Department of Economic & Social Affairs

CDP Background Paper No. 33
ST/ESA/2016/CDP/33

July 2016

Clusters of Least Developed Countries, their evolution between 1993 and 2013, and policies to expand their productive capacity

Giovanni Andrea Cornia[*] and Antonio Scognamillo[**]

ABSTRACT

The conventional approach to least developed country (LDC) graduation has considered these countries as an undifferentiated group whose problems could be solved by means of similar measures focussing on domestic and international liberalisation, preferential aid allocations, and the promotion of their exports by means of trade preferences and free market access. This paper tries to go beyond this analytical and policy tradition and attempts to identify different LDC clusters in which underdevelopment is caused by specific economic and social conditions, and for which the solution depends not only on traditional support measures, but also on the implementation of differentiated, country-specific policies sensitive to the local context.

Keywords: least developed countries, cluster analysis, productive capacity, graduation, country-specific policy measures

JEL Classification: F35, F55, O19, O57

* Giovanni Andrea Cornia (giovanniandrea.cornia@unifi.it) is Professor of Development Economics at University of Florence and a member of the United Nations Committee for Development Policy (CDP).
** Antonio Scognamillo (antonio.scognamillo@unifi.it) is an empirical analysis specialist consultant at the Food and Agriculture Organization of the United Nations (FAO).

CONTENTS

Typesetter: *Melanie Sauter*

UNITED NATIONS
Department of Economic and Social Affairs
UN Secretariat, 405 East 42nd Street
New York, N.Y. 10017, USA
e-mail: undesa@un.org
http://www.un.org/en/development/desa/papers/

Acronyms

CDP	Committee for Development Policy
CPI	Consumer Price Index
CSP	Center for Systemic Peace
EVI	Economic Vulnerability Index
FDI	Foreign direct investment
GATS	General Agreement on Trade in Services
GDP	Gross domestic product
GNI	Gross national income
HDI	Human Development Index
IMF	International Monetary Fund
LDCs	Least developed countries
REER	Real effective exchange rate
SDGs	Sustainable Development Goals
SME	Small and Medium Enterprises
UNCTAD STAT	United Nations Conference on Trade and Development Statistics
WDI	World Development Indicators
WTO	World Trade Organization

The authors would like to acknowledge the detailed comments of Matthias Bruckner, Daniel Gay, Charles Gore and Stephan Klasen on prior versions of this paper. They would also like to thank the participants to the Committee for Development Policy (CDP) Expert Working Group on Expanding Productive Capacity in Least Developing Countries (Geneva, 5 February 2016) and to the 18th CDP plenary session (14-18 March 2016) – including, inter alia, José Antonio Alonso, Mathias Bruckner, Ana Cortez, Diane Elson, Ann Harrison, Keung Lee, Stephan Klasen, Keith Nurse, José Antonio Ocampo and Dodzi Tsikata - for their comments and suggestions. The usual caveats apply. Antonio Scognamillo gratefully acknowledges the generous financial support received from the Georg-August Universität, Göttingen.

Clusters of Least Developed Countries, their evolution between 1993 and 2013, and policies to expand their productive capacity

1 Introduction and motivation of the study

With rare exceptions[1], the conventional approach to least developed countries (LDCs) graduation has consisted in considering them as an undifferentiated group of countries whose problems – including the expansion of productive capacity – could be solved by means of similar measures focussing on domestic and international liberalisation, preferential aid allocations, and the promotion of their exports by means of trade preferences and duty-free, quota-free market access. As the evidence shows (table 1) this approach has failed with only four countries having graduated from the LDC category since its formation in 1971, and three more expected to graduate in 2017, 2020 and 2021 (mainly driven by the recent commodity-price boom or other reasons). This paper tries to break with this analytical and policy tradition[2] and attempts to identify different LDC clusters in which underdevelopment is caused by specific economic and social conditions, and for which the solution depends not only on traditional international support measures, but also on the implementation of differentiated, country-specific policy measures sensitive to the local context. In doing so, we aim at contributing to the international dialogue on the importance of broader policy interventions to expand productive capacity, as discussed for instance in the Istanbul Programme of Action[3] and the Sustainable Development Goals (SDGs) objectives 8a, 9, 11 and 17[4]. In this regard, we present in sections 5 and 6 policy proposals aiming at expanding productive capacity and achieving graduation in different LDC clusters.

To do so, the paper regroups the LDCs by means of a cluster analysis. This is necessary as these countries are highly heterogeneous and therefore need to be supported – in addition to the existing undifferentiated measures – by cluster-specific measures aiming at expanding productive capacity and facilitating their graduation. In this regard, section 2 discusses the choice of the clustering variables and the clustering methodology followed in the paper. Section 3 identifies six LDC clusters for the years 1993, 1998, 2003, 2008 and 2013, and traces in table 2 their evolution over time, to test whether changes in domestic and global conditions determined their migration from one cluster to another. A main finding of such dynamic analysis is that, while during the last 20 years the LDC group recorded a gross domestic product (GDP) growth rate of about five percent, with few exceptions they also experienced a suboptimal structural evolution characterized by economic re-primarization, deindustrialization, informal tertiarization and, in a few cases, a retreat to subsistence agriculture. Of particular concern is the limited expansion or decline of the value added shares of manufacturing, construction and modern

[1] See UNCTAD (2002) and (2009)

[2] The challenge is to move away from the generic, one-size-fits-all approach promoted by both the Washington Consensus and the heterodox approaches promoting in all countries the adoption of similar industrial policies emphasizing the development of manufacturing, while recognizing that there are different types of industrial policies, that some LDCs need to follow alternative development patterns, and that this choice depends on specific country circumstances.

[3] http://unohrlls.org/about-ldcs/istanbul-programme-of-action/

[4] http://www.un.org/sustainabledevelopment/sustainable-development-goals

agriculture. In this regard, table 1 presents the evolution of the sectoral value added shares for 1993 and 2013 grouped according to six clusters identified for 2013 for the countries that are still on the LDC list. The first two clusters identify countries at war or with populations of less than a million, while the subsequent four are based on increases over 1993-2003 in the value added share of the four main economic sectors.

In section 4 we estimate panel regressions with the standard criteria used for country graduation as dependent variables, i.e. the Gross National Income per capita (GNI per capita), the Human Asset Index (HAI) and the Economic Vulnerability Index (EVI). For each of these three variables, we include among the regressors the yearly values of standard explanatory variables as well as the cluster dummies and cluster means of the dependent variable, using as pivot the LDC that have graduated or are about to graduate (i.e. the "successful LDC"). Such panel regressions aim at testing formally whether belonging to a given cluster improves or worsens performance in the fields of GNI per capita, HAI and EVI and – therefore – the probability that countries belonging to such cluster may graduate in the near future. In turn, in section 5 we discuss cluster-specific policies that – together with the current international support measures – may help promoting a sustainable expansion of productive capacity in LDC, while in section 6 we outline a package of macroeconomic policies that – mutatis mutandis – could help achieve such objective.

2 Cluster analysis

The cluster analysis is a multivariate technique that helps regrouping countries (or other entities) in a way that minimizes the distance of the clustering variables between countries belonging to the same group, while maximizing it among groups. In this approach, the variables that identify each cluster have a higher mean and smaller standard deviation compared to those of other clusters. This allows to reduce a large number of observations into a smaller number of groups. The cluster analysis is a-theoretical (or 'blind') and the choice of the clustering variables by the analyst influences substantially the formation of clusters. In order to obtain meaningful results, such a-theoretical approach often needs to be combined with prior hypotheses about the importance of some clustering criteria based on the researcher's experience.

2.1 Clustering methodology

In order to overcome some of the limitations of a completely a-theoretical cluster analysis, this study adopts a two-steps methodology. For ease of information, we list in the first row of tables 1 and 2 the countries that have already graduated. We include in this group also those LDCs that are six years ahead of the actual graduation date, which corresponds to the shortest possible timeframe between meeting the LDC graduation criteria and leaving the LDC category. Second, for the non-graduated LDCs we identify two clusters on the basis of 'prior dominant criteria' i.e. 'being at war' and 'having a population of less than a million' (see later for their precise definition). The reason for this decision is that these two non-economic characteristics prevail in our view over all other economic characteristics, as they influence substantially economic activity and the evolution of economic structure. Countries at war, for instance, generally experience a disruption of production, trade, social infrastructure and growth. Likewise, countries with a very small population and land mass cannot engage in agriculture and manufacturing because of their limited resources and narrow domestic market, and have therefore to seek non-Rostowian development paths. Thus, for the first two clusters we created dichotomous variables based on prior data.

The remaining clusters are identified by a standard hierarchical cluster analysis in which we chose ex-ante to limit the number of additional clusters to four. The clustering criterion selected are the

Table 1

Descriptive statistics of cluster variables with reference to 2013

		War Index		Population		Agriculture		Oil Mining		Manufacturing		Services	
		1993	2013	1993	2013	1993	2013	1993	2013	1993	2013	1993	2013
Graduated	Botswana	0	0	1.5	2.2	4.6	2.55	35.5	24.3	5.2	5.7	47.3	60.5
	Cabo Verde	0	0	0.4	0.5	16.1	9.21	7.2	2.4	10.6	6.3	53.6	70.5
	Equatorial Guinea	0	0	0.4	0.8	46.5	1.4	20.5	89.2	1.5	0.1	26.0	3.1
	Maldives	0	0	0.2	0.4	6.8	3.9	1.1	1.34	4.3	5.7	83.2	81.6
	Samoa	0	0	0.2	0.2	20.6	9.3	3.2	4.87	17.8	7.7	51.5	63.
At War	Afghanistan	7	3	14.8	30.7	63.5	25.6	0.2	0.94	10.3	11.4	22.2	53.9
	Central African Republic	0	3	3.2	4.7	34.5	41.7	8.2	2.8	18.5	18.3	37.1	34.4
	Dem. Rep. of the Congo	0	5	39.3	72.6	51.7	20.8	7.2	22.7	6.9	16.55	31.8	34.8
	Myanmar	4	4	43.6	53.0	63.0	33.2	0.7	5.4	6.8	19.8	28.0	36.9
	Somalia	5	5	6.3	10.3	61.7	60.2	0.6	0.7	2.1	2.5	31.3	32.5
	Yemen	0	2	14.0	25.5	18.5	15.0	5.8	23.7	10.5	8.2	62.3	49.0
Small And Remote	Bhutan	0	0	0.5	0.8	33.8	17.1	11.5	17.9	9.4	9.0	35.7	38.3
	Comoros	0	0	0.5	0.8	38.1	42.8	1.2	1.7	4.4	6.8	50.2	46.3
	Djibouti	0	0	0.6	0.9	3.5	3.7	6.9	5.2	3.4	2.5	81.3	75.7
	Kiribati	0	0	0.1	0.1	27.5	25.8	2.2	1.1	6.5	5.3	62.5	64.6
	Sao Tome and Principe	0	0	0.1	0.2	28.9	20.7	2.3	3.1	8.6	7.6	51.4	61.8
	Solomon Islands	0	0	0.3	0.6	45.7	28.4	1.2	4.2	5.6	8.3	45.1	56.5
	Tuvalu	0	0	0.1	0	23.6	25.5	2.1	0.1	1.7	1.1	60.6	65.3
	Vanuatu	0	0	0.2	0.3	27.2	24.3	1.8	2.1	4.9	4.5	63.6	65.2
Oil & Mininig	Angola	6	0	12.3	23.5	11.9	9.3	42.1	50.4	5.8	5.9	35.6	27.1
	Chad	4	0	6.6	13.2	34.0	19.9	1.0	42.4	8.5	7.0	54.5	28.9
	Eritrea	0	0	3.2	5.0	22.4	17.6	0.7	1.8	9.2	6.0	61.9	58.9
	Lao PDR	0	0	4.6	6.6	42.5	24.1	2.2	19.0	5.3	8.1	43.5	41.8
	Lesotho	0	0	1.7	2.1	12.7	8.1	2.3	12.4	10.2	14.1	61.1	59.6
	Mauritania	0	0	2.2	3.9	44.3	23.1	11.7	33.4	10.3	8.0	30.7	28.5
Agricultural	Benin	0	0	5.6	10.3	35.7	35.9	1.5	1.3	7.8	8.0	51.5	50.4
	Burkina Faso	0	0	9.6	17.1	31.1	34.3	1.9	9.2	13.5	7.5	48.6	43.6
	Gambia	0	0	1.0	1.9	15.6	23.5	0.7	4.7	7.9	5.8	70.4	60.9
	Guinea	0	0	7.2	12.0	15.1	27.1	21.1	16.8	3.3	6.8	52.8	41.1
	Liberia	4	0	2.0	4.3	49.3	70.1	2.0	3.0	8.9	5.7	35.9	18.6
	Mali	0	0	9.1	16.6	32.6	38.2	3.5	10.3	8.1	7.1	51.4	39.4
	Niger	0	0	8.7	18.4	37.4	39.6	6.1	11.6	6.4	6.5	48.5	39.8
	Sierra Leone	3	0	3.9	6.2	48.1	49.0	3.2	20.0	3.5	1.7	42.8	28.4
	United Rep. of Tanzania	0	0	28.1	50.2	31.8	33.5	3.2	5.8	9.3	7.2	50.8	43.9

		War Index		Population		Agriculture		Oil Mining		Manufactur-ing		Services	
		1993	2013	1993	2013	1993	2013	1993	2013	1993	2013	1993	2013
Manufact.	Bangladesh	0	0	113.4	157.2	25.0	16.2	3.1	3.1	14.0	17.3	53.0	56.1
	Cambodia	2	0	10.0	15.1	47.7	33.5	0.6	1.5	7.7	16.4	40.5	40.8
	Guinea-Bissau	0	0	1.13	1.8	55.2	47.2	0.9	0.6	3.5	12.0	34.7	39.0
	Madagascar	0	0	12.6	22.9	33.5	25.7	1.3	1.5	11.3	14.2	52.9	55.2
	Uganda	0	0	19.1	36.6	43.3	26.8	2.3	3.7	7.0	10.1	44.0	50.9
Services	Burundi	4	0	6.0	10.5	50.6	38.1	0.8	1.0	14.1	10.5	28.3	46.7
	Ethiopia	0	0	53.5	94.6	64.7	45.5	1.5	2.3	4.3	3.9	27.3	43.5
	Haiti	0	0	7.5	10.4	31.5	18.6	1.3	0.7	13.5	9.6	43.9	44.7
	Malawi	0	0	9.7	16.2	50.2	32.2	3.2	2.4	17.7	11.1	24.2	51.2
	Mozambique	0	0	14.8	26.5	37.2	29.0	0.5	6.9	12.5	10.9	47.8	50.2
	Nepal	0	0	20.3	27.8	40.4	34.7	1.4	1.9	8.9	6.2	43.1	50.3
	Rwanda	3	0	6.3	11.1	44.4	34.7	2.1	2.6	8.6	5.4	40.1	49.8
	Senegal	0	0	8.2	14.2	18.2	16.0	3.1	5.5	17.0	14.0	58.3	60.0
	Togo	0	0	4.1	6.9	48.4	45.7	10.2	7.6	9.4	7.2	29.0	34.9
	Zambia	0	0	8.8	15.3	33.1	17.5	11.0	5.2	27.2	8.1	26.1	44.9

Source: Authors' elaboration on sources cited in the text.

Note: The highlighted cells indicate the 2013 values of the dominant clustering variable and two examples of 'borderline cases' discussed in the text.

increase between 1993 and 2013 of the value added shares of agriculture (that includes cattle raising, fishing and forestry), manufacturing, mining (that includes utilities) and services. With this approach, we emphasize the evolution over time in economic structures more than their level (that is listed in any case in the descriptive statistics in table 1). Following this procedure, we identified a cluster of LDCs which experienced a rise of the value added share of agriculture; a cluster of LDCs that became increasingly more dependent on oil-mining; a group of economies with a growing value added share of manufacturing; and the group of LDCs that experienced an increase in the value added share of services[5]. The standard hierarchical cluster analysis used to identify these four clusters uses the distance metric proposed by Gower (1971) and relies on the 'Ward linkage method' to re-compute distances between previous and new formed intermediate cluster groups. This 'two-step approach' assigns countries to clusters in a way which is consistent with the empirical evidence and economic common sense.

2.2 Source of data for the clustering variables

Due to lack of data we exclude from the analysis Timor-Leste and South Sudan, while we include in the analysis the LDCs that have graduated and (in braces) that were about to join the LDC list. The number of LDCs in table 2 varies between 44 and 47 depending on entries and exits to/from the United Nations LDC list. As for the clustering variables, the data on countries at war are from the Center for Systemic Peace (CSP) Major Episodes of Political Violence, 1946-2013. We consider a country to be at war if in the reference year it experienced a conflict (whether internal or external), excluding however episodes of political violence that are difficult to identify. Data on population and value added shares

[5] We could have also introduced a cluster of economies with broadly stable value added shares, but this would have added not much to the analysis (except for the identification of structural immobility) and not changed much the narrative of the paper. The reader can easily identify such countries based on the data of table 1.

are from United Nations Conference on Trade and Development Statistics (UNCTAD STAT). Population data are in millions while the value added shares in percentages. Though we calculated clusters for every year between 1993 and 2013, for space reasons table 2 presents only the results for 1993, 1998, 2003, 2008 and 2013. Note that the composition of clusters 3 to 6 in each of these 5 years does not evolve due changes in value added shares between couples of subsequent years, but on the basis of changes in value added shares over 1993-2013. However, the clusters composition changes from one year to the next because some countries graduated or move to the 'at war' cluster. Also, with the changes in the number of countries in clusters 3 to 6, the clustering algorithm may change the allocation of countries to the four groups at the margin. Overall, this approach reduces the number of countries changing cluster in relation to a methodology in which the countries are allocated to clusters on the basis of five year changes. This approach would have, however, increased clusters instability from one year to the next.

3 Clustering results

3.1 Country clusters and their evolution over time

The results of the clustering analysis are reported in table 2. The analysis refers to all countries that have been on the official LDC list over the two decades of the analysis. By 2013 five countries had graduated or are graduating in the near future, while the remaining 44 countries in 2013 were grouped as follows (table 2): six countries at war (13 per cent of the total); eight small/remote countries (18 per cent); six with an expanding share of the 'oil/mining sector' (14 per cent); nine with a rising share of agricultural value added (20 per cent) though economies belonging to other clusters still have high value added share in this sector (table 1); five with a still large agricultural sector but with a rising share of value added in manufacturing (11 per cent); ten with a rising share of services value added (23 per cent). As expected, the mean of the six clustering variables varies markedly across clusters, while the coefficient of variation of each cluster is smaller than the coefficient of variation of the LDCs as a group and of the other five countries combined. This confirms that the countries belonging to each cluster are similar among each other but differ from those in other clusters.

As in all country clustering exercises based on multiple clustering criteria, also our approach generates a number of 'borderline cases' that could be interpreted as misclassifications, but that are instead the result of the clustering rule adopted. One of such cases is Myanmar which has been industrializing over 1993-2013 (table 1) but that the CSP database on Major Episodes of Political Violence places in the 'at war' group due to the continued low intensity conflicts involving the Karen, Kachin, Shan and Rohingya minorities that have claimed thousands of little publicized deaths during the last two decades. The same applies to Lesotho that is included among the economies that recorded an increase in the value added share of the mining sector (that includes utilities) due to the growing importance of its diamond deposits and, especially, because of the royalties, value added and exports generated by the Lesotho Highland Water Project that brings water all the way to Johannesburg. A similar situation is that of Bhutan whose hydropower generation and exports should place it among the industrializing countries though, because of its small size (the second of our dominant clustering criteria), was classified among the 'small and remote countries'. A few other borderline cases can be singled out in table 1. Yet, though there are a few of such cases, the LDC classification in table 2 makes broad economic sense, though its results must certainly be interpreted keeping in mind the clustering rules followed.

To start with, in 1993-98 the number of LDC at war ranged between 10 and 12. This high value is explained to a large extent by conflicts in former 'client states' of the former Union of Soviet Socialist

Table 2

Evolution of LDC clusters over 1993-2013

Country clusters	1993	1998	2003	2008	2013
Countries that have graduated	(1) Botswana	(1) Botswana	(2) Botswana, Cabo Verde	(3) Botswana, Cabo Verde, Maldives	(5) Botswana, Cabo Verde, Equatorial Guinea, Maldives, Samoa
1. Countries at war	(10) Afghanistan, {Angola}, Burundi, Cambodia, Chad, Liberia, Myanmar, Rwanda, Sierra Leone, Somalia	(12) Afghanistan, Angola, Burundi, Dem. Rep. of the Congo, Eritrea, Ethiopia, Guinea-Bissau, Myanmar, Nepal, Rwanda, Sierra Leone, Somalia	(6) Afghanistan, Burundi, Dem. Rep. of the Congo, Myanmar, Nepal, Somalia	(6) Afghanistan. Central African Republic, Dem. Rep. of the Congo, Myanmar, Somalia, Yemen	(6) Afghanistan, Central African Republic, Dem. Rep. of the Congo, Myanmar, Somalia, Yemen
2. Small/remote countries (excluding Equatorial Guinea)	(11) Bhutan, Cabo Verde, Comoros, Djibouti, Kiribati, Maldives, Samoa, Sao Tome and Principe, Solomon Islands, Tuvalu, Vanuatu	(11) Bhutan, Cabo Verde, Comoros, Djibouti, Kiribati, Maldives, Samoa, Sao Tome and Principe, Solomon Islands, Tuvalu, Vanuatu	(10) Bhutan, Comoros, Djibouti, Kiribati, Maldives, Samoa, Sao Tome and Principe, Solomon Islands, Tuvalu, Vanuatu	(9) Bhutan, Comoros, Djibouti, Kiribati, Samoa, Sao Tome and Principe, Solomon Islands, Tuvalu, Vanuatu	(8) Bhutan, Comoros, Djibouti, Kiribati, Sao Tome and Principe, Solomon Islands, Tuvalu, Vanuatu
3. Countries that experienced a rise over 1993-2013 of the mining value added share	(6) Equatorial Guinea, Eritrea, Lao PDR, Lesotho, Mauritania, Yemen	(6) Chad, Equatorial Guinea, Lao PDR, Lesotho, Mauritania, Yemen	(8) Angola, Chad, Equatorial Guinea, Eritrea,Lao PDR, Lesotho, Mauritania, Yemen	(7) Angola, Chad, Equatorial Guinea, Eritrea, Lao PDR, Lesotho, Mauritania	(6) Angola, Chad, Eritrea, Lao PDR, Lesotho, Mauritania
4. Countries that experienced a rise over 1993-2013 of the agriculture value added share*	(8) Benin, Gambia, Guinea, United Rep. of Tanzania *Burkina Faso, Central African Republic, Mali, Niger*	(9) Benin, Gambia, Guinea, Liberia, United Rep. of Tanzania *Burkina Faso, Central African Republic, Mali, Niger*	(10) Benin, Gambia, Guinea, Liberia, Sierra Leone, United Rep. of Tanzania *Burkina Faso, Central African Republic, Mali, Niger*	(9) Benin, Gambia, Guinea, Liberia, Sierra Leone, United Rep. of Tanzania *Burkina Faso. Central African Republic, Mali, Niger*	(9) Benin, Gambia, Guinea, Liberia, Sierra Leone, United Rep. of Tanzania *Burkina Faso. Central African Republic, Mali, Niger*
5. Countries that experienced a 1993-2013 rise of the manufacturing value added share*	(5) Bangladesh, Dem. Rep. of the Congo, Guinea-Bissau, Madagascar *Uganda*	(6) Bangladesh, Cambodia, Madagascar, Mozambique, {Senegal} *Uganda*	(5) Bangladesh, Cambodia, Guinea-Bissau, Madagascar *Uganda*	(5) Bangladesh, Cambodia, Guinea-Bissau, Madagascar *Uganda*	(5) Bangladesh, Cambodia, Guinea-Bissau, Madagascar *Uganda*
6. Countries that experienced a rise over 1993-2013 of the services value added share	(8) Ethiopia, Haiti, Malawi, Mozambique, Nepal, {Senegal}, Togo, Zambia	(4) Haiti, Malawi, Togo, Zambia	(8) Ethiopia, Haiti, Malawi, Mozambique, Rwanda, Senegal, Togo, Zambia	(10) Burundi, Ethiopia, Haiti, Malawi, Mozambique, Nepal, Rwanda, Senegal, Togo, Zambia	(10) Burundi, Ethiopia, Haiti, Malawi, Mozambique, Nepal, Rwanda, Senegal, Togo, Zambia
TOT	**49**	**49**	**49**	**49**	**49**
On the LDCs list	**47**	**47**	**47**	**46**	**44**

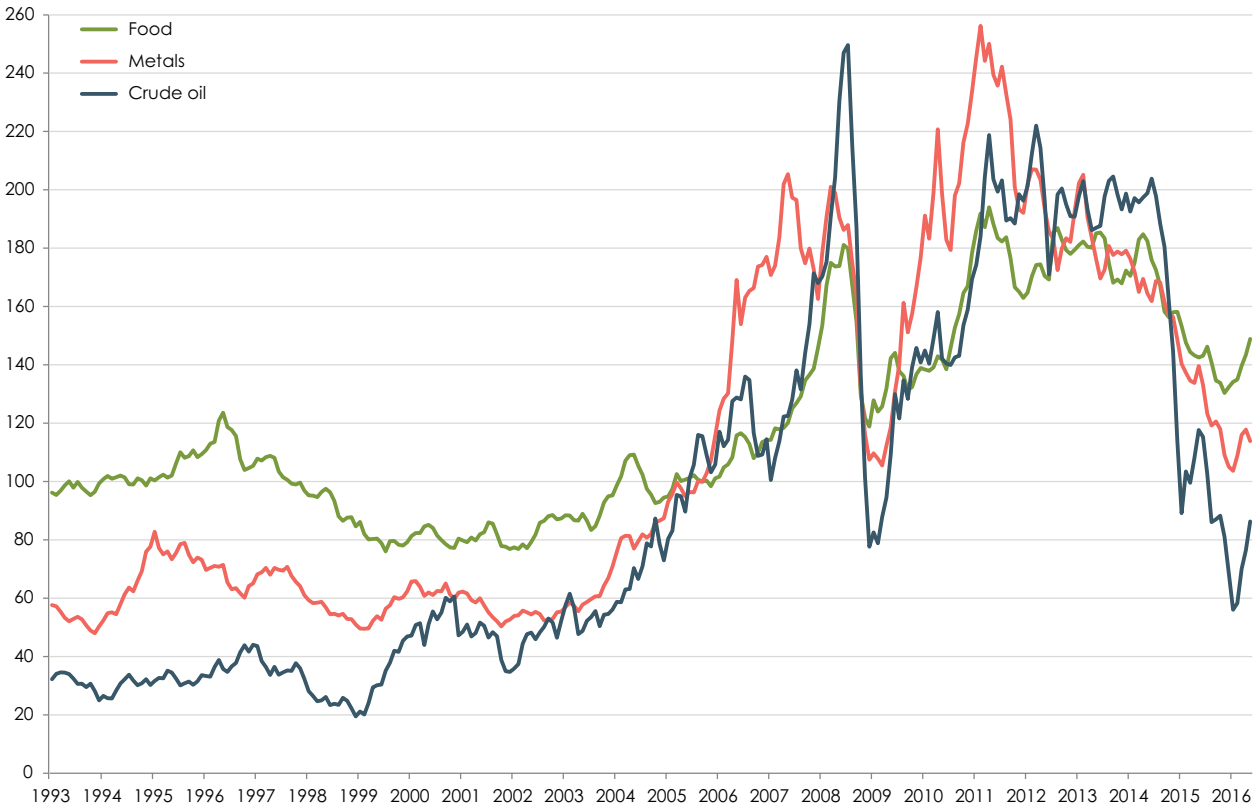
Source: Authors' elaboration on official data cited in text.

Notes: Countries in braces had not been included yet in LDCs list in the year of reference. The group 'Graduated' includes countries that have graduated and those that will graduate within a six year period; see text for explanation.

*Countries in italics are landlocked

Figure 1

Commodity price index (2005=100)



Source: IMF, World Economic Outlook Database (downloaded 20 June 2016)

Republics and the United States of America. With the disintegration of the former and withdrawal of military and financial support by both superpowers, the incumbents of these regimes often faced violent opposition by groups previously excluded from power. Other factors explaining the high number of conflicts include ethnic-driven power-struggles, stagnant growth, the impact of high population growth on limited resources, and 'greed wars'. Yet, by 2013 the size of this cluster fell in half, as countries formerly at war reached more stable political arrangements. However new types of conflicts – e.g. inter-ethnic (as in the Central African Republic) and due to religious tensions and a struggle over dwindling resources (as in Yemen) – have emerged. Preliminary data of the CSP database suggest that in 2014-15 also other LDCs (Mali, the Democratic Republic of the Congo and South Sudan) were at war.

Second, cluster 2 remained fairly stable due to no relevant changes in population size. The cluster size however declined from 11 in 1993 to 8 in 2013 due to the graduation of Cabo Verde, Maldives and Samoa (Vanuatu is expected to graduate in 2020). The high persistence of the cluster composition does not mean that the economic structure of these countries has not evolved (table 1). High transport costs, and a limited land base for agriculture and manufacturing forced these economies to further tertiarize (from already high levels), i.e. to graduate by relying on outmigration (Samoa), tourism (Maldives) and other services, while the value added share of agriculture and manufacturing generally declined.

Third, the countries belonging to the cluster with rising value added in mining first increased from 6 in 1993 to 8 in 2003 thanks to new discoveries

and the increase in the world prices of metals and energy, but then declined to 6 in 2013 as Equatorial Guinea moved to the 'graduated group, as it is will graduate in 2017, while Yemen moved to the group of countries at war. It is important to note that – as the clustering is done on the bases of the 'increase' of the value added share of mining – the group of economies dominated by mining is greater as it includes also those that did not expanded these activities but already in 1993 has a sizeable share of valued added in this sector (table 1). Changes in world commodity prices (figure 1), in particular between 2003 and 2013, impacted the size of this cluster.

Fourth, in cluster 4 there was a rise in the number of countries with a rising share of agricultural value added, indicating in some cases an increase in productivity, but in others a 'retreat to subsistence agriculture'. This emphasizes that the number of economies where such sector is dominant in 2013 is still very high (see table 1). Of the economies with a rising share of agricultural value added, four (declining to 3 in 2013) are landlocked Sahelian countries, whose efforts at modernizing are penalized by very high transport and communication costs.

Cluster 5 shows that only five countries (one, Uganda, is landlocked) witnessed an increase in their share of manufacturing over 1993-2013. If we combine this information with that of table 1 about the 29 LDCs that witnessed a decline in their 1993 share of manufacturing value added, we obtain a clear picture of the deindustrialization that has afflicted the African LDCs. In contrast, the situation is much more encouraging in the Asian LDCs.

Finally, cluster 6 shows than an increasing number of countries recorded a rise in the services value added share (though some of them still have a non-negligible share of agriculture, as shown in table 1). While modern services such as banking, insurance, tourism and government feature adequate labor productivity and wages, and facilitate the development of manufacturing and modern agriculture, 'informal services' consist of low value-added activities in petty trade, local transport, maintenance, and personal services. With no changes in policies, the premature development of informal services is likely to continue in the future (see section 5).

3.2 Summing up: a sub-optimal structural evolution of most LDCs

The size of the LDC group has changed little over time. Between 1993 and 2013 there were only three new entries, Angola, Eritrea and Senegal, (plus Timor-Leste and South Sudan that are excluded from this analysis due to lack of data) and five graduations (Botswana, Cabo Verde, Maldives, Samoa and soon Equatorial Guinea) with two more (Vanuatu and Angola) scheduled to graduate in 2020 and 2021. Of these seven countries four belong to the small population cluster and three to the mining group. In the first group graduation was achieved thanks to outmigration, high-scale tourism and fishing. In the second, thanks to 'luck', i.e. the discovery of valuable mineral deposits and increases in world commodity prices. No LDCs relying on agriculture, manufacturing and informal services graduated, and most of them remain mired in a low level equilibrium poverty trap. This suggests that while the standard LDC support measures may have at the margin a positive effect on their exports (Klasen and others 2015), they are not yet capable of triggering a broad-based development. While trade-promotion policies may generate an impact in a few countries, in others (little endowed with valuable exportable or lacking infrastructure) their impact may be non-significant. If this is true, broader cluster-specific support measures need to be introduced in the future to achieve graduation.

The analysis shows that LDCs' structural evolution over 1993 and 2013 has in most cases deviated from Rostow's standard 'stages of economic growth'. Obviously, such pattern of growth is not the only one that countries can follow for their development, as shown by the graduation of some 'small-remote countries', but slow progress or regression in agriculture and manufacturing is in most case an indication

of economic malaise, as they are not accompanied by the rise of alternative viable sectors but rather by an informal tertiarization. Things are obviously different in the small and mining countries, where the search for an alternative development path has been at times fruitful, but in others there was little, no, or negative structural evolution. What factors explain this fairly disappointing finding that affects most African LDCs but less so the Asian ones? The first is the persistence of war and acute political instability that affected between 12 and 25 per cent of all LDCs over 1993-2013. In such countries, the standard support measures have had by necessity a limited effect, as these need to be preceded or at least accompanied by pacification, reconstruction, and normalization of economic and social relations.

The remote and small countries cluster recorded the highest number of graduations thanks to a non-Rostowian development path supported by tourism, emigration and fishing. Due to this, and despite a medium level of GDP per capita, their economies are characterized by a high level of tertiarization – with services accounting for 55-75 per cent of total value added. As shown in Annex table 1, migrant remittances have represented for a few of them an alternative development strategy, as they account for more than 10 percent of GDP in seven (generally very small) LDCs, and range between 5 and 10 percent in another seven. However, such percentage shows very high fluctuations over time. Furthermore, the literature suggests that while remittances increase GNI per capita, consumption and wellbeing over the short-medium term, they do not increase investments and long term GDP growth (IMF 2005).

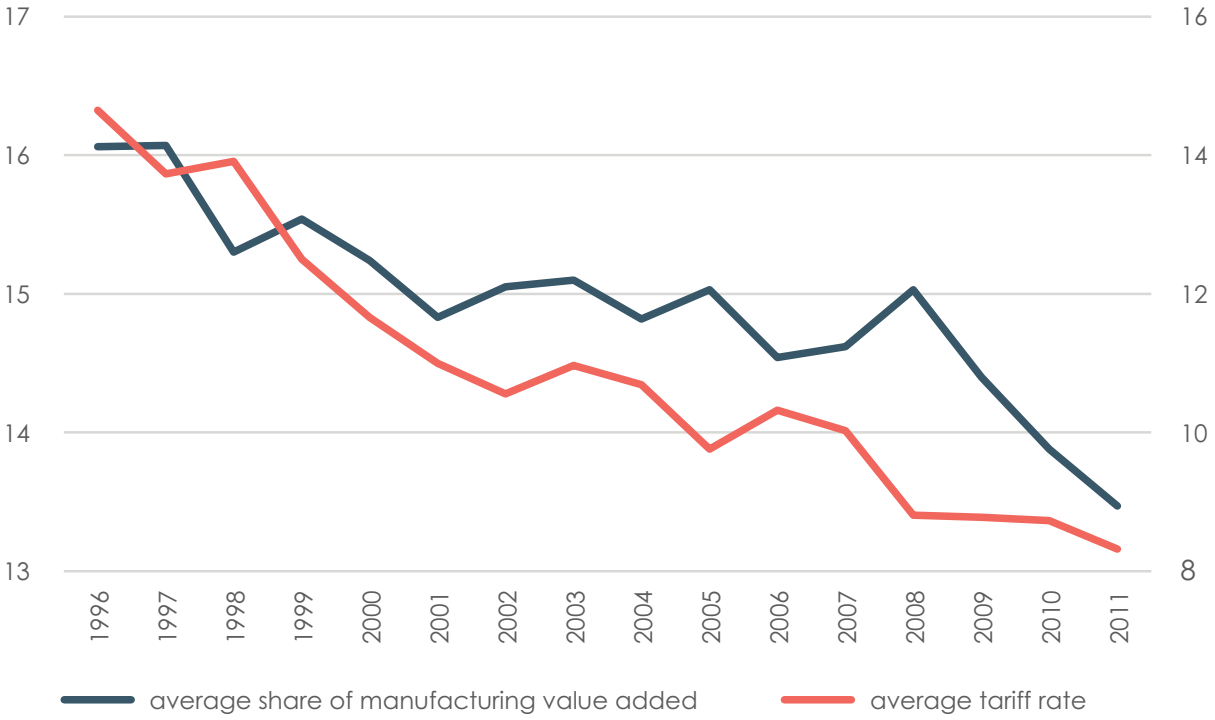
New discoveries and rising world prices (figure 1) have led to the graduation of Botswana and Equatorial Guinea. Yet, the development of mining entailed a drop of the value added share of the non-resource tradable sector (manufacturing and agriculture). Furthermore, graduation in the remaining mining countries requires an improvement in the HAI index that does not automatically follows from an increase in the share of mining in GDP. Other long term factors (discussed in section 5) need to be dealt with to make graduation permanent and achieve long term development. For instance, the high price instability of oil and metals (figure 1) may lead to de-graduation. Also this group did not benefit much from the standard LDC support measures, as the export of minerals and oil does not depend on such measures.

The small number of LDCs with an increasing share of manufacturing value added and the decline of manufacturing in many other is bad news for the LDC group. This was due in part to premature trade liberalization (figure 2) and the appreciation of the real effective exchange rate (REER), and in part to limited capital accumulation and foreign direct investment (FDI) inflows in sectors that in the past were often characterized by microeconomic inefficiency and inadequate infrastructure. This was however less the case for the Asian LDCs with closer links to the Chinese economy. Ceteris paribus, the group of manufacturing economies benefitted the most from the LDC support measures (duty-free quota-free access and other trade preferences). For instance, Bangladesh became an important exporter of readymade garments thanks also to these measures (Rahman 2014). Yet, such result was preceded by other improvements, i.e. an increase in land yields and overall agricultural productivity. In contrast, the 'retreat into subsistence agriculture' (as in a Burkina Faso and Niger) signals that the limited modernization of agriculture and related activities remains a major problem for the LDCs. Unless other paths to development are found (as in Botswana, Cabo Verde and Samoa), the stagnation or decline of land yields will retard the development of manufacturing and modern services. Specific measures are needed for this group of countries.

Finally, the rapid rise in the share of services value added (that now reach 50-60 per cent or more) in several LDCs (table 1), signals in part the failure to develop modern agriculture, manufacturing and complementary modern services. As mentioned, this is not true for the small and the Asian LDCs. But, in all others, the consumption of services did

Figure 2

Average regional tariff rate (right scale) and average share of manufacturing value added in total (left scale), 29 African countries, 1996-2011.



Source. Cornia (2015)
Note: Outliers (i.e. share greater than 30 and lower than 10 percent) were dropped.

not increase because consumer demand for food and manufactured goods got saturated, but because underemployed workers found refuge in informal services. Of course, the services sector includes also modern services (finance, insurance, modern transport, tourism and government services). Yet data for 11 middle-income African countries show that their combined value accounts only for 12-31 per cent of GDP, while that of informal services (commerce, restaurants, hotels, transport, and community and personal services) ranges between 12-42 per cent (GGDC 10-Sector Database). In LDCs this imbalance is likely to be greater.

Summing up, the persistence of some conflicts, deindustrialization, re-primarization, retreat to subsistence farming, premature tertiarization and urban informalization observed during the last 20 years in several (if not all) LDCs – especially in Sub-Saharan Africa – are indicative of a sub-optimal structural evolution of these countries despite a non-negligible GDP growth. For sure, there are examples of LDCs (as some small-remote and mining economies) that successfully leapfrogged the industrial phase and followed alternative development paths. Other positive examples, like Bangladesh and Ethiopia, followed successfully a Rostowian path. But, overall, the success cases are few. Indeed, many LDCs experienced a limited increase or a decrease of the size of the tradable sector. Such sector is characterized by scale economies, positive spillovers, learning by doing, higher productivity and positive balance of payments effects. This means that in many LDCs the usual package of support measures might have generated some benefits, but that their full impact was precluded by the problems illustrated at the beginning of this paragraph.

4 Clusters and their performance

In this section we examine by means of a panel regression analysis whether, after taking into account the impact of several control variables, the performance in terms of the three criteria used by the CDP to reach graduation[6] – i.e. GNI per capita, HAI and EVI – varies significantly across the six LDC clusters[7] identified above.

To test the above hypothesis we rely on the Mundlak (1978) estimator which runs a random-effects regression model by adding to the control variables (Z) not only the six cluster dummies (C) for the country groups identified above but also the time invariant mean of the country dummies $\overline{c_i}$. This technique is particularly indicated for our analysis because it estimates within-effects in random-effects models. Analytically, we start from the usual linear random effect panel-data model:

$$(1)\ Y_{i,t} = \beta_1 C_{i,t} + \beta_2 Z_{i,t} + \alpha_i + \varepsilon_{i,t}$$

where the subscripts 'i' and 't' refer to the countries and years analyzed, α_i is the time invariant country random effect, $\varepsilon_{i,t}$ the idiosyncratic error term, and β_1, β_2 and β_3 vectors of parameters. We then decompose α_i in the cluster level mean $\overline{c_i}$ and the time-invariant country unobservable term ω_i that is uncorrelated with the regressors. The model can thus be rewritten as:

$$(2)\ Y_{i,t} = \beta_1 C_{i,t} + \beta_2 Z_{i,t} + \beta_3 \overline{c_i} + \omega_i + \varepsilon_{i,t}$$

In this framework, for each dependent variable Y (i.e. GNI per capita, HAI and EVI), the performance of each cluster in relation to the pivot cluster (the group of countries that have graduated) is given by the sum of the statistically significant coefficients of the cluster dummies (C) and cluster means $\overline{c_i}$.

[6] For a detailed discussion on the LDC criteria and the identification process, see CDP and UN DESA (2015)

[7] The data on GNI per capita, HAI and EVI were provided by the CDP Secretariat.

4.1 Country clusters and their impact on GNI per capita

Between 1993 and 2013 the GNI per capita of LDCs diverged substantially. How can this growth-cum-divergence be explained? Did belonging to a cluster rather than another affect economic performance and GNI per capita? To answer this question, we estimate a Mundlak panel regression for the years 1993-2013 including dummies for the six clusters identified in table 2 and their period mean and assess their performance in relation to a comparator-pivot constituted by the countries that graduated or are about to do so. We introduced in regression the following control variables: the log of fixed capital formation; FDI/capita; the labor participation rate; the consumer price index (CPI) and the terms of trade. All these variables are taken from the World Bank's World Development Indicators (WDI) and UNCTAD STAT. As the purpose of this paper is to identify the relative performance of our six clusters, the above variables are used as 'plausible controls' and do not pretend to catch all the effects analyzed in detailed growth regressions. The sum of the coefficients of the six dummies and of their mean indicates whether – after taking into account the above control variables – belonging to a given cluster improves or worsens the GNI per capita growth performance in relation to the pivot. The regression was carried out on a panel of 44-47 countries (depending on the number of countries that had graduated) and 21 years, for a total theoretical number of 1,042 observations, which declines gradually to 851 in the case of model 4 due to missing data.

The results show that all control variables are statistically significant and with the expected sign, regardless of the specification chosen, suggesting that the estimated parameters are fairly robust. More important, model 4 shows that the sum of the parameters of the cluster dummies and, in few cases, of the cluster mean affect differentially and significantly the log of GNI per capita. In particular – relative to the pivot – belonging to the small/remote countries group helps performing better than in all other clusters, as their

Table 3

Mundlak regression with cluster dummies and cluster means (dependent variable: GNI per capita), 1993-2013

	Model 1	Model 2	Model 3	Model 4
Countries at war dummy	-2.6***	-2.5***	-1.5***	-1.2***
Small countries dummy	-0.8***	-0.3***	-0.3***	-0.2***
Oil & mining countries dummy	-2.3***	-2.2***	-1.4***	-1.1***
Agricultural countries dummy	-2.4***	-2.3***	-1.5***	-1.3***
Manufacturing countries dummy	-2.3***	-2.4***	-1.4***	-1.1***
Services countries dummy	-2.3***	-2.4***	-1.6***	-1.2***
Countries at war cluster mean	-0.4	-0.1	-0.9**	-1.4***
Small countries cluster mean	-0.6	-0.8*	0.0	-0.5
Oil & mining cluster mean	0.4	0.7	-0.0	-0.5
Agricultural cluster mean	-0.2	0.1	-0.4	-0.9**
Manufacturing cluster mean	-0.2	-0.2	-1.0**	-1.4***
Services cluster mean	-0.3	-0.1	-0.5	-1.0***
Labor force/population (%)	–	0.1***	0.0***	0.0**
Log Gross capital formation	–	–	0.4***	0.3***
Stock of FDI/capita	–	–	0.0***	0.1***
Terms of trade	–	–	–	0.0***
CPI (2005=100)	–	–	–	0.0***
Observations	1,021	979	967	832
R^2 within	0.2	0.3	0.7	0.7
R^2 between	0.7	0.5	0.7	0.7
R^2 overall	0.6	0.5	0.7	0.7

Source: Authors' elaboration in the text.

Note: *, ** and *** indicate that the estimated parameters are significantly different from zero at the 90%, 95% and 99% confidence levels.

coefficient is always the smallest, followed by oil and mining cluster. Furthermore, the war clusters always perform – as expected – significantly worse, while agricultural, services and, especially, the manufacturing clusters perform significantly worse than the oil-mining cluster.

4.2 Country clusters and their impact on the Human Asset Index

The second variables used for LDCs graduation is the HAI, which is the simple average of the following min-max standardized indexes: percentage of undernourished people, under-5 mortality rate, gross secondary enrolment rate, and adult literacy rate. In principle one may think that the countries (small and oil-mining) performing best for GNI per capita should record also in the case of the HAI index better results (i.e. smaller negative parameters in relation to the pivot), as higher households incomes should improve nutrition, health and education. Also in this case we introduce a number of control variables traditionally used in regressions of human wellbeing, i.e. access to fresh water sources, the measles immunization rate, female literacy, and total fertility rate, all taken from WDI, UNCTAD STAT and UNESCO. Other control variables (such as food intake, public expenditure on education as share of GDP, income inequality, and so on) could not be included for lack of data. As in the prior case, we also introduce in regression the yearly values of the six dummies and their period mean. The regression analysis is conducted on 44-47

Table 4

Mundlak regression with cluster dummies and cluster mean (dependent variable: HAI), 1993-2013

	Model 1	Model 2	Model 3	Model 4
Countries at war dummy	-12.2**	-8.5**	-1.1	-1.4
Small countries dummy	-13.1***	-8.6***	-6.4***	-1.6
Oil & mining countries dummy	-6.0	-8.1***	-1.6	0.9
Agricultural countries dummy	-10.3*	-10.6***	-6.3*	-1.6
Manufacturing countries dummy	-4.8	-6.3*	0.2	1.1
Services countries dummy	3.0	-1.1	2.7	2.3
Countries at war cluster mean	-40.6***	1.1	4.8	3.3
Small countries cluster mean	0.3	7.8	10.1	5.9
Oil & mining cluster mean	-35.8**	9.6	12.5	6.5
Agricultural cluster mean	-43.0***	-9.4	13.0	5.9
Manufacturing cluster mean	-30.0**	7.4	12.0	3.1
Services cluster mean	-48.6***	-9.9	3.6	1.1
Access to improved water sources	–	0.9***	0.7***	0.5***
Measles immunization rate	–	0.2***	0.1***	0.1***
Women literacy rate	–	–	0.5***	0.3***
Total fertility rate	–	–	–	-7.1***
Observations	1,013	969	788	788
R^2 within	0.1	0.7	0.8	0.8
R^2 between	0.6	0.6	0.7	0.7
R^2 overall	0.6	0.6	0.7	0.8

Source: Authors' elaboration in the text.

Note: *, ** and *** indicate that the estimated parameters are significantly different from zero at the 90%, 95% and 99% confidence levels.

countries with yearly data from 1993 to 2013 for a total of 1034 observations in model 1 that declines to 802 in models 3 and 4.

The results of the estimate show that the control variables are all highly significant and with the right sign and explain a considerable share of the HAI variance. The cluster dummies are statistically significant only in models 1 (no control variables) and in part in model 2 (only 2 control variables), while in models 3 and 4 the cluster dummies and their period means are all but one not statistically significant. This means that the clusters do not perform significantly worse than the pivot, as their real life different performance depends on the values of the control variables. Yet, as, we could not include all desired controls for lack of data, and since the R^2 in models 3 and 4 is 0.70-0.75, we also assess the relative clusters performance based on model 1 (no controls). In this case, the sum of the clusters and mean parameters shows that the best relative performance is recorded once more by the small and remote country cluster followed by the manufacturing cluster. Despite their good performance in terms of GNI per capita the oil-mining cluster performs in a mediocre way, while the clusters of agricultural, services countries and, especially, of the countries at war perform much less satisfactorily. These results are at variance with those presented in table 3 where the oil-mining countries, which perform among the best in terms of GNI per capita, are only third in the case of HAI.

Table 5

Mundlak regression with cluster dummies and cluster mean (dependent variable: EVI), 1993-2013

	Model 1	Model 2	Model 3	Model 4
Countries at war dummy	9.7***	9.7***	8.6***	9.2***
Small countries dummy	3.0***	3.0***	2.9***	2.9***
Oil & mining countries dummy	9.9***	9.9***	8.9***	9.2***
Agricultural countries dummy	12.6***	12.6***	10.5***	11.1***
Manufacturing countries dummy	10.1***	10.1***	9.2***	9.7***
Services countries dummy	10.0***	9.9***	9.1***	9.7***
Countries at war cluster mean	-8.3	-8.6	-8.9	-13.9
Small countries cluster mean	16.2*	16.2*	14.8*	9.4
Oil & mining cluster mean	-1.5	-1.5	-2.4	-4.7
Agricultural cluster mean	-9.3	-9.6	-11.9	-13.4*
Manufacturing cluster mean	-9.0	-9.5	-10.1	-11.9
Services cluster mean	-8.1	-8.3	-9.6	-11.9
Natural disaster dummy	–	0.2	0.2**	0.2*
Arable land per capita	–	–	13.3***	13.2***
REER instability	–	–	–	0.0***
Observations	999	999	978	901
R^2 within	0.0	0.0	0.1	0.1
R^2 between	0.4	0.3	0.2	0.1
R^2 overall	0.3	0.3	0.2	0.1

Source: Authors' elaboration in the text.

Notes: *, ** and *** indicate that the estimated parameters are significantly different from zero at the 90%, 95% and 99% confidence levels. In random effects models, adding a regressor that varies across countries and over time always increases the 'R^2 within'. In contrast, the 'R^2 between' could decrease (even if the number of observations does not change) because the between countries variance may decline following the inclusion of an additional regressor. The 'R^2 overall' is a weighted sum of the 'R^2 within and between', and its change depends on the respective weight of the 'R^2 within and between'.

4.3 Country clusters and the impact on the Economic Vulnerability Index

EVI summarizes the vulnerability of LDC to economic changes and natural disasters. It is obtained by aggregating two sub-indexes reflecting 'exposure to risk' (due to population size, remoteness, export concentration, dependence on the primary sector and share of coastal population living in low-lying areas) and 'risk of shocks' (due to export instability, number of victims of natural disasters, and the volatility of agricultural production).

Also in this case we tested whether, once taken into account the effect of a several control variables, belonging to a given cluster improves or worsens the performance in relation to the pivot. Yet, in this case the choice of the control variables explaining economic vulnerability turns out to be particularly complicated, as the EVI index includes no less than eight variables affecting instability, and we cannot choose as controls any of them or others closely correlated to them to avoid to come up with a tautological explanation of EVI or to run into endogeneity problems. In the end, we introduced only three control variables, i.e. a natural disaster dummy (taken from EMDAT), arable land per capita (taken from UNCTAD STAT) and the instability of the REER (taken from the Bruegel dataset), expecting all of them to have a positive sign. As usual, for the purpose illustrated above, we introduce also yearly values for the cluster dummies as well as their period mean. The regression analysis is carried out on 44-47 countries with yearly data 1993

to 2013 for a total of 1,020 observations in model 1 that decline to 921 in model 4.

The results of table 5 are both encouraging and surprising. Indeed, though all explanatory and dummy variables are statistically significant and with the expected sign, the R^2 statistics remain always extremely small (between 30 and 12 per cent), suggesting that other variables explain most of the variation of EVI across countries and over time. In terms of relative performance in relation to the pivot, the analysis suggest that the agricultural LDCs (often affected by floods, droughts, terms of trade shocks, volatile world demand and, at times, landlocked-ness, as in the Sahel) and the small and remote cluster countries (most of whom are located in the typhoon-affected Pacific Ocean) are by far the worst performers in terms of economic vulnerability. However, once controlling for natural disaster and land endowment (see model 4) the small countries perform the best due to their diversified economic structure and limited dependence from agriculture and goods exports. The remaining countries clearly do worse than the pivot, but are not too different among each other.

In conclusion, this simple econometric test shows that – after taking into account the effect of several control variables - belonging to one cluster or another affects substantially the probability of graduating. The small countries (that most closely resemble the pivot ones) are those that performed the best in terms of GNI per capita, HAI, though they are the worst in terms of EVI (but this is due to geographic characteristics rather than economic policies). As noted, however, after the inclusion of three control variables, the small countries perform the best also for EVI. As for the GNI per capita performance, also the oil-mining and to a lesser extent the services perform somewhat better than the remaining clusters and should thus have – ceteris paribus – a medium probability to graduate in the not too distant future. Yet, both oil-mining and services LDCs need to improve their performance in terms of HAI. In contrast, the countries belonging to the 'at war' and agricultural clusters perform poorly, either because turmoil and war disrupt economic activity and social sector activities aiming at improving social conditions, or because of stagnant land yields, lack of modernization of agriculture, vulnerability to climatic shocks and inadequate public infrastructure. It is therefore on these two disfavored clusters (and to a lesser extent the services cluster) that a broad-based international assistance should focus urgently to help them to exit from the low-level equilibrium poverty traps in which they have been caught for decades.

5 Cluster-specific policies to expand productive capacity in LDCs

In growth models, 'expanding productive capacity' generally means extending the land frontier, opening up new mines and oilfields, accumulating physical, infrastructural and human capital, technological capabilities, entrepreneurship, and intra-country/industry relationships that facilitate realizing economies of agglomeration[8] and intra-firm externalities. A socially acceptable income distribution (to avoid labor shirking and social conflicts) and efficient public institutions are also essential for growth. The ability to expand production depends also on macroeconomic signals (the exchange, wage, interest, and inflation rate, as well as the budget and balance of payments positions, and the debt/GDP ratio) and the extent of trade and financial liberalization. Finally, international economic conditions also affect the degree to which productive capacity can be efficiently increased, as LDCs are highly dependent on the international business cycle. Yet, macroeconomic conditions vary substantially among heterogeneous LDCs. This means that the standard LDC support package needs to be complemented by cluster-specific measures that are briefly discussed below, noting –

[8] For explicit linkage policies see http://unctad.org/en/Docs/diaepcb200918_en.pdf . For instance Thailand's Unit for Industrial Linkage Development is said to have been successful http://unctad.org/en/docs/iteipc20056_en.pdf

inter alia – that some of the policies recommended for individual clusters might be relevant also in other clusters. For instance, attracting foreign investment and technology transfer mentioned below for the manufacturing LDCs are useful as well for service or agriculture-dependent LDCs. Of course, the success of the policies reviewed below depends on political leadership. Latin America in the 2000s is a good example of how democracy and policies introduced by progressive regimes permitted to achieve both growth and equity (Cornia 2014).

5.1 Policies for LDCs at war

As noted in section 4, the LDCs at war recorded the worse GNI per capita performance, though UNCTAD (2004) found less extensive effects on exports (that in some cases originate from protected enclaves, whose control is in fact the cause of the conflict). Yet, the regression results in table 3 suggest that this cluster's GNI per capita performed comparatively worst in relation to all other clusters. As shown in figure 3 the origins of internal conflicts are quite different, and include factors such as ethnicity, the collapse of the Soviet Union (and the related vanishing of the aid provided by the Soviet Union and the United States of America to 'client states'), failed development, horizontal inequality (Stewart 2001) and 'greed wars' for the control of natural resources (Collier and Hoeffler, 2002; UNCTAD, 2004). Reducing the number of LDC at war requires introducing ex-ante measures to prevent the outbreak of conflicts, and ex-post measures to promote the country's pacification and reconstruction.

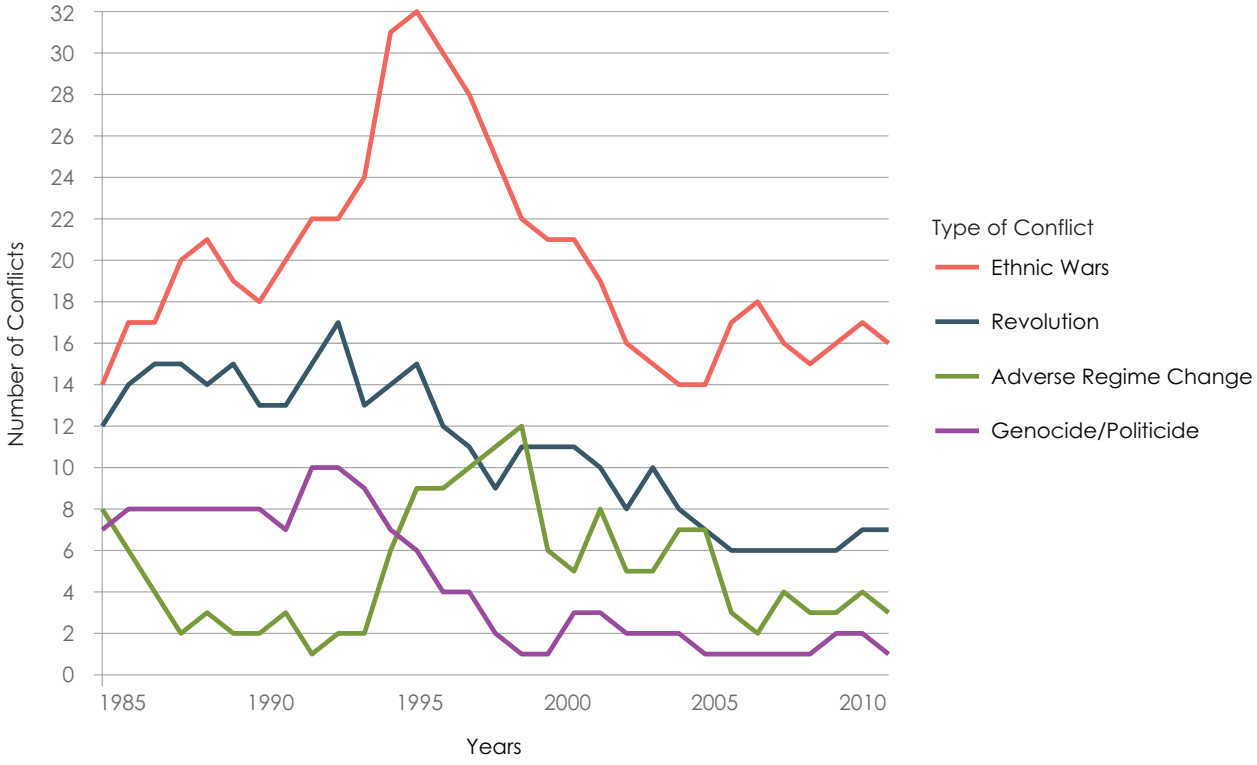
Ex-ante measures for conflict prevention include removing acute 'horizontal inequality'[9] between social groups in the distribution of assets, state jobs, higher education, top military positions, social services and so on. They should also aim also at avoiding the failure of the state and of political institutions that mediate the competing interests of different social classes. It is important in particular to avoid the collapse of the 'minimum state' (often caused by revenue crises) by ensuring that a sufficient amount of revenue is available for the functioning of essential services. Finally, conflicts are at times triggered by a protracted growth collapse (at times due to external shocks) that eventually transforms a country's 'exchange economy' into an 'economy of scarcity' and then into an 'economy of expropriation' and conflict. Under these circumstances, it is the interest of the international community to intervene early on with funds and technical and legal assistance, to prevent the much larger human and economic costs of conflicts and ensuing reconstruction. The literature on aid to countries at risk of conflict finds that in highly fragile states growth would be 1.4 percentage points lower in the absence of aid, and that most fragile states are under-aided with respect to other developing countries (McGillavray and Feeny 2008).

Ex-post reconstruction measures focus on guaranteeing security in LDCs previously at war. A peace agreement is a necessary but not sufficient conditions to return to normalcy. There is in fact an immediate need to demobilize, disarm and re-integrate former combatants (possibly with the help of peace-keeping forces); to organize the return and reintegration of displaced populations; grassroots level reconciliation; meeting the humanitarian needs of affected populations by improving food security, eliminating black market profiteering and rehabilitating essential social infrastructure. Next, reconstruction efforts should focus on rebuilding credible and well-regulated state institutions (central bank, treasury, revenue collection authority, police and judiciary), and laying the foundations for a democratic transition (African Union 2006). Once these key pillars have been rebuilt, economic policy should focus on the promotion of a broad-based recovery driven also by the private sector and FDI. In this regard, public

[9] A good example of the need for horizontal equality is given by South Sudan, where a biased distribution of economic gains led to frustration on the part of socially and geographically isolated communities. Whilst aggregate economic growth was high owing to oil revenues, few of the resource gains trickled down to the poor. Much more should have been done in the early days after independence to prevent such occurrence by means of a more equitable distribution of incomes and basic services.

Figure 3

Trends in the number of violent conflicts, 1985-2010



Source: Center for Systemic Peace (2016)

expenditure reforms to promote growth and poverty alleviation must avoid recreating conditions of 'horizontal inequality' (Addison 2003). In this regard, relation with donors are essential, especially in the initial phase. As an example, in the early years of post-war reconstruction in Mozambique, 87 per cent of the monetary GDP was constituted by foreign aid. Only after most of these measures have been implemented, LDCs formerly at war may be benefitting from the LDC standard support measures.

5.2 Policies for small and remote LDCs

As noted, countries in cluster 2 have a small land base and lack mineral deposits. Despite a small population, the pressure on land, fresh water and other resources is very high. All this precludes sizeable agricultural and industrial projects or leads to overspecialization on few items that exposes these countries to adverse terms of trade changes. In addition, distance from export markets entails high transport costs so that the few existing manufacturing activities must focus on high valued-added and low-weight items, the production of which requires a limited land area. Finally, most LDCs in this cluster are located in the South Pacific and are therefore exposed to natural disasters which are increasing in frequency, intensity and duration. They are also threatened by a long term rise in see level due to global warming. These countries have limited capacity to respond to these threats, as it is not possible to move to a high ground. For instance, Tuvalu is less than three meters above sea level and the tallest building on the island is three stories high.

As noted earlier, given all this the past development strategies of these countries mainly concentrated on migration, fishing, and tourism. Given their high population density and limited work opportunities, the Southern Pacific Islands and Cabo Verde

recorded a high rate of outmigration that generated remittances ranging between 10 and 20 percent of GDP (see Annex table 1). As for the future, the countries of immigration could consider reducing the barriers to the entry of migrants coming from countries affected by natural disasters and establish quotas for ecological migrants, not least for the 'temporary move of LDC service providers' within the context of Mode 4 negotiations under the General Agreement on Trade in Services (GATS) of the World Trade Organization (WTO). Yet, Australia and New Zealand have resisted accepting South Pacific migrants on a permanent basis, and have offered instead a highly successful seasonal worker schemes outside any trade agreement. Improvements in this area, a reduction of the cost of remittances and an improvement in working conditions would generate a steady flow of income to cluster 2 countries.

Practically all countries in this cluster are surrounded by waters rich in fish, but exploitation of this resource requires that their fishing rights are protected and possibly extended. Finally 60-70 per cent of their value added is generated by the services sector (table 1). In the LDCs belonging to such clusters, tourism generated an important share of GDP. Where tourism is a practicable option, one could consider adopting norms to attract FDI in this sector that – as discussed just below – plaid a key role in Mauritius's successful development.

Intensifying efforts in these three areas is a first way for expanding productive capacity in this cluster. Yet, one could also explore the possibility of implementing multi-steps strategies like those followed with success in Mauritius. In 1961, the Nobel Laureate James Meade declared the country 'un-developable' due to its isolation, lack of natural resources, small population (0.6 million), high inequality and ethnic tensions. The island survived for years as a sugar mono-culture that was its sole source of exports. But it then introduced a few export processing zones for the high-scale garment sector that raised substantially exports. When textile wages started rising, Mauritius diversified into tourism and – more recently – into offshore banking. This process was driven by domestic investments as well as by FDI in these three sectors (while they were forbidden in agriculture and commerce) – where they plaid a key role in transferring know-how, increasing capital accumulation and raising output (Blin and Ouattara, n.d.).

These LDCs also need special assistance to strengthen disaster resilience, and mitigation of climate changes. Without external support, it will take a long time to build locally these capacities. The following international support measures could therefore be considered: first, broaden the coverage of formal insurance mechanisms against co-variant shocks. As noted in Linnerooth-Bayer and Mechler (2008) in rich countries about 30 per cent of losses due to natural disaster (totaling about 3.7 per cent of GNI) were insured in the 2000s. In contrast, in low-income countries only about one per cent of losses (amounting to 12.9 per cent of GNI) were insured. Due to lack of insurance, a limited tax bases and modest donor assistance, many vulnerable developing countries are unable to raise sufficient resources to replace or repair damaged assets and restore livelihoods in the aftermath of natural disasters. Additional insurance measures could be introduced to improve such situation including catastrophe bonds, weather derivatives, and commodity indexed bonds. Such contracts may be costly, but this problem could be solved if an international public intermediary financed the cost of insuring against the above risks, or by pooling among countries non-covariant risks. The latter approach has been adopted by Caribbean Community that set up with the help of donors a Caribbean Catastrophe Risk Insurance Facility that pools the risks of several Caribbean countries and provides immediate liquidity in case of shocks for a much lower insurance premium than private insurers.

Finally, it should be possible to strengthen aid-based measures, including a global contingency fund, financed in advance by donors, providing resources to countries affected by severe shocks, or by earmarked international taxes on carbon emissions and other

activities that cause climate change. Initial fund to strengthen disaster resilience already exists (such as the United Nations Green Climate Fund, and the LDC Fund under the United Nations Framework Convention on Climate Change), though the countries included in cluster 2 claim that access to such funds is cumbersome.

5.3 Policies for mining-oil LDC

While experiencing over 1993-2013 a faster growth of GDP per capita and exports than LDCs belonging to clusters (tables 4 and 5), the mining-oil LDCs faces numerous challenges in the field of macroeconomic management, inequality, political stability, long term growth and human development. Also in this case, it is unlikely that the standard LDC support measures had an impact on the graduation of Botswana and Equatorial Guinea.

While new discoveries and gains in terms of trade accelerate short term growth, history and macroeconomics show that the mining-oil LDCs face several short and long term problems. In a classical article, Sachs and Warner (1995) show that over the long term countries endowed with abundant natural resources tend to grow more slowly and have higher income and asset concentration than other economies. One explanation of the slow growth is that manna from heaven leads to laziness and sloth. Another emphasizes that growth of the resource sector does not lead to broad-based development as mines/oil fields have small forward and backward linkages with rest of economy. Also, ex-ante uncertainty about future commodity prices reduces capital accumulation and investments in education.

Inequality and political stability are also affected. In this sector, production requires a lot of capital but little unskilled labor, while ownership of mines and mining rents are highly concentrated in the hands of multinationals and local elites. Yet, in countries with high income and wealth inequality, long term growth has been shown to be hampered by negative incentives, political instability and social conflicts (Cornia 2004). In extreme cases (Angola was a good example in the 1990s), resource rents (particularly from oil fields and diamond mines) may cause 'greed wars' between national factions aiming at capturing such rents.

Another problem are the long term fluctuation in the prices of metals, oil and cash crops as shown in figure 4 below. Such fluctuations, especially those due to the super-cycles documented by Erten and Ocampo (2012), threaten long term growth stability, fiscal revenue and public expenditures. As noted by Ocampo (2013), the commodity price booms that lasted till 2013 (figure 1) is likely to continue only if China, India and other large developing countries are able to de-link from the slow-growing OECD countries. Other problem concern the inability to diversify over the long term.

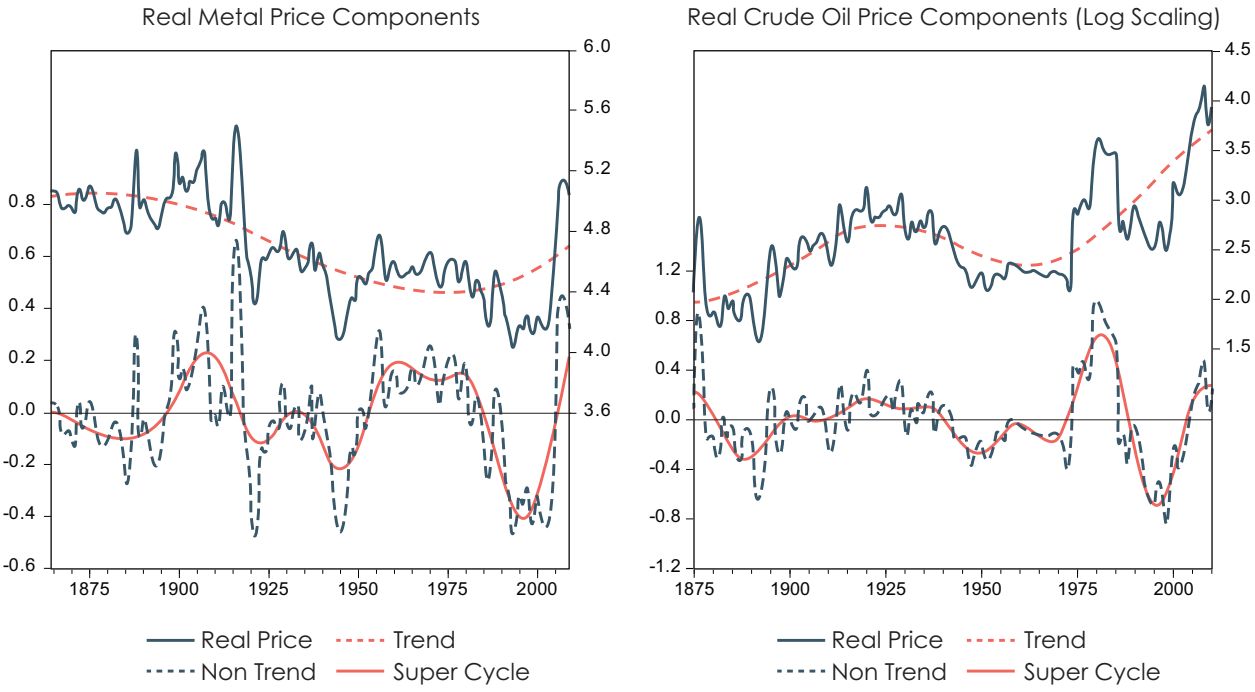
These LDCs face also more immediate problems: the first is the Dutch Disease. As shown by the Swan-Salter model, large inflows of export proceeds generate an increase in absorption that drives upward the price of non-tradables and typically causes housing bubbles. This causes a REER appreciation, the fall of manufacturing exports, de-industrialization and – once the mineral deposits are exhausted – slow long term growth.

There are, of course, virtuous examples of how resource-rich countries controlled such problems through policy action, as in the case of well-managed Botswana (that avoided the political problems of rent economies) and other countries. These examples and policies are reviewed briefly hereafter.

The first policy objective is to promote economic diversification and avoid re-primarization. A few mid-high income countries such as the Chile, the Netherlands and Abu Dhabi managed to diversify their economy and increase the export of non-resource tradables characterized by positive learning-by-doing externalities. The policy adopted in this regard included a stabilization of the exchange rate to avoid Dutch Disease effects. The same objective can also be achieved by 'sterilizing' the increase

Figure 4

Long term 'super-cycles' in the real prices of metals (left panel) and oil (right panel)



Source: Erten and Ocampo (2012)

in money supply due to a commodity bonanza by issuing state bonds that reduce the money in circulation Another approach relies on administrative measures that reduce the monetary base, for instance by encouraging domestic entities to invest abroad or asking banks to shifts their deposits at the Central Banks. Reaching the objective of diversifying the economy will also be facilitated by the adoption of an overall industrial policy (see later).

Policy measures can also moderate the impact of specialization in mining/oil on public finance and intra- and inter-generational inequality. Chile introduced a Copper Stabilization Fund to reduce the impact of price volatility on government revenue and the exchange rate. In years of high prices (relative to a long term benchmark set by law) the excess dollar receipts were placed in an offshore Copper Stabilization Fund without affecting the macroeconomy. These monies were re-injected into the national budget in years of low copper prices. Timor Leste's Oil Fund is an example of an LDC that successfully saved temporary windfall gains for future generations, although also in this case high commodity prices lead to fiscal laziness.

As for the impact on inequality, in the 2000s Plurinational State of Bolivia and other Latin American countries redistributed part of their resource rents to low-income people by means of non-contributory pensions and well targeted subsidies. Such approach reduced intra-generational inequality (Cornia 2014). In turn, inter-generational inequality improved in oil/gas producing Norway where the government set up an inter-generational Government Pension Fund that absorbs every year around 10 percent of GDP, depending on the level of oil/gas prices. The interests on this growing fund will be spent by the government to the benefit of future generations.

Additional policies are needed in LDCs part of this cluster as such nations are almost unavoidably affected

by fiscal laziness that postpone sine die much needed reforms to broaden the tax base. Yet, in years of low commodity prices, this stance entails that the budget deficit increases sharply or that public expenditure is cut. A broadening of direct and value added taxes and the removal of tax allowances and elusion are thus necessary, during periods of bonanza. Last, institutional reforms are needed to ensure transparency in the management of resource rents. The literature surveyed in Ndikumana (2014) indicates that at least eight percent of petroleum rents earned by oil-rich African countries with weak institutions ends up in tax heavens located in advanced countries.

5.4 Policies for agricultural LDC

Table 2 shows that the number of economies with a rising share of agricultural value added has risen, including in countries belonging to other clusters. Such phenomenon highlights a major problems faced by most LDCs, i.e. the limited diffusion of the Green Revolution, especially in Africa. A measure of this imbalance is given by the fact that in cluster 4 low land productivity entails that 50-70 per cent of labor is employed in agriculture that accounts however for only 25-35 per cent of GDP.

Due to low yields and rising population growth such countries produce today 30 per cent less food per person than in 1960s, though this trend has improved in the 2000s in part of Sub-Saharan Africa (Block 2010) and in Asia. By 2006, 35 LDCs were net food importers as well as recipients of food aid. Long term prospects are even more worrying, as by 2050 Africa (to which most LDCs of this cluster belong) will have to produce 300 per cent more food to feed its fast growing population of 2 billion. Under current policies, it is unlikely that several agricultural LDCs will 'graduate' as suggested also by the results of tables 4 and 6 that indicate that such kind of economies (a well as the services oriented ones and those at war) have a low chance to graduate due to their poor performance in terms of both GNI per capita (due also to a persistently very high population growth) and EVI. Graduation thus requires a major change in agricultural policies and greater efforts at reducing population growth (now running at around 2.8 per cent a year in African LDCs and at close to four per cent in Niger).

What factors explain the persistence of low land and labor productivity in agriculture? The main problem is the absence of modernisation of farming techniques. This is turn due to the 'policy neglect' of this sector that for long has been considered not as a growth driver but as a reserve of labour, food, raw material and savings to be transferred to the urban sector, as posited – inter alia – by the Lewis model. There are however examples of LDCs that have overcome this problems, including Bangladesh and Ethiopia. In this regard, table 6 shows that Bangladesh's growth acceleration during its first 15 years after independence was driven not so much by the export of ready-made garments but by a rapid increase in land yields and food output made possible by a Green Revolution pivoting around improved rice seeds, the spread of irrigation and fertilizers and the shift from one to three crops a year. Indeed, over 1974-80 and 1981-90 the Green Revolution and reduced female fertility explained between 45 and 75 per cent of a rising GDP per capita growth. The contribution of remittances and exports of garment started to be felt only in the 1990s. An equally encouraging example of agricultural modernization is provided by Ethiopia that between 2001 and 2012 increased its food production per capita by 70 per cent. Yet, the country remains vulnerable to recurrent droughts, such as the one of 2016, due to the low spread of irrigation. An expansion of productive capacity in this cluster requires overturning the past neglect and the prioritization of investments in agriculture, as suggested by the Ranis-Fei model, and as shown for instance by Ethiopia's Agriculture Development Lead Industrialization strategy. Given missing or incomplete markets and poor infrastructure, this objective cannot be reached only through a free-market approach, and requires also an active state intervention.

Table 6

Bangladesh: Average annual GDP per capita growth by policy driver over 1974– 2011, per cent.

	1974-80	1981-90	1991-04	2005-11
Fertility reduction	0	0.4	0.7	0.4
	2.6	35.9	22.5	8.2
Readymade garment industry	0	0.1	0.6	0.8
	0	6.6	21.8	15.4
ODA	0.3	0.1	-0.2	-5.0
	25.3	4.9	-7.8	-96.0
Remittances	0.2	0.1	0.4	1.2
	18.2	11.7	13.4	22.0
Green Revolution	0.6	0.5	0.6	0.7
	42.4	44.8	21.8	14.2
Other factors	0.2	0	0.8	2.1
	11.5	-3.8	28.4	40.1
Average GDP per capita growth	1.3	1.0	2.9	5.1
Standard deviation of GDP per capita growth	4.1	1.2	0.9	0.3

Source: Traverso (2015)

The measures needed to modernize agriculture broadly include: first, an acceptably egalitarian access to the land, to be achieved via a land reform or informal land titling by local authorities. The changes in land concentration in Sub-Saharan LDCs are not too encouraging (Cornia 2016). During the last 20 years tenancy reforms and land titling programs improved the security of tillers in some countries, but land concentration did not improve, while the Land Matrix database and FAOSTAT indicate that over 2000-2010 there were at least 25 land deals (or 'land grabs') in at least 17 LDCs. Such un-equalizing land deals have occurred also in countries with low land/man ratios. While, according to some, 'land grabs' in Africa may help accelerating output growth (but evidence in this regard is still limited, as these new ventures are still in their initial phase), at the same time they could raise income inequality and land concentration, as in a typical 'trade off'[10]. Indeed, in LDCs where land rights are uncertain and poorly protected, and land governance weak, land grabs can imply the eviction from the land of smallholders and pastoralists and a long series of legal litigations (Oxfam 2012).

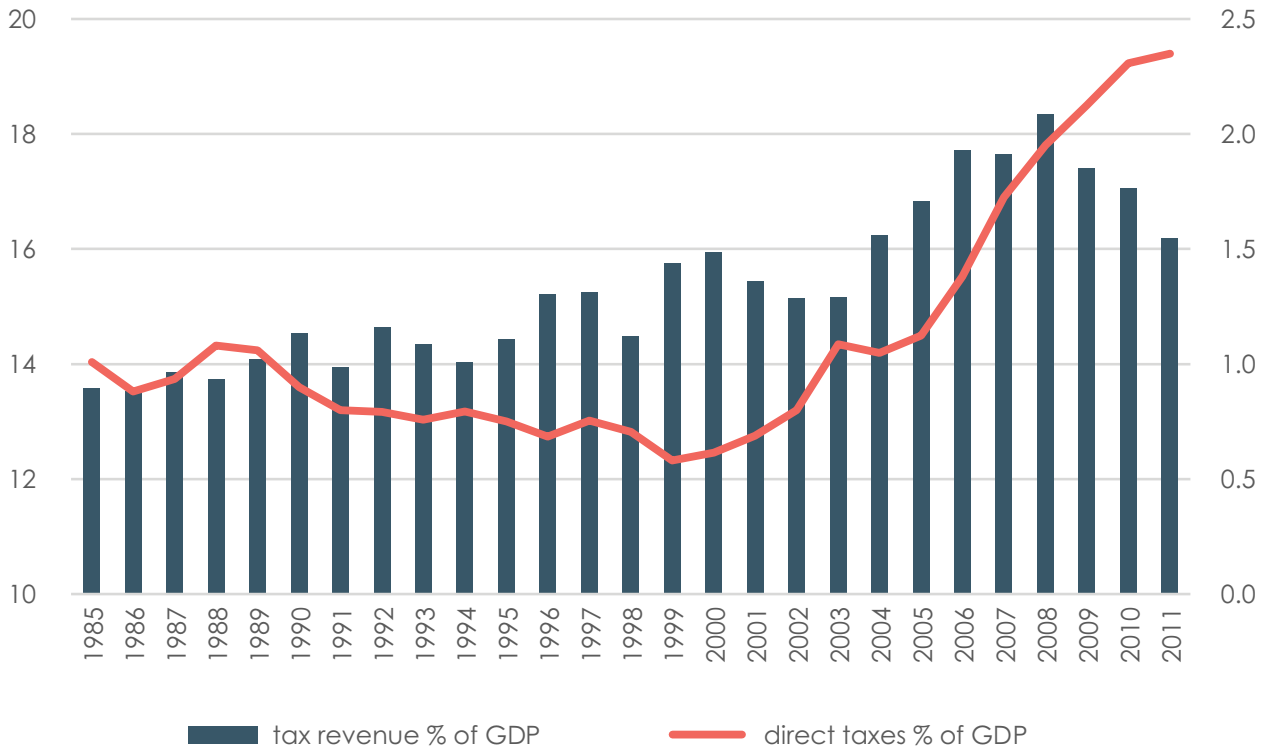
The second condition for the spread of the Green Revolution in African LDCs is that the use of improved seeds and modern inputs must increase. Where credit markets are absent, access to seeds and inputs may need to be subsidized. The wisdom of such policy has been frequently contested. But such programs are needed in countries – like Malawi – characterized by high population density, falling farm size, rising cost of imported fertilizers, skewed access to credit, and weak extension services. For instance, its 1998 government-subsidized Starter Pack Program (providing free small packs of high yielding maize and legumes' seeds and fertilizers enough for 0.1 ha) raised over 1998-2005 average household maize production by 125-150 kg (World Bank, n.d.).

Third, indigenous capacities to develop and adapt new farming technologies ought to be strengthened. Research and development (R&D) on local food crops has lagged behind – with the exception of the maize revolution of East Africa that raised food production

[10] http://www.tni.org/article/debating-global-land-grab.

Figure 5

Average regional tax/GDP ratio in Sub-Saharan Africa (vertical bars, left scale) and direct taxes/GDP ratio (right scale)



Source: Cornia (2016)

per capita therein between 2005 and 2011. Such policy requires increasing public expenditure to promote the diffusion of new technologies, strengthen indigenous farming capacities, and develop road infrastructure and electricity for storage and output commercialization. This means restoring budgetary support to LDC's agriculture, as this was eliminated during the 'get the prices right' era. The Consultative Group on International Agricultural Research centers and other organizations in this field should promote research on African crops, supporting R&D in national research institutions, and ensure that improved seeds remain (as they were in the past) 'international public goods'.

Fourth, growing public expenditure on agriculture needs to be accompanied by additional revenue generation. In this regard, figure 5 suggests that several African LDCs have already intensified their tax efforts, as shown by the gradual increase in tax/GDP ratio recorded since the early 2000s, while in several countries direct taxation rose as a share of the total. Last, agricultural LDCs may consider imposing countervailing duties on subsidized food imports from developed countries (that caused a declining food production and increased dependence on food import in many large African coastal cities), while at the same time lowering tariffs on seeds, fertilizers and transport equipment.

5.5 Policies for manufacturing LDCs

The industrial take-off of China, India and Vietnam was preceded by a rise in land yields and agricultural output driven by changes in institutions (e.g. an equitable land reform), domestic terms of trade and subsidization of modern inputs. The impact of a prosperous agriculture on industrialization is well known. Higher yields reduce the prices of food and lower real

wages in manufacturing and services, increase the supply of raw materials, create a market for manufacturing goods, and improve the balance of payments.

After this objective is achieved, there is need to diversify the economic structure by expanding manufacturing and modern services. In doing so, countries may choose to focus on an export-oriented strategy or rely on both domestic and export markets. However, the latter choice is available only to countries with a sufficiently large domestic market (i.e. with a population of at least 20-25 millions). This option is scarcely available to LDCs with a small domestic market. For them, specialization in a few manufacturing products or components to be exported is in order (together, as mentioned above, with the search for alternative development strategies).

What are the obstacles to industrial development in many LDCs? The main ones are a limited mobilisation of domestic savings (that are still low, but could be increased following for instance the example of the Asian Tigers in the 1950s and 1960s), lack of foreign investments, public infrastructure, skills, credit and financial services. As argued in section 3.2 and figure 2, premature trade liberalization and an appreciated real exchange rates were also responsible for the decline of manufacturing in LDCs.

How can capacity be expanded in this sector? To start with, it is necessary to increase the supply of public goods, in particular human capital and infrastructure (roads, markets, electrical grids, water systems, and harbors/airports). The literature on the 'crowding in' effect of private investments due to rising investments in public infrastructure supports this recommendation. Without such measures, the standard LDC preferential market access and aid-for-trade measures (potentially more effective in this than other clusters) likely have a limited effect. This is particularly true for small and undiversified LDCs. An improvement in business climate and a reduction of administrative barriers to export, access to credit, and technology are also needed.

Increasing private investments, especially in medium and large firms is of course a central issue. In LDCs private firms can scarcely self-finance their investments due to their limited cash-flow. They thus depend on expensive bank financing, the result of the under-banking of LDCs and the oligopolistic structure of this sector. FDI offers an opportunity to fill this gap, foster structural change and technology transfer, while generating positive spillovers. In a way, the insufficient industrialization of many LDCs is related to their inability to attract manufacturing FDI. The situation is more favourable in the Asian LDCs (table 1) while since 2000 FDI originating from China, India, Brazil and South Africa have increased, if from a low base (Chen and others 2015) following 'market seeking' strategies and to benefit from low labor costs. Most of these FDI focus on low value-added productions such as textile, clothing, leather and footwear, food processing, beverages, product assembling, metal products and printing. The LDCs receiving most FDI include Ethiopia, Rwanda, Uganda and United Republic of Tanzania (ibid.) as well as Bangladesh, Cambodia and Lao People's Democratic Republic. The concentration in labor-intensive but low value added activities is useful in the short run, but should be seen as a first step to integrate into Global Value Chains. The introduction of tax-free export processing zones (as done in China and Mauritius) may also help, as it would the establishment of joint-ventures[11].

An additional option is to promote Small and Medium Enterprises (SMEs), Chinese-type Town and Village Enterprises and rural non-farm (RNF) activities. These comparatively smaller units specialize in the production of a broad range of goods in sectors that can be efficient producing also on a limited scale, are

[11] The LDCs could try to benefit from Gerschenkron's 'advantage of backwardness', i.e. take advantage of their latecomer status in manufacturing production and engage in industrial leapfrogging, by missing out the stage of pollution-heavy, inefficient, low-level manufacturing and jump directly to green technologies as their price decline. An example of such leapfrogging is the rapid spread of cell phones that occurred in Africa well before the network of costly landlines was completed.

vertically integrated with the primary sector, produce goods that are consumed locally, or are heavy and therefore protected by high transport costs. Such strategy entails facilitating the creation and financing of SMEs. These have lower investment per capita, greater flexibility than firms, soak up surplus labour, modernise rural areas, and can spread also in regions with low savings. SMEs can also congregate in networks that attract international aid and FDIs to build 'hub-and-spoke' firms in which SMEs work as subcontractors, benefiting from the technical knowledge and spin-offs of skilled personnel of the 'hub' (the foreign firms). In several countries SME have gradually developed into middle-size firms, filling in this way the 'missing middle' in production A variant of this approach is to promote RNF activities producing locally traded goods produced in the livestock, fisheries, cottage industries, and services sectors demanded by local consumers. In China and Bangladesh 40-50 per cent of rural employment is in RNF activities, while in African LDCs it is much lower.

A strategy that promotes manufacturing needs to be supported by an overall 'open-economy industrial policy'. Such policy needs first of all to adopt a macro-policy that – in addition to creating export infrastructure – offers protection from competing imports. Such protection can be provided by WTO-compatible trade protection (in case of threats to the balance of payments), a devalued and stable exchange rate, and non-tariff barriers (like rules of origin and phytosanitary norms, that are widely used in the industrialized countries), an attraction of FDI, and private-public partnerships for the production of new goods, as done for instance in Chile's very successful salmon production and export.

5.6 Policies for service-oriented LDCs

The service sector is highly heterogeneous. It includes modern tradable and non-tradable services located mainly in urban areas[12] as well as a low-productivity sector offering some kind of livelihood to people with no better opportunities. Overall development depends crucially on services in the field of banking, insurance, utilities, transport, tourism, and public services (that as mentioned in section 3 in LDCs account for some 20-30 per cent of the total value added of the services sector). These are complementary to the growth of manufacturing, construction, rural non farming activities, and modern agriculture. In addition some tradable-services (e.g. in tourism, call centers, typesetting, accounting and other activities) have grown in importance. On the other side, the low-productivity (mostly urban) informal sector behaves like a 'sponge' that absorbs surplus labor unable to find employment in manufacturing or formal services. A faster development of manufacturing, utilities, construction and modern agriculture would by itself reduce the size of informal services, but often these sectors have grown more slowly than it was desirable. In this case, the size of the informal sector rose. In addition, given the very low rate of urbanization and still high population growth of many LDCs (especially in Africa), rural-urban migration is likely to accelerate in the future, and most new urban migrants will unavoidably have to seek jobs in the informal sector.

Policy measures for this cluster should thus follow a three-pronged approach. First and foremost, there is a need to introduce preventative measures that sustain the modernization and of agriculture, construction and manufacturing. If these develop, there will be fewer people engaged in 'livelihood activities' in the informal sector. The measures necessary to promote the growth of modern agriculture, construction and manufacturing have already been discussed above. Second, there is a need to help developing modern services. And third, especially if the two prior measures have failed, governments and aid agencies should aim at upgrading the productivity of informal activities. The informal sector is very heteroge-

[12] A detailed analysis of the heterogeneous structure of the services sector, and of the graduation opportunities of its various sub-sectors is necessary in each LDC or groups thereof.

neous and a disaggregation of its structure is needed before planning the most suitable interventions. Due to the complexity of this sector, the measures to promote formal services cannot be fully reviewed here. Suffice it to mention that the development of government services, infrastructure and utilities often entails an increase in public spending and so require an increase in tax revenue. Perhaps the most important related policy should focus on the creation of a de-repressed, accessible and – at the same time – strictly regulated financial and insurance sector. In this regard, the experience of Japan in the 1960s and Latin America in the 2000s may be a blueprint for action for many LDCs. Stiglitz argued that during the early phases of its development, Japan reached a high coverage of banking services thanks to its reliance on a widespread network of post offices. This reform helped raising savings deposit and providing credit to the productive sectors all over the country. In turn, Latin America – that had in the past over-liberalized its financial sector without increasing credit supply to the economy while experiencing considerable financial instability – introduced in the 2000s reforms that enhanced the capitalization, funding, and supervision of banks. It also introduced a stricter prudential regulation of the financial systems, enhanced risk-assessment mechanisms in large banks, developed appropriate legal and accounting frameworks, and reduced currency mismatches (Rojas-Suarez 2007).

As noted above, people enter the informal sector by default, i.e. due to lack of formal sector jobs and steady migration from rural areas. The informal sector comprises micro-firms of 1-5 people, is characterized by low levels of technology, and employs unskilled labor (but more recently also graduates), most of them women. Its entry (motivated mostly by economic survival) and exit are easy. The sector makes extensive use of local raw materials and produces for local markets. The main activities include food processing, making clothes, cooking utensils, small furniture and handicrafts, as well as building small houses and kiosks, or working as hairdressers, car washers, drivers of informal taxis and traders. The main obstacles to their development are lack of credit, skills, technology, space, access to water and electricity, and being subject to complicated administrative norms. Policy responses (ILO 2007) generally focus on breaking up informality while preserving its job-creation and income generating potential, by investing in the 'integrated urban local development'. This entails investing in human capital formation (e.g. via apprenticeship courses), facilitate access to improved technology and credit via bank-assisted credit unions and micro-credit institutions especially for women (as done in Bangladesh by the BRAC Bank), titling of public land used for production, improved supply of water and power, and affirmative policies that enhance social protection for informal sector workers. To see these measures implemented, the informal sector needs to organize itself and consult with government to frame policies in its favor.

6 Suggestions for macroeconomic policies to expand capacity in LDCs

It is impossible to define a universal package of macroeconomic policies for expanding production capacity in different clusters of LDC. Yet, some broad principles apply fairly generally (Rodrik 2003, Cornia 2005). These should focus on maintaining acceptable macro balances, while orienting the key policy tools (interest rate, exchange rate and financial regulation) to capacity expansion and the prevention of external and internal crises. The key elements of such policy common denominator are very briefly summarized hereafter.

To start with, LDCs should aim – whenever possible – at reducing dependence on foreign savings, lowering foreign indebtedness and mobilizing domestic savings. The experience of Japan and the Asian Tigers in the 1950s and 1960s – where domestic savings surged to finance both private and public investment – may be a source of inspiration.

As shown above, FDI can help expanding capacity and skills, especially if they are directed to industries with high-labor absorption. In contrast, portfolio flows cause problems and must be controlled, as countries relying on this kind of finance often end up in financial traps and suffer from a pronounced exchange rate instability. A key issue concerns the timing, duration and scope of capital controls. While the International Monetary Fund (IMF) now supports temporary controls on inflows during crises, the approach suggested here entails that they can be used as long as needed and be extended also to outflows. Capital accumulation thus needs to be funded mainly by increasing domestic savings, strengthening local banking institutions, improving the firms' incentives to invest, attracting FDI and introducing measures to discourage the massive capital flights common in several LDCs (Ndikumana 2014). In countries with low tax/GDP ratios, raising taxes and public savings is also an option to increase public investment and overall capital accumulation. The increase in tax/GDP ratios that has taken place in African LDC between the late 1990s and 2011 (figure 5) ought to be continued by broadening the tax base (i.e. by reducing tax holidays, exemptions and elusion) and improving tax administration (UNCTAD 2009).

The choice of the exchange rate regime is crucial. Where possible (i.e. except in LDCs part of monetary unions) the exchange rate should aim at promoting exports while reducing currency crises. Fixed-peg regimes have often lead to crises and may be useful only in very small countries. In most LDCs, countries may opt for a stable and competitive (REER) that has been shown to be a key factor for kick-starting growth and improving long-term performance (Rodrik 2003). In addition, LDCs should aim at achieving a broadly defined long term equilibrium of the current account balance. As argued above, the 'growth financed by foreign savings' paradigm should be reconsidered to avoid problems of foreign indebtedness and inability to control the exchange rate.

The free trade policies adopted in the 1990s have not been overturned during the 2000s. In many LDC they contributed to reprimarization, deindustrialization, informal tertiarization and overall informalization of the economy, as well as to a rise in income inequality. As shown in figure 2, a fall in tariffs has gone hand in hand with a shrinkage of manufacturing. As argued in section 5.5 the trade and exchange rate policy must thus be reconsidered so as to avoid a further collapse of the import-competing manufacturing sector, promote new industries, actively seek to diversify exports, and rebalance trade asymmetries with China and other emerging economies (Ocampo 2012). An appropriate exchange rate is necessary also to avoid that LDC's coastal cities become totally dependent on food imports while being delinked from their agricultural hinterlands.

Unlike in the past, fiscal policy should adopt a countercyclical stance during both crises and booms. The copper stabilization fund of Chile mentioned in section 5.3 is a good example of this policy that can be pursued also by means of pre-announced 'fiscal rules' and fiscal responsibility laws. There must therefore a shift away from Washington Consensus policies demanding quick budget cuts during crisis years, as such cuts reduce growth, investments and tax revenue over the short term, thus leading to an 'illusory fiscal adjustment'. In very poor LDCs, donor assistance needs to be raised on occasion of extremes external shocks. While deficits certainly need to be reduced, this should be done gradually, e.g. by 1-1.5 per cent of GDP a year.

Tax policy needs to be strengthened and – in the many LDC with very low tax/GDP ratios – tax revenue must be increased, while dependence on resource rents should be reduced, as discussed in section 5.3. Also in several LDCs, the last decade witnessed a fairly general rise in tax/GDP ratio (figure 5). Increases in commodity prices do contribute rising revenue, but what is needed is a broader and equitable tax reform, which helps raising badly needed public investments in infrastructure and human cap-

ital, both essential for expanding productive capacity and the private sector.

Also monetary policy can play a role in expanding productive capacity in LDCs. According to the orthodox stance, inflation is costly and affects the poor the most. However, in LDCs affected by structural rigidities driving inflation below 10 per cent is difficult and does not produce perceptible growth benefits while rapid disinflation generally causes a contraction of GDP and – because of the endogeneity of tax revenue to GDP – a widening of the fiscal deficit. As a result, a policy of high real interest rates should be avoided as it increases production costs and prices. While the control of inflation is sacrosanct, its target and the speed of its reduction must take into account the above considerations, and be broadly driven by flexible inflation targeting. This policy should help contain cost-push inflation and, at the same time, avoid a contraction in investment that depresses capacity expansion and long term growth. Last, monetary policy should aim at providing liquidity more broadly and focus on countercyclical regulation to prevent asset price bubbles leading to systemic crises.

Finally, as discussed in section 5.6, while in LDCs there is an urgent need to increase credit provision, this must be done while avoiding the creation of shadow financial institutions not subjected to Central Bank. LDCs thus require banking reforms and financial regulation like those mentioned in that section.

References

Addison Tony (2003), 'From Conflict to Recovery in Africa', Oxford University Press, Oxford.

African Union (2006), 'Policies on Post- conflict Reconstruction and Development' Policy framework adopted in Banjul, The Gambia, July. http://www.peaceau.org/uploads/pcrd-policy-framwowork-eng.pdf

Blin M. and B. Ouattara (n.d.), "Foreign Direct Investment and Economic Growth in Mauritius: Evidence from Bounds Test Cointegration", mimeo, SOAS, and University of Manchester.

http://www.socialsciences.manchester.ac.uk/medialibrary/economics/discussionpapers/EDP-0418.pdf

Block, Steven (2010),"The decline end rise of agricultural productivity in Sub-Saharan Africa since 1961", Working Paper 16481, National Bureau of Economic Research. http://www.nber.org/papers/w16481.

Chen, G., M.Geiger and M.Fu (2015), "Manufacturing FDI in Sub-Saharan Africa: Trends, Impact, Determinants, and Impact" A World Bank Report, 15 June 2.

Collier, P and A. Hoeffler (2002), "Greed and Grievance in Civil War", The World Bank Policy Research Working Paper n. 2335, The World Bank, Washington D.C.

Committee for Development Policy and United Nations Department for Economic and Social Affairs (2015), 'Handbook on the Least Developed Country Category: Inclusion, Graduation and Special Support Measures. Second edition". United Nations, New York.

Cornia, G.A. (2004), 'Inequality, growth and poverty in an era of liberalization and globalization' OUP.

Cornia, G.A. (2005), 'Pro-poor macroeconomics: Potential and Limitations" Palgrave-MacMillan.

Cornia, G.A. (2014), 'Falling inequality in Latin America: policy changes and lessons'', OUP.

Cornia, G.A. (2016), "An econometric investigation of the causes of Sub-Saharan Africa's inequality trends bifurcation over 1990-2011" UNDP- RBA.

Erten, B. and J.A. Ocampo (2012), "Super-cycles of commodity prices since the mid-nineteenth century", DESA Working Paper No. 110ST/ESA/2012/DWP/110, February 2012.

Gower, J. C. (1971), A general coefficient of similarity and some of its properties. Biometrics 27: 857–871.

Klasen, S. (2003), "In Search of the Holy Grail: How to Achieve Pro-Poor Growth?" October 2003, Discussion Paper n.93, Ibero-American Institute for Economic Research, Gottingen University.

Klasen, S., I. Martinez-Sarzoso and F.Novak Lehman (2015), 'Trade Preferences for Least Developed Countries. Are they Effective? Preliminary Econometric Evidence', PowerPoint. Georg August University.

ILO (2007), "Upgrading work and enterprises in the informal economy: Organizing for voice and participation" Geneva. http://www.ilo.org/wcmsp5/groups/public/---dgreports/---integration/documents/meetingdocument/wcms_084175.pdf

IMF (2005), "World Economic Outlook", IMF, Washington D.C.

Linnerooth-Bayer J. and R.Mechler (2008), "Insurance against Losses from Natural Disasters in Developing Countries" IIASA, Background paper for UN WESS, July 2008. http://www.un.org/en/development/desa/policy/wess/wess_bg_papers/bp_wess2008_mechler.pdf

McGillivray, M. and S. Feeny, (2008). 'Aid and Growth in Fragile States'. WIDER Working Paper 2008/003. Helsinki: UNU-WIDER.

Menchi-Rogai, L. (2012), "Democracy and Inequality in Sub-Sharan Africa", M.Sc. thesis, University of Florence.

Mundlak, Y. (1978), "On the pooling of time series and cross section data", Econometrica 46:69-85.

Mustafizur Rahman (2014), "Trade Benefits for Least Developed Countries: the Bangladesh Case: Market Access Initiatives, Limitations and Policy Recommendations' CDP Background Paper 018, UN-DESA, New York.

Ndikumana, Leonce (2014), "Capital Flight and Tax Havens: Impact on Investment and Growth in Africa", Révue d'Economie du Developpement, 2014/2.

Ocampo, J. A. (2012), "The Development Implications of External Integration in Latin America", WIDER Working Papers 2012/48, UNU-WIDER, Helsinki.

Ocampo, J.A. (2013), "Super cycles of commodity prices since the mid-nineteenth century" Presentation at the International Monetary Fund, March 20.

Oxfam (2012), "Our land, our lives: time out on the global land rush", Oxfam Briefing Note, October 2012. https://www.oxfam.org/sites/www.oxfam.org/files/bn-land-lives-freeze-041012-en_1.pdf

Rodrik, D. (2003), 'Growth Strategies'. NBER Working Paper 10050. Cambridge, MA: National Bureau of Economic Research.

Rodrik, D. (2013), "Structural Change, Fundamentals, and Growth: an Overview", Institute for Advanced Study September 2013.

Rojas-Suarez, L. (2007), "The Provision of Banking Services In Latin America: Obstacles and Recommendations" CGD Working Paper Number 124, June 2007, CGD, Washington.

Sachs, J. D. and A.M.Warner (1995), 'Natural Resource Abundance and Economic Growth', NBER Working Paper No. 5398, December 1995.

Stewart, Frances (2001), 'The Root Causes of Emergencies: An Overview', in, The Origins of Humanitarian Emergencies: War and Displacement in Developing Countries, edited by E. Wayne Nafziger, Frances Stewart and Raimo Väyrynen, WIDER Studies in Development Economics, OUP.

Traverso, S. (2015), "Escaping from low level equilibrium poverty traps: the case of Bangladesh", PhD term paper, University of Florence.

UNCTAD (2002), "The Least Developed Countries Report: Escaping the Poverty Trap". UNCTAD Geneva.

UNCTAD (2004), "The Least Developed Countries Report: Linking International Trade to Poverty Reduction". UNCTAD Geneva

UNCTAD (2009), "The Least Developed Countries Report: the State and Development Governance", UNCTAD, Geneva.

UNCTAD (2015), "The Least Developed Countries Report: Transforming Rural Economies", UNCTAD, Geneva.

World Bank (n.d.), "Jump-Starting Maize Production in Malawi through Universal Starter Packs". http://www.worldbank.org/html/extdr/fertilizeruse/documentspdf/MalawiSP.pdf

Annex

Table 1

Personal remittances in LDCs as percentage of GDP, ranked by the 2013 level

Country	1993	2003	2013
Nepal	–	11.9	30.7
Lesotho	–	57.5	21.7
Samoa	27.2	–	20.5
Gambia	–	11.1	20.0
Liberia	–	–	19.7
Senegal	–	–	10.8
Tuvalu	–	27.7	10.6
Cabo Verde	18.6	11.7	9.6
Kiribati	–	–	9.5
Togo	–	–	9.5
Bangladesh	–	6.2	9.0
Sao Tome and Principe	–	–	8.7
Mali	–	–	8.2
Guinea-Bissau	–	–	5.5
Madagascar	0.4	0.3	4.0
Uganda	–	–	3.7
Vanuatu	–	1.3	3.0
Benin	4.7	1.4	2.7
Myanmar	–	0.9	2.7
Djibouti	–	–	2.6
Solomon Islands	–	1.2	2.1
Burundi	–	–	1.9
Niger	–	–	1.9
Rwanda	–	0.5	1.6
Afghanistan	–	–	1.5
Guinea	–	–	1.4
Sierra Leone	–	1.9	1.4
Cambodia	0.4	2.8	1.1
Burkina Faso	–	–	1.0
Mozambique	–	–	1.0
United Rep. of Tanzania	–	0.1	0.8
Bhutan	–	–	0.7
Malawi	–	0.4	0.7
Timor-Leste	–	–	0.6
Lao PDR	–	–	0.6
Botswana	–	0.4	0.2

Source: Unctad-Statistics.

Note: No data are available for the remaining LDCs.