4. Economic Vulnerability and Resilience: Concepts and Measurements

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1. Background

Chapter 17 of Agenda 21, emanating from the 1992 UN Conference on Environment and Development, asserts that small island developing states are a special case for both environment and development, and that they face special challenges in planning and implementing sustainable development. The Programme of Action for the Sustainable Development of Small Island Developing States (SIDS Programme of Action), approved during the 1994 UN Global Conference held in Barbados, identified the priority areas for action to address the special challenges faced by SIDS. During the Barbados Global Conference and in many subsequent international fora on the sustainable development of SIDS, it was established that small island developing states merit special consideration in view of a number of factors, including economic vulnerability.

The Barbados Programme of Actions (BPoA) for the sustainable development of SIDS was endorsed by the General Assembly in 1994 in its resolution 49/122 of 19 December 1994, with Paragraphs 113 and 114 calling for the development of a vulnerability index (indices) for small island developing States (SIDS) as follows:

'Small island developing States, in cooperation with national, regional and international organizations and research centres, should continue work on the development of vulnerability indices and other indicators that reflect the status of small island developing States and integrate ecological fragility and economic vulnerability. Consideration should be given to how such an index, as well as relevant studies undertaken on small island developing States by other international institutions, might be used in addition to other statistical measures as quantitative indicators of fragility.'

In 1996 the Commission on Sustainable Development called on 'the relevant bodies of the United Nations system to accord priority to the development of the index'. Subsequently the Department of Economic and Social Affairs 1997, engaged two consultants, Professor Lino Briguglio of the University of Malta and Dr Dennis Pantin of

the University of the West Indies, one to develop an economic vulnerability index, and the other to develop an ecological vulnerability index. The Department also convened an ad hoc expert group to review the technical work of the consultants and to make appropriate recommendations. The meeting, held at UN headquarters in December 1997, concluded that 'Judging from the results of a number of studies using a diversity of approaches, in particular, two reports of the Commonwealth Secretariat, the report of UNCTAD and the reports of consultants that were submitted to the meeting, the group concluded that .... as a group small island developing States are more vulnerable than other groups of developing countries.' (A/53/65 - E/1998/5) (see www.un.org/documents/ecosoc/docs/1998/e1998-5.htm).

One outcome of this meeting was the development of the economic vulnerability index by the Committee for Development Policy (of the UN ECOSOC), which it uses as one of the criteria to identify the least-developed countries and to decide which countries are to be graduated from the list of LDCs (UN CDP, 2005; Encontre, 2004).

Other international fora, including the 1999 UN General Assembly special session and the International Meeting on the 10-year review of the BPoA held in Mauritius in January 2005,[1] as well as various meetings of experts convened by the Commonwealth Secretariat between 1996 and 2000, gave prominence to the economic vulnerability of SIDS.

At the Commonwealth Heads of Government Meeting (CHOGM) held in Malta 25-27 November, 2005, the issue of economic vulnerability was again on the agenda, and member states issued a statement titled the 'Gozo Statement on Vulnerable Small States' which highlighted the high degree of economic vulnerability of these states.[2]

Original studies and recent updates of the economic vulnerability index carried out by the University of Malta (Briguglio 1992, 1993, 1995, 1997), Briguglio and Galea (2003) and Farrugia (2004) again confirm this tendency.

More recent meetings organised by the Commonwealth Secretariat and the University of Malta, in March 2004, March 2005 and April 2006, led to the construction of a resilience index, which when juxtaposed against the vulnerability index assessed the risk of being harmed by external shocks (see http://events.um.edu.mt/resilience2007).

2. What makes countries economically vulnerable?

Economic vulnerability stems from a number of **inherent** and **permanent**[3] economic features, including:

- a high degree of economic openness, rendering these states particularly susceptible to economic conditions in the rest of the world;
- dependence on a narrow range of exports, giving rise to risks associated with lack of diversification;

- dependence on strategic imports, in particular energy and industrial supplies, exacerbated by limited import substitution possibilities; and
- insularity, peripherality and remoteness, leading to high transport costs and marginalisation from the main commercial centres.

SIDS tend to be particularly vulnerable because of their small size and insularity. Small size forces SIDS to resort to international trade more than other group of countries. They need to find export markets due to their small domestic market, and they need to import heavily, due to their lack of natural resources. At the same size, the small size of their market limits the possibilities for diversification.

Small size leads to additional constraints, since it limits SIDS's ability to reap the benefits of economies of scale, leads to high infrastructural, administrative and other overhead costs, and poses additional constraints, such as limited attraction for foreign direct investment (FDI).

Small size also leads to the prevalence of natural monopolies and oligoplistic structures, leading to high consumer costs. Transforming a government monopoly into a private business may even make matters worse, due to fact that a private monopoly is often less accountable to consumers than the public sector.

3. The Economic Vulnerability Index

3.1 The University of Malta and Commonwealth Secretariat Indices

The economic vulnerability indices as developed by Briguglio, the Commonwealth Secretariat and Crowards, generally include a relatively small number of variables, often limited to three to five. One reason for this is that many economic variables are correlated, and one variable can be used to represent others.

The most frequent variables used as components of economic vulnerability indices relate to:

- economic openness;
- export concentration;
- dependence on strategic imports, such as fuel and food; and
- peripherality.

3.1.1 Economic openness

Economic openness captures the degree to which a state is susceptible to economic conditions in the rest of the world. It is often measured by expressing exports or imports, or an average of both, as a percentage of GDP.[4]

Dependence on a narrow range of exports

The range of exports captures the extent to which a country lacks export diversification, a condition that exacerbates the degree of economic openness. This is usually measured by the export concentration index devised by UNCTAD, which only covers merchandise. Briguglio (1997) argued that export concentration can also be observed in the trade in services, especially in tourism and financial services, and he devised a concentration index with services and exports included.

Peripherality

Peripherality is associated with insularity and remoteness, leading to high transport costs and marginalisation. The problem with remoteness and insularity is that these variables cannot be measured directly by taking the number of kilometres from a main commercial centre, the nearest island or the nearest continent. In the case of certain islands, a relatively large proportion of international trade is directed to and from their ex-colonising powers, even though other centres of commercial activity could be more proximate. In other words, measuring remoteness by taking distance in kilometres may convey the wrong sort of information regarding insularity and remoteness, for economic purposes. Two variables which may reflect the effects of remoteness are (a) the ratio of FOB/CIF factors and (b) the ratio of transport and freight costs to imports. The second has been considered to be more meaningful in studies that utilise the 'peripherality' variable.

Dependence on strategic imports

This variable is intended to measure the extent to which a country's livelihood depends on imports. There are obvious vulnerability connotations, when a country depends heavily on imported energy and industrial supplies for production and on imported food for consumption. Various indices have been used for this purpose. Briguglio (1997) and Atkins et al (2001) suggested that this variable can be measured as average imports of commercial energy as a percentage of domestic energy production.

These variables are suitably standardised, and combined together in a composite index. In some studies, the summing procedure involved weighting.[5]

A recent study conducted by Briguglio and Galea (2003) updated the vulnerability index using these variables and reconfirmed that SIDS tend to:

- be more exposed to international trade;
- have higher concentration indices;
- be more dependent on strategic imports; and
- have higher transport costs than other groups of countries.

As a result SIDS tends to have higher economic vulnerability scores.

3.2 The CDP Vulnerability Index

An alternative formulation of the vulnerability index is that proposed by the by the Committee for Development Policy (CDP) of the UN ECOSOC. According to the CDP, the Economic Vulnerability Index developed by the Committee reflects the risk posed to a country's development by exogenous shocks, the impact of which depends on the magnitude of the shocks, and on structural characteristics that determine the extent to which the country would be affected by such shocks.

Originally, the variables used in the CDP index were (1) population size; (2) share of manufacturing and modern services in GDP; (3) merchandise export concentration; (4) instability of agricultural production; and (5) instability of exports of goods and services. A number of modifications were proposed by the Committee at its seventh session (UN CDP, 2005), and the index now consists of seven indicators, namely: (1) population size; (2) remoteness; (3) merchandise export concentration; (4) share of agriculture, forestry and fisheries in gross domestic product; (5) homelessness owing to natural disasters; (6) instability of agricultural production; and (7) instability of exports of goods and services.

The CDP uses this index as one of the criteria for the identification of least-developed countries (LDCs) and for deciding which countries are to be graduated from the list of LDCs. The CDP Vulnerability Index assigns importance to instability, which implies that countries with relatively unstable export growth or agriculture production will register higher vulnerability scores. The variables 'share of agriculture, forestry and fisheries' and 'merchandise export concentration' are intended to capture the extent to which a country is structurally exposed to shocks. The index is also assumed to capture the structural handicaps that explain the high exposure of the economy, namely economic smallness, (measured with a population variable[6]) and remoteness.

4. Vulnerability and resilience

Resilience can be defined in many ways, but here it is defined as the ability to recover from or adjust to change. This definition is associated with the coping ability of an economically vulnerable country.

Resilience may be inherent or nurtured. The inherent aspect of resilience may be considered as the **obverse of vulnerability**, in the sense that inherently resilient countries should register low vulnerability scores.

Nurtured resilience is that which is developed and managed, often as a result of some deliberate policy. In this sense, a country can adopt policies which enable it to withstand its inherent vulnerability, thereby nurturing its resilience. This is of course what is meant by resilience building. On the other hand, a country can adopt polices which exacerbate its inherent vulnerability.

	Countries that adopt policies to withstand vulnerability	*Countries that adopt polices that exacerbate vulnerability*
Inherently vulnerable countries	The 'self-made' scenario	Worst-case scenario
Inherently resilient countries	Best-case scenario	The 'prodigal son' scenario

Four possible scenarios

We can therefore consider four possible country scenarios with regard to vulnerability and resilience as follows:

This method of defining vulnerability in terms of inherent features and resilience in terms of policy measures has a number of advantages, including:

(a) The vulnerability measurement would refer to features on which a state has little or no control and therefore cannot be attributed to bad governance. In other words, a country with a high inherent vulnerability score cannot be described as having self-inflicted vulnerability.

(b) The resilience component would refer to what a country can do in perms of policy. In this regard, the international donor community can be a source of support to enable vulnerable countries to build up their resilience.

Usefulness of considering resilience building

The issue of resilience building in small states is important because it carries the message that these states should not be complacent regarding their development possibilities, even if inherently economically vulnerable. In other words, they should adopt measures to build economic, environmental and social resilience (see Briguglio et al., 2006).

In addition, the discussion on resilience sheds light on why a number of vulnerable small states have managed to do well economically in spite of (and not because of) their inherent economic vulnerability. Briguglio (2002) has referred to this reality as the 'Singapore Paradox'.[7]

5. Measuring resilience

Briguglio et at (2006) have constructed a resilience index, to complement the vulnerability index, and to assess the degree to which economically vulnerable countries,

individually or as a group, are moving ahead or otherwise, in coping with or withstanding economic vulnerability.

The variables selected for this purpose were:

(a) good governance, which consisted of five components, namely (i) judicial independence; (ii) impartiality of courts; (iii) the protection of intellectual property rights; (iv) military interference in the rule of law; and (v) political system and the integrity of the legal system; the data was derived from: Gwartney and Lawson, 2005);

(b) macroeconomic stability which was measured by made up of the simple average of the following three variables: (i) the fiscal deficit to GDP ratio; (ii) the sum of the unemployment and inflation rates; and (iii) the external debt to GDP ratio; the major data sources was the International Monetary Fund;

(c) market reform which was derived from the Economic Freedom of the World and is intended to measure the extent to which regulatory restraints and bureaucratic procedures limit competition and the operation of financial, labour and product markets; daa was derived from the Gwartney Lawson (2005).

(d) social development which was measured by the education and health indices of the Human Development Index for the years 2000 to 2002 (UNDP, 2002; 2003; 2004).

6. Concluding considerations

A number of considerations emerge from this write-up:

(a) The Economic Vulnerability Indices produced so far indicate clearly that small states, particularly SIDS, tend to be more economically vulnerable than other groups of countries.

(b) Many small states have managed to register high GDP scores in the past in spite of their inherent economic vulnerability. This suggests that these states have adopted policies to withstand or cope with their vulnerability.

(c) SIDS with a relatively low GDP per capita are vulnerable and poor, and therefore merit special attention and support by the donor community, to enable them to strengthen their resilience

(d) Building economic resilience to cope with and withstand economic vulnerability should take centre stage in the sustainable development strategy of such states. The international donor community should assist small states that do not have the resources or the capacity to strengthen their resilience

(e) It would be useful to construct a resilience index, to complement the vulnerability index, and to assess the degree to which economically vulnerable countries, individually or as a group, are moving ahead or otherwise, in coping with or withstanding economic vulnerability.

Notes

1. There were three regional meetings in the run-up to the Mauritius meeting, respectively held in Samoa (October 2003) for the Pacific region, Cape Verde (September 2004) for the AIMS region, and Trinidad and Tobago (October 2003) for the Caribbean region. The interregional meeting was held at The Bahamas in January 2004. In all these meetings, the vulnerability of SIDS was extensively discussed.
2. The document is available at: www.thecommonwealth.org/document/147536/gozo_statement_on_vulnerable_small_states.htm
3. There are human-induced measures (possibly as a result of bad policies or lack of awareness) which exacerbate the inherent vulnerability of SIDS. In this paper these are considered to be man-made actions leading to the weakening of resilience against vulnerability.
4. During the December 1997 UN meeting on the Vulnerability Index, it was argued that this variable should not form part of the vulnerability index because high dependence on foreign trade is not a disadvantage but a strength of SIDS. As a result, the Committee for Development Policy (UN ECOSOC) excluded this variable from its Vulnerability Index.
5. The Commonwealth Vulnerability index uses Least Squares Method to derive the weights. Briguglio and Crowards use equal weights, although they have also experimented with variable weights.
6. The population size indicator is very problematic, if the index is to be used in the context of SIDS, since it will bias the index in favour of small states, thereby begging the question. It would therefore not be proper to use this sub-index to show that small states are more vulnerable than larger ones.
7. It is sometimes argued that many small states have managed to register high GDP scores in the past, partly as a result of the preferential trade arrangements that they enjoyed, and the incentive package they were allowed to put in place to attract FDI. However, the success of the likes of Singapore, Cyprus, Malta, Barbados and other small states cannot be attributed simply to trade preferences.
8. This could happen if, for example, two or more variables reflect the same underlying changes, in which case they would be measuring the same thing and, if included in a composite index, would implicitly increase the weight of that underlying change.

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