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Abstract
The vulnerability and resilience (V&R) framework tests the hypothesis that highly economically vulnerable countries, in terms of their exposure to adverse external shocks, can still be successful economically if they are governed well, and conversely, countries that are relatively sheltered from such shocks can perform badly, if their governance is weak. The model is based on two indices, the first measuring economic vulnerability and relates to exposure of countries to adverse external shocks and the second relating to resilience, which in this study is associated with policy induced measures, thus with governance. In this framework, governance is given a wide definition, covering economic, political, social and environmental dimensions. The mentioned hypothesis was tested empirically with up to date data a re-estimation of the original model. This paper presents additional methodological explanations on how the model of the V&R framework was developed, and discusses new results. Our study finds that small states are disproportionally burdened, relative to other states, especially when trying to build resilience to adverse external shocks. The paper concludes by discussing the issue of concessional finance for small states so as to enable them to strengthen their institutional frameworks, aiming to inform the policy donor community.

Keywords: Economic vulnerability; resilience; governance; small states; development funds; composite indices.

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1. Introduction

The vulnerability and resilience (V&R) framework is intended totest the hypothesis that countries that are highly economically vulnerable, in terms of their exposure to adverse external shocks, can still be successful economically if they are governed well, and conversely, countries that are relatively sheltered from such shocks can perform badly, if their governance is weak. The model is based on two indices, the first measuring economic vulnerability and relates to exposure of countries to adverse external shocks and the second relating to resilience, which in this study is associated with policy induced measures and therefore with governance. In this framework, governance is given a wide definition, covering its economic, political, social and environmental aspects. The mentioned hypothesis was tested empirically and confirmed in Briguglio et al. (2009) and Briguglio (2016).

However, the present study uses updated data to re-estimate the model, to assess whether the results of the 2009 and 2016 studies still hold. Furthermore, the study also presents additional methodological explanations on how the model of the V&R framework was developed, how it is constructed and further implications than can be drawn from it, especially for small states.

The paper is organised in seven sections. The two sections that follow deal respectively with the construction of the vulnerability and the resilience indices, and their scholarly literature. The fourth section explains how these two indices are juxtaposed to construct the V&R framework, while Section 5 describes the methodology and the data used to construct the same framework.Section 6 presents the results derived empirically from recent data, discussing the stated hypothesis. The seventh and final section derives a number of implications from these results and concludes.

1.1 *The economic vulnerabilityindex*

The association between small states[1] and economic vulnerability first occurred in May 1985 during an international conference on the economic development of small states organised by the University of Malta.The conference wasattended by a large number of foreign scholars and representatives of international organisations, including the World Bank, UNCTAD and the Commonwealth Secretariat. One of the speakers presented a graph showing a scatter diagram with GDP per capita linked to country size, from which the trend line was derived indicating that small states tended, on average, to have a higher GDP per capita than larger states. The main message of the speaker was that small states do not seem to fare badly internationally, and therefore, he argued, one should not worry too much about the economic development of these states. The negative slope of the fitted line was heavily influenced, on the lower side, by China, India, Indonesia, the Philippines and other large states with a very low GDP per capita at that time, and, on the upper side, by small countries such as Luxembourg, Malta and Iceland, with a relatively high GDP per capita? It was true that

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[1] The size of a country is often measured in terms of its population. There is no fixed cut-off population size to distinguish small states from larger ones, but the World Bank and the Commonwealth define small states as those with a population of 1.5 million or smaller. In practice however, countries with a larger population are often categorized as small states, as is the case of the UN list of small island developing states (SIDS) which includes Jamaica, Singapore, Papua New Guinea, Dominican Republic, Haiti and Cuba. The list of UN SIDS is available at. https://www.un.org/ohrlls/content/list-sids.

countries like Malta generated more income per capita than India, but they were economically more vulnerable because their existence depended very highly on demand from abroad, and most of their physical resources including oil, wood, textiles and metal had to be imported from elsewhere. This observation led to theconstructionof theeconomic vulnerability index (EVI) and to the publishing of a number of papers on this matter, starting in the early 1990s (Briguglio, 1992; 1995; 1997; 2014, 2016; Briguglio and Kaminarides, 1993; Briguglio and Galea, 2003; Briguglio *et al.*, 2006; 2009; Guillaumont, 2009), including critical reviews discussing, amongst other things, the use of such indices as the basis for distributing development funds (Barnett et al., 2008), that vulnerability is not correlated with economic growth (Armstrong and Read, 2002), and that the success of small states is evidence of strength (Baldacchino and Bertram, 2009).

Variables associated with economic vulnerability across countries

From the very start, in these publications, economic vulnerability was associated with a high exposure to adverse external shocks due to inherent features of the economy, which are permanent or quasi permanent, and the EVI was therefore composed of variables measuring such features. These included high dependence on international trade,export concentration and high dependence on strategic imports. In addition, due to their economic size, small states find it difficult to diversity their economy, and, as a result, they tend to depend on a narrow range of exports, and this exacerbates the economic vulnerability caused by a high degree of trade openness.[2]

Many versions of the EVI also contained a component measuring proneness to disasters. Such events are assumed to exacerbate the effects of external economic shocks and can themselves lead to economic shocks (Adrianto and Matsuda 2002; Turvey, 2007).

These components of the vulnerability index across countriesare generally measured using global databases with data, suitably standardised, to enable the construction of a composite index.

All the vulnerability indices that were constructed in the publications cited aboveshowed that country size and economic vulnerability are inversely related, indicating that small states tend to be more economically vulnerable than larger ones. Among these, the most vulnerable small states were found to be the island ones.
There remained the need to explain why many small states succeed in spite of their exposure to adverse economic shocks. As will be explained in section 3 below, the answer is that a number of small states manage to build their economic resilience, through policy measures, enabling them to withstand or recover from their economic vulnerability.

The vulnerability index in international fora

Matters relating to the economic vulnerability of SIDS were raised and discussed at some length during the International Conference on Islands and Small States, held in Malta on 23-25 May 1991 at the University of Malta. In its final statement, the conference resolved "to construct a Vulnerability Index which could be used to supplement GDP per capita index for the purpose of accounting for the special problems associated with small economic size" and " to explore ways and means to have the United Nations and other international institutions

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[2]Guillaumont (2009) developed alternative economic vulnerability indices, where trade openness does not feature as one of the components of the index, but contained indices of instability which are the effects and not the cause of vulnerability.

consider such an index for assessing the need for aid to small countries" (Foundation for International Studies, 1991). Subsequently UNCTAD engaged scholars to prepare a report on the construction of a vulnerability index. This report (Briguglio, 1992) was one of the main documents discussed during a meeting of a Group of Experts on Island Developing Countries, held in Geneva on 14-15 July 1992.

The concept of economic vulnerability was considered as a good argument for small island developing states to seek the support of the international donor community. This matterfeatured prominently in various meetings under the auspices of the United Nations (UN). The outcome document of the 1994 UN Global Conferences on the sustainable development of small island developing states (SIDS), called the Barbados Programme of Action (BPoA)[3] contained two paragraphs (para 114-115) on the vulnerability index. The UN Commission on Sustainable Development called on the relevant UN bodies to accord priority to the index.[4] The issue of economic vulnerability of SIDS was also featured in the 2005 and 2014 UN international conferences on the sustainable development of SIDS, respectively held in Mauritius and Samoa, as well as in the preparatory meetings, including the recent review of the Samoa Conference (UN, 2019).

The economic vulnerability of small states also featured in many Commonwealth Secretariat meetings. The Islands and Small States institute of the University of Malta published many works on this subject in collaboration with the Commonwealth Secretariat (Briguglio and Kisanga 2004; Briguglio et al. 2006, 2008, 2010), all of which led to the conclusion that small states tend to be highly exposed to adverse external economic shocks.

The vulnerability index in the literature

The EVIwas highly cited in the literature on small island states. Some studies criticised the idea of the index (Armstrong and Read, 2002; 2003; Baldacchino and Bertram, 2009), where the criticism was often based on the observation that some island states such as Malta, Singapore and others, considered to be highly vulnerable according to the EVI, performed well economically and therefore the concept of vulnerability was irrelevant or misspecified. This criticism disregarded the fact that the EVI was intended to capture inherent features that led to exposure to adverse external shocks, which are only one side of the economic success equation, and that policy induced measures could enable small states to succeed economically in spite of their economic vulnerability, as assumed in the Vulnerability and Resilience (V&R) model.

The Multidimensional Vulnerability Index

Recently there were calls for constructing what is known as the multidimensional vulnerability index (UN, 2021). The idea was basically to add social and environmental components to the index.In a resolution adopted by the UN General Assembly in December 2020, a request made to the UN Secretary to provide recommendations on the development and coordination of work within the United Nations system on a multidimensional vulnerability index for SIDS, including on its potential finalization and use.

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[3] Available at: https://www.un.org/esa/dsd/dsd_aofw_sids/sids_pdfs/BPOA.pdf
[4] The UN Department of Economic and Social Affairs engaged Lino Briguglio as an expert for this meeting, in which capacity he wrote a report on the economic vulnerability index (Briguglio, 1997). The report of this meeting (UN document A/53/65 - E/1998/5) is available at:
https://www.un.org/esa/sustdev/sids/A5365Vulindex.pdf .

So far, two published studies on the MVI are available, namely Assa, &Meddeb (2021), who did not include social variables and Ram *et al.* (2019), who utilized social variables in the index but applied it to the Caribbean only. The present authors are of the view that social and environmental aspects (other than natural hazards) are not inherent features of countries, and are highly influenced by governance. These variables should therefore be included in a resilience context, as shall be explained below.

1.2   The concept of economic resilience

Economic resilience can be defined in many ways, but in the publications by Briguglio (e.g. 2016) and Briguglio *et al.* (e.g. 2009) on this subject, this was defined as the ability of an economy to recover from or withstand the effect of adverse external shocks, as a result of policy-induced measures.

The conceptual framework for the measurement of economic resilience was developed in Briguglio (2004), and was later supported by datain the form of an index (Briguglio *et al.*, 2006; 2009) capturing policy-induced measures, including macroeconomic stability, market efficiency, good governance and social development. Subsequently, environmental governance wasadded as a component of the resilience index (Briguglio, 2014; 2016). As in the case of the vulnerability index, the components of the resilience index were measured using global databases, with data suitably standardised to enable the construction of a composite index.

On the basis of the results of the economic resilience index (ERI), it emerged that there was no correlation between country size, measured in terms of population, and the resilience scores. However, there was a positive correlation between economic success and resilience, a tendency confirmed through the use of the analysis of the relationship between the resilience scores and the GDP per capita of countries.

1.3   The vulnerability and resilience framework

Briguglio (2004; 2016) juxtaposedthe results of the EVI and ERI to construct the so-called vulnerability and resilience (V&R) framework,as shown in Figure 1, which illustrates the risk of an economy being harmed by adverse external shocks.
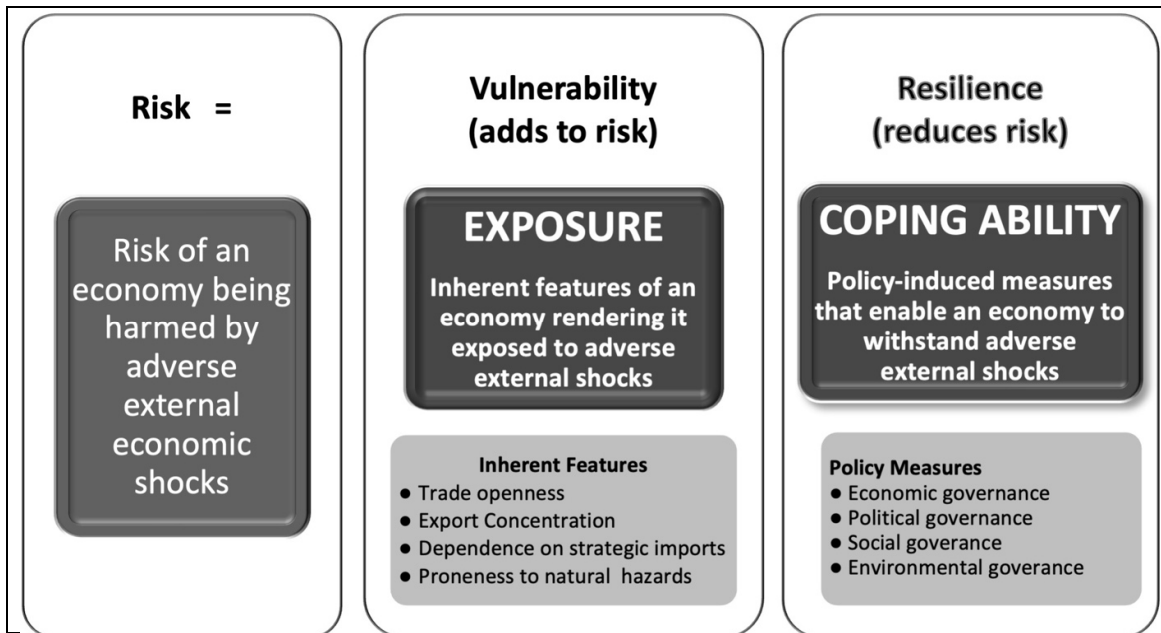
Figure 1. The vulnerability and resilience framework. Source: Adapted from Briguglio (2016).

The author identified four possible scenarios into which countries may be categorized according to their vulnerability and resilience characteristics. These scenarios were termed as "best case", "worst case", "self-made", and "prodigal son". Countries classified as "self-made" are those with a high degree of inherent economic vulnerability and which are economically resilient enabling them to cope with their inherent vulnerability. Countries falling within the "prodigal son" category are those with a relatively low degree of inherent economic vulnerability but whose policies are detrimental to economic resilience, thereby exposing them to the adverse effects of shocks. The "best case" category applied to countries that are not inherently vulnerable and which at the same time adopt good economic policy measures. Conversely, the "worst case" category refers to countries that compound the adverse effects of inherently high vulnerability by adopting policies that run counter to economic resilience.

In Briguglio *et al.* (2006; 2009), the scores of the vulnerability and resilience indices, enabled the authors to identify which countries could be classified in terms of the four categories, as shown in Figure 2. Given that the vulnerability feature were considered permanent or quasi permanent, the authors argued that it would be difficult for a country to move from one quadrant to another horizontally, but with suitable governance it can move vertically.
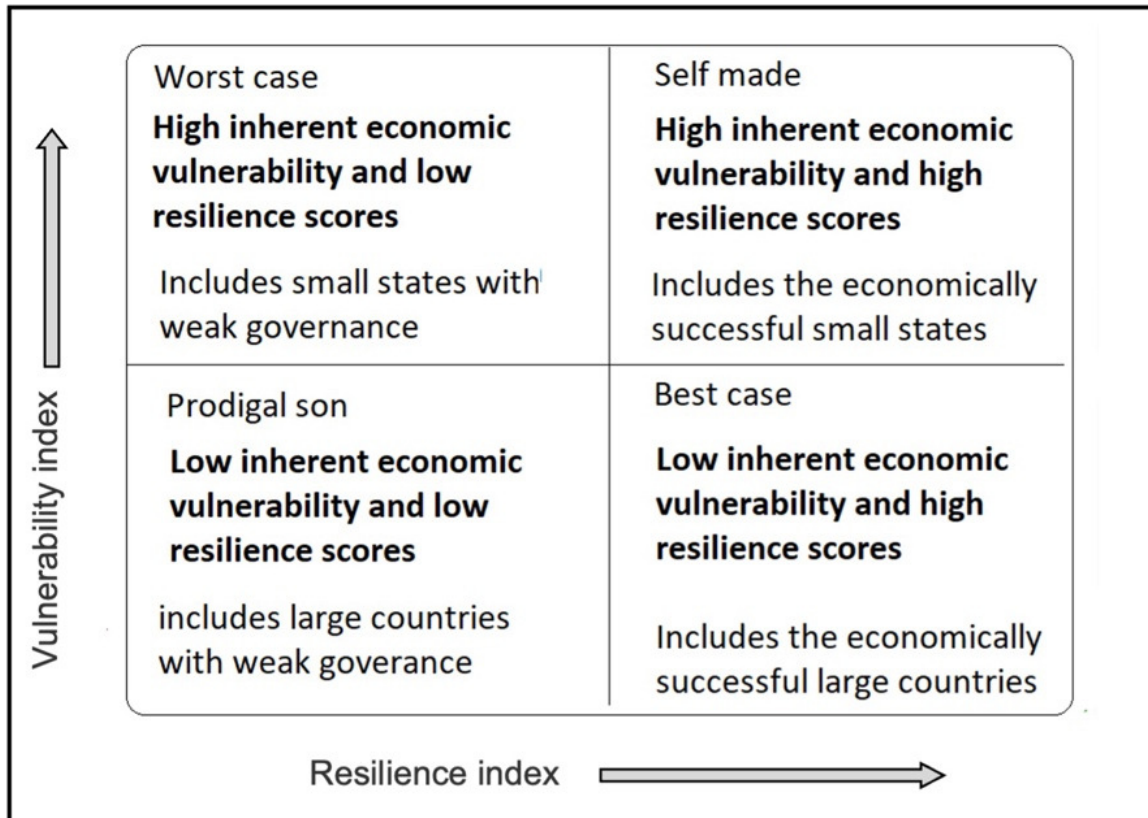
Figure 2.Four country scenarios in terms of vulnerability and resilience scores. Source: Adapted from Briguglio et al. (2004).

The V&R framework shed light on the reason why a number of vulnerable small states manage to do well economically in spite of their inherent economic vulnerability. In Briguglio (2004: 96), the author referred to this reality as the "Singapore Paradox" with reference to a small country, highly exposed to external shocks, which, through relatively good governance, managed to achieve economic success. An important implication of the V&R framework is that given that small states tend to be highly economically vulnerable, inherently, they, possibly more than other groups of countries, need to adopt suitable policy measures to step up their ability to withstand or recover from adverse external economic shocks. This result can have an important implication for policy, firstly in relation to possible prioritisation in the distribution of development funds, and secondly on the need to regularly update such indices, including their methodologies, in order to provide policy makers, and the donor community, with suitable and up-to-date policy tools.

Works referring to the V&R Framework.

Many studies on the V&R framework were published (Briguglio, 2016; Briguglio et al. 2006, 2009, 2010; Briguglio and Piccinino, 2012). Some studies utilised the framework methodology to various issues, including natural hazards (Briguglio, 2003), climate change (Briguglio, 2010), competitiveness, (Briguglio, 2017), macroeconomics (Paul, 2021), transportation (Pereira and Steenge 2021), livelihoods (Ha-Mim et al., 2020)and health (Ziglio*et al.*, 2017; WHO, 2020).

The framework was also referred to in UN meetings. Thejuxtaposition of vulnerability and resilience featured in the 2005 Mauritius and 2014 Samoa global conferences on the sustainable development of small island developing states (UN, 2005; UN, 2014).

Other instances where the V&R framework was referred to in UN documents include the report of the UN Secretary-General, on the occasion of the five-year review of the Mauritius Strategy for the Further Implementation of the Programme of Action for the Sustainable Development of SIDS.[5] In the ESCAP, ADB and UNDP publication the study by Briguglio *et al.* (2019) on the V&R framework was acknowledged as the source of the inspiration for their work.[6]UNDESA, in preparation for the 2014 Samoa International Conference on SIDS, embarked on developing a vulnerability-resilience framework, building on the approach pioneered by Briguglio *et al.* (2009).[7] In the Commonwealth Secretariat, adopted the V&R framework as one of its flagship remits.

Between 2004 until 2010, the Commonwealth Secretariat collaborated closely with the Islands and Small States Institute of the University of Malta on the vulnerability and resilience framework, which resulted in the organisation of various technical workshops, the publication of books on vulnerability and resilience, the development of a resilience index covering 86 countries, and the profiling of three SIDS (St Lucia, Seychelles and Vanuatu) in terms the vulnerability/resilience framework (Briguglio et al., 2010).[8]

2.   Method

The approach used to develop the V&R framework in the present study is basically the same as that adopted in Briguglio (2016) which involved constructing an economic vulnerability index (EVI) and a multidimensional resilience index (MRI)[9]and juxtaposing the two indices. As already explained, EVI attempts to measure exposure to adverse external shocks and the MRI associated with policy induced measures enabling countries to withstand or recover from such shocks.

2.1 Variables used to construct the Economic vulnerability index

It is assumed that the following four variables capture the extent to which an economy is exposed to adverse shocks:
- Trade Openness
- Export concentration
- Dependence on Strategic Imports
- Exposure to natural hazards

Trade openness across countries is measured as the ratio of exports and imports of goods and services to GDP. A high degree of trade openness is likely to render a country susceptible to external economic conditions over which it has no direct control. Trade openness is, to a significant extent, an inherent feature of an economy, conditioned mainly by the size of the country's domestic market affecting the exports-to-GDP ratio; and the availability of

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[5]http://www.un.org/ga/search/view_doc.asp?symbol=A/65/115.
[6]*Achieving the Millennium Development Goals in an era of global uncertainty - Asia-Pacific Regional Report 2009/10,* http://content.undp.org/go/cms-service/stream/asset/?asset_id=2269033.
[7]*UNDESA: Vulnerability-Resilience Country Profile (VRCP) .*
https://sustainabledevelopment.un.org/content/documents/1982Vulnerability-Resilience%20Country%20Profile%20(VRCP).pdf
[8] In the Commonwealth Secretariat, adopted the V&R framework as one of its flagship remits, http://thecommonwealth.org/agv/building-resilience-vulnerability .
[9]We are calling this index MRI (M standing for multidimensional) rather than ERI (E standing for Economic) due to the fact that it encompasses various aspects of governance, and not just economic ones, all of which have an effect on the ability of a country to withstand adverse external shocks.

resources in a country and its ability efficiently to produce the range of goods and services required to satisfy its aggregate demand, affecting the imports-to-GDP ratio.[10]

Dependence on a narrow range of exports gives rise to risks associated with lack of diversification, and therefore exacerbates vulnerability associated with trade openness. Again this condition is, to a large extent, the result of inherent features in the production base of an economy and reflects the fact that small size restricts a country's ability to diversify its exports.

Likewise, high dependence on strategic imports across countries, notably food and fuel, which tend to be income inelastic, intensifies economic vulnerability associated with a high degree of trade openness. Again, this condition is, to a large extent, inherent in that it depends on country size and resource endowments.

Proneness to natural hazards is assumed to exacerbate the effects of external economic shocks and themselves lead to economic shocks. In this study this component is measured in terms of economic damage relative to GDP.

These four variables, equally weighted,[11] were used as components of the EVI, with data derived from global country databases, and standardised using the Min-Max scaling formula.[12]The manner in which the data are measured for the purpose of the present study and the sources of the data are given in Appendix 3.[13]

2.2   *Variables used to construct the Multidimensional Resilience Index (MRI)*

It is hypothesized that the variables that capture policy-induced measures that lead to multidimensional resilience are associated with the outcomes of economic, political, social and environmental governance. The outcomes of these four aspects of governance, equally weighted, were used as components of the EVI, with data derived from global country databases suitable standardised, using the Min-Max scaling formula.[14]

Economic governance

The outcomes of good economic governance are various, but we hypotheses that (a) the macroeconomic stability and(b) market flexibility are of major importance in this regard.

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[10] It may be argued that openness to international trade may be influenced by policy and is therefore nurtured and not inherent. Briguglio, in his various studies on vulnerability, argued that countries with a relatively small domestic market have no option but to resort to exports, and those with limited natural resources endowment have no option but to depend highly on imports. Openness to international trade could be a source of economic strength, in that it may indicate that a country is successfully participating in the international markets. This argument, however, does not detract from the fact that by increasing its participation in international trade, a country would be exposing itself to a larger degree to external shocks over which it has relatively little control.

[11] The fours aspects of governance outcomes were therefore each assigned 25% weight in the MRI.

[12] The method often used for standardizing (or rescaling) numerical observations when a composite index is made up of components measured in different units is termed the Min-Max scaling formula. It is specified as follows: $XRS_{ij} = (X_{ij} - X_j \min) - (X_j\max - X_j\min)$ where $i = 1; 2; 3; . . .;$ n and $j = 1; 2; 3; ….;$ m . XRS_{ij} is a rescaled observation i of n observations pertaining to variable j of m variables; X_{ij} is the actual observation of the same observation; $X_j\min$ and $X_j\max$ are the minimum and maximum values of all observations making up variable j. It can be seen from the formula that XRS_{ij} takes a value of between 0 and 1.

[13]All EVI data (except that pertaining to natural hazards) were averaged for the period 2009 to 2019. This was done mainly to minimize the effects of cyclical fluctuations. In the case of natural hazards, data was for period of 4 decades.

[14] Again in the MRI, the data were averaged for the period 2009 to 2019.

These two sub-components of economic governance were equally weightedwith a 12.5% share of the MRI.

Macroeconomic stability relates to the interaction between an economy's aggregate demand and aggregate supply. If aggregate expenditure in an economy moved in equilibrium with aggregate supply, the economy would be characterized by internal balance, as manifested in a sustainable fiscal position, low price inflation and an unemployment rate close to the natural rate, as well as by external balance, as reflected in its balance of payments, as generally accepted by established literature (Fisher, 1992; Yevdokimov et al., 2018). These can be considered to be variables that are highly influenced by economic policy and related to economy's resilience in facing adverse shocks.

The macroeconomic stability component of the resilience index proposed in this study consists of twoequally weighted variables, namely(a) the government debt-to-GDP ratio and (b) the BoP current account balance to GDP. The variables are available for a reasonably wide set of countries spread over a spectrum of stages of development, size and geographical characteristics.

The debt ratio is considered to be associated with resilience, because a country with a high level of debt may find it difficult to mobilize resources in order to offset the effects of external shocks. As regards the current account ratio, deficits are bad economic governance, indicating that a country would be living beyond its means, and therefore not sustainably. In addition, a deficit reflects relatively lower national savings in relation to investment.

Data for the two indicators for macroeconomic stability was sourced from the IMF world economic outlook database, as explained in Appendix 3. These two indicators were equally weighted and assigned a 6.25 share of the MRI.

*Market flexibility*relates to the efficient operation of the market through the price mechanism, which in the science of economics is considered as the best way to allocate resources (Davis, 2010; Lee at al., 2018). If markets adjust rapidly to achieve equilibrium following an external shock, the risk of being negatively affected by such a shock will be lower than if market disequilibria tend to persist. Indeed, with very slow or non-existent market adjustment, resources will not be efficiently allocated in the economy, resulting in welfare costs, manifested, for instance, in unemployed resources and waste or shortages in the goods markets. These considerations have important implications for shock-absorbing resilience.
Not many indicators of market efficiency that span a sufficiently wide range of countries, as required for the purpose of this study, are available. In this study, market flexibility was proxied by the Index of Economic Freedom as explained in Appendix 3.This indicator was assigned a 12.5% weight in the MRI.

Political governance

Good political governance is essential for an economic system to function properly and hence to be resilient (Jessop, 1998; Weiss, 2000). Governance relates to issues such as rule of law and the security of property rights. Without mechanisms of this kind in place, it would be relatively easy for adverse shocks to result in economic and social chaos and unrest. Hence, the effects of vulnerability would be exacerbated. On the other hand, good governance can strengthen an economy's resilience. In this study, political governance is measured by the rule of law index, including in the World Bank Worldwide Governance Indicators (see Appendix 3 for more details).

An explanation as to why the good governance component has been included alongside a market efficiency component is warranted at this juncture. The market efficiency index emphasizes the importance of freely and properly operating markets for allocative efficiency and, hence, relates to the ability of an economy to reallocate resources quickly and effectively following an economic shock. This fundamentally neo-liberal approach, which has been questioned recently with the market failures associated with the financial turmoil (Stiglitz, 1989), is here balanced by an emphasis on appropriate government intervention to foster economic resilience as measured by the governance index. Thus, the resilience index proposed here views properly functioning markets and a framework of appropriate governance as two essential aspects of economic resilience.

Social governance

Social governance is another essential component of economic resilience. The outcome of good social governance includes the extent to which relations within a society enable an effective functioning of the economic apparatus without the hindrance of civil unrest (Sirowy & Inkeles, 1990; Coccia & Bellitto, 2018). This aspect of governance also relates to the extent to which effective social dialogue takes place in an economy, which, in turn, would enable collaborative approaches towards the undertaking of corrective measures in the face of adverse shocks.The outcome of good social governancein a country can be measured in a number of ways. Variables relating to income, such as its dispersion and the proportion of the population living in poverty, the long-term unemployment rate (indicating the proportion of the population with low skills and inadequate employment prospects) and the proportion of the population with low levels of education, could be useful indicators (Berger-Schmitt, 2000). Still another possible approach would be to measure the number and extent of instances of industrial or civil unrest. These approaches are interesting but rather narrow in scope and very difficult to measure across countries.We have opted to measure the outcomes of social governance by with regard to two important aspects of social development namely education and health. The data for education and health was sourced from the Human Development Report, and assigned equal weights 12.5% weight in the MRI. The education index consisted on two sub-indices, to which of which 6.25% weight in the MRI was assigned.

Educational outcomes, measured by the adult literacy rate and school enrolment ratios, is considered to be a good indicator of social development. In addition, an improved standard of education could be indicative of an improved ability to cohere in the face of external shocks—a condition conducive to economic resilience.

Health outcome, measured by life expectancy at birth is considered to be suitable for measuring the health aspects in a society. This in turn is likely to be related to medical facilities, housing and degree of proneness to accident or risk of injury. Again, advancement in health standards is considered to be conducive to economic resilience.

Data for the two indicators of social governance was sourced from the Human Development Report, as explained in Appendix 3.

Environmental governance

Environmental governance, or lack of it, has an important bearing on the ability of a country to withstand economic shocks (Moncada et al., 2018). The connection between environmental governance and economic resilience can be explained in terms of the link

between stability and environmental management through enforceable rules, economic instruments and education aimed at encouraging good environmental practices. As argued in the section on macroeconomic stability, withstanding a downside external shock is more likely to be difficult under unstable conditions. Environmental governance may be defined as institutions, regulation, practices and other processes conducive to environmental conservation, protection and use of natural resources. In order to achieve this aim, governments have to put in place appropriate legislative, judicial and educational systems and foster economic and social arrangements, which collectively can fall under environmental law and policy. The environment, in many of its aspects, is a public good and may generate negative externalities, which in turn are associated with market failure and therefore need to be regulated by the government or some other governance entity.

In selecting an indicator of environmental governance in the context of economic resilience, it is important to identify the scope of the indicator. Some sets of indicators are intended to capture natural hazards, such as earthquakes, volcanoes, droughts and floods. These indicators focus on the condition of the environment. Other indicators measure anthropogenic pressures, such as industrial pollution. Still, other indicators refer to policy responses to the state of the environment and to anthropogenic pressure.

For the purpose of this study, the relevant indicators are considered to be those that are associated with policy responses conducive to environmental governance.We did not find it practical to use a large number of environmental variables, and we opted for those that are available in global databases for a large number of countries and capture the essence of environmentalgovernance. For this purpose, we chose two variables namely unsafe drinking water and unsafe sanitation, to each of which an equal weight was assigned. Each of the two components of the environmental governance outcome was assigned 12.5% weight in the MRI. The data were sourced from the Environmental Performance Index, as explained in Appendix 3.

2.3   *Constructing the vulnerability and resilience matrix.*

The results of the EVI and the MRI were juxtaposed so as to identify which countries fall into each of the four quadrants identified in Figure 2 above. For this purpose, the countries were grouped in a matrix of four categories,[15] as follows:

(1) High EVI and high MRI, shown in the north west (NW) quadrant: it is hypothesized that these tend to be small states with relatively good governance;
(2) High EVI and low MRI shown in the north east (NE) quadrant: it is hypothesized that these tend to be small states with relatively weak governance;
(3) Low EVI and high MRI, shown in the south west (SW) quadrant: it is hypothesized that these tend to be large developed countries with relatively good governance;
(4) Low EVI and low MRI shown in the north west (NW) quadrant: it is hypothesized that these tend to be large developing countries with relatively weak governance.

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[15] The different categories of countries are distinguished by their location in the four quadrants, with the cut-off point set at a score of 0.5 on both axes.

3. Results: Updating the V&R framework

3.1 The Economic Vulnerability Index

The EVI was constructed using the methodology and the data described in Section 2, with detailed results presented in Appendix 1, covering 177 countries.[16] The same results are shown graphically in Figure 3, where it can be seen that there is a clear negative correlation between country size (measured in terms of population) and the index scores, where the highest EVI scores pertain to small island states. At the same time, there appears to be no correlation between the EVI and GDP per capita, as can be seen in Figure 4.

Figure 3.EVI and country-size. Sources: UNCTAD, 2021; EM-DAT, 2021, IMF, 2021; World Bank, 2021;World Bank, 2021b; Heritage, 2021, UNDP, 2021.

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[16]The following countries were left out of the computation of the EVI, the MRI and the V&R matrix, due to missing data: Cuba, Eritrea, Marshall Islands, Nauru, Niue, Palau, Somalia, South Sudan and Tuvalu.

Figure 4. EVI and GDP per capita. Sources: UNCTAD, 2021; EM-DAT, 2021, IMF, 2021; World Bank, 2021;World Bank, 2021b; Heritage, 2021, UNDP, 2021.

3.2   *The multidimensional resilience Index*

Again, using the methodology described in Section 2, the resilience index was computed, by using data averaged for the period 2009 to 2019. The results of the MRI are shown in Appendix 1, and shown graphically in Figure 5 where it can be seen that there is a poor correlation between country size (measured in terms of population) and the index scores. At the same time, there appears to be a clear positive correlation between the MRI and GDP per capita, as can be seen in Figure 6, where the highest MTI scores pertain to the most highly developed countries.
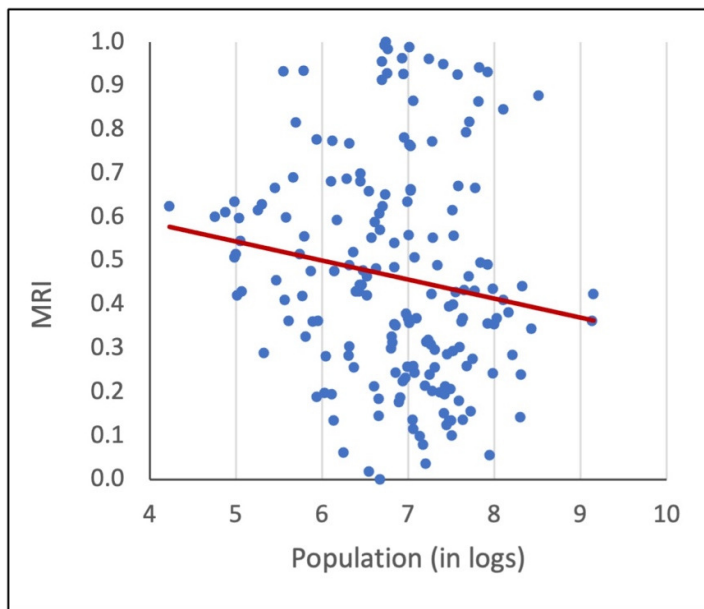
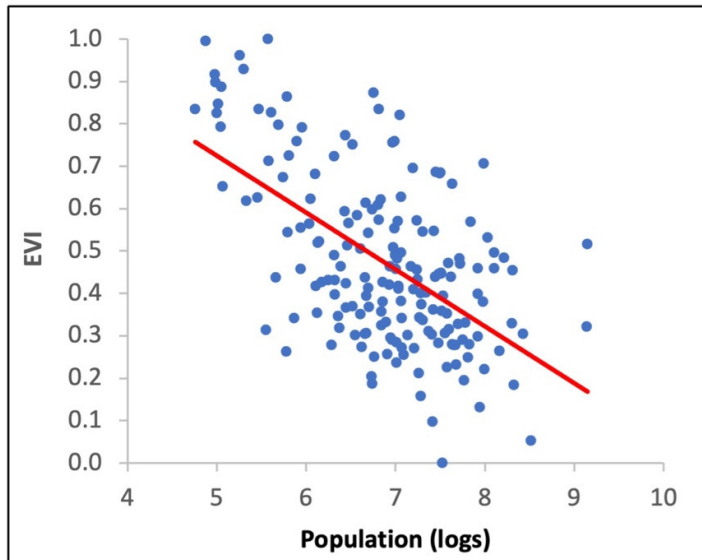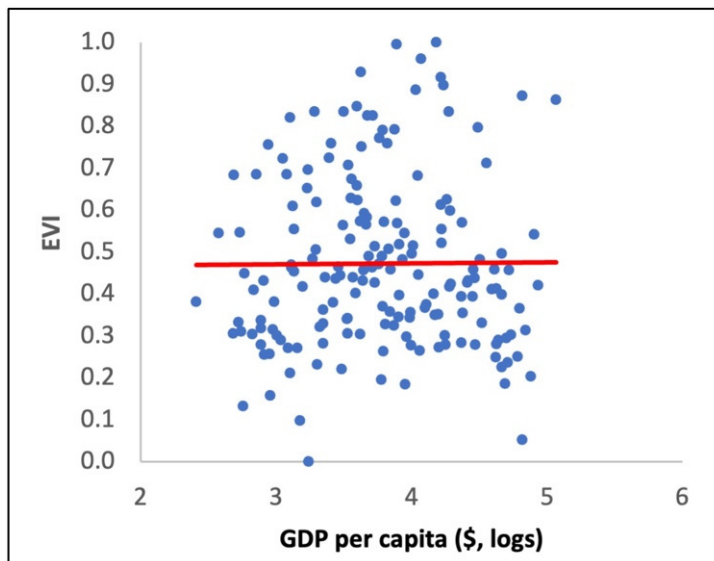**Figure 5.MRI and country size. Sources: UNCTAD, 2021; EM-DAT, 2021, IMF, 2021; World Bank, 2021;World   Bank,   2021b;   Heritage,   2021,   UNDP,   2021**.

Figure 6. MRI and GDP per capita. Sources: UNCTAD, 2021; EM-DAT, 2021, IMF, 2021; World Bank, 2021;World Bank, 2021b; Heritage, 2021, UNDP, 2021.

3.3 The V&R framework: Juxtaposing the EVI and the MRI

The scores of the EVI and the MRI were juxtaposed and grouped in a matrix of four categories,[17] as described in Section 2 of this paper, with the results shown in Appendix 2 and illustrate in Figure 7.

Figure 7. Results of juxtaposing the EVI and MRI scores. Sources: UNCTAD, 2021; EM-DAT, 2021, IMF, 2021; World Bank, 2021;World Bank, 2021b; Heritage, 2021, UNDP, 2021.

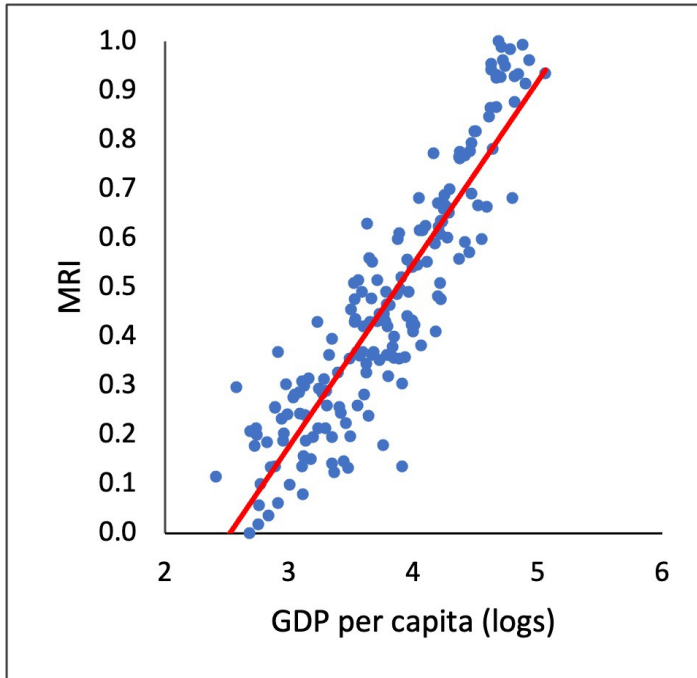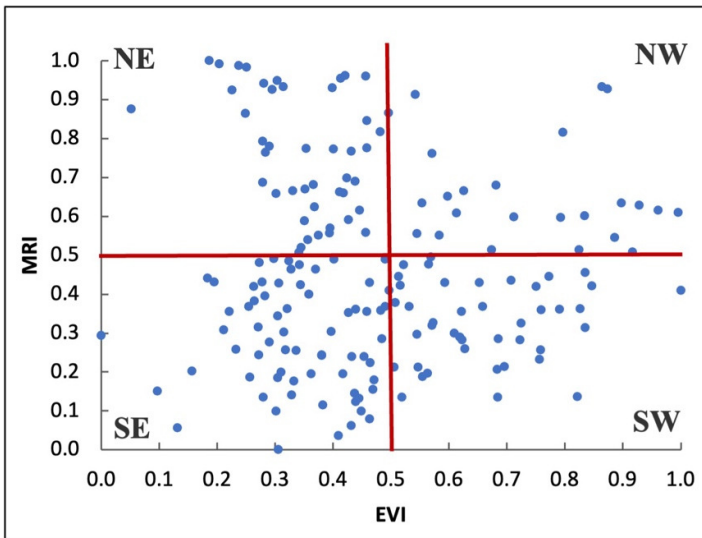[17] The different categories of countries are distinguished by their location in the four quadrants, with the cut-off point set at a score of 0.5 on both axes.

The results in general support the hypothesised location of different groups of countries in the V&R matrix, although there are exceptions.

Table 1 summarises the results by indicating the number of different types of countries in each quadrant of Figure 7.

Category	Quadrant	EVI	MRI	Total	Small	SIDS*	High	Low	LDCs
1. Self- made	NW	HIGH	HIGH	23	16	14	22	1	0
2. Worst-case	NE	HIGH	LOW	42	14	13	14	28	15
3. Prodigal-son	SE	LOW	HIGH	68	3	5	24	44	28
4. Best-case	SW	LOW	LOW	44	5	1	44	0	0
	Total			**177**	**38**	**33**	**104**	**73**	**43**

Table 1.Small States in the V&R grid. Sources: own calculations. Notes: * Some small states are not SIDS, and some SIDS are not small states. Hence the distinction between the two in this study.[#] High income countries include high-income and upper-middle-income economies as classified by the World Bank in 2019.[§] Low income countries include low-income and lower-middle-income economies as classified by the World Bank in 2019.

It can be seen that 27 out of 33 SIDS[18] are in the Categories 1 and 2, characterised by high vulnerability scores. Of these 14 are in the NW category, indicating that they are highly economically inherently vulnerable but are relatively well governed. The other highly inherently vulnerable 13 SIDS are in the NE category, indicating that they need to adopt policies conducive to resilience building.

Six SIDS recorded relatively low vulnerability scores, mostly due to their limited reliance on international trade. These states are characterised by relatively low income per capita.[19]

The SW quadrant includes countries which are not highly inherently vulnerable and relatively well governed. This quadrantis made up almost exclusively ofrelatively large developed countries. The SE quadrant also includes countries which are not highly inherently vulnerable but, conversely, they are relatively not-well governed. This quadrant is made up of almost exclusively, relatively large economies in Africa, Asia and South America.

4. Discussion and Conclusions

The main message of this paper is that the fact that SIDS tend to be highly economically vulnerable should not be construed as an argument for complacency on their part because a number of policy options are available to these states, possibly enabling them to minimise the harmful effects of high exposure to adverse external economic shocks.

As argued above, the economic vulnerability of small island states is mostly associated with their high degree of trade openness, narrow range of exports and high dependence on strategic imports (Briguglio, 1995; Scandura et al., 2018).Trade related vulnerability in a number of SIDS is exacerbated by proneness to natural hazards, which has short-term cost (particularly for recovery of housing, transport and energy systems) and long-term ones,

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[18] The UN list of SIDS consists of 38 states (see appendix). In this study, Cuba, Marshall Islands, Nauru, Palau, Tuvalu were not included as the data required to compute the V&R scores was not fully available for these states.

[19]These are Dominican Republic, Guinea-Bissau, Papua New Guinea, Suriname and Timor-Leste.

particularly due major infrastructure damage, which is very costly per capita for small states, due to the relatively high overhead costs involved.

It has been emphasised in this study that resilience building requires appropriate policy frameworks which in their totality are conducive to good multidimensional governance (Krugman, 2005). In turn, suitable policy frameworks require institutional set-ups, which in small states, involve considerable expertise and high overhead costs, and therefore likely to be highly costly per capita for SIDS. This is due to the fact that overhead costs are not normally downscaled in proportion to the population, the so called *indivisibility problem*(Srinivasan, 1986).

Many SIDS are middle-income or high-income countries, leading to their exclusion from concessionary financing, even though theyare highly exposed to external shocks and experiencing, as a result, a high degree of growth volatility (McGillivray et al., 2010). The international donor community, in supporting the economic development of SIDS, ought to take cognizance of these states' high degree of economic vulnerability and assign major importance to reinforcing resilience building, so as to enable these states to strengthen their ability to withstand and cope with economic shocks. Development aid aimed at promoting and supporting resilience building in small states is likely to have a lasting effect on recipient countries, not only because this improves aid effectiveness but also because it is likely to foster the belief in that country itself, that it can climb the development ladder through improved policies and institutions (Bräutigam and Woolcock, 2001, Farrugia, 2007). It can therefore be argued that concessional funding for SIDS couldbe directed at strengthening resilience, giventhe high per unit costsof institutional building in SIDS, irrespective of the income per capita of the recipient.

All countries face external economic shocks and therefore need to be economically resilient, but, as argued above, SIDS are disproportional exposed to such shocks, and therefore economic-resilience building is especially important for these states.

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APPENDIX 1: Computed values of the EVI and MRI

Country	EVI	MRI	Country	EVI	MRI
Afghanistan	0.449	0.099	Laos	0.381	0.244
Albania	0.513	0.445	Latvia	0.279	0.687
Algeria	0.658	0.367	Lebanon	0.622	0.355
Angola	0.445	0.132	Lesotho	0.723	0.282
Antigua and Barbuda	0.897	0.634	Liberia	0.305	0.184
Argentina	0.278	0.432	Lithuania	0.424	0.699
Armenia	0.565	0.477	Madagascar	0.546	0.212
Australia	0.303	0.949	Malawi	0.545	0.296
Austria	0.295	0.926	Malaysia	0.446	0.616
Azerbaijan	0.490	0.368	Maldives	1.000	0.410
Bahamas	0.712	0.598	Mali	0.157	0.202
Bahrain	0.427	0.592	Malta	0.797	0.816
Bangladesh	0.484	0.285	Mauritania	0.506	0.212
Barbados	0.626	0.666	Mauritius	0.682	0.680
Belarus	0.508	0.378	Mexico	0.496	0.409
Belgium	0.496	0.865	Micronesia	0.847	0.421
Belize	0.826	0.362	Moldova	0.593	0.429
Benin	0.272	0.243	Mongolia	0.751	0.420
Bhutan	0.342	0.475	Montenegro	0.545	0.555
Bolivia	0.628	0.259	Morocco	0.306	0.428
Bosnia and Herzegovina	0.370	0.464	Mozambique	0.684	0.207
Botswana	0.345	0.519	Myanmar	0.469	0.155
Brazil	0.184	0.442	Namibia	0.463	0.430
Brunei Darussalam	0.438	0.690	Nepal	0.686	0.286
Bulgaria	0.357	0.540	Netherlands	0.456	0.961
Burkina Faso	0.337	0.255	New Zealand	0.413	0.954
Burundi	0.382	0.115	Nicaragua	0.835	0.313
Cabo Verde	0.674	0.514	Niger	0.311	0.199
Cambodia	0.696	0.213	Nigeria	0.329	0.141
Cameroon	0.098	0.151	North	0.491	0.490
Canada	0.226	0.925	Norway	0.204	0.992
Central African Republic	0.306	0.000	Oman	0.613	0.608
Chad	0.410	0.036	Pakistan	0.454	0.239
Chile	0.401	0.772	Panama	0.273	0.482
China	0.516	0.423	Papua New	0.464	0.224
Colombia	0.328	0.463	Paraguay	0.427	0.352
Comoros	0.555	0.188	Peru	0.358	0.400
Congo Democratic Republic	0.132	0.056	Philippines	0.531	0.368
Congo Republic	0.437	0.145	Poland	0.352	0.670
Costa Rica	0.368	0.624	Portugal	0.284	0.765
Croatia	0.351	0.588	Qatar	0.366	0.681
Cyprus	0.458	0.776	Romania	0.375	0.552
Czech Republic	0.571	0.761	Russia	0.264	0.382
Denmark	0.251	0.984	Rwanda	0.255	0.368
Djibouti	0.563	0.197	Samoa	0.929	0.629
Dominica	0.995	0.610	São Tomé and	0.619	0.289
Dominican Republic	0.483	0.358	Saudi Arabia	0.394	0.557
Ecuador	0.571	0.319	Senegal	0.271	0.314
Egypt	0.221	0.355	Serbia	0.324	0.485
El Salvador	0.573	0.327	Seychelles	0.916	0.508
Equatorial Guinea	0.519	0.135	Sierra Leone	0.332	0.176
Estonia	0.354	0.774	Singapore	0.873	0.928
Eswatini	0.623	0.282	Slovak Republic	0.598	0.651
Ethiopia	0.381	0.242	Slovenia	0.432	0.767
Fiji	0.791	0.361	Solomon	0.724	0.326
Finland	0.187	1.000	South Africa	0.195	0.430
France	0.249	0.864	South Korea	0.482	0.817
Gabon	0.397	0.303	Spain	0.279	0.793
Gambia	0.318	0.256	Sri Lanka	0.402	0.490
Georgia	0.584	0.552	St. Kitts and	0.835	0.601
Germany	0.398	0.931	St. Lucia	0.961	0.615
Ghana	0.283	0.395	St. Vincent and	0.792	0.597
Greece	0.418	0.659	Sudan	0.279	0.135
Grenada	0.886	0.545	Suriname	0.263	0.420
Guatemala	0.432	0.239	Sweden	0.237	0.988
Guinea	0.301	0.098	Switzerland	0.421	0.962
Guinea-Bissau	0.431	0.061	Tajikistan	0.756	0.232
Guyana	0.759	0.360	Tanzania	0.290	0.276
Haiti	0.821	0.136	Thailand	0.569	0.495
Honduras	0.758	0.256	Timor-Leste	0.417	0.194
Hungary	0.554	0.634	Togo	0.257	0.187
Iceland	0.314	0.933	Tonga	0.825	0.515
India	0.321	0.362	Trinidad and	0.522	0.475
Indonesia	0.304	0.344	Tunisia	0.341	0.507
Iran	0.459	0.356	Turkey	0.298	0.491
Iraq	0.471	0.179	Uganda	0.315	0.302
Ireland	0.542	0.913	Ukraine	0.439	0.360
Israel	0.290	0.781	United Arab	0.411	0.663
Italy	0.330	0.666	United	0.280	0.942
Ivory Coast	0.362	0.195	United States	0.052	0.877
Jamaica	0.772	0.445	Uruguay	0.301	0.658
Japan	0.459	0.846	Uzbekistan	0.000	0.293
Jordan	0.457	0.559	Vanuatu	0.835	0.455
Kazakhstan	0.344	0.424	Venezuela	0.439	0.124
Kenya	0.232	0.258	Vietnam	0.707	0.435
Kiribati	0.652	0.429	Yemen	0.685	0.134
Kuwait	0.395	0.570	Zambia	0.211	0.309
Kyrgyz Republic	0.609	0.299	Zimbabwe	0.464	0.079

APPENDIX 2: Computed values of the V&R Matrix

NW Quadrant	EVI	MRI	NE Quadrant	EVI	MRI	SW Quadrant	EVI	MRI	SE Quadrant	EVI	MRI
Ranked in order of the EVI			Ranked in order of the EVI			Ranked in order of the MRI			Ranked in order of the MRI		
Dominica	0.995	0.610	Maldives	1.000	0.410	Finland	0.187	1.000	Tunisia	0.341	0.507
St. Lucia	0.961	0.615	Micronesia	0.847	0.421	Norway	0.204	0.992	Turkey	0.298	0.491
Samoa	0.929	0.629	Nicaragua	0.835	0.313	Sweden	0.237	0.988	North Macedonia	0.491	0.490
Seychelles	0.916	0.508	Vanuatu	0.835	0.455	Denmark	0.251	0.984	Sri Lanka	0.402	0.490
Antigua/Barbuda	0.897	0.634	Belize	0.826	0.362	Switzerland	0.421	0.962	Serbia	0.324	0.485
Grenada	0.886	0.545	Haiti	0.821	0.136	Netherlands	0.456	0.961	Panama	0.273	0.482
Singapore	0.873	0.928	Fiji	0.791	0.361	New Zealand	0.413	0.954	Bhutan	0.342	0.475
Luxembourg	0.864	0.934	Jamaica	0.772	0.445	Australia	0.303	0.949	Bosnia/Herzegovina	0.370	0.464
St. Kitts/Nevis	0.835	0.601	Guyana	0.759	0.360	United Kingdom	0.280	0.942	Colombia	0.328	0.463
Tonga	0.825	0.515	Honduras	0.758	0.256	Iceland	0.314	0.933	Brazil	0.184	0.442
Malta	0.797	0.816	Tajikistan	0.756	0.232	Germany	0.398	0.931	Argentina	0.278	0.432
St. Vincent/	0.792	0.597	Mongolia	0.751	0.420	Austria	0.295	0.926	South Africa	0.195	0.430
Bahamas	0.712	0.598	Solomon I.	0.724	0.326	Canada	0.226	0.925	Namibia	0.463	0.430
Mauritius	0.682	0.680	Lesotho	0.723	0.282	United States	0.052	0.877	Morocco	0.306	0.428
Cabo Verde	0.674	0.514	Vietnam	0.707	0.435	Belgium	0.496	0.865	Kazakhstan	0.344	0.424
Barbados	0.626	0.666	Cambodia	0.696	0.213	France	0.249	0.864	Suriname	0.263	0.420
Oman	0.613	0.608	Nepal	0.686	0.286	Japan	0.459	0.846	Mexico	0.496	0.409
Slovak Republic	0.598	0.651	Yemen	0.685	0.134	South Korea	0.482	0.817	Peru	0.358	0.400
Georgia	0.584	0.552	Mozambique	0.684	0.207	Spain	0.279	0.793	Ghana	0.283	0.395
Czech Republic	0.571	0.761	Algeria	0.658	0.367	Israel	0.290	0.781	Russia	0.264	0.382
Hungary	0.554	0.634	Kiribati	0.652	0.429	Cyprus	0.458	0.776	Rwanda	0.255	0.368
Montenegro	0.545	0.555	Bolivia	0.628	0.259	Estonia	0.354	0.774	Azerbaijan	0.490	0.368
Ireland	0.542	0.913	Eswatini	0.623	0.282	Chile	0.401	0.772	India	0.321	0.362
			Lebanon	0.622	0.355	Slovenia	0.432	0.767	Ukraine	0.439	0.360
			São Tomé/	0.619	0.289	Portugal	0.284	0.765	Dominican Rep.	0.483	0.358
			Kyrgyz Republic	0.609	0.299	Lithuania	0.424	0.699	Iran	0.459	0.356
			Moldova	0.593	0.429	Brunei/Darussalam	0.438	0.690	Egypt	0.221	0.355
			El Salvador	0.573	0.327	Latvia	0.279	0.687	Paraguay	0.427	0.352
			Ecuador	0.571	0.319	Qatar	0.366	0.681	Indonesia	0.304	0.344
			Thailand	0.569	0.495	Poland	0.352	0.670	Senegal	0.271	0.314
			Armenia	0.565	0.477	Italy	0.330	0.666	Zambia	0.211	0.309
			Djibouti	0.563	0.197	UAE	0.411	0.663	Gabon	0.397	0.303
			Comoros	0.555	0.188	Greece	0.418	0.659	Uganda	0.315	0.302
			Madagascar	0.546	0.212	Uruguay	0.301	0.658	Uzbekistan	0.000	0.293
			Malawi	0.545	0.296	Costa Rica	0.368	0.624	Bangladesh	0.484	0.285
			Philippines	0.531	0.368	Malaysia	0.446	0.616	Tanzania	0.290	0.276
			Trinidad/Tobago	0.522	0.475	Bahrain	0.427	0.592	Kenya	0.232	0.258
			Equatorial Guinea	0.519	0.135	Croatia	0.351	0.588	Gambia	0.318	0.256
			China	0.516	0.423	Kuwait	0.395	0.570	Burkina Faso	0.337	0.255
			Albania	0.513	0.445	Jordan	0.457	0.559	Laos	0.381	0.244
			Belarus	0.508	0.378	Saudi Arabia	0.394	0.557	Benin	0.272	0.243
			Mauritania	0.506	0.212	Romania	0.375	0.552	Ethiopia	0.381	0.242
						Bulgaria	0.357	0.540	Pakistan	0.454	0.239
						Botswana	0.345	0.519	Guatemala	0.432	0.239
									Papua New Guinea	0.464	0.224
									Mali	0.157	0.202
									Niger	0.311	0.199
									Ivory Coast	0.362	0.195
									Timor-Leste	0.417	0.194
									Togo	0.257	0.187
									Liberia	0.305	0.184
									Iraq	0.471	0.179
									Sierra Leone	0.332	0.176
									Myanmar	0.469	0.155
									Cameroon	0.098	0.151
									Congo Republic	0.437	0.145
									Nigeria	0.329	0.141
									Sudan	0.279	0.135
									Angola	0.445	0.132
									Venezuela	0.439	0.124
									Burundi	0.382	0.115
									Afghanistan	0.449	0.099
									Guinea	0.301	0.098
									Zimbabwe	0.464	0.079
									Guinea-Bissau	0.431	0.061
									Congo Dem. Rep.	0.132	0.056
									Chad	0.410	0.036
									Central African Rep.	0.306	0.000

APPENDIX 3: SOURCES OF THE DATA

The Vulnerability Index

Trade openness
The index, measured as the average of exports plus imports of good and services as percentage of GDP. The data were averaged over the years 2009-2019.
Source: The data were retrieved in July 2021 from the UNCTAD statistics database available at: https://unctadstat.unctad.org/wds/

Export concentration
The export concentration was measured as the sum of the three highest export categories in total exports of goods (sum of SITC 0+1+22+4 + SITC 2 + SITC 3 + SITC 5 + SITC 7) and services (sum of TRANSPORT+ TRAVEL + OTHER SERVICES). This sum was expressed as a ratio of total exports of goods and services. The data were averaged over the years 2009-2019.
Source: The data were retrieved in July 2021 from the UNCTAD statistics database available at: https://unctadstat.unctad.org/wds/ReportFolders/

Dependence on strategic imports
The dependence on strategic imports was measured by the ratio of the sum of the imports in all food items and fuels and the GDP. The data were averaged over the years 2009-2019.
Source: The data were retrieved in July 2021 from the UNCTAD statistics database available at: https://unctadstat.unctad.org/wds/ReportFolders/

Disaster Proneness
The index was measured in terms of total disaster damage in thousands of US dollars over the GDP for a period of four decades (1980-2019) given that proneness implies a relatively long period of time and that disasters do not necessarily occur every year.
Source: The data were retrieved in July 2021 from the EM-DAT, the International Disaster Database available at: https://public.emdat.be/data

The Resilience Index

Economic governance
This component of the MRI consists two variables, equally weighted, which are (a) macroeconomic stability and (b) market flexibility.

(a) Macroeconomic stability was itself composed of two indices, again equally weighted, which are: (i) "General Government Gross Debt"measured as percentage of GDP and averaged from 2009 to 2019 and (ii) "Current Account Balance of the Balance of Payments",measured as percentage of GDP and averaged from 2009 to 2019 (except for Uruguay with data averaged from 2012 to 2019 and for Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Vincent and the Grenadines with data averaged from 2014 to 2019, due to lack of data. The data for both variables were retrieved in July 2021 from IMF World Economic Outlook database available at: https://www.imf.org/en/Publications/WEO/weo-database/2021 .

(b) Market Flexibility

The data for this component of the MRI consisted of a sub-component of the Index of Economic Freedom titled "Business Freedom", averaged from 2009 to 2019 (except for Afghanistan, Iran and Sudan with data were averaged from 2013 to 2019 and Brunei Darussalam, with data averaged from 2014 to 2019). There was missing data for Antigua and Barbuda, Grenada, and St. Kitts and Nevis. This was proxied using data from the World Bank's "Ease of Doing Business Index" (DBI), suitably adjusted to align it with the Index of Economic Freedom list. The data were retrieved in July 2021 from the Index of Economic Freedom available at: https://www.heritage.org/index/explore .The data from the World Bank's Ease of Doing Business Index was retrieved from https://www.doingbusiness.org/en/data .

Political Governance
The "Rule of law" index was utilised for this purpose, averaged from 2009 to 2019.
The data were retrieved in July 2021 from Worldwide Governance Indicators (World Bank) available at: https://info.worldbank.org/governance/wgi/ .

Social Governance
The data for this component were sourced from the (a) Education and (b) Health components of the Human Development Index equally weighted, averaged from 2009 to 2019. The education component consisted of (i) "Expected years of schooling" index and (ii) "Mean years of schooling" index, equally weighted, while the health indicator was measured in terms of "Life expectancy at birth".
The data were retrieved in July 2021, from the Human Development Report, available at: http://hdr.undp.org/en/indicators/ .

Environmental Governance
This was proxied by two indicators relating to (a) "unsafe drinking water" and (b)
 "unsafe sanitation" equally weighted. The data were averaged from 2009 to 2019.
The data were retrieved in July 2021, from the Environmental Performance Index, available at: http://hdr.undp.org/en/indicators/