
ON THE ECONOMIC VULNERABILITY OF LOW-INCOME COUNTRIES¹

Patrick Guillaumont

Abstract. This chapter examines the relevance of the economic vulnerability concept for low-income countries (LICs), a topic which has recently been given considerable importance by several international bodies. Reference is also made to the vulnerability of small island developing states. Conceptual aspects of vulnerability are first discussed. It is argued that an indicator of structural economic vulnerability across LICs can be constructed with three main components namely (1) natural shocks proxied by instability in agricultural production (2) trade shocks, proxied by instability of real exports and (3) structural exposure to these shocks, proxied by the size of the population. Other possible components are also examined. Special reference is made to the economic vulnerability index, constructed by the UN Committee for Development Policy (CDP-EVI). The chapter argues that structural vulnerability is a matter of concern for growth, factor productivity and co-operation policies.

1. Recent Interest in Economic Vulnerability

The economic vulnerability of developing countries is not really a new concept, but it has recently been given considerable attention, mainly because of the interest of several international organisations. There are two important and, to some extent interrelated, concerns, in this regard, namely (1) the concern of the UN to consider vulnerability in the process of identification of the LDCs and (2) the concern of the small island developing states (SIDS) to be recognised as more vulnerable than other groups of countries.

The UN concern was first expressed in connection with the revision of the LDCs' identification criteria in 1991, and this led eventually to the adoption of an economic vulnerability index as a criterion for identification in 1999-2000.

¹ For a preliminary and longer version of this paper see Guillaumont (2000). See also Guillaumont (2001).

On the Economic Vulnerability of Low-Income Countries

SIDS expressed their concern about their vulnerability during the preparations for and at the 1994 Barbados Conference on Sustainable Development of Small Island Developing States. The Programme of Action which was endorsed at this conference called for “the development of vulnerability indices and other indicators that reflect the status of small island developing countries and integrate ecological fragility and economic vulnerability” (United Nations, 1994: para 113).

Vulnerability has also been an issue with regard to commodity-dependent countries. An international task force has been requested, following an initiative of the World Bank to make proposals as to how such countries can manage the risks they face in a market-based approach. Such proposals were directly intended to enable these countries to cope with their vulnerability and so involved an assessment of their vulnerability (World Bank, 1999).

In addition, the vulnerability issue has been connected with the “Asian crisis”, as a result of which it became clear that not only small island developing states, LDCs, and/or commodity dependent economies might be economically vulnerable. Many comments and analyses of the causes of this crisis have dealt with the vulnerability of some emerging countries, which before the crisis registered a high level of capital inflows, albeit within a weak financial structure.

Thus the concept of vulnerability can be considered relevant in various contexts. There is therefore the need for a clearly defined concept of economic vulnerability that could be measurable according to largely acceptable methods. However the measures need to be adapted to the purpose for which the index is intended to be used. This chapter focuses on low-income countries LICs, but it also refers to LDCs, the commodity dependent economies and small island states. After an examination of the concepts, this chapter briefly considers the impact of vulnerability on growth.

The CDP and the Economic Vulnerability Index

Some background information about the work of the Committee for Development Policy is in order here. In November 1996, the UN General Assembly, at its 51st Session, requested the Secretary General to prepare a report on the Vulnerability Index, and the Committee for Development Planning (old CDP) was asked to examine this index. In accordance with its own suggestion, the Committee considered the index for the purpose of classifying countries as LDCs.

Conceptual and Methodological Issues

In its 52nd Session (December 1997), the UN General Assembly requested the Committee for Development Policy (the name of the Committee was changed in 1999) to consider “the usefulness of the vulnerability index as a criterion for the designation of the Least Developed Countries”.

In May 1998, the CDP postponed its conclusions, pending the results of additional work on the Vulnerability Index, and in July 1998 the ECOSOC of the UN again urged the CDP to assess the usefulness of a Vulnerability Index as a criterion for the designation of LDCs, and to consider the work of all the other international agencies on the vulnerability of small states. This was done by the CDP in April 1999 (United Nations, 1999) and the Economic Vulnerability Index was proposed as one of the criteria to be used for the identification of LDCs, instead of the former Economic Diversification Index. The other two criteria were the level of GDP per capita (replaced in 2003 by GNI per capita) and the Augmented Physical Quality of Life Index (APQLI), an indicator of human resources, renamed the Human Assets Index (HAI) in 2003.

The ECOSOC requested some diagnostic testing of this new indicator before applying the new criteria to the 2000 triennial review of the list of LDCs. The CDP, in its 2000 report, relying on the work done by an expert group, confirmed its proposal that the EVI should be one of the criteria for LDCs’ identification. The new criteria were endorsed by ECOSOC in July 2000, and again applied (with a reviewed EVI) in the 2003 triennial review of the list of LDCs (United Nations, 2003).

The components of the EVI used by the CDP (CDP-EVI) are the following:

- instability of agricultural production;
- instability of exports of goods and services;
- log of population size;
- concentration of exports of goods;
- share of manufacturing and modern services in GDP.

In 2003 a sixth component was added to the EVI, namely the percentage of population displaced due to natural disasters. This last component added another dimension to the natural shocks factor.

The first two indices reflect natural shocks and trade shocks respectively. The population variable reflects exposure to shocks. The last two components are drawn from the Economic Diversification Index which was previously used by the CDP for

LDC identification, and have been retained for the sake of continuity between the EDI and the EVI, but are likely to disappear in the future. Guillaumont (2003-2004) proposed to replace these two indices by two other indicators of exposure, namely remoteness from the main world markets and the share of agriculture, forestry and fisheries in GDP.

2. Economic Vulnerability: Concept and Measurement

Definition of Vulnerability

Vulnerability refers to the risk of being harmed or wounded, or negatively affected by unforeseen events. In economic terms, these unforeseen events are often called “shocks”. Economic vulnerability is susceptibility to shocks of various kinds.

Static and dynamic notions of vulnerability. If vulnerability relates to the risk of being harmed by shocks, the first question to ask is how can harm be measured. Shocks could result in immediate loss of welfare. When successive and opposite shocks of equal size occur, the loss associated with the instability of income is due to the decreasing marginal utility of income. Shocks could also have dynamic negative effects on growth and development. In this case, it can be said that vulnerability is the risk of economic growth to be markedly and/or durably negatively affected by shocks. Indeed most of the international debate on vulnerability, notably the consideration of vulnerability as a major handicap to growth in the search of criteria for LDCs’ identification, is implicitly based on this dynamic meaning. Another dynamic definition, somewhat broader, is related to the likelihood of negative effects of shocks on poverty reduction.

Main kinds of shocks. Shocks can be classified into three categories, namely:

- a. environmental or “natural” shocks, such as natural disasters including earthquakes, volcanic eruptions, typhoons and hurricanes, and droughts;
- b. shocks related to trade² such as slumps in external demand, world commodity prices instability (and the correlated instability of terms of trade), and international fluctuations of interest rates;
- c. domestic shocks, notably those generated by political instability, or more generally by unforeseen political changes.

²Low-income countries are generally “price takers” so that the instability of prices for the commodities they export can be assumed to be exogenous.

The first two shocks are to a large extent structural and exogenous, while the third is more policy induced.

Economic vulnerability and ecological fragility. Initially, the concern of the UN related to both economic vulnerability and ecological fragility in an integrated way. But it rapidly became clear that the two notions should be analysed separately. For instance, losses in biodiversity, which reflect ecological fragility are not necessarily major elements of economic vulnerability. This difference was clearly recognised by the *ad hoc* expert group on vulnerability, which was set up by the UN in 1977. But this group also considered that economic vulnerability could be induced by natural factors, such as the relative susceptibility of economies to damage caused by natural disasters. So the environmentally induced economic vulnerability can be considered in the context of economic vulnerability as well as in the context of ecological vulnerability.

Economic vulnerability and economic handicaps. Many developing countries suffer from structural handicaps, not all of which can be considered as vulnerability factors. Remoteness from large markets, landlockedness and the consequent high transportation costs as well as a low level of human capital may indeed be serious structural handicaps to growth. But they need not be elements of vulnerability as such. They are not unforeseen events and cannot be considered as shocks per se. To be justifiably considered as vulnerability features, structural economic conditions, such as distance from markets, should have a bearing on shocks. On this basis “remoteness” is now considered by the CDP as a possible component of its EVI. As noted by Encontre (1999), who makes a clear distinction between shocks and handicaps, remoteness may delay the arrival of basic goods when needed and this increases vulnerability. Several authors have included a measure of remoteness or “peripherality” as a component of their vulnerability index (see for instance Briguglio, 1995; Crowards, 1999).

On being an island. The discussion on the concept of vulnerability has to a large extent been small-island-state driven, as evident in many UN resolutions and several works in this context. Of course, if one is to make comparisons between small island developing states and other groups of countries³, the concept has to be applicable to other states as well. But the index also needs to capture the specific aspects of islands’ vulnerability, such as climatic instability and remoteness. As noted above, smallness and climatic shocks are already captured in the

³ Studies focusing on the vulnerability of small states include Briguglio (1995; 1997), Crowards (1999), Atkins et al. (1998, 2000), and Easter (1999).

On the Economic Vulnerability of Low-Income Countries

CDP-EVI and a “remoteness index” is being considered by the CDP as a possible component.

Three Vulnerability Components: Shocks, Exposure, Resilience

The risk of a country to be harmed by unforeseen events (shocks) can be broken down in three components, namely:

1. the size and likelihood of the shocks;
2. the exposure to the shocks; and
3. the country’s capacity to absorb the shocks, or its “resilience”.

A similar decomposition of risk was used by Guillaumont (1985) to analyse expansion or recession transmission from one economic area to another one. It has initially been used to explain the transmission of US recessions to European countries during the post-war period, as a result of three factors, namely sensitivity, dependence and receptivity (Guillaumont, 1961).

The concept of resilience is largely used in works more specifically oriented towards the environmental or natural sources of vulnerability (see Kaly et al., 2003). A similar approach has also been used in social conflict. For example Rodrik (1999) considered separately the severity of the external shocks, the depth of latent social conflict (which is likely to increase the impact of the shocks), and the quality of conflict management institutions.

It is useful to distinguish between structural vulnerability, which is mainly related to exposure to shocks and the size of the shocks, and resilience which is more policy dependent. In this regard, Briguglio (2004) distinguishes between “inherent” and “nurtured” vulnerability. The EVI of the CDP has been designed as an index of structural vulnerability and as such does not capture resilience.

Measurement of Shocks

When analysing the vulnerability of LICs, one needs to derive indicators of structural economic vulnerability, based on the identification of shocks likely to affect such countries.

Natural shocks. Climatic and natural shocks are a main source of vulnerability in many developing countries. An indicator of the risk of natural catastrophes could be based on the frequency of such events, measured over a sufficiently long period of time. An alternative indicator would be the average proportion of the population affected by these events. Such indicators or similar ones have been used by

some authors as a component of a vulnerability index (for instance Atkins et al. 1998). Unfortunately these data are not available for all countries and do not cover a long enough period of time, so that, statistically speaking, such indicators pose a serious problem.⁴ Moreover the potential negative impact of these very different events may differ from one event to another, and even within one kind of event. Weighting by the number of people affected—if this is known—does not solve the problem, since people are also not evenly affected. Measuring the economic losses resulting from these events in a country concerned would give a good indicator of the damage, but this seems to be a very difficult task.⁵

For these reasons it is useful to obtain a proxy of natural shocks. The EVI proposed by the CDP in 1999 contains such a proxy in the form of an index measuring the instability of agricultural production with regard to its trend. The trend of agricultural production may be assumed to mainly depend on the economic policy pursued and on permanent factors, whereas the fluctuations around the trend may be assumed to reflect the occurrence and severity of natural shocks, which are likely to affect agricultural production.⁶ This proxy variable was retained in 2000 and 2003 by the CDP as a component of a revised EVI (United Nations, 1999, 2000, 2003). In 2003 however the CDP added another component indicator drawn from the database on natural disaster, namely the percentage of population displaced (“homeless” index).

Trade shocks. Another main source of vulnerability relates to foreign trade, even if trade openness is in itself a factor promoting development. The EVI proposed by the CDP contains a component measuring this aspect of vulnerability, assuming that it is manifested by the instability of real export proceeds with regard to a long term trend. Exports of goods as well as services have to be considered, because shocks can affect both. Proceeds from exports of services often constitute a very high proportion of foreign exchange inflows of small countries.

⁴ Recurrent droughts in the Sahelian countries are an important source of negative shocks, but most often not registered as “disasters”. For instance, Senegal, a new country proposed for the inclusion on the list of LDCs, does not appear prone to disaster in the Emergency Events Database, but has a high agricultural production instability, due to recurrent droughts.

⁵ The United Nations Disaster Relief Organisation (UNDRO) attempted to do this, (UNDRO, 1990), by developing a database which was used by Briguglio (1995).

⁶ This indicator was used by the present author in several previous works (see for instance Guillaumont and Guillaumont, 1988; Guillaumont et al. 1988, Guillaumont et al., 1999).

On the Economic Vulnerability of Low-Income Countries

If one assumes that LICs are price takers, such instability can be considered structural, in that it results from exogenous events, namely fluctuations in world prices, in external demand and in domestic events not related to domestic policy. Of course, some fluctuations of the export volume with regard to its trend may be due to the instability of domestic policy itself, but it can be assumed that the effect of policy on export volume is captured more by the trend than in fluctuations.

Other possible shocks. Other kinds of external shocks may occur, such as those related to short-term capital flows, as often experienced by Asian and Latin American countries. However, with regard to LICs, and more specifically commodity dependent economies, trade shocks are probably much more relevant, given that they are basically structural factors, and not as much policy induced as the fluctuations in short-term capital flows.

Measurement of Instability

The use of instability indices as components of a vulnerability index raises measurement problems, which are briefly discussed below. Instability is always relative to a reference or trend value. Fluctuations are often measured by the average absolute deviation from a trend, or by the variance of this deviation. One may however encounter problems when deriving the trend, mostly associated with the specification of the underlying statistical model and with regard to the choice of the reference period.

For instance, in the literature on export instability, a trend is generally obtained by expressing exports as a function of time, suitably adjusted depending on whether the model is linear or exponential. But if the series is non-stationary, the trend would not correspond to this assumed simple functional form, as it may be influenced permanently by shocks affecting the series, which may lead to a purely stochastic series or to a random-walk process. It is possible to estimate a “mixed” function, combining a deterministic element and a stochastic element. The variance of the residual can then be taken as a measure of instability. This approach has been adopted by the CDP in its EVI.

Indicators of Exposure

In a composite indicator of economic vulnerability, the exposure to shocks can be taken into account through one or more component indicators. One possible indicator is the size of the population. The choice of such an indicator can be justified on the grounds that, *ceteris paribus*, the smaller the country the more vulnerable it is. The CDP

includes the log of the size of the population as one of the components of its economic vulnerability index.

It can be argued that the population size is a better indicator of structural exposure to trade shocks than the export to GDP ratio, since the latter depends not only on structural factors such as the population size, but also on policy factors.⁷ In fact the exports to GDP ratio can be broken down into two components: a structural component and a policy component, the latter being considered as an indicator of outward looking policy (Guillaumont and Guillaumont, 1988; Guillaumont, 1989; 1994). Of course the population index would not be an adequate component of an EVI designed to prove that smaller countries are more vulnerable. But population size becomes an appropriate and major component of an EVI designed, for instance, to identify LDCs, as is the case of the CDP-EVI.

Weighting the Components for a Composite Index

If the component indicators of vulnerability are to be aggregated to construct an EVI composite index, some system of weights has to be used.

Equal weights. The simplest way to aggregate the components of an index is by computing a simple (unweighted) average, after suitably standardising each component of the index. The EVI used by the CDP for the last two triennial reviews of the list of LDCs (United Nations, 2000; 2003) is an unweighted average of its component indices.

Revealed weights. In a recent work, Guillaumont and Chauvet (2001) used a set of component indicators to build a composite indicator of vulnerability, with the weights drawn from an econometric exercise so that they reflect the estimated impact on economic growth of the different component indicators. The exercise was based on the assumption that vulnerability is a handicap to growth. The components which were retained after diagnostic tests were the instability of exports of goods and services and of agricultural production, population size and the trend in the terms of trade. These four factors appear to be statistically significant in the estimated equation, which utilised pooled data relating to two eleven-year periods and covering 95 observations. The coefficients on the components were taken as the revealed weights. The result can be

⁷ The export to GDP ratio has however been used in several studies on economic vulnerability (see for instance Briguglio, 1995, 1997; Crowards, 1999; Atkins et al., 1998; Easter, 1999).

interpreted as the *ceteris paribus* impact of the exogenous shocks and exposure to such shocks on economic growth.

Another example of weights derived from an econometric model is the Commonwealth Secretariat Vulnerability Index (several versions have been presented including Atkins et al., 1998; Easter, 1999). The instability of the rate of growth is considered as a dependent variable, with three explanatory variables, namely (a) an index of natural disasters, (b) the so-called UNCTAD index of export diversification and (c) the ratio of exports of goods and services to GDP. One main problem with this index is that it measures vulnerability with regard to growth volatility, which is less relevant than GDP growth itself.⁸ Moreover the last of the three factors (export to GDP ratio) is, as already explained, partly policy-induced, and as such inappropriate to measure structural vulnerability.

3. The Impact of Vulnerability on Growth

In this chapter, vulnerability is assumed to negatively affect economic growth. It is therefore useful to clarify the ways in which it is expected to do so. Relying on some of our previous works, we here present some propositions which are likely to shed light on the link between vulnerability and growth.

Instabilities and Growth

Let us first consider the effect of exogenous instabilities on GDP growth. The effects of export instability on the growth of developing countries have often been discussed in the literature. The results derived from regression analysis are mixed, possibly partly due to methodological shortcomings but there is an emerging consensus that export instability, or more generally output volatility has a significant negative effect on growth (see for instance, Dawe, 1996; Guillaumont, 1994; Ramey and Ramey, 1995; Combes and Guillaumont, 2002).⁹

⁸ The choice of GDP growth volatility may also be criticised because it depends on policy measures. Combes et al. (2000) have shown that trade openness has varying impacts on GDP volatility, depending on whether it is the effect of structural factors as against the effect of an outward looking policy orientation. They concluded that structural vulnerability leads to more unstable growth, whereas outward looking policy renders it more stable.

⁹ See reviews in Araujo et al. (1999) or CERDI (1997). Reviewed cross-sectional studies include Glezakos (1984), Moran (1983), Guillaumont (1987), Gyimah-Brempong (1991), Fosu (1992), Guillaumont (1994) and Dawe (1996). An important work relying on case by case studies can be found in Collier and Gunning (1997).

Primary and intermediate instabilities. Guillaumont et al. (1999) attempted to estimate the influence of several kinds of so-called “primary” instabilities¹⁰ on the rate of growth of GDP and concluded that these instabilities may have been a major factor of the slow rate of growth in sub-Saharan Africa during the seventies and eighties. These instabilities appear to have been significantly higher in Africa, South of the Sahara, than in other developing countries.

The same authors also tested the hypothesis that the primary instabilities (terms of trade, agricultural production and political instability) influence growth through two important intermediate instabilities, namely those (a) related to the rate of investment and (b) those related to relative prices.

The instability of the rate of investment, curiously not given adequate importance in the literature, is possibly a factor leading to lower average productivity. As a result of the decreasing marginal productivity of investment, the gain in total output due to an increase in the level of investment is less than the loss due to an equivalent decrease. This effect is particularly manifested in public sector investment.

The instability of relative prices, which may be proxied by the instability in the real effective exchange rate (REER) also appears to have a strong negative effect on the rate of growth. The effect can occur through the blurring of market signals, leading to misallocation of investment. This negative effect of REER volatility has also been discussed in several recent papers (see for instance Aizenman and Marion, 1999; Ghura and Grennes, 1993). REER volatility appears to have not only a negative effect on the total factor productivity, but also a similar effect on the rate of investment (Guillaumont et al., 1999).

Instability of agriculture producer prices. Producer prices can be affected by macroeconomic policies through REER instability or through the effect of fluctuations in world agricultural prices. Instability in real producer prices may be considered as a factor leading to the lowering of agricultural output, noticeably by its negative effects on the adoption of new techniques (Newbery and Stiglitz, 1981). This effect has been analysed in time-series studies related to specific products and countries (see Behrman, 1968; Just, 1974; Lin, 1977; Guillaumont and Bonjean, 1991; Araujo, 1995).

¹⁰ The primary instabilities were terms of trade instability (weighted by the average export to GDP ratio), real value of exports instability (weighted in the same way), agricultural value added instability (weighted by the average share of agricultural value added in GDP) and political instability (an index reflecting the frequency of political troubles).

On the Economic Vulnerability of Low-Income Countries

Other studies have tested the effects of the real producer prices instability on the growth of agricultural production from a sample pooling several products in many countries (Guillaumont and Combes 1996; Guillaumont and Guillaumont, 1994; Boussard and Gérard 1996). The results suggest that external price instability has a negative effect on the rate of investment and on the real exchange rate, either by its impact on public finances at government level, or by the impact at the producer level, if changes in producer prices are not cushioned at government level.

Instability, policy and performance. The hypothesis that economic vulnerability is linked to government behaviour has been tested by Burnside and Dollar (2000) who devised an indicator composed of the ratio of budget surplus to GDP, the rate of inflation, and the Sachs and Warner measure of openness, weighted by their impact on growth, in a cross-sectional model with a number of control variables. This indicator of macroeconomic policy appears to be significantly and negatively influenced by the level of economic vulnerability, as measured by the index devised by Guillaumont and Chauvet (2001). This suggests that structural vulnerability weakens the effect of policy measures.

Dependence of Structural Vulnerability on Macroeconomic Policy

There may be a two-way effect in the relationship between structural vulnerability and economic policy; that is vulnerability affects and at the same time it is affected by policy. Policy and institutional factors are important resilience factors in the face of shocks. A test of this conditional effect of structural vulnerability was conducted in Guillaumont (1994) and Combes and Guillaumont (2002), where the effect of export instability and of the terms of trade instability on economic growth appear to depend on the extent to which policy is outward-looking. The results suggested that an outward-looking trade policy may have three effects, namely (a) a positive effect on the growth of exports (b) a negative effect via the increase of exposure to instability, and (c) a positive effect of lessening the impact of export instability, leading to a higher degree of resilience.

Structural Vulnerability and Aid

Guillaumont and Chauvet (2001) argued that aid effectiveness depends on structural vulnerability in that the more vulnerable the recipient country, the higher is the marginal contribution of aid to growth. The reason for this is that aid may help the recipient vulnerable country avoid collapses and lasting recessions.

Conceptual and Methodological Issues

This assumption, tested on the basis of pooled data for the period 1970-1993 divided into two eleven-year periods, with a large sample of developing countries and a number of control variables, was found to be statistically significant by conventional econometric tests. A conclusion that could be derived from this study is that although structural vulnerability lowers growth prospects, it is likely to increase aid effectiveness (see also Collier and Dehn, 2001).

In a more recent study, Chauvet and Guillaumont (2004) distinguished the effects of economic vulnerability as distinguished from political vulnerability, both of course having a direct negative effect on growth, but with opposite effects on aid effectiveness: while economic vulnerability increases aid effectiveness, political instability lowers it.

Implications for aid allocation. An implication of the previous argument is that structural vulnerability of the recipient countries has to be taken into account, not only with regard to its direct negative impact on economic growth, but also with regard to aid effectiveness, and consequently poverty reduction.

This suggests that, at least in part, aid has to be allocated according to the vulnerability of the country, not only to compensate for a loss of welfare, but also to maximise its effects on growth, given that, as argued, aid is more effective in vulnerable countries. In this way it can contribute more to poverty reduction.

It should be noted here that the choice made by the CDP of an EVI as one of the main criteria for the identification of LDCs, a category of countries expected to mobilise a relatively larger amount of aid than other developing countries, is consistent with the argument of a higher aid effectiveness in vulnerable countries.

Implications for aid design. The consequences of vulnerability have a second set of implications for aid design. Aid could be designed precisely to lessen vulnerability. We have seen that vulnerability has three components, namely shock, exposure and resilience. The most efficient way in which aid can contribute to the lessening of vulnerability of LICs is to enhance the capacity of the countries to manage the shocks they face, and at the micro level, the capacity of the farmers to cope with the shocks transmitted to them or occurring at their level.

In other words, aid should be targeted to build or enhance resilience at the macro and the micro level, for instance through insurance schemes.

On the Economic Vulnerability of Low-Income Countries

Some types of aid, such as the IMF Compensatory and Contingency Financing Facility and the European Union's former STABEX and SYSMIN, now renamed "Support in Case of Short-term Earnings Fluctuations" (called FLEX), have been explicitly dedicated to face vulnerability problems, but have met implementation setbacks (for information on STABEX see Collier et al., 1999).

4. Conclusions

Vulnerability matters. But to be used efficiently as a conceptual tool in international co-operation, structural economic vulnerability should be considered distinctly from policy-based resilience.

It has been argued here that it is possible to build an internationally comparable indicator of structural economic vulnerability for LICs, consisting of three basic components namely (1) natural shocks (2) trade shocks and (3) structural exposure to these shocks. These indicators are included in the CDP-EVI.

This chapter has argued that structural vulnerability is a matter of concern for growth, development, factor productivity and co-operation policies, basing on conclusions based on various studies related to structural vulnerability.

An important conclusion presented in this chapter is that structural vulnerability has a negative effect on growth.

Another conclusion is that the effects of structural vulnerability are to a large extent passed into the economy through "intermediate" instabilities, namely those related to the rate of investment, the real exchange rate, and agricultural producer prices.

The chapter has also argued that the negative effects of structural vulnerability can be cushioned if the country adopts an outward-looking economic policy. Such a policy increases economic exposure, but improves economic resilience.

These negative effects can also be partially offset by foreign aid. It has been argued that foreign aid effectiveness is *ceteris paribus* higher in the more vulnerable countries.

For these reasons, it is justifiable to consider structural vulnerability as one of the criteria for the identification of LDCs, as proposed by the CDP.

References

- Aizenman, J. and Marion, N. (1999). "Volatility and Investment: Interpreting Evidence from Developing Countries." *Economica*, Vol. 68 (26): 157-180.
- Araujo, C. (1995). "Les producteurs brésiliens et l'instabilité des prix: différences de comportement entre le Nord et le Sud." *Canadian Journal of Agricultural Economics*, Vol. 43: 443-461.
- Araujo, C., Bonjean, C., Combes, J.L. and Combes Motel, P. (1999). *The Economic Consequences of Export Instability in Developing Countries: A Survey*, CERDI, Etudes et Documents, August.
- Atkins, J., Mazzi, S., and Ramlogan, C. (1998). *A Study of the Vulnerability of Developing and Island States: a Composite Index*. London: Commonwealth Secretariat.
- Atkins, J., Mazzi, S., and Easter, C. (2000). "Commonwealth Vulnerability Index for Developing Countries: The Position of Small States." *Economic Paper*, No. 40. London: Commonwealth Secretariat, London.
- Behrman, J.R. (1968). *Supply Response in Underdeveloped Agriculture*. Amsterdam: North-Holland Publishing Company.
- Boussard, J.M. and Gérard, F. (1996). "Stabilisation des prix et offre agricole." In Benoit-Cattin, M., Griffon, M. and Guillaumont, P. (eds) *Economics of Agricultural Policies in Developing Countries*, Tome 2, Paris: Edition Revue Française d'Economie: 269-286.
- Briguglio, L. (1995). "Small Island Developing States and their Economic Vulnerabilities." *World Development*, Vol. 23(9): 1615-32.
- Briguglio, L. (1997). *Alternative Economic Vulnerability Indices for Developing Countries*. Report prepared for the Expert Group on the Vulnerability Index. UN DESA, 17-19 December.
- Briguglio, L. (2004). "Vulnerability and Resilience: Concepts and Measurements". Chapter 1 of this volume
- Burnside, C. and Dollar, D. (2000). "Aid, Policies and Growth." *World Bank Policy Research Paper*, no. 1777, June.
- CERDI (1997). *Evaluation globale du Stabex*, Rapport effectué à la demande de la Commission Européenne, Rapport intermédiaire.
- Chauvet, L. and Guillaumont, P. (2004). "Aid and Growth Revisited: Policy, Economic Vulnerability and Political Instability." In Tungodden, B., Stern, N., and Kolstad, I. (eds) *Toward Pro-Poor Policies: Aid, Institutions and Globalization*. World Bank/Oxford University Press.
- Collier, P. and Dehn, J. (2001), "Aid, Shocks, and Growth." Policy Research Working Paper no. 2688, World Bank, Washington, D.C.
- Collier P., Guillaumont, P., Guillaumont, S. and Gunning, J. (1999). "Reforming Stabex." *World Economy*, July: 669-682.
- Collier, P. and Gunning, J. (eds) (1997). *Trade Shocks in Developing Countries: Theory and Evidence*. Oxford University Press, Clarendon.

On the Economic Vulnerability of Low-Income Countries

- Combes, J.L. and Guillaumont, P. (2002). "Commodity Price Volatility, Vulnerability and Development." *Development Policy Review*, Vol. 20 (1): 25-39.
- Combes, J.L., Guillaumont-Jeanneney, S., Guillaumont, P., Combes M.P. (2000), "Ouverture sur l'extérieur et instabilité des taux de croissance." *Revue Française d'Economie*, n°1: 3-33.
- Crowards, T. (1999). "An Economic Vulnerability Index for Developing Countries, with Special Reference to the Caribbean: Alternative Methodologies and Provisional Results." Barbados: Caribbean Development Bank.
- Dawe, D. (1996). "A New Look at the Effects of Export Instability on Investment and Growth." *World Development*, Vol. 24 (12):1905-1914.
- Easter, C. (1999). "A Commonwealth Vulnerability Index for Developing Countries. The Position of Small States." *The Journal of Commonwealth Affairs* (351) Carfax, Oxford.
- Encontre, P. (1999). "The Vulnerability and Resilience of Small Island Developing States in the Context of Globalization." *Natural Resources Forum*, 23: 261-270.
- Fosu, A.K. (1992). "Effect of Export Instability on Economic Growth in Africa." *The Journal of Developing Areas*, Vol. 26 (3): 323-332.
- Ghura, D. and Grennes, T.J. (1993). "The Real Exchange Rate and Macroeconomic Performance in Sub Saharan Africa." *Journal of Development Economics*, Vol. 42: 155-174.
- Glezakos, C. (1984). "Export Instability and Economic Growth : Reply." *Economic Development and Cultural Change*, Vol. 32: 615-23.
- Guillaumont, P. (1961). *La transmission des récessions américaine depuis la deuxième guerre mondiale*. Septembre 1961 Cahiers de Institut de Science Economique Appliquée, Paris.
- Guillaumont, P. (1985). *Economie du développement*. Tome III : Dynamique internationale du développement, Paris: PUF.
- Guillaumont, P. (1987). "From Export Instability Effects to International Stabilization Policies." *World Development*, Vol. 15 (5): 633-643.
- Guillaumont, P. (1989). "Stratégie de développement et ouverture sur l'extérieur." *African Development Review*, Vol. 1 (1): 40-57.
- Guillaumont, P. (1994). "Politique d'ouverture, exportation et croissance économique." *Revue d'Économie du Développement*, no. 1: 91-114.
- Guillaumont P. (2000). *On the Economic Vulnerability of Low Income Countries*. CERDI, Études et documents.
- Guillaumont, P. (2001). "Ouverture, vulnérabilité et développement." In Boudhiac M. and Siroën, J.M. *Ouverture et développement économique*, Paris: Economica.
- Guillaumont, P. (2003-2004). "A Revised EVI." CDP 2004 / PLEN / 16, 31.03.2004 New York: United Nations.

- Guillaumont, P. and Bonjean, C. (1991). "Effects on Agricultural Supply of Producer Price Level and Stability with and without Scarcity : The Case of Coffee Supply in Madagascar." *Journal of International Development*, Vol. 3 (2): 115-133.
- Guillaumont, P. and Combes, J.L. (1996). "The Effects of Producer Price Trends and Instability on the Growth of Agricultural Exports: a Cross-section Analysis." In Benoit-Cattin, M., Griffon, M. and Guillaumont, P. (eds) *Economics of Agricultural Policies in Developing Countries*, Revue Française d'Economie: 287- 300.
- Guillaumont, P. and Chauvet, L. (2001). "Aid and Performance : A Reassessment." *Journal of Development Studies*, Vol. 37 (6): 66-92.
- Guillaumont, P. and Guillaumont, S. (eds) (1988). *Stratégies de développement comparées zone franc et hors zone franc*. Paris: Economica.
- Guillaumont, P. and Guillaumont, S. (eds) (1994). *Adjustment and Development. The Experience of the ACP Countries*. Paris: Economica.
- Guillaumont, P., Guillaumont-Jeanneney, S. and Brun, J.F. (1999). "How Instability Lowers African Growth." *Journal of African Economies*, Vol. 8 (1): 87-107.
- Guillaumont, P., Guillaumont, S. and Plane, P. (1988). "Participating in African Monetary Unions: An Alternative Evaluation." *World Development*, Vol. 16 (5): 569-576.
- Gyimah-Brempong, K. (1991). "Export Instability and Economic Growth in Sub-Saharan Africa." *Economic Development and Cultural Change*, Vol. 39 (4): 815- 828.
- Just, R.E. (1974). "An investigation of the Importance of Risk in Farmers' Decisions." *American Journal of Agricultural Economics*, Vol. 2 (February): 14-25.
- Kaly, U., Pratt, C., Mitchell, J., Howorth, R. (2003). *The Demonstration Environmental Vulnerability Index (EVI) SOPAC Technical Report 356*.
- Lin, W. (1977). "Measuring Aggregate Supply Response under Instability." *American Journal of Agricultural Economics*, Vol. 5 (December): 903-907.
- Moran, C. (1983). "Export Fluctuations and Economic Growth: an Empirical Analysis." *Journal of Development Economics*, Vol. 12: 195-218.
- Newbery, D.M. and Stiglitz, J.E. (1981). *The Theory of Commodity Price Stabilization. A Study in the Economics of Risk*. Oxford: Clarendon Press.
- Ramey, G. and Ramey, V. (1995), "Cross Country Evidence on the Link Between Volatility and Growth." *The American Economic Review*, Vol. 85(5): 1138-1151.

On the Economic Vulnerability of Low-Income Countries

- Rodrik (1999) "Where Did All the Growth Go? External Shocks, Social Conflict and Growth Collapses." *Journal of Economic Growth*, Vol. 4 (4): 385-412.
- United Nations Disaster Relief Organisation (1990). *Preliminary Study on the Identification of Disaster Prone Countries based on Economic Impact*. Geneva: UNDRO.
- United Nations (1994). *Report on the Global Conference on the Sustainable Development of Small Island Developing States*. A/Conf.167/9.
- United Nations (1999). *Vulnerability and Poverty in a Global Economy*. Report of the Committee for Development Policy on the 1st Session, Department of Economic and Social Affairs.
- United Nations (2000). *Poverty Amidst Riches: the Need for Change*. Report of the Committee for Development Policy on the 2nd Session, Department of Economic and Social Affairs.
- United Nations (2003). *Local Development and Global Issues*. Report of the Committee for Development Policy on the 5th Session.
- World Bank (1999). *Dealing with Commodity Price Volatility in Developing Countries. A Proposal for a Market-Based Approach*. International Task Force on Commodity Risk Management in Developing Countries.