



ADB –ASIAN THINK TANK DEVELOPMENT FORUM 2023

PACIFIC ISLAND ECONOMIES: AIMING FOR SUSTAINABLE ECONOMIC
DEVELOPMENT IN THE MIDST OF GROWING UNCERTAINTIES



THRESHOLD EFFECTS OF MIGRATION STOCK ON ECONOMIC VULNERABILITY: EVIDENCE FROM SMALL ISLAND DEVELOPING STATES(SIDS)

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MOTIVATION

- ❑ Increasing extreme phenomena in the last decades have demonstrated the potential increased vulnerability of human existence to extreme events and disturbances.
- ❑ The vulnerability refers to the sensitivity and exposure of key sectors of an economy to exogenous shocks and resilience refers to its ability to withstand and recover from these shocks.
- ❑ Reducing the vulnerability of communities and nations is crucial for economic stability and resilience against exogenous shocks
- ❑ Thus, it is immensely important to identify which factors contribute to and which factors impede vulnerability



MOTIVATION



- ❑ Although extreme climatic events and external shocks affect both developed and developing countries, they vary in their susceptibility to exogenous shocks, as well as their level of exposure, commitment, and response strategies
- ❑ Small Island Developing States (SIDS) which are characterized by low levels of economic and social development, unique geography, and size are at immense risk from exogenous and incur the greatest cost of adjusting to threats associated with global warming and climate change
- ❑ High burden of cost relates to low resilience of social, physical, and environmental factors



MOTIVATION

- ❑ Increasing concentration of economic activities, physical infrastructure, and greater population densities further acerbates vulnerability of SIDS to hazards
- ❑ In this perspective, labor migration and its associated remittances inflow become a double-edged sword, on the one hand, they can lessen vulnerability through reduced risk of social instability like protests and violence by reducing the demand for public services in home countries.
- ❑ According to the altruism hypothesis, individuals and families migrate to spread household risk and protect the household against unexpected income changes due to natural disasters and/or economic shocks.
- ❑ On the other hand, labor migration can make the country more vulnerable by causing the loss of highly skilled workers and affecting the food supply, creating dependency and an insecure income source.



MOTIVATION



- The link between migration (remittances) and vulnerability is particularly important for SIDS for the following reasons
 - Migrant remittances to SIDS have been steadily increasing, particularly in comparison to capital flows, due to the growing international labor mobility
 - In many cases, remittance flows to SIDS, particularly PICs, have increased during these crises, providing much-needed support for these countries.
- Despite the growing significance of migrant remittances to SIDS in general and PICs in particular, there is a lack of studies examining the impact of remittances and migration on economic vulnerability in SIDS.



AIM

- Examine the threshold impact of Migration stock, contingent on FDI on Economic vulnerability using panel data of 32 SIDS over the period 2002-2018.
- In this study, the Economic vulnerability index, composed of shocks (scale and possibility of natural or external shocks) and exposure (structural exposure to those shocks), is a weighted average index of population, export concentration, agriculture, forestry and fisheries, natural disasters, and exports of goods and services.

METHODOLOGY

$$\begin{cases} ev_{it} = \beta_{0i} + \beta_1^{lower} mig_{it} + \beta_2^{lower} gni_{it} + u_{it}, & mig_{it} < \gamma \\ ev_{it} = \beta_{0i} + \beta_1^{upper} mig_{it} + \beta_2^{upper} gni_{it} + u_{it}, & mig_{it} \geq \gamma \end{cases}$$

- ❖ The dependent variable $ev_{i,t}$ is the economic vulnerability index measured out of 100.
- ❖ The explanatory variables of interest is natural logarithmic migration stock, $mig_{i,t}$, sourced from United Nations Department of Economic and Social Affairs.
- ❖ mig_{it} is the proposed threshold variable and FDI to GDI ratio ($fdi_{i,t}$) is the regime variable.
- ❖ Further, the control variable is natural logarithmic gross national income, $gni_{i,t}$.
- ❖ Data on FDI and GNI are sourced from World Bank's World Development Indicators database. And γ is the proposed single threshold level.

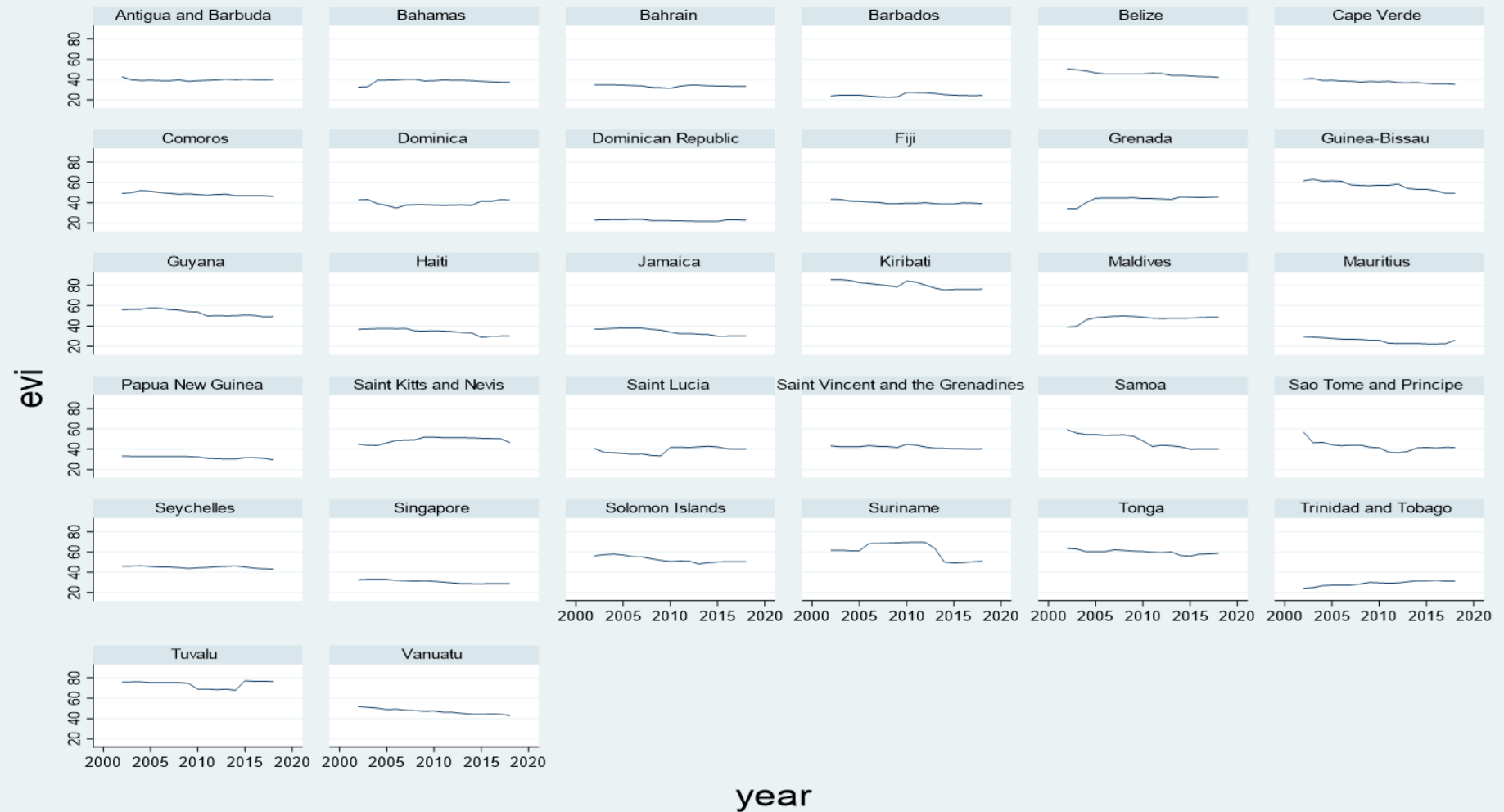
DATA DESCRIPTION

- The current study utilizes the data on 32 small island developing countries over the period 2002-2018

| Country | Country | Country |
|---------------------|-----------------------|----------------------------------|
| Antigua and Barbuda | Grenada | Solomon Islands |
| Bahrain | Guyana | Sao Tome and Principe |
| Bahamas | Haiti | Suriname |
| Belize | Jamaica | Seychelles |
| Barbados | Kiribati | Tonga |
| Comoros | Saint Kitts and Nevis | Trinidad and Tobago |
| Cape Verde | Saint Lucia | Tuvalu |
| Dominica | Maldives | Saint Vincent and the Grenadines |
| Dominican Republic | Mauritius | Vanuatu |
| Fiji | Papua New Guinea | Samoa |
| SGP | Singapore | |

RESULTS

- Trends of economic vulnerability index over 2002-2018.

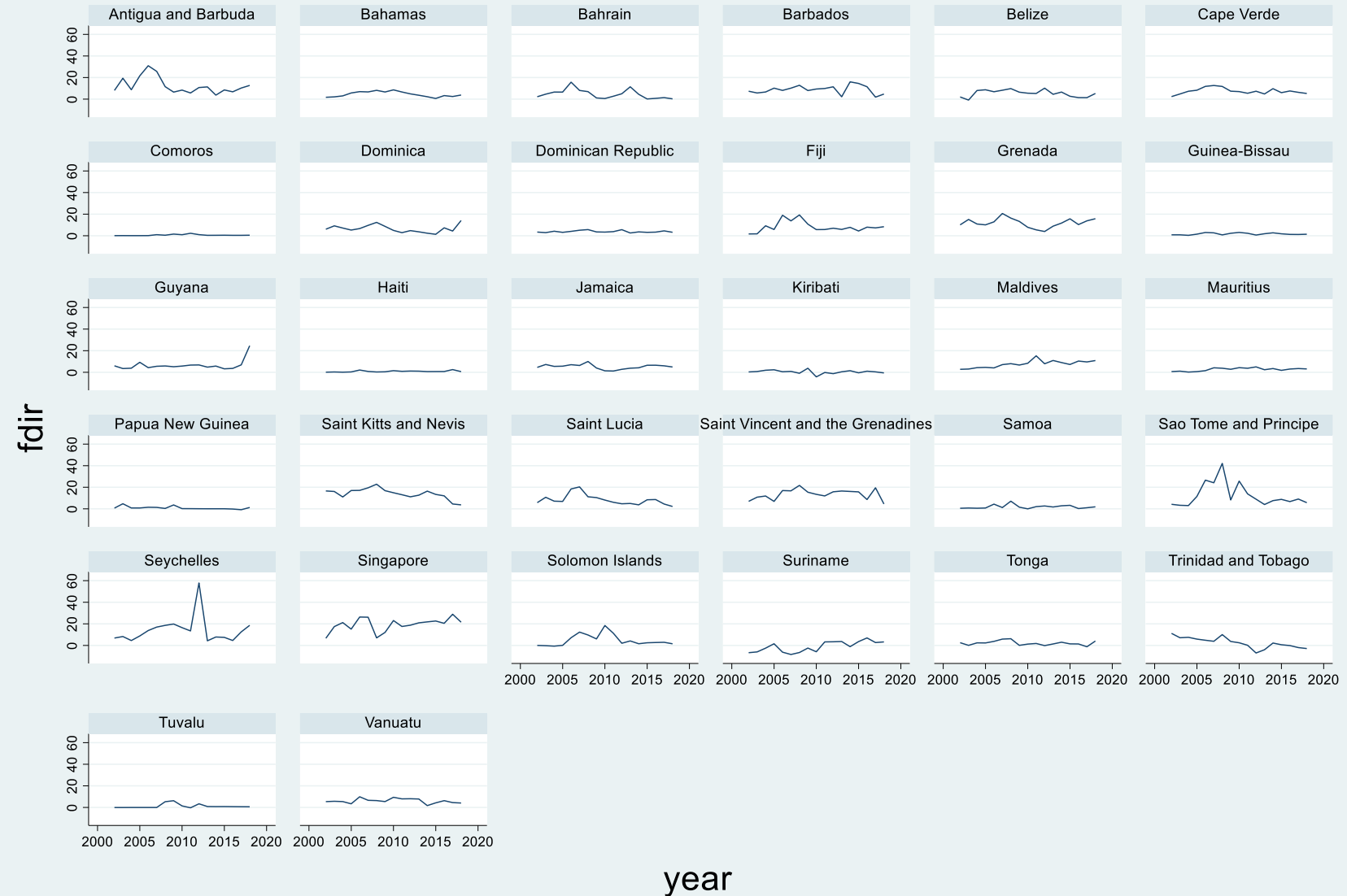


Trends of migration stock (natural logarithm) over 2002-2018.

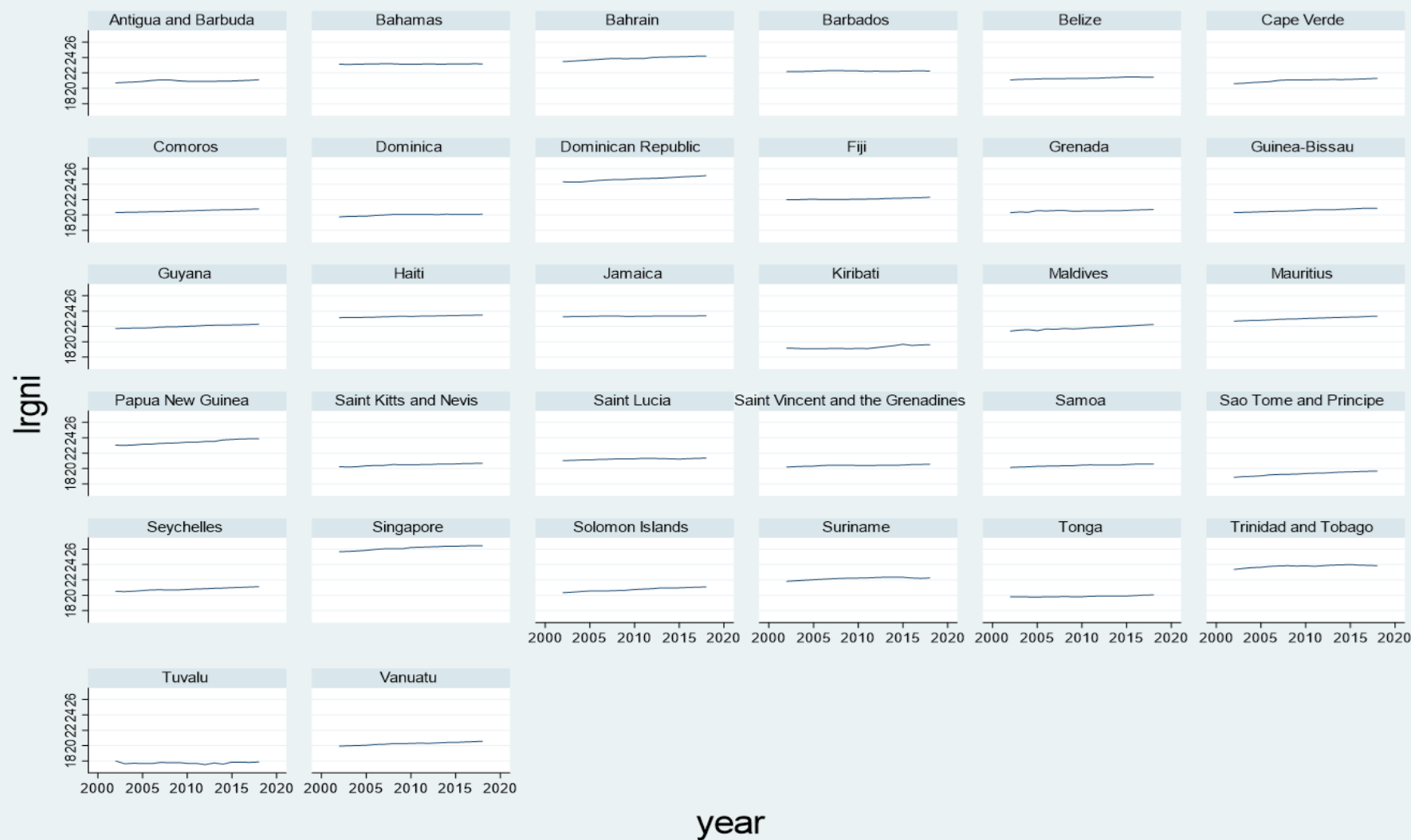


Graphs by country

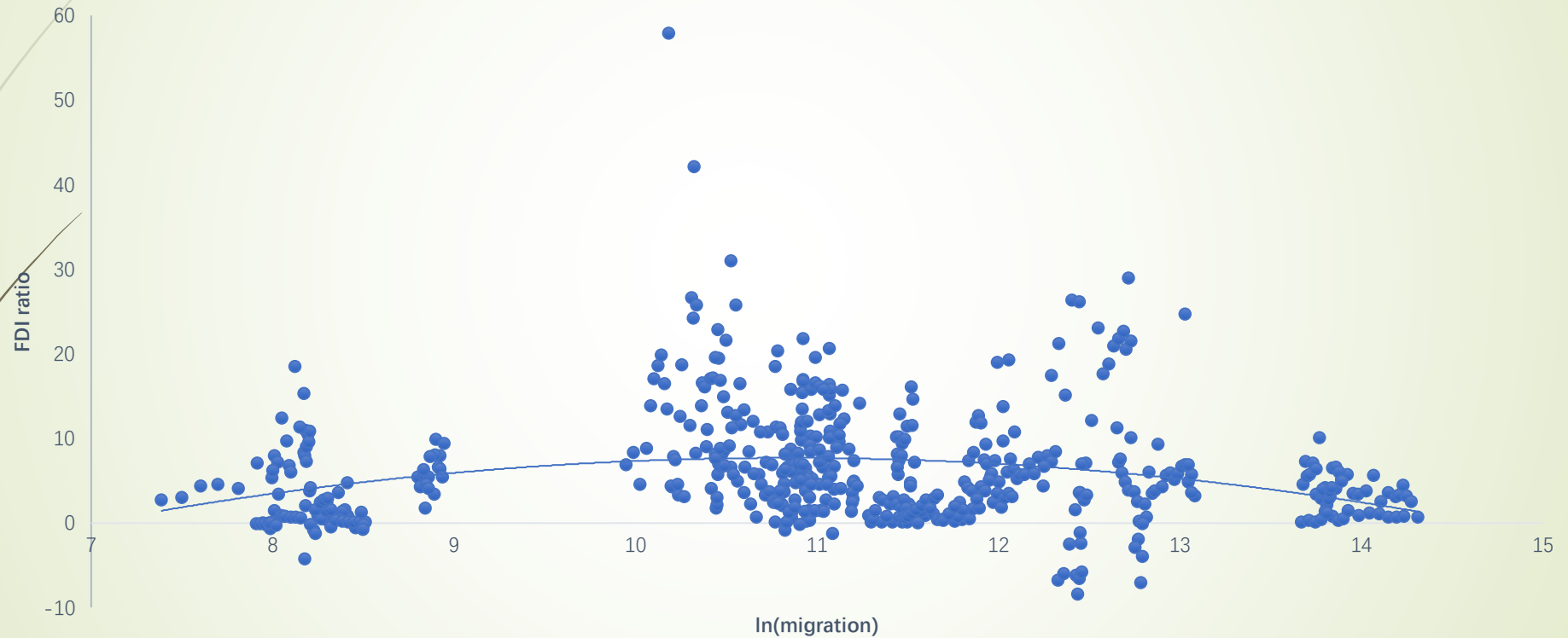
Trends of FDI inflows to GDP ratio over 2002-2018



Trends of real gross national income (natural logarithm) over 2002-2018



Scatter diagram between migration stock (natural logarithm) and FDI ratio



UNIT ROOT TEST

- Karavias and Tzavalis (2014) panel unit root test is used to test for the null hypothesis that all panel time series are unit root processes
- The null hypothesis is not rejected for all series at level but rejected in their first differences, leading to the conclusion that all series are integrated of order one.

| Variable | minZ-stat | p-value | Variable | minZ-stat | p-value |
|-------------|-----------|---------|--------------------|-----------|---------|
| $ev_{i,t}$ | -1.4734 | 0.4700 | $\Delta ev_{i,t}$ | -18.6971 | 0.0000 |
| $mig_{i,t}$ | -2.0168 | 0.4048 | $\Delta mig_{i,t}$ | -1.8595 | 0.0315 |
| $gni_{i,t}$ | -0.0002 | 0.6700 | $\Delta gni_{i,t}$ | -0.2288 | 0.0300 |
| $fdi_{i,t}$ | -1.1057 | 0.1344 | $\Delta fdi_{i,t}$ | -10.8365 | 0.0000 |

COINTEGRATION TEST

- Kao (1999), Pedroni (1999, 2004), and Westerlund (2005) tests were employed to test for the null hypothesis of no panel cointegration.

| Test | stat | p-value | Test | stat | p-value |
|---------------------------|---------|---------|----------------------------|---------|---------|
| Kao (1999) tests | | | Pedroni (1999, 2004) tests | | |
| Dickey-Fuller t | -1.6766 | 0.0468 | Modified Phillips-Perron t | 3.8960 | 0.0000 |
| Modified D-F t | -0.3330 | 0.3696 | Phillips-Perron t | -2.0077 | 0.0223 |
| Augmented D-F t | -1.3131 | 0.0946 | Augmented D-F t | -1.4040 | 0.0802 |
| Unadjusted modified D-F t | -0.4814 | 0.3151 | Westerlund (2005) test | | |
| Unadjusted D-F t | -1.7744 | 0.0380 | Variance ratio | 1.9264 | 0.0270 |

CROSS-SECTIONAL INDEPENDENCE

- Frees (1995, 2004), Friedman (1937) and Pesaran (2004) tests.

| Test | stat | 5% critical value | p-value |
|-----------------|--------|-------------------|---------|
| Frees (1995) | 5.030 | 0.1996 | |
| Friedman (1937) | 19.635 | | 0.9433 |
| Pesaran (2004) | 0.168 | | 0.8665 |

Table 5. Regressions of economic vulnerability $ev_{i,t}$

| Variables | (1) | (2) | (3) | (4) | (5) |
|----------------------|---------------------|---------------------|---------------------------------|-----------------------|---------------------|
| $gni_{i,t}$ | -5.24*** (-4.76) | -3.68*** (-2.98) | -7.24*** (-5.14) | -4.82*** (-4.76) | -3.93*** (-2.81) |
| $mig_{i,t}$ | -3.38* (-1.93) | -3.94** (-2.09) | -4.15 (-1.54) | -3.40** (-2.16) | -2.69 (-1.30) |
| $_cat\#c.fdi_{i,t}$ | | | | | |
| 0 | -1.89*** (-4.28) | -2.26*** (-4.44) | -3.25*** (-5.00) | -1.79*** (-4.53) | -2.02*** (-4.18) |
| 1 | -.07*** (-2.68) | -.11*** (-3.00) | -.05 (-1.49) | -.04** (-1.85) | -.07*** (-2.53) |
| constant | 194.7*** (12.03) | 168.1*** (8.54) | 247.0*** (12.92) | 184.2*** (12.35) | 158.1*** (8.25) |
| γ | 7.8153 | 7.7017 | 7.6073 | 7.9133 | 7.7017 |
| Sigma_u | 9.7940 | 9.8882 | 13.2074 | 8.0262 | 8.8894 |
| Sigma_e | 2.9056 | 3.0262 | 3.0133 | 2.6006 | 2.8710 |
| rho | .9191 | .9143 | .9505 | .9049 | .9055 |
| Sample | All continents | Exc. Africa | Exc. North & Central America | Exc. South America | Exc. Pacific |
| # countries | 32 | 26 | 19 | 30 | 24 |
| N | 544 | 442 | 323 | 510 | 408 |
| R^2 (between) | 0.5257 | 0.5218 | 0.4822 | 0.6522 | 0.3127 |



FINDINGS

- Findings are consistent to a large degree across different regressions. According to Columns (1)-(5), GNI plays a significant role, both statistically and quantitatively, in reducing economic vulnerability in the sample SIDS. According to the full sample regression in Column (1), given other conditions unchanged, a one percent increase in real GNI is associated with a reduction of 5.24 units in the EV index. Migration stock's mitigation effects are significant in most regressions.
- Under the influence of FDI inflows, migration stock has threshold effects on reducing economic vulnerability. On average, a larger magnitude of migration stock is found when natural logarithmic migration stock is below an estimated threshold level, for instance, 7.82 in the full sample regression in Column (1), equivalent to migration stock of around 2440 emigrants.
- For migration stock higher than the estimated threshold level, the magnitude of migration stock's effect is smaller but remains statistically significant in SIDS of most continents. This suggests that at a higher level of migration stock, migration hinders inflows of FDI due to brain drain.



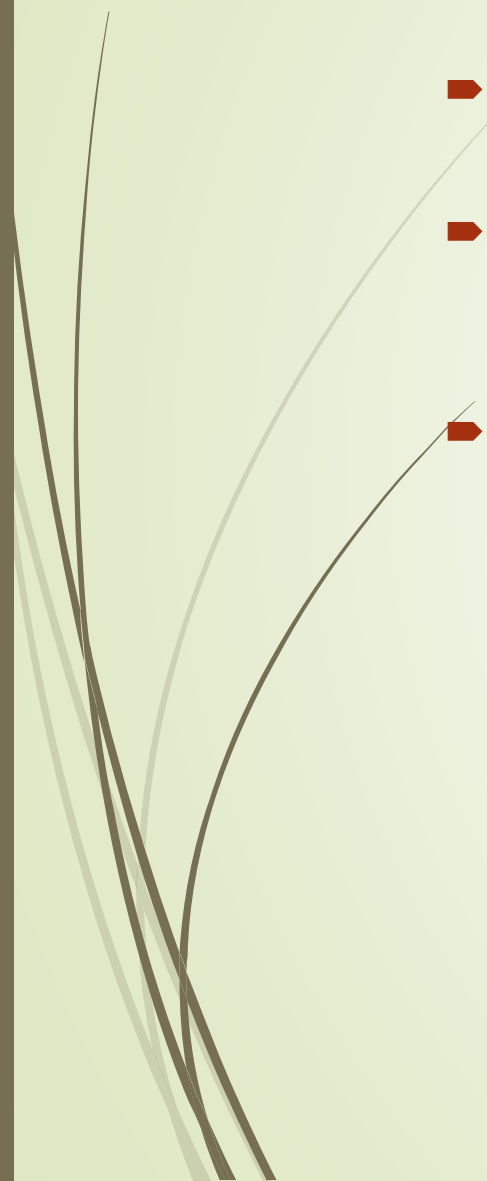
Implications

Migration

- Our findings suggest migration can provide opportunities for nationals in SIDS to reduce their economic vulnerability. Households that send migrants are able to diversify and generate new sources of income, insurance, and savings. Migrant remittances are emerging as the most important foreign exchange earner for many of the SIDS. Thus, migration reduces the vulnerability of households and economies to exogenous shocks (Howell, 2017).
- In the absence of migration opportunities, families could have been trapped in locations where food security and opportunities to make a liveable income are scarce (Bharadwaj et al., 2021; Silchenko and Murray; 2023).
- The findings are similar to Bouoiyour, Selmi and Miftah (2016), Chami et al. (2008) and Bugamelli and Paterno (2009) who noted economic vulnerability reducing effects of migration. However, our study is the first study that provides evidence on threshold effects of migration on economic vulnerability.




CONCLUSION

- Our findings show that migration significantly mitigates economic vulnerability in SIDS, and such mitigation effect diminishes with the development of migration stock.
 - Our research suggests that worker migration can help mitigate the effects of internal and external shocks, such as sea level rise and crises. During the COVID-19 pandemic, remittance flows to SIDS significantly increased.
 - Our finding that migration stock's effect on economic vulnerability is contingent on FDI also implies that SIDS does not have the technological absorption capacity, with respect to human capital, which limits investment returns for foreign firms and restrains productive linkages with small and medium firms.
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POLICY SUGGESTIONS

- Therefore, we recommend that SIDS should continue to invest in human capital to mitigate any negative effects of migration and labor shortages.
 - Additionally, governments should consider redirecting FDI towards high-value-added sectors such as manufacturing, ICT, and food processing, and prioritize more sustainable projects such as eco-tourism and inclusive development initiatives for the society.
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THANK YOU