FONDATION POUR LES ÉTUDES ET RECHERCHES SUR LE DÉVELOPPEMENT INTERNATIONAL

The concept of structural economic vulnerability and its relevance for the identification of the Least Developed Countries and other purposes (nature, measurement and evolution)

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1. Introduction

This note summarizes and updates analyses presented in previous work by the author on the economic vulnerability of the Least Developed Countries (see references at the end of the note).

It is well evidenced in the academic literature that the exogenous shocks and related instabilities of economic variables have a detrimental effect on the economic growth of the developing countries and the rate of poverty reduction. These are both short terms and long term effects.

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• • • / • • • The economic vulnerability is the risk for a country to see its development hampered by these shocks and instabilities. As long as vulnerability is not the result of current or recent policies and rests on persisting factors and features it is considered as "structural".

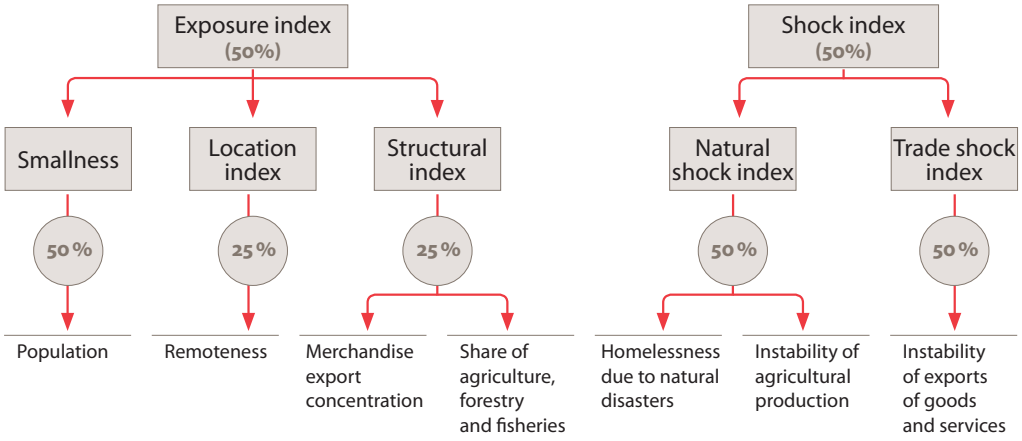
The LDCs are designed as low income countries facing structural obstacles to development, and seemingly "caught in a trap". Economic vulnerability to exogenous shocks and related instabilities are a major structural handicap to sustained growth and poverty reduction, and thus considered as a relevant criterion for the identification of the LDCs[1].

1. On the origin of Economic Vulnerability Index (EVI): economic vulnerability, a long lasting concern of the Committee for Development Policy

Following a recurrent concern on the economic vulnerability of the LDCs, the Committee for Development Policy (CDP) has made the choice to build an EVI after considering whether other available indices were adequate. The need of building a specific vulnerability index for the LDCs identification was recognized in 1999 with the objective of having a simple and transparent index, possibly supplemented by a "vulnerability profile" for those countries meeting the criteria for graduation from the LDC category (see details in Guillaumont 2009a, p 33-5, 173-5). The first version of the CDP index, retained for the 2000 triennial review of the list of LDCs, had been strongly influenced by the structure of a previous criterion, the Economic Diversification Index (EDI), which the EVI was intended to replace as one of the three identification criteria of LDCs.

An improved and more comprehensive EVI was developed in 2005 and used for the 2006 and 2009 triennial reviews. It relies on two groups of components, each group with equal weights, one reflecting the size of the recurrent shocks, the other the exposure to the shocks. The shock components capture both external shocks and natural shocks, both again with equal weights. Among the exposure components the size of the population (smallness) has a weight equal to 50 per cent. EVI has seven components and is structured as follows:

Economic Valuability Index (EVI) >>> CDP and UN DESA (2005)



It should be underlined that the EVI is used by the CDP as one of three complementary criteria for the identification of the LDCs, along with a low level of income per capita and a low level human capital. High vulnerability and a low human capital are considered as complementary obstacles to growth: a high economic vulnerability is an obstacle to growth all the more important that human capital is low (and income per capita as well).

III. On structural economic vulnerability

The EVI differs from other existing vulnerability indices, not only because of its simplicity and clear structure, but also and mainly because it is an index of structural vulnerability only. For equity and fairness reasons, LDCs identification requires an index of vulnerability which reflects only structural factors, i.e. non dependent on the present policy and changing rather slowly. This is an essential feature of EVI.

As far as the vulnerability of a country would be linked to a poor present policy, it would no longer be a reason for this country to benefit from the specific support associated to the membership in the category. The LDC category is intended to give support to developing countries suffering the most from structural handicaps, not from poor policies. EVI is designed in this spirit and this is why it fundamentally differs from several other vulnerability indices which most often mix structural and policy components.

From the beginning of the work by the CDP on building an EVI (Guillaumont 1999 or 2004), a distinction has been made among three elements underlining vulnerability: (i) the size of the shocks, (ii) the exposure to these shocks, (iii) the country resilience. While the first two elements can be considered as largely structural, resilience is mainly related to policy. This is the reason why the EVI relies on two groups of components: one related to the exposure (4 components) and the other to the size of the shocks (3 components)[2]. Additionally, the exposure components of EVI are designed to capture the structural factors of exposure only.

For instance, there were proposals to consider the trade to GDP ratio, or trade dependency, as one of the indicators of vulnerability. Yet, this is not a good indicator of structural exposure. The trade to GDP ratio not only depends on (i) structural factors such as population size but also on (ii) economic policy (some authors even doing the opposite error by taking this ratio as an indicator of policy openness). What matters for the LDCs identification is to know whether the exposure (in the example discussed here, trade dependency) results from structural factors, rather than from policy. In this regard, the size of population as a component of exposure captures the structural factor behind the ratio of trade to GDP.

The same argument can be made for other (so-called) "dependency" indicators, such as aid, remittances and FDI to GDP ratios, also strongly influenced by the population size of the country. In any case, these flows should be considered as a benefit, not as a handicap. One of the support measures adopted for the category is specific targets for ODA flows by bilateral donors in view of LDCs limited capacity to mobilize resources either domestically or in financial markets.

IV. Some questions about EVI

Of course EVI is not a perfect index. Anyway it is simple, parsimonious and transparent. To be recalled, the most successful HDI (Human Development Index), also very simple and transparent (indeed corresponding to a less complex concept), has not ceased to be criticized, but at the same time it has been more and more accepted and used…

A concern about EVI may have come from a misunderstanding of how vulnerability is measured and how it is used as a criterion for LDCs identification. The concern has emerged about the graduation of some small island developing states (SIDS), still considered as highly vulnerable. But their eligibility to graduation is not the result of an underestimation of their

1. Structural economic vulnerability can also be considered for other purposes, in particular as an indication of the need of development assistance and as such as a criterion for its allocation among countries.
2. Resilience not only strongly depends on policy, it also depends on many aspects of policy, and as such is very difficult to capture in an appropriate index (Guillaumont 2009a, pp.185-7, 200). It also depends on human capital and income per capita, independently taken into account as criteria for the identification of the LDCs.

vulnerability. It results from the rationale of the category and the complementarity of the criteria (all three criteria are required to be met for inclusion in the category while no longer meeting any two criteria – not only one - would make a country eligible for graduation). In this regard, countries having high structural vulnerability qualify to graduation if they are above a certain level of income and human resource development. A given level of income and human assets enables countries to better overcome their structural vulnerability.

Thus even with a higher EVI, the countries eligible to graduation could still be eligible. A change in the composition of EVI that would even more enhance its level could have an impact on eligibility only if the EVI was merged with HAI in a structural handicap index (Guillaumont 2009a) [3] in the framework of a change in the criteria (from three to two) [4]. Even in that case, simulations show that the eligibility results would not be necessarily changed (Ibid.)

Some improvements however could be introduced to EVI in order to better reflect the vulnerability to unexpected and non-recurrent shocks, by giving a higher possible role to the exposure components. That could be done, without changing the weights of components themselves, by changing the way by which they are averaged, in particular by using a semi-geometrical average of the shock and the exposure indices, as explained in Guillaumont 2009a pp199-201, and 2010. Doing so, a very high exposure index would lead to a high EVI, even with a rather low shock index (to capture a vulnerability to unexpected or non-recurrent shocks).

Another concern refers to the fact that EVI may not be considered enough "forward-looking" and reflects retrospective vulnerability. This observation however does not seem to be applicable to the exposure components of the index which are unlikely to be rapidly changing in the future. Is the point valid for shock components, which rely on past averages? Actually, as far as they reflect recurrent shocks, they give a proxy of the likelihood of occurrence in the future. Moreover, by being recurrent or exceptional (e.g. earthquakes), they are likely to have a negative impact on future growth. Past shocks are handicaps for future growth.

In any case, if new components were to be added to EVI, they should be few (for simplicity), clear (for transparency), and correspond to available and reliable statistical information [5]. Above all, to be consistent with the rationale of the category, these additional components should clearly reflect a handicap to growth in the medium term. In this regard, it should be noted that the time horizon considered in the preparation of UN IV Conference on LDCs—which provides the development strategy framework for these countries and the corresponding support by the international cooperation---is a decade, with a wish expressed by some member states to see the number of LDCs reduced by half during the next ten years.

v. EVI and the vulnerability to climate change

Vulnerability to climate change is a big issue, well examined by Bruckner (2011). A relevant indicator of vulnerability to climate change is highly desirable and there is already some significant literature on this concept (most noticeable and recent references are Adger, 2006, Füssel, 2010). But the relevance of an index should be assessed with regard to its aim. Vulnerability to climate change takes place not only on a medium term horizon, but also on the longer term, with a specific concern and an increasing uncertainty on impacts the longer the period considered is.

3. To stay somewhat consistent with the complementarity of the present criteria, this index would then be not a simple arithmetic average (Ibid)

4. In fact, at the last two reviews, the two indices, in their present composition, have been averaged to give the CDP a supplementary information on borderline cases, without changing the conclusion.

5. To limit the number of components, it can also be relevant to delete the export concentration index from the exposure components, for reasons already examined (Guillaumont 2009, pp. 193-4, 262, 325)

Of course climate change also has detrimental consequences on developing countries even on the medium term as other natural shocks may have. For this reason two indicators of recurrent natural shocks have been included in EVI (homelessness and instability of agricultural production). These shock indicators whose respective magnitudes have progressively changed over time, may already reflect an impact of climate change, as far as climate change can increase the frequency and/or the size of events leading to homelessness or instability of agricultural production.

A large part of the vulnerability to climate change (and other natural shocks) can be reflected in EVI's exposure components, as they presently stand, in particular the size of population and remoteness. Vulnerability to climate change can also be reflected with the addition of new components such as the share of the land (or population) at risk to be flooded. However, this is more a long-term risk than a medium term one, except in few cases (Tuvalu). Only could be retained the risk to be flooded in this medium term, depending on the share of areas under a rather low altitude.

An index of vulnerability to climate change may have independently to be built for a specific purpose, differing from the identification of the LDCs. The most obvious purpose is to have an indicator to allocate external resources for the adaptation to climate change (Guillaumont 2008). On the international agenda, the adaptation issue seems to be addressed separately from the LDCs treatment, even if a significant number of LDCs are likely to be vulnerable to climate change, since many non LDCs developing countries (middle income countries) are also highly vulnerable to climate change. In this perspective, the relevant indicator of vulnerability to climate change to be incorporated in the LDC criteria should be, as the EVI, an indicator of vulnerability not depending on present policy, i.e. structural or in this case "physical" and it should also be clear and transparent.

A tentative indicator of geo-physical vulnerability to climate change has recently been set up at Ferdi (Guillaumont and Simonet, 2011a and 2011b). Keeping aside human capital and income per capita, as EVI, it relies on a small number of components respectively capturing the risks related to progressive and cumulative shocks and the risks related to the intensification of recurrent shocks, and, again as EVI, combining exposure and (likely) shock indicators.
This Physical Vulnerability to Climate Change Index has the following structure:

- Index of the risks related to progressive shocks, with two parts
  - risk of flooding due the rise of sea level, depending on this rise size (shock) and on the altitude of the country (exposure)
  - risk of increasing aridity and desertification, depending on the rising trend of temperature and/or the decreasing trend in rainfall (shocks) and on the share of arid areas (exposure)
- Index of the risks related to the intensification of recurrent shocks, with two parts
  - the average frequency of shocks in rainfall and in temperature (which can be seen as an indicator of long term exposure)
  - the (past) trend in the size of these shocks (taken as an indicator of the likelihood of increasing future shocks).

It has to be noted that the average frequency of rainfall or temperature shocks differs from the present two indicators of natural shocks in the EVI, which are not specific to climate change and are supposed to reflect any kind of natural shock.

While only structural, as EVI (keeping aside resilience factors), this index basically differs from EVI, for three reasons. First, its focus is narrower, since it is related to one source only of vulnerability, although a major one, while EVI refers to all kinds of natural shocks (besides external ones), captured indistinctly through intermediate socio-economic indicators, such as the population homeless or affected due to natural disasters or the instability of agricultural

production. Second it refers to a potentially longer term horizon. Third, it tries to capture less a handicap to growth than a risk of changes in geophysical conditions, some of them likely to hamper economic growth, some other doing so less clearly, but all leading to a need of "adaptation". For these reasons and because it is still tentative, it might not be recommended to be used as an input for EVI [6].

VI. Using EVI beyond LDCs identification

Although imperfect, EVI has gained increasing recognition in the international community. Not only it is now intimately linked to the meaning of the LDC category, what is important in the perspective of the next UN LDC IV, but also it has been used in other contexts.

A large debate has been engaged at the UN (United Nations 2008, 2010) and as at some multilateral development banks, in particular at the African Development Bank (Guillaumont Jeanneney et Vencatachellum 2009) and the International Development Association (IDA) of the World Bank (Guillaumont, Guillaumont Jeanneney, Wagner, 2010) on how EVI can be used as one of the criteria of aid allocation.

Support to considering structural vulnerability as a possible aid allocation criterion has initially been expressed at UN (United Nations 2008a, §36; 2008b, pp2 and 16; 2010, §48 and 127). It was also expressed by the Finance Ministers of the Commonwealth and the Organisation internationale de la francophonie (2009, §9). It has been recently and noticeably reiterated by the Commonwealth Secretariat (2010, pp10-11), with explicit reference to EVI as an appropriate index. It should be noted that in the debate at the Multilateral Development Banks the point under discussion has essentially been whether there could be a move from the traditional PBA ("performance based allocation"), which relies essentially on a subjective measurement of the quality of policy (CPIA, the Country Policy and Institutional Assessment) to an allocation taking into account the structural economic vulnerability through an index such as EVI.

Finally, EVI has appeared to be a useful concept and measure for research works, as illustrated in several academic papers in peer reviewed journals using extensively the EVI (e.g. Amprou et al. 2007, Ferrarini, 2009, Guillaumont 2009a, 2010b, Guillaumont and Guillaumont Jeanneney 2010,…). Moreover several researchers have expressed the wish to obtain time series of EVI, likely to be used in quantitative studies of the effects of vulnerability.

VII. Lessons from a retrospective EVI

Due to the successive revisions of EVI before the triennial reviews of the LDCs list in 2003, 2006 and 2009, the values of EVI are not comparable over time. A retrospective evaluation of EVI according to the last and present definition is needed for research purposes.

A "Retrospective EVI" was first and tentatively established on a 5 year and 10 year basis (Guillaumont 2007). Thanks to the collaboration with the UN/DESA, the Ferdi has now calculated a retrospective EVI on a year-to-year basis, covering 128 developing countries over the 1975-2008 period. This more robust and less rigid (yearly) series relies on a methodology very close to that used for the last two reviews of the list of LDCs,and allows observers to make consistent comparisons over time (Cariolle and Guillaumont 2011 for the brief, Cariolle 2011 for the full document) [7]. It also confirms previous findings, as analyzed in Caught in the trap (Guillaumont 2009a pp. 209-14).

For the recent years, as well as for all the previous years covered by the study, the least

6. The same can be said on another vulnerability index recently presented by Wheeler (2011) at the Center for Global Development and also to be used as a criterion for the allocation of adaptation funds, but less clearly structural than the Ferdi index.

7. At the same time a "Retrospective HAI", also giving comparable annual time series, has been set up (Korachais, 2011).

developed countries (LDCs) show a level of EVI higher than the other developing countries, and even more compared to the other low income countries. In order to permit a relevant comparison of the long term evolution of EVI between groups of countries, the group of low income countries has been defined as including all the countries that are or have been low income during the period covered (the number of countries still low income, but not LDCs, has become very small).

The retrospective measurement of EVI evidences a decreasing trend in the structural economic vulnerability for the whole set of developing countries, at least since 1995. But the evolution of the LDCs is significantly different from that of the other developing countries. The LDCs EVI has been increasing from 1985 to the end of the nineties, then decreasing, with a level in 2008 similar to that of 1984-85, while EVI in the other developing countries has been regularly decreasing from 1985. Considering only the "low income countries", the difference between the two groups appears even stronger: the EVI has less decreased in the second part of the period covered than it has increased in the first one, while for the "other low income countries" it has sharply decreased, so that the gap between the two groups has become larger. This increasing gap is essentially due to the respective evolution of the shock components, the exposure indices evidencing a progressive decline in the various groups of countries (see details and graphs in Cariolle 2011 and Cariolle and Guillaumont 2011). As for exposure, population size has been increasing in all groups, although a little faster in LDCs; the average export concentration has increased in LDCs, decreasing elsewhere; remoteness of LDCs has not significantly changed on average and the share of agriculture, fishery and forestry has decreased by a similar number of points in LDCs and other developing countries. The increase in the shock index of LDCs, contrasting with its decline in other developing countries, results mainly from a more rapid increase of the homeless index and from a long term stagnation of the two instability indices, while the instability of exports strongly decreased in other developing countries and that of agricultural production slightly decreased.

Since structural vulnerability is a major obstacle to development, its persistence in LDCs and the increasing gap of its level between the LDCs and the other developing countries, in particular those that been or are low income, designate the fight against LDCs vulnerability as a priority in the future programme of action for LDCs. Facing the LDCs vulnerability involves both increasing their resilience to exogenous shocks and lowering their structural vulnerability.

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