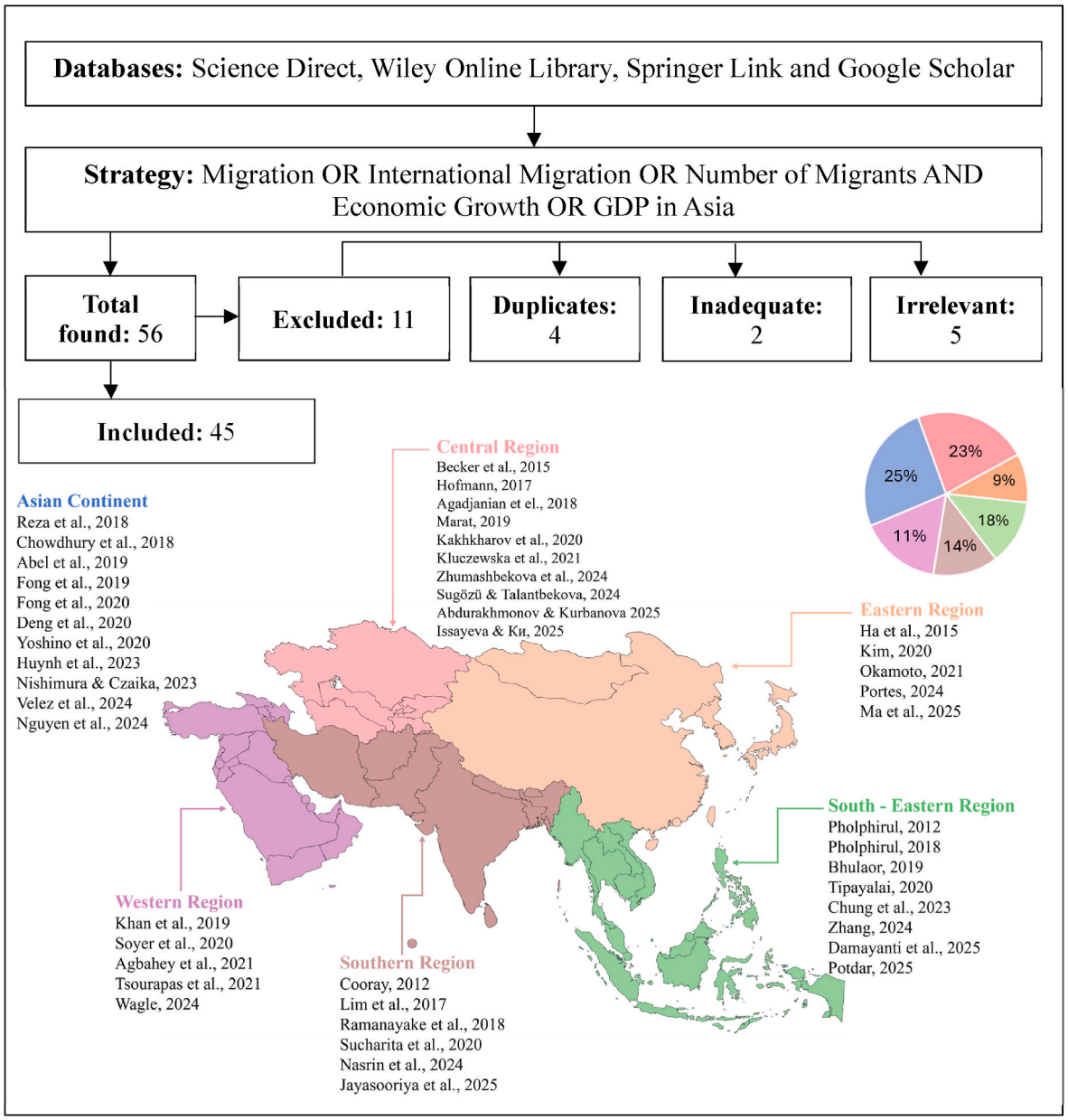

Fig. 2. Literature search diagram.
Source: Authors' composition.

were run with the selection of optimal lags. Furthermore, in Equations [1] and [2], two covariance stationary variables are considered across *n* periods, where *s* represents the continent and *q* represents the lag used in the VAR model. Equations [3] and [4] represent each country that will allow us to explore the causal relationships between PGDP and PNM, where in across *d* periods, *h* represents individual countries.

3.3. Granger causality tests

The Granger causality determines causal relationships between variables by testing whether lagged values of one variable significantly improve the forecast of another variable beyond what can be predicted using its own history alone. This approach is grounded in the principle that causes must precede effects temporally (Granger, 1969), making it ideal for analysing dynamic panel data timing is essential for deriving policy-relevant insights. The causal relationship between the two variables is tested with a time-stationary VAR model for each unit in the dataset. Moreover, researchers from various fields of study, such as economics (Caldera et al., 2024; Perera et al., 2024), finance (Shahzad et al., 2017; Vyas et al., 2023), healthcare (Akbar et al., 2021; Gao et al., 2023) and computer science (Arvin et al., 2021), frequently uses Granger causality to test multiple variables.

Compared to other analytical techniques, Granger causality is suitable for this study as it matches the studies' temporal research questions about lead-lag relationships, accommodates Asia's diverse economies through panel methods, provides policy-actionable results without restrictive assumptions, allows comprehensive testing of all potential causal directions, and reveals persistent effects of economic shocks on migration patterns and vice versa. Further, the Dumitrescu and Hurlin Granger non-causality test is selected for panel data analysis due to its ability to accommodate cross-country heterogeneity by allowing coefficients to vary across units, account for cross-sectional dependence via bootstrapping, and effectively handle datasets with short T and large N. Moreover, this method is robust to bidirectional causality and

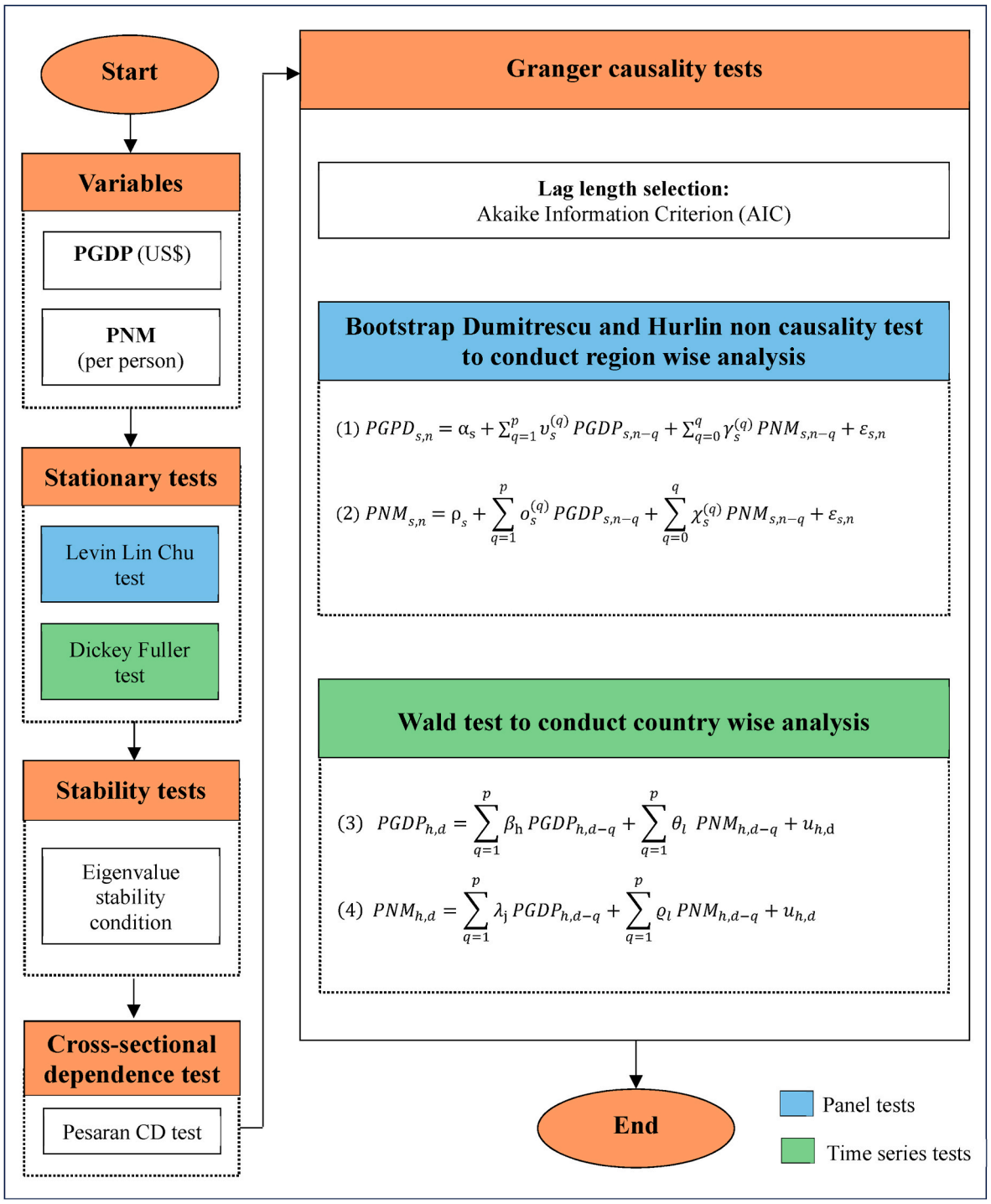

Fig. 3. Data analysis flow diagram.
Source: Authors' composition.

provides reliable inferences even when reverse causality is possible (Dumitrescu & Hurlin, 2012).

4. Results

The following section outlines the descriptive statistics and historical trends of mean PGDP and PNM with a comparison between all Asia and its five sub-regions, followed by the bootstrap Dumitrescu and Hurlin Granger non causality test results.

4.1. Descriptive and historical analysis

The comprehensive summary of the sub-regions' descriptive statistics for the two variables PGDP and PNM is detailed in Appendix B and is visualised in Fig. 4.

The ridgeline plot in Fig. 4(A) shows the distribution of per capita GDP. Most regions, specifically Central Asia and Southern Asia have majorly low per capita GDP ranging up to approximately US$2500 per capita on average. On the contrary, Eastern, has the highest GDP per capita, with the broadest distribution, whereas, South-Eastern and

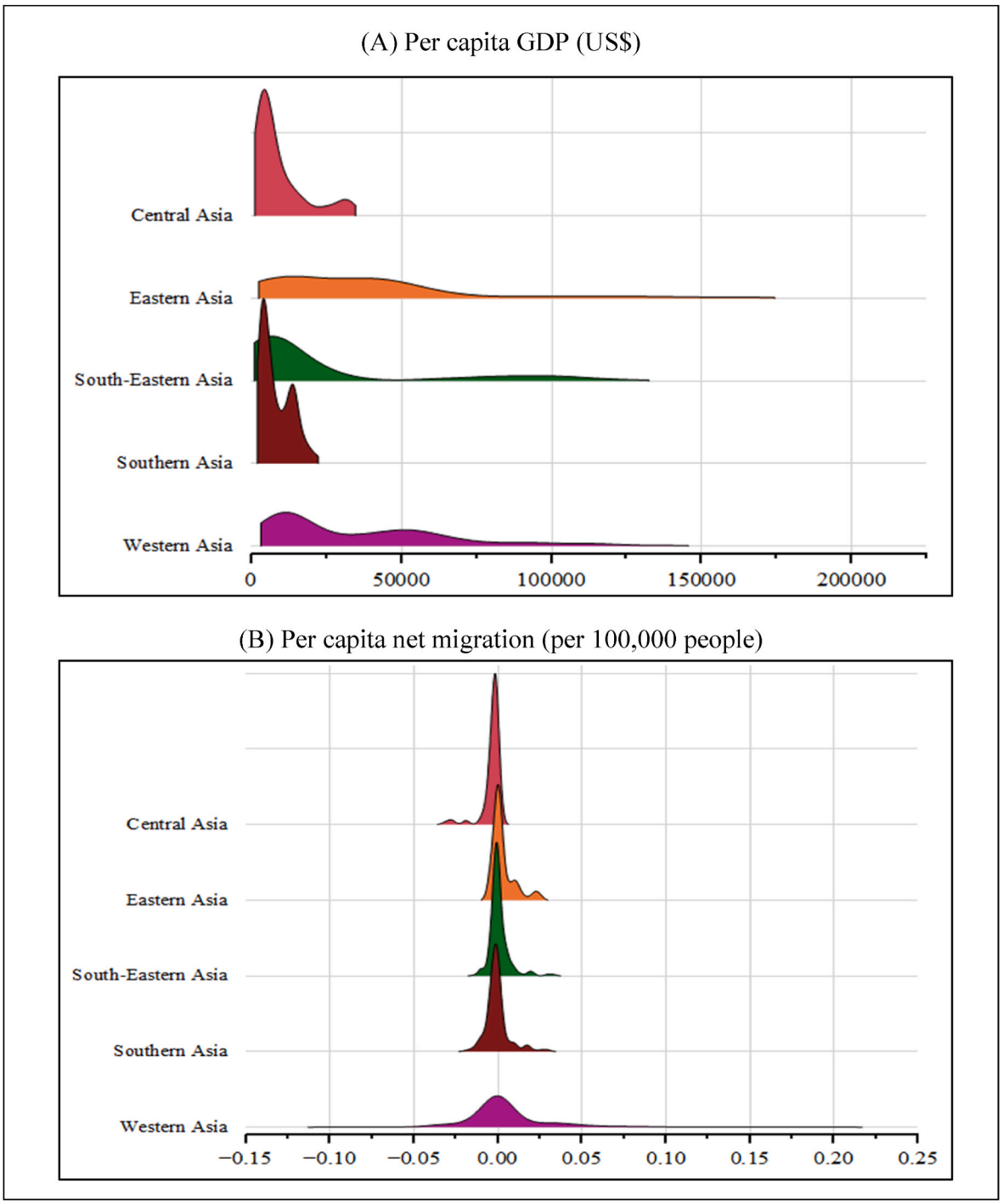

Fig. 4. Economic growth and migration ridgeline plots.
Source: Authors' composition based on (World Bank, 2025a, 2025b).

Western Asia have similar distributions.

Furthermore, the ridgeline plot in Fig. 4(B) shows the per capita net migration for the same regions. Unlike other regions, Central Asia, has more distribution in the negative net migration, indicating comparatively high emigration rates, whereas Eastern Asia, South-Eastern Asia and Southern Asia lean towards positive net migration on average. However, Western Asia displays a balance of both positive and negative migration patterns, indicating a mix of inflow and outflow of migrants.

A closer analysis of the historical trends in PGDP and PNM from 1994 to 2023, Fig. 5 highlights some key economic events.

Overall, PGDP has a relatively steady growth, although it faced temporary decreases during the Asian Financial Crisis (1997–1998), the Great Recession (2007–2009) and COVID-19 (2020–2023). In contrast, PNM depicts more volatile trends, depicting a sharp inflow of migrants from 2004 to 2006. However, after the Great Recession, PNM showed a significant drop in migrants, eventually leading to the highest outflow of migrants during COVID-19. Therefore, overall, both PGDP and PNM are affected by economic disruptions, but PGDP consistently recovers and depicts an upward trend, whereas PNM shows frequent fluctuations.

Further analysis of the most recent data of PGDP and PNM (in 2023), visualised in Fig. 6.

As shown in Fig. 6(A), most Asian countries have a per capita GDP

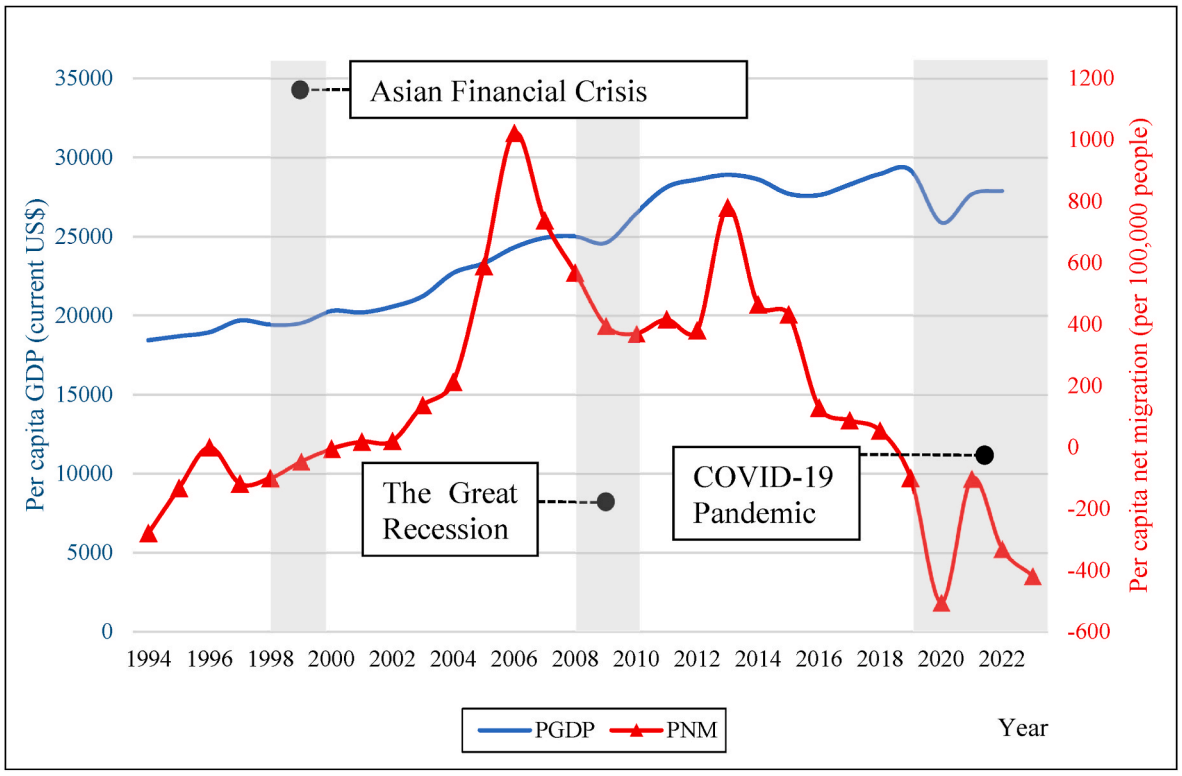

Fig. 5. Historical trend of PGDP and PNM from 1994 to 2023.
Source: Authors' composition based on World Bank data (World Bank, 2025a, 2025b).

below US$50,000 and only a minor number of countries like Qatar and Singapore have significantly high PGDP, exceeding US$100,000. For many countries, migration also has a net value near zero, as shown in Fig. 6(B). However, certain countries face extremities, like Qatar, with high emigration (−5400 net migrants) and the Syrian Arab Republic with high immigration rates (3259 net migrants).

4.2. Stationarity, stability and lag length selection

Initially, the stationarity tests were conducted to determine any unit roots present. For Asia and the five sub-regions (panel dataset), Levin Lin Chu (LLC) unit root tests were conducted, and the results are presented in Appendix C. For the variable PGDP, unit roots were present for Asia and the five -sub-regions; however, they became stationary at a 1 % significance level at the first difference. However, for the variable PNM, Asia and the sub-regions are stationary at level expect for Southern Asia, which gets stationary at first difference.

As for country-wise (time series dataset) stationarity, the Dickey-Fuller test was conducted, and the results are presented in Appendix D. PGDP and PNM is stationary at the first difference for almost all countries, with a few exceptions of countries that becomes stationary at second difference.

For the bootstrap Dumitrescu and Hurlin non-causality tests and Wald tests, the lag length selection criterion of the Akaike Information Criterion (AIC) was used as it is best for a relatively large sample and avoids underfitting the model (Akaike, 2025; Bozdogan, 1987) and the results are summarised in Appendix E.

4.3. Cross-sectional dependence

Table 1 shows the results of the Pesaran cross-sectional dependence tests.

As indicated by majority of values for Asia and the five sub-regions have a significance level under 5 %, which indicates the existence of cross-sectional dependency. Therefore, to address the cross-sectional dependence and ensure robustness of the study, Bootstrap Dumitrescu and Hurlin Granger non causality tests were conducted. This test ensures validity and robustness remains, despite cross-sectional dependence.

4.4. Bootstrap Dumitrescu and Hurlin Granger non-causality test results

Appendix F summarises the Granger non-causality results for Asia and the five sub-regions. To analyse the results effectively, these values have been visualised using the LJC heatmaps, as shown in Fig. 7, and the in-depth guide to interpretation can be seen in Appendix G. The size of the circles represents the Z bar tilde values, and the colours represent the significance level (p-value), with bright red signifying a stronger significance level. Further, the length of the arrows is representative of the lag length.

When considering the Asian continent, a significant unidirectional Granger causality exists from PGDP to PNM. According to the bootstrap results, it indicates that previous values of economic growth can help predict future values of migration. Whilst the Asian continent shows strong unidirectional causality from PNM to DPGDP, the nexus various in causality amongst the five sub regions. In Eastern Asia, there is a significant unidirectional Granger causality from PNM to PGDP, and in Western Asia, is a causal flow from PGDP to PNM. The remaining three sub-regions of Central, South-Eastern and Southern Asia, displayed no significant causalities.

4.5. Granger causality Wald test results

To enhance the analysis and gain further insights, Granger Wald tests were run for the 41 countries, and the results are in Appendix H. The country wise results are depicted in the map visualisation in Fig. 8.

Overall, out of 41 Asian countries tested, majority had no causalities, whereas 7 countries have different causality directions between migration and economic growth. Countries such as Saudi Arabia,

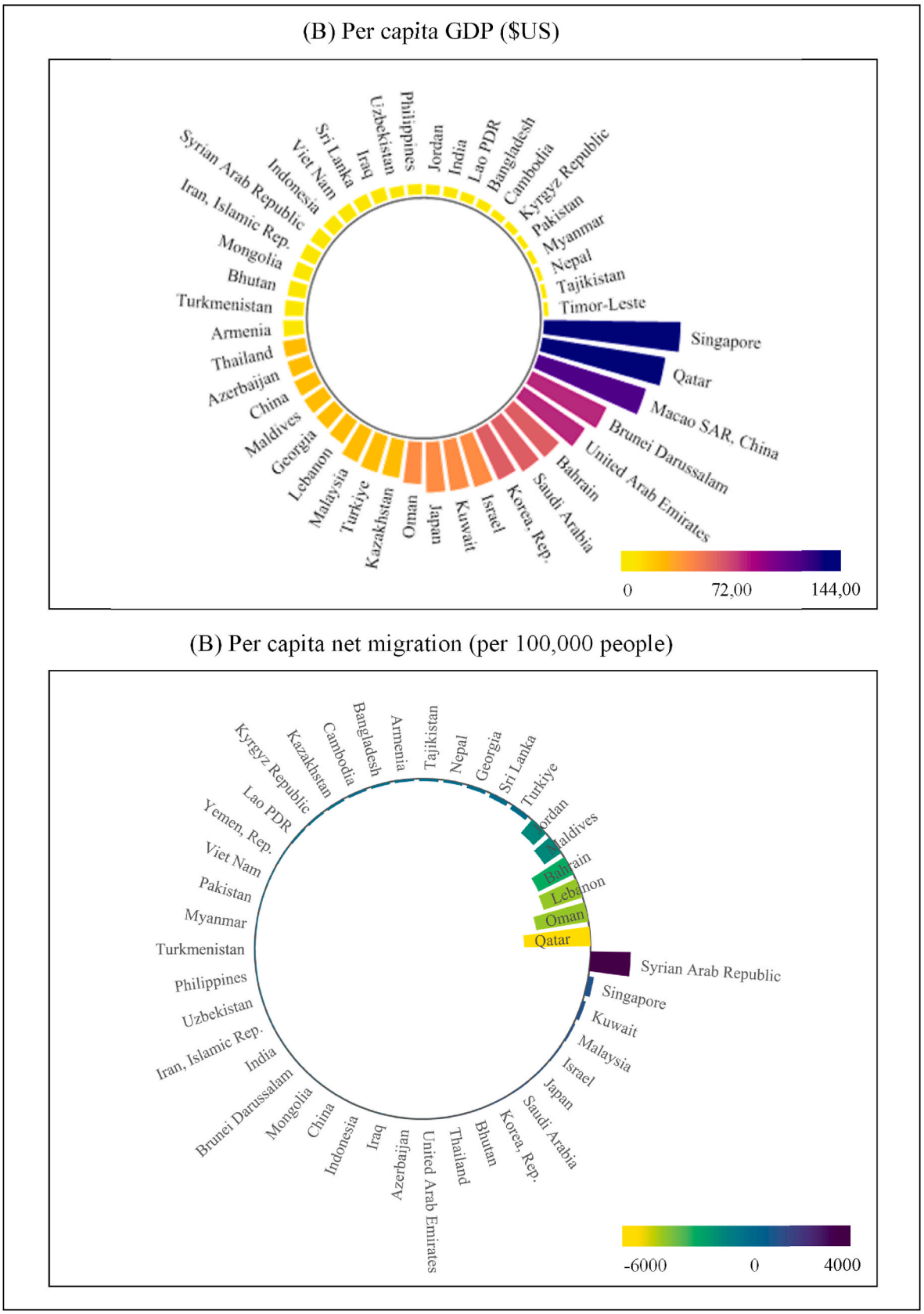

Fig. 6. Per capita GDP and per capita net migration of Asian countries in 2023.
Source: Authors' composition based on World Bank data (World Bank, 2025a, 2025b).

Table 1
Pesaran Cross sectional dependency results.

Variable	Asia	Central Asia	Eastern Asia	South-Eastern Asia	Southern Asia	Western Asia
DPGDP	40.288***	4.885***	5.353***	12.053***	8.199***	11.478***
PNM	0.167	0.488	5.660***	−0.725***		4.556***
DPNM					1.724***	

Note – The symbol (***) represents cross sectional dependance at 1 % significance level.
Source: Authors' composition.

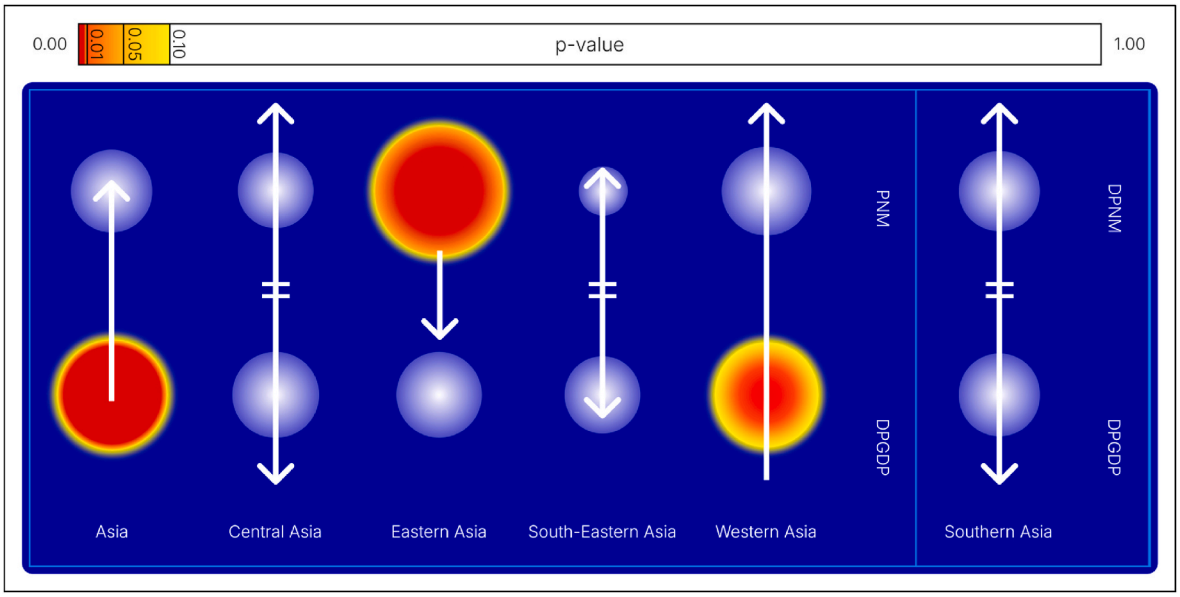

Fig. 7. Bootstrap Granger non-causality visualisation using LJC heatmap.
Source: Authors' composition using ljcheatmaps website (LJC, 2024).

Turkmenistan, Macao SAR, China, Malaysia, and Viet Nam indicate unidirectional causality from PGDP to PNM. Whereas Sri Lanka and Korea shows a unidirectional causality from PNM to PGDP.

5. Discussion

The following sections are categorised into sub-region-wise and country-wise, with in-depth discussions about the results of each category.

5.1. Asia and sub-regions

The unidirectional flow from economic growth to migration in the Asian continent, indicates the strong driving force that economic status has on migration. These findings confirms certain neoclassical theories and recent literature that state GDP per capita and wage differentials drive migrants for better opportunities abroad (Abel et al., 2019; Amornkitvikai et al., 2022; Fong & Shibuya, 2020). Such a finding re-inforces the important linkage between economic growth and migration in the Asian region and revitalises the need to promote regional integration to ensure that the high intracontinental migration flows economically benefit all regions involved.

Eastern Asia is characterised by having some Asia's strongest economies. In this region, the significant unidirectional causality from migration to economic growth, suggests a dependency on the arrival of migrants to support economic expansion. With 45 % of 14.8 million East Asian migrants residing in the same region and 59 % of international migrants also residing in East Asia (Global Migration Data Portal, 2024), migration plays a crucial role in labour markets and regional economic integration. This findings aligns with previous studies that positive net migration boosts economic growth, by offsetting challenges of ageing populations and labour shortages in key East Asian economies (Kim, 2021; Okamoto, 2021).

Moreover, in the sub-region of Western Asia, economic growth Granger causes migration. Past economic growth conditions can predict future migratory patterns. This region's economic landscape ranges from highly developing countries to less developed countries. The GCC countries in particular had massive influx of migrants, with over 50 % of the population being migrants (Aarthi & Sahu, 2021; GRC, 2022). Rapid development of the Gulf nations attracts many migrants, who are mainly in search of work in secondary markets. However, while economic growth plays a huge role in contributing towards migration, in the lesser developed areas of Western Asia, unstable political conditions, and rise in climate change also drives migration (Agbahey et al., 2021; Almulhim et al., 2024) leading to high levels of refugees, mainly migrating within the sub-region. This indicates that non-economic factors can cause people to force migrate in search of safer environments.

Notably, in regions of Central Asia, South-Eastern Asia and Southern Asia, past values of migration cannot predict future values of economic growth, and likewise past values of economic growth cannot predict future values of migration. These findings are contradictory to previous literature, which indicates the existence of a relationship between migration and economic growth (Kluczewska & Korneev, 2022; Sahoo et al., 2020; Tipayalai, 2020). However, this study's findings indicate that for these sub-regions, the nexus is more nuanced, wherein various other migration drivers such environmental challenges and political instability affect the existence of a distinct link between migration and economic growth.

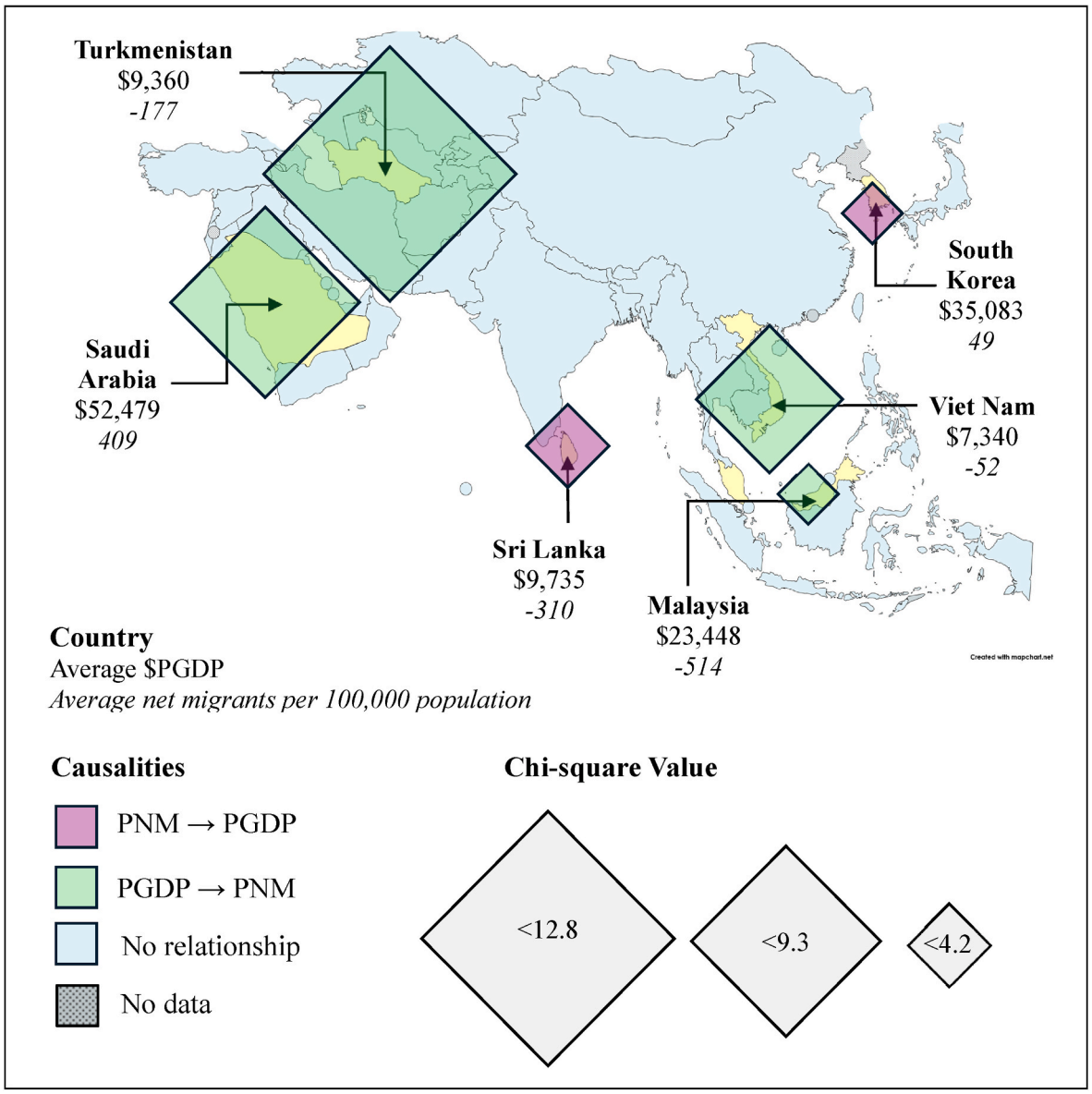

Fig. 8. Granger causality Wald test results.
Source: Authors' composition.

5.2. Country wise analysis

Saudi Arabia is a known destination for migrants who migrate in search of high paying jobs. As of 2022, 45 % of international migrants under the Gulf Corporation Council are the migrants that have migrated to Saudi Arabia (ILO, 2022). The existing literature also identifies that Saudi Arabia is a country that has higher rates of GDP. Which allows to attract more migrants due to guaranteed returns such as higher wage rates (Pritchett & Hani, 2020). Macao SAR, China is also a host for labour migrants while also being a source country of educated migrants in foreign countries (Chang & Fong, 2023). Furthermore, when it comes to Macao SAR, China, many industries that are labour intensive are moving towards becoming capital intensive with the help of advanced technologies and new innovations(Zeng et al., 2023). As a result of this, Macao SAR, China will be less dependent on migrant employees. Whereas the migrant employees will have to find new employment opportunities within the host country itself or return to their source country.

Moreover, Malaysia is another preferred destination by migrants who are seeking jobs that require low skilled and semi-skilled employees (IOM, 2025). Furthermore, the immigration rates of the Republic of Korea have been rising rapidly due to not only labour migration but also as a result of their families migrating (OECD, 2024). As a result of people moving out in search of job opportunities, families living in the source countries will be experiencing many benefits. This will then lead these countries to attract more migrants. However, in the long run both source and host countries can experience disadvantages as well. The source countries will highly depend on migrant returns leading to more people leaving out. Moreover, this can lead the host countries to be highly dependent on migrant employees. This can then lead to a rise in competition levels for job opportunities. Furthermore, if the people are skilled, they may have a higher chance of competing for better opportunities than those who do not have enough skills to meet the demands of the evolving job markets.

On the other hand, Turkmenistan is a country where emigration is high in comparison to immigration. This is mainly as a result of people having to migrate in search of better job opportunities (Integral Human Development, 2020). Prior studies done shows that Turkmenistan offers less job opportunities. Additionally, as a result of this, migrants who

study abroad are also less likely to return (Osadchaya et al., 2023). This can be mainly due to understanding that the skills and knowledge gathered can be effectively utilised in host countries itself than the source countries.

Being the second most prosperous economy in Central Asia, due to its natural resources and experiencing overall economic growth, enables more people to migrate out of the country to seek better opportunities, in terms of jobs and education. However, consider shifting perspectives. Turkmenistan faced economic turmoil since 2015, whose ripple effects have increased poverty and unemployment levels, driving more people out of the country (BTI, 2024). However, due to the complex nature of migration, designing policies suitable for both source and host countries is a must to maximise the benefits, so that challenges can be minimised. Source countries can create circular migration programs which leads to migrants returning with adequate knowledge and skills that allows to improve growth. While host countries can create job opportunities that supports circular migration programs along with safe working environments with fair wages. Moreover, Viet Nam is also a country with high rates of emigration due to seeking opportunities related to higher education and employment (IOM, 2023). This can be mainly due to understanding that the skills and knowledge gathered can be effectively utilised in host countries itself than the source countries.

Furthermore, Sri Lanka is a country that is highly depended on migration. Each year the number of people who migrate to host countries is rising rapidly (Macrotrends, 2025) leading to a negative net migration. The past studies conducted mainly show that GDP is what causes migration. The host countries with a higher GDP indicates and guarantees better opportunities in terms of living standards. Therefore, people are more likely to migrate. However, PNM can cause PGDP as well. This can happen mainly due to strict rules and regulations set by host countries to limit foreign born people from settling in. Furthermore, this can especially lead students who migrate to study to return and contribute towards the growth of the country.

However, the majority of the countries considered in this study show no causality and one of the main reasons can be due to the highest number of populations. For example, countries such as China, India, Indonesia, Pakistan, Bangladesh, Japan, Philippines, Iran, and Turkiye belongs to the top 10 countries in Asia that has highest population (World Population Review, 2024). Moreover, the majority of the countries in Asia belong to low-income or lower-middle-income country categories. For example, countries such as Bhutan, Nepal, Tajikistan, Timor-Leste, and Uzbekistan (World Bank, 2025d). As a result of the less income earned, the majority of the people from these countries may not be able to afford to immigrate to a host country, even if they had the desire to do so.

6. Conclusion

Asia, a region of diverse migratory trends, and being one of the largest contributors to international migration, has a nuanced nexus between migration and economic growth. Asia also compromises of unique economic environments hosting a range of highly developed to developing countries. The variety of migratory opportunities within Asia, is reflected by its high intracontinental migration rates between these regions. Therefore, the study conducted an in-depth analysis of the link between migration and economic growth in the Asian continent and its five sub-regions. This study confirms a unidirectional Granger causality from economic growth to migration in Asia. Further Granger causality analysis was conducted, and unidirectional causalities were identified for Eastern and Western Asia. The country-level analysis unveiled that the majority of the countries indicated no individual causalities. However, Saudi Arabia, Turkmenistan, Macao SAR, China, Malaysia, and Viet Nam show unidirectional causality from economic growth to migration. Furthermore, Korea, Rep. and Sri Lanka shows migration to economic growth. These findings help reveal the important links between migration and economic growth in Asia and its regions.

6.1. Limitations and future research

This study excludes certain countries due to a lack of data availability and limits its scope to identifying the existence of causality rather than a direction. Furthermore, future research can aim to identify directions to determine whether the nexus brings about long-term or short-term impacts.

6.2. Policy recommendations

Asia and its respective sub-regions have varying causalities between migration and economic growth, and leveraging certain policy recommendations would allow sub-regions to maximise their benefits of the nexus. The Asian continent and region of Western Asia can make use of economic growth as a key indicator to predict migration. Migratory forecasting can be based on real GDP per capita trends. The sub-region of Western Asia is characterised by rapid economic development, and this can be linked to an increasing dependency of labour migrants. Based on this migration policies can be used to attract a certain category of migrants, necessary for the different industries in the rapidly developing regions, through means of training programs and specialised work visas.

In contrast, other sub-regions, like Eastern Asia have opposing causality, wherein previous migration values can predict future real GDP per capita. In Eastern Asia, many countries are characterised by an ageing working population and low birth rates and often depend on intraregional migrants. Migratory policies can be re-visited, in order to attract high skilled migrants, through education grants and innovation schemes. Additionally, analysing recent migratory trends and its relevant economic growth performance will help these countries in identifying periods of exercising relaxed and strict migration policies.

Overall, Asia and its sub-regions are recommended to enhance regional cooperation, to facilitate a smoother transfer of skills and migrants from one sub-region to another, and to ensure appropriate migration frameworks are in place to mutually benefit from the nexus between migration and economic growth.

CRediT authorship contribution statement

Yusra Azmi: Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Methodology, Formal analysis, Data curation, Conceptualization. **Shamen Landersz:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Methodology, Data curation, Conceptualization. **Pramoda Dissanayake:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Formal analysis, Data curation. **Lucius Chloe:** Writing – review & editing, Writing – original draft, Visualization, Validation, Software, Formal analysis, Data curation. **Ruwan Jayathilaka:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Methodology, Formal analysis.

Data availability statement

The data that supports the findings of this study are available in the supplementary material of this article.

Ethics approval

Ethical approval is not applicable to this manuscript.

Declaration of use of AI

During the preparation of this work the authors used Grammarly for proof reading and spell checking. The authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

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The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ssaho.2025.102018.

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