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How long will it take for LDCs and SIDS to recover from the impacts of COVID-19?

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ABSTRACT

The COVID-19 pandemic is entailing huge costs worldwide. To help developing countries formulate policy responses to minimize negative impacts of the COVID-19, possible size and duration of the shocks on most vulnerable countries, i.e., least developed countries (LDCs) and Small Island Developing States (SIDS), and their resilience to overcome the shocks need to be assessed. This paper quantitatively examines possible paths of LDCs and SIDS recovering from the impacts of the COVID-19 crisis, using an autoregressive model of income growth and a panel regression model of external demand for LDCs and SIDS. Evidence from the experience of the 2007-08 global financial crisis suggests that the income growth of LDCs and SIDS had not recovered to the level of pre-crisis rates even 5 years after the crisis. This suggests a slower recovery for many LDCs and SIDS, while developed economies were able to achieve a quick recovery. The magnitude of current COVID-19 crisis relative to previous shocks is unknown, and so the regression analysis suggested that, if income in advanced economies fell by 6 per cent in 2020 and bounced back in 2021, growth of per capita income in LDCs and SIDS may need about 4 to 5 years to be able to return to the projected path under the baseline scenario without the COVID-19 crisis. The actual speed and duration of recovery in LDCs and SIDS are likely to be slower and longer, considering other factors, such as additional impacts from shocks related to commodity prices and climate change.

JEL Classification: E17; F47; O10; O47; O57

Keywords: COVID-19; forecast; business cycle; least developed country; Small Island Developing States

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I Introduction

The COVID-19 pandemic is inflicting high human costs worldwide, and the worst is yet to come. The health crisis will bring a severe impact on the economic activity in the coming months and years. While there is a great deal of uncertainty, estimating the magnitude of the impacts is a critical starting point to formulate policy responses. UN DESA predicts that, in the worst-case scenario, the global output would contract by 0.9 per cent in 2020, instead of the previous projection of positive 2.5 per cent (UN DESA 2020). IMF estimates the global economy to contract by –3 per cent in 2020, and bounce back to grow by 5.8 per cent in 2021 as economic activity normalizes, if appropriate policy support is in place. (IMF 2020). The WTO said global trade would fall in 2020 by between 13 and 32 per cent (WTO 2020). According to ILO, working hours will decline by 6.7 per cent in the second quarter of 2020, which is equivalent to 195 million full-time workers (ILO 2020).

The pandemic threatens to impact the least developed countries (LDCs), and Small Island Developing States (SIDS) disproportionately. While it is still not clear how big the potentially devastating impacts on human health in those countries would be, the social and economic effects of sudden shutdowns of the global economy will hit the vulnerable countries through diverse channels. The lack of domestic financial resources, high debt levels and fragile health systems present an urgent challenge. As the trade impacts of the pandemic are emerging, an estimated $50 billion drop in global exports in February 2020 alone, this is to severely compromise the ability of vulnerable countries to access what are increasingly precarious international markets (OHRLLS 2020).

While the cause and nature are different, the experience of the global financial crisis 2007-2008 would be a good starting point to describe possible paths of LDCs to recover from the current COVID-19 crisis. The initial impact of the global financial crisis was estimated to amount to a total income loss for the LDCs of about $71.5 billion in 2009. This was about 30 per cent of the GDP of the affected LDCs and compares with $28.2 billion net ODA received by the LDCs in 2006 (OHRLLS 2009). Some argue that for many individual LDCs, 2009 was not extraordinarily worse than expected, partly helped by their limited integration in the global trade and financial markets (Audiguier 2012). Others find substantial and persistent output and growth loss for LDCs because of the fall in external demand and terms of trade shocks (Bhattacharya and Dasgupta 2012).

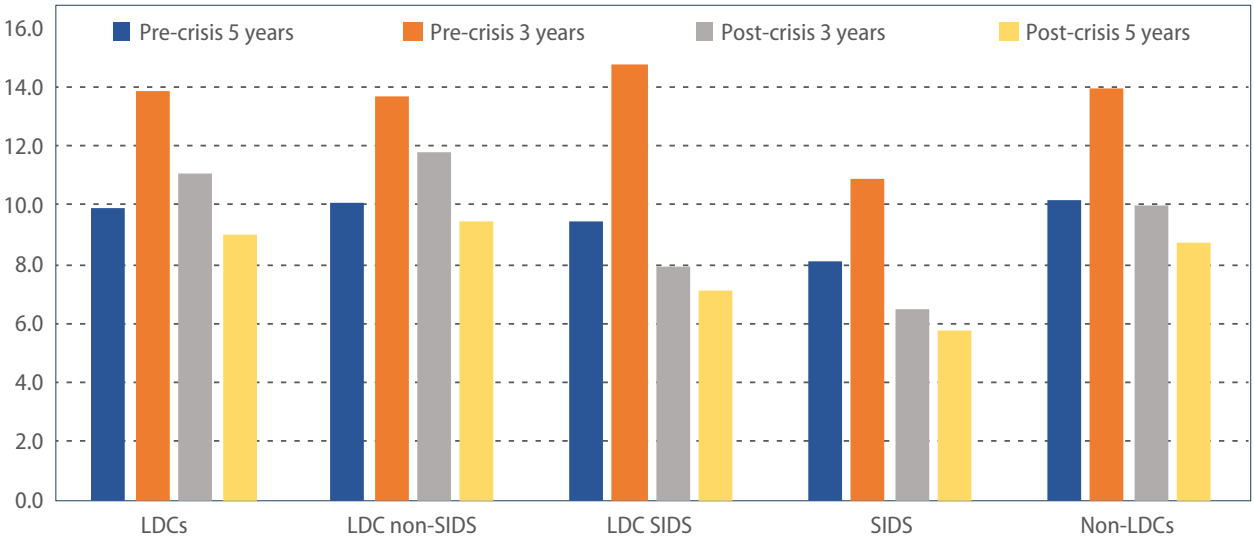
The Covid-19 shock is still ongoing and thus its overall impacts are difficult to predict. But there are clear indications that developing countries, particularly vulnerable countries such as LDCs and SIDS, will face much bigger challenges compared to the 2007-08 global financial crisis, for a number of reasons (UNCTAD 2020). First, the full effects of the health crisis have yet to hit many developing countries. Second, many of the conditions that produced a sharp rebound in developing countries after 2010, such as China's rapid growth, are no longer present or much weaker. Third, the strong recovery in developing country trade that occurred in 2010 seems less likely this time. Fourth, the current fall of commodity prices has started from a lower value compared to what happened in 2007-08 when the world economy was at the peak of the "super commodity cycle", and it appears to be broader. Fifth, new vulnerabilities such as debt risk and climate change, have emerged that are likely to hold back growth in developing economies. Lastly, the compound impacts are likely to be larger than a simple sum of individual hazards arising from the COVID-19 crisis, commodity market shocks, and national hazards.

This paper quantitively examines possible paths of LDCs, SIDS and subgroups of countries recovering from the impacts of the COVID-19 crisis. Section 2 reviews the experience of country groups regarding the recovery from 2007-08 global financial crisis, Section 3 predicts a possible path of growth, and Section 4 concludes.

2 Evidence from 2007-08 Global Financial Crisis

Changes in criteria used for identifying LDCs are reviewed to sketch impacts of the 2007-08 global financial crisis on LDCs and SIDS.[1] Figure 1 presents the 3-year and 5-year pre-crisis and post-crisis averages of GNI per capita. For LDCs, the average growth of GNI per capita fell from 13.9 per cent to 11.0 per cent when comparing 3 years before and after the crisis. It changed from 9.9 per cent to 9.0 per cent when comparing 5 years before and after. 27 out of 47 LDCs experienced reduction of growth rates, and the negative impacts were larger, 8.7 percentage point decrease comparing 3 years before and after the crisis.

Figure I
GNI per capita growth, 3- and 5-year average pre- and post-2007-08 crisis



Source: Author's calculation from United Nations Committee for Development Policy Secretariat, Time series estimates of the LDC criteria, 12 April 2020.

Table 1
Growth rate of GNI per capita pre- and post- 2007 global financial crisis

GNI per capita	LDCs	LDC non-SIDS	LDC SIDS	SIDS	Non-LDC developing countries
Number of countries	47	38	9	32	96
Pre-crisis 3 years average change (%)	13.9	13.6	14.7	10.9	13.9
Post-crisis 3 years average change (%)	11.0	11.8	7.9	6.5	9.9
Number of countries with reduced rate of change	27	20	7	32	68
Average difference for countries with reduced rate of change (percentage point)	-8.7	-8.3	-9.9	-6.7	-7.7
Pre-crisis 5 years average change (%)	9.9	10.1	9.4	8.1	10.2
Post-crisis 5 years average change (%)	9.0	9.4	7.1	5.8	8.7
Number of countries with reduced rate of change	27	20	7	30	61
Average difference for countries with reduced rate of change (percentage point)	-5.7	-6.0	-4.8	-4.9	-6.2

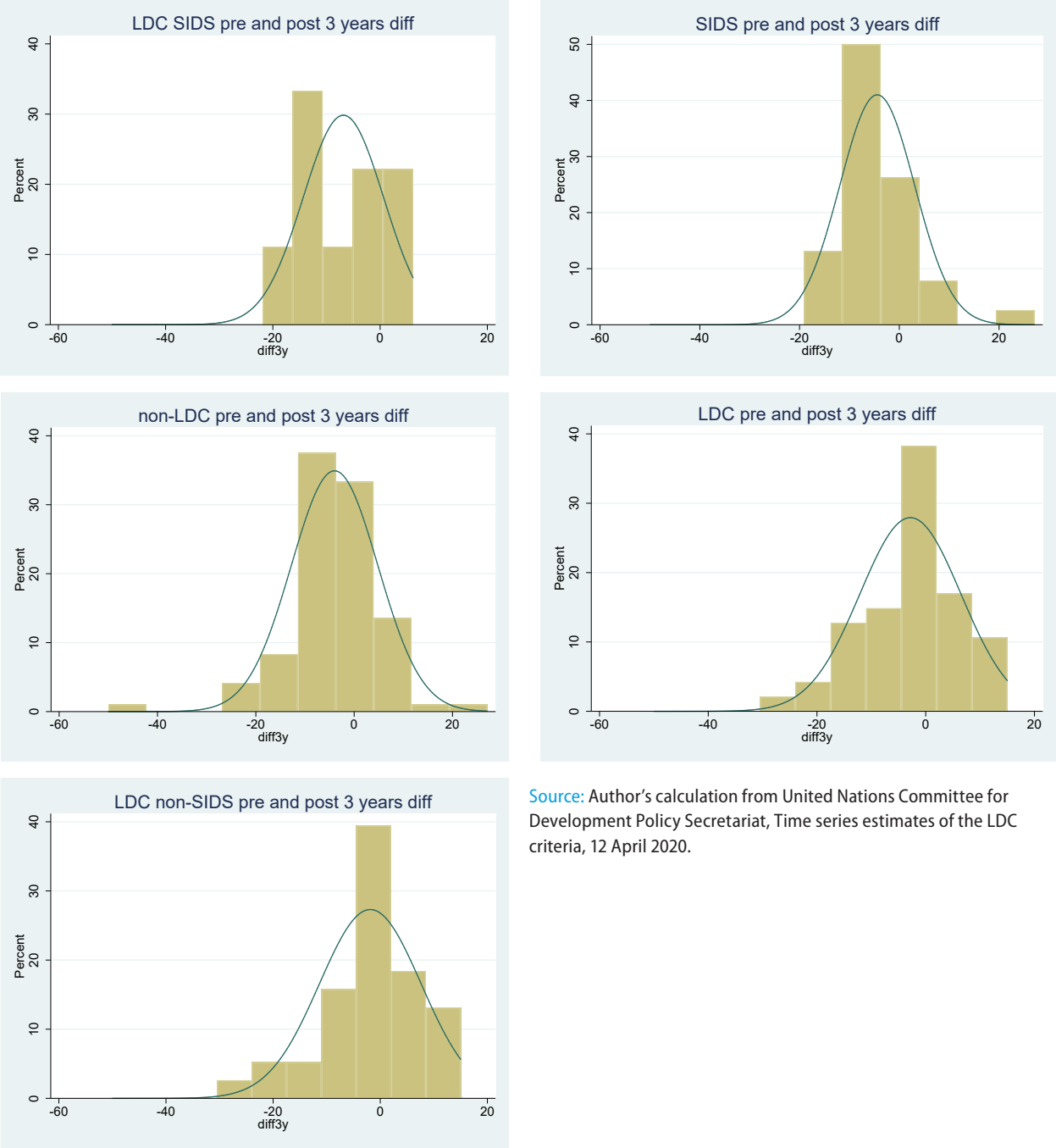
Source: Author's calculation from United Nations Committee for Development Policy Secretariat, Time series estimates of the LDC criteria, 12 April 2020.

1 See the list of LDCs at https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/ldc_list.pdf; The list of SIDS is at http://unohrlls.org/about-sids/country-profiles/; Non-LDCs are the developing countries (low and middle income countries defined by the World Bank), excluding LDCs. World Bank's country classification is at https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups

Small island LDCs were hardest hit by the crisis. The average growth fell almost half, from 14.7 to 7.9 per cent compared to 3 years before and after the crisis (see table 1). Almost all LDC-SIDS had a lower growth after the crisis, with 6.7 percentage point reduction for 3 years after the crisis, and 4.9 percentage point reduction for 5 years after the crisis. This is consistent with large impacts indicated in SIDS.

Figure 2 further illustrates the distribution of countries by changes in GNI per capita growth. A lot more countries showed decrease in their growth rates in all country groups, and particularly in LDC-SIDS.

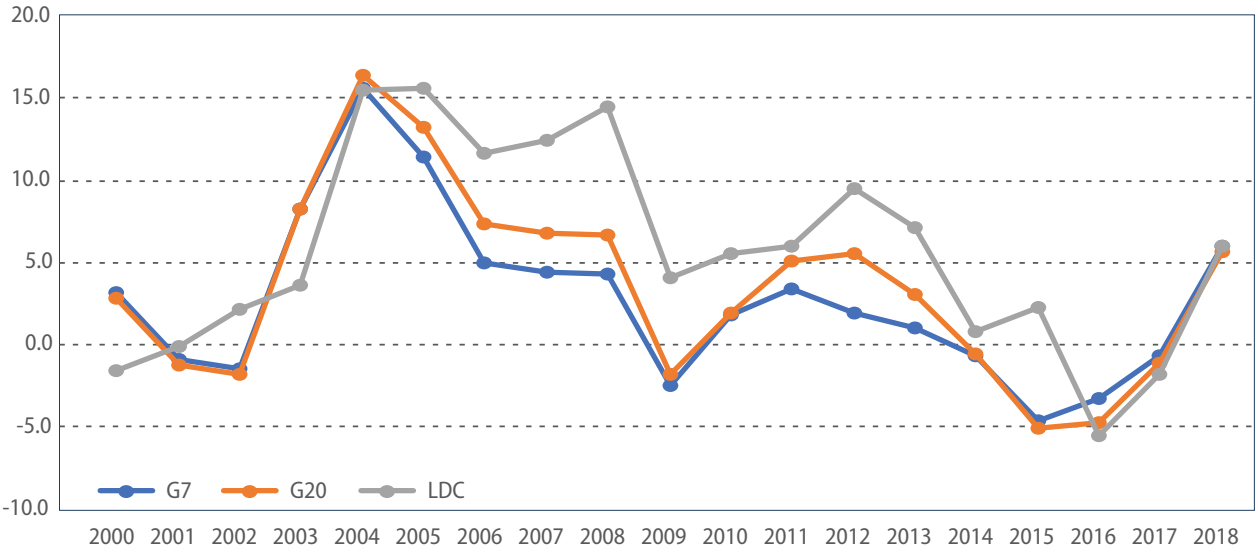
Figure 2
Distribution of countries by changes in GNI per capita growth, post crisis minus pre crisis 3-year averages



Source: Author's calculation from United Nations Committee for Development Policy Secretariat, Time series estimates of the LDC criteria, 12 April 2020.

The recovery was slower for LDCs and SIDS, comparing to that of advanced economies. Figure 3 presents the annual growth rate of average GNI per capita in G7 and G20 countries.[2] Following the financial crisis, the income growth hit the bottom at -2.5 per cent for G7, and -1.8 per cent for G20. Then all economies quickly rebounded in 2010 and 2011, suggesting a V-shaped recovery in advanced economies (UNCTAD 2020). While the shocks from the financial crisis on advanced economies were long-lived, the impacts lingered longer in LDCs, as suggested by delayed recovery in 2009-2012.

Figure 3
GNI per capita annual growth rate (%), annual, G7, G20, LDCs averages, 2000-2018



Source: Author's calculation from World Bank, World Development Indicators, accessed 25 April 2020.

On the other hand, LDC criteria on human assets or economic vulnerability were not affected heavily by the crisis (see table 2 and 3). The reasons are: 1) the Human Assets Index (HAI) and Economic and environmental vulnerability index (EVI) consist of multiple indicators which smooth out different impacts across indicators[3]; 2) some of the sub-indicators are in a form of averages over years, e.g., export instability, which smooth out short term shocks over time; 3) some of the sub-indicators, e.g., adult literacy rate, are not affected by short term variations in economic factors.

In sum, the income growth of LDCs and SIDS had not recovered to the level of pre-crisis rates even 5 years after 2007-08. This suggests a low resilience with a slow recovery for those vulnerable countries, while the advanced economies were able to quickly rebound right after the crisis. But the duration of recovery from 2007-08 crisis was affected by many factors in the subsequent years.

While the evidence from the 2007-08 suggest useful information for projecting the impacts of COVID-19 pandemic, it is important to note the similarities and differences between the 2007-08 financial crisis and the COVID-19 crisis.[4] Similarities are, among others: (1) Uncertainty: both crises share uncertainty as a key factor after they broke out in the leading economies like the United States in 2007 and China in 2019 and

2 The GNI per capita growth is calculated in current USD. The exceptionally high growth in 2004 was driven by the expansion of the world economy, led by China, India, Brazil, Indonesia, United States and some European countries.

3 See LDC Handbook for details of the LDC criteria and subindicators, at http://bit.ly/ldchandbook2

4 There are many articles, for example, Strauss-Kahn (2020), Lustig and Mariscal (2020), and Sheiner (2020)

Table 2
Annual rate of change for HAI, pre- and post- 2007-08 global financial crisis

Human Asset Inex (HAI)	LDCs	LDC non-SIDS	LDC-SIDS	SIDS	Non-LDC developing countries
Number of countries	47.0	38	9	38	96
Pre-crisis 3 years average change (%)	5.3	5.9	2.3	0.8	0.8
Post-crisis 3 years average change (%)	4.8	5.4	2.0	0.7	0.9
Number of countries with reduced rate of change	22.	17.	5	25	56
Average difference for countries with reduced rate of change (percentage point)	-3.5	-4.2	-1.2	-0.6	-0.6
Pre-crisis 5 years average change (%)	4.9	5.5	2.2	0.8	1.0
Post-crisis 5 years average change (%)	4.5	5.0	2.5	0.8	0.8
Number of countries with reduced rate of change	23.	18.	5	26	65
Average difference for countries with reduced rate of change (percentage point)	-2.8	-3.4	-0.9	-0.5	-0.6

Source: Author's calculation from United Nations Committee for Development Policy Secretariat, Time series estimates of the LDC criteria, 12 April 2020.

Table 3
Annual rate of change for EVI, pre- and post- 2007-08 global financial crisis

Economic and environmental Vulnerability Index (EVI)	LDCs	LDC non-SIDS	LDC-SIDS	SIDS	Non-LDC developing countries
Number of countries	47	38	9	38	96
Pre-crisis 3 years average change (%)	-0.2	-0.1	-1.0	0.4	0.0
Post-crisis 3 years average change (%)	-0.1	-0.1	-0.2	-0.4	-0.4
Number of countries with reduced rate of change	21.	16	5	13	37
Average difference for countries with reduced rate of change (percentage point)	2.4	2.2	2.9	3.0	1.8
Pre-crisis 5 years average change (%)	-0.3	-0.2	0.6	0.3	0.0
Post-crisis 5 years average change (%)	0.0	0.0	0.0	-0.3	-0.5
Number of countries with reduced rate of change	22.	18	4	14	36
Average difference for countries with reduced rate of change (percentage point)	2.2	2.0	3.2	2.8	2.0

Source: Author's calculation from United Nations Committee for Development Policy Secretariat, Time series estimates of the LDC criteria, 12 April 2020.

spread globally; (2) Collapse: the initial drops in the stock exchanges of major countries were among the largest since the Great Depression; (3) Responses: to limit the negative impacts on economies, many countries adopted massive support through monetary and fiscal policies.

Some of the differences between two crises are: (1) Origin: in 2007-08, the financial shock started a turmoil in the demand side first, and lead into recession, while the current COVID-19 crisis started as a sanitary shock that affected supply chains and then spread into the demand side; (2) Spreading the shock: in the current COVID-19 crisis, the virus and policy reactions accelerate and escalate, while the 2007-08 crisis observed subsequent mini cycles appearing in different speed and extend depending on countries; (3) Policy space: In COVID-19, countries have fewer options and narrow policy space, comparing to the 2007-08 when China led massive stimulus in many parts of the world; (4) Multilateralism: Coordinated reactions of major countries

are most needed under the current COVID-19, but so far fall short of what is needed to stop the crisis and start to recover.

3 Projection of length of the recovery period

The length of shock-recovery can be estimated by impulse response functions based on an autoregressive (AR) model, a simplified version of the vector autoregressive models used in Berg and others (2010) and Bhattacharya and Dasgupta (2012) which estimated impulse responses for low income countries and LDCs during the 2007-08 global financial crisis. The specification of the AR model is as follows:

$$ln(Income_{i,t}) - \ln(Income_{i,t-1}) = \beta_{0,i} + \beta_{1,i}[\ln(Income_{i,t-1}) - \ln(Income_{i,t-2})] + \beta_{2,i}[\ln(Income_{i,t-2}) - \ln(Income_{i,t-3})] + \varepsilon_{i,t} \quad (1)$$

where i and t represent country group and time (year), respectively. The dependent variable is the first difference of log of GNI per capita in current USD, approximating the annual growth rate. Right-hand-side variables are two lags of the left-hand-side variable. Table 4 present the regression analysis results.

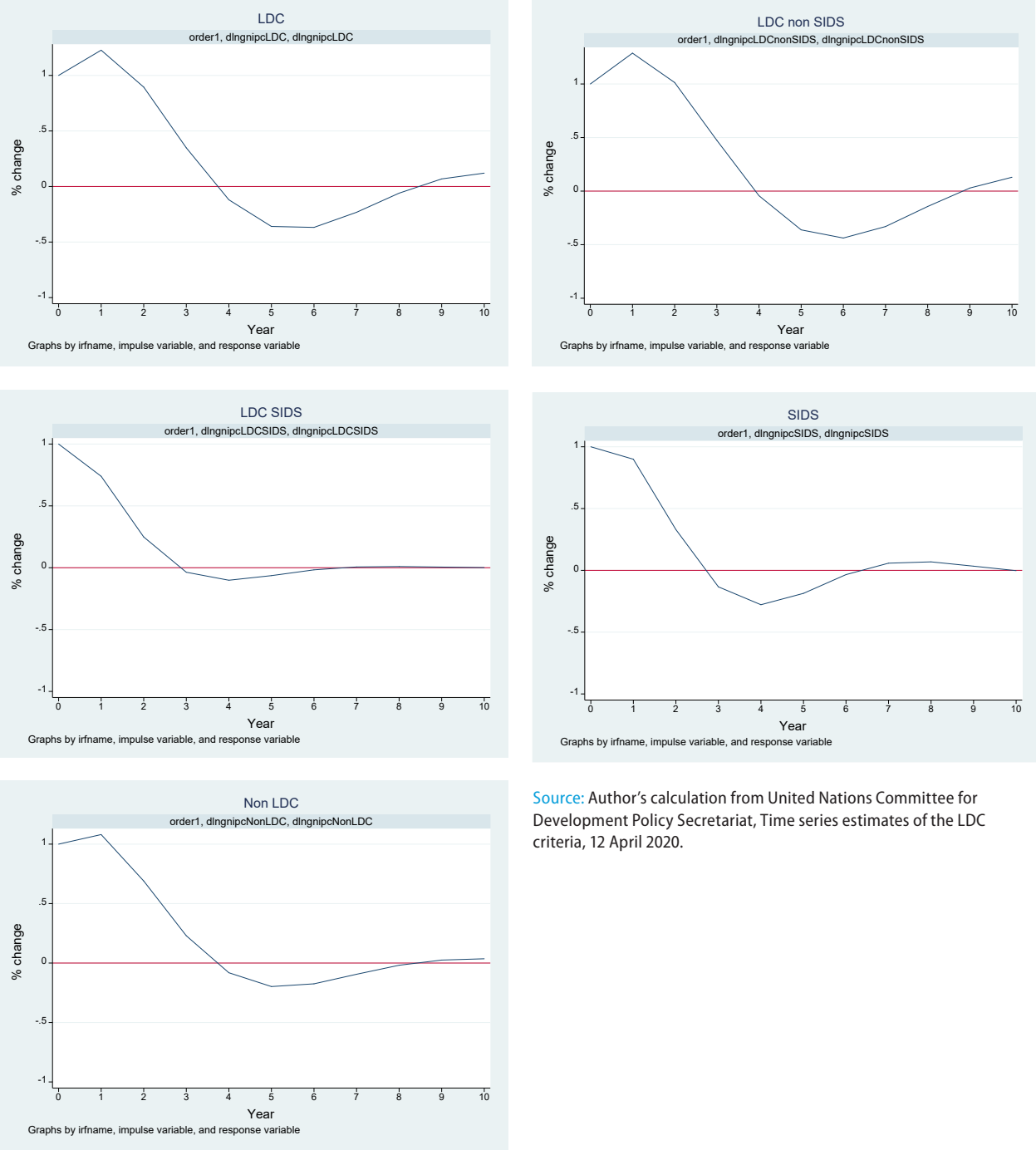
Table 4
Autoregressive model estimation of GNI per capita, 2000-2018

Dependent variable = difference of log of GNI per capita				
Independent variables	**Coefficient estimate**	**Standard Error**	**Z Value**	**P>|z|**
LDCs				
L1.	1.23	0.21	5.90	0.00
L2.	-0.61	0.21	-2.91	0.00
constant	0.03	0.01	2.65	0.01
	R^2=0.73			
LDC-non-SIDS				
L1.	1.29	0.20	6.60	0.00
L2.	-0.65	0.19	-3.33	0.00
constant	0.02	0.01	2.77	0.01
	R^2=0.78			
LDC-SIDS				
L1.	0.74	0.25	3.00	0.00
L2.	-0.30	0.26	-1.14	0.25
constant	0.03	0.02	2.03	0.04
	R^2=0.37			
SIDS				
L1.	0.90	0.22	4.04	0.00
L2.	-0.48	0.23	-2.05	0.04
constant	0.03	0.01	2.84	0.00
	R^2=0.50			
Non-LDC				
L1.	1.08	0.22	4.84	0.00
L2.	-0.48	0.23	-2.09	0.04
constant	0.02	0.01	2.09	0.04
	R^2=0.64			

Source: Author's calculation from United Nations Committee for Development Policy Secretariat, Time series estimates of the LDC criteria, 12 April 2020.

Based on the AR regression, Figure 4 describes the response function of the impulse for each country group, showing how long and how much 1 per cent positive shock would affect the growth over time.

Figure 4
Impulse response, 1% of positive shock in difference of log (GNI per capita)



Source: Author's calculation from United Nations Committee for Development Policy Secretariat, Time series estimates of the LDC criteria, 12 April 2020.

The length of time to recover from a shock will depend on the magnitude of the initial shock. To estimate the possible magnitude of the shocks on LDCs and other country groups, the author estimated how much a decrease in the income of advanced economies results in a decrease in external demand in the LDCs. The channels of transmission would be diverse, but mainly through the trade of goods (for resource- and merchandise-exporting countries), and services (for tourism-dependent countries). A simple panel generalized least squared regression (GLS) is used to estimate the magnitude of the transmission, using the equation as follows:

$$Income_{i,t} - Income_{i,t-1} = \beta_{0,i} + \beta_{1,i}(G20_t - G20_{t-1}) + \varepsilon_{i,t} \qquad (2)$$

where *i* and *t* represent country and time (year), respectively. The dependent variable is GNI per capita in current USD, using the Atlas exchange rate. G20 is the average GNI per capita of G20 countries. The equation (2) is estimated by GLS, using random country specific effect.

This minimalist regression, as opposed to a full-blown growth regression with external shocks as additional variables, was adopted just for the purpose of finding controlled correlation coefficients for LDCs and SIDS, as partner-country demand is plausibly exogenous to most LDCs and SIDS, which are almost always small in the markets for goods and services they trade (Berg and others 2010; Bhattacharya and Dasgupta 2012). These shocks may be correlated with other variables that may matter for growth, for instance, terms of trade, the inflation rate or institutional quality. But it is likely that the direction of causality runs from these shocks to the other variables, rather than the reverse. The true relations will be much more complex, there could be structural changes within the sample period, more time lags in LDC's income responding to shocks, or some LDC's closer integration to regional group rather than global economy. In any case, purpose of equation (2) in this paper is to find the minimum relations between LDC's income and global shock, and it could be further elaborated in future studies.

Table 5 presents the coefficient estimates, representing the changes in GNI per capita correlated with income change in G20.[5] In terms of value, the magnitudes appear to be small for LDCs, only 3 cents decrease for every dollar decrease in G20 average income. For Non-LDCs, it would be 60 cents change for every dollar change in G20 average income. This is consistent with the fact that LDCs are, in a way, protected from shocks in G20 because of their limited integration to the world economy.

However, taking into consideration the relatively small size of economies of LDCs, the magnitude is significant in terms of growth rates. If G20 average income decreases by 1 per cent, it is correlated with 0.67 per cent decrease in growth rate in LDCs. For LDC-SIDS, it would be 0.80 per cent. Since LDCs are starting from a very low base, these changes in growth rates mean even more deterioration in the welfare of the population in LDCs.

Possible impacts of recessions in G20 due to the COVID-19 on LDCs and SIDS are projected for coming years, using the coefficients from table 4 (response to the shock over time) and table 5 (size of shock transmitted from G20). To determine the size of shock, the author used the IMF forecast of -6.1 per cent growth in 2020 for advanced economies (IMF 2020), which can be correlated with a -4.1 per cent shock for LDCs, -3.7 for LDC non-SIDS, -4.9 for LDC-SIDS, -3.4 for SIDS, and -9.5 for non-LDCs as shown in table 5.

5 The country group of Advanced economies is from the IMF classification.

Table 5
GLS with random effect estimation, GNI per capita (current USD, Atlas exchange rate) changes correlated with income changes in G20 economies, 2000-2018

Country group	Change in $ value correlated with $1 change in G20 average income	Change in growth rate correlated with 1% growth rate change in G20 average income	Changes in growth rate correlated with -6.1% growth rate in G20 in 2020
LDCs	$0.03	0.67%	-4.11
LDC non-SIDS	$0.03	0.61%	-3.71
LDC-SIDS	$0.07	0.80%	-4.91
SIDS	$0.20	0.55%	-3.38
Non-SIDS	$0.60	1.56%	-9.50

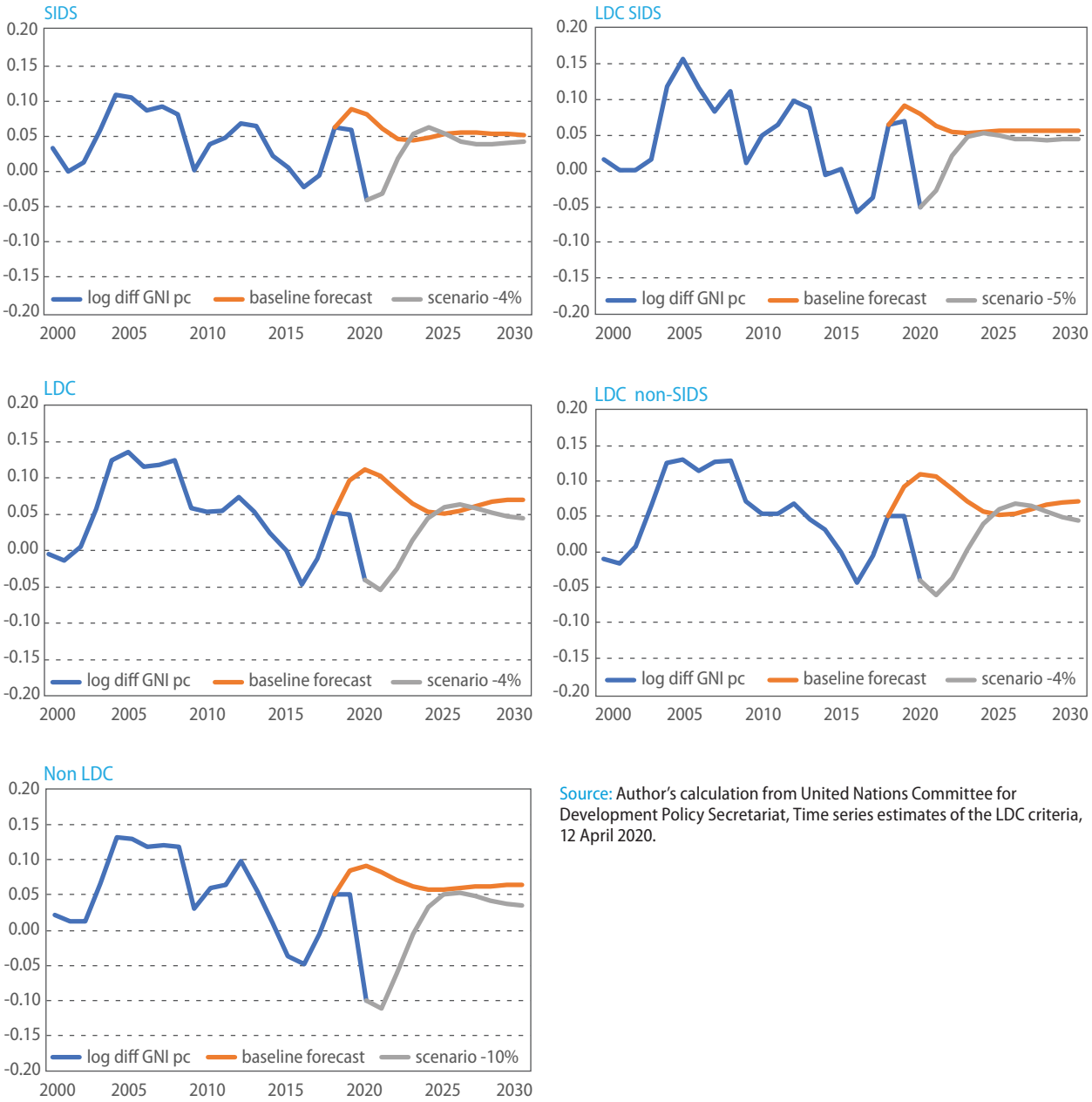
Source: Author's calculation from United Nations Committee for Development Policy Secretariat, Time series estimates of the LDC criteria, 12 April 2020.
Note: All coefficient estimates are statistically significant at 1% confidence level.

Figure 5 presents projected paths for each country group based on the baseline forecast (no shock in 2020), vis-a-vis the COVID-19 scenario described above (contraction in 2020, no shock in 2021). Even if the shock in 2020 is short-lived, with a quick rebound in 2021 in an advanced economy, the LDCs will need about 5 years (2020-2024) until they return to the projected path under the baseline scenario. LDC-non-SIDS will need slightly more time to recover and return to the projected path under the baseline scenario.

LDC-SIDS, and SIDS, in general, are projected to take about 4 years to return to the baseline forecast path. It is important to note that the AR model fits the observed growth paths of LDC-SIDS and SIDS less than LDCs or LDC-non-SIDS, implying that there are additional other factors determining the growth paths for small islands countries. Given the size and structure of those countries, idiosyncratic shocks, such as natural disasters, the income of close partner countries (e.g., Australian tourists), start or closure of one large business, etc., play a greater role compared with other country groups. Therefore, the projected recovery paths for small island countries in this paper should be regarded as very optimistic. There will also be variations in recovery within country groupings, which is not looked into in the present paper.

In sum, with possible contraction in G20 in 2020 due to COVID-19, LDCs and SIDS will need about 4 to 5 years to be able to return to the baseline forecast path. This is a rather optimistic forecast for a number of reasons: 1) the impact of COVID-19 on G20 is assumed to be short-lived, with these countries rebounding back in 2021; 2) only the external demand shock is the factor in the model affecting LDCs and SIDS. No other shocks, such as domestic demand due to lockdowns, national disasters, higher dependency on certain trading or development partners, etc., are included; 3) National capacity to adopt remedial policies to minimize negative impacts, such as emergency financing to support domestic demand or keeping the exchange rate and terms of trade, etc., is assumed to be the same as what we have observed in the past 2 decades. In reality, though, such national capacity in LDCs and SIDS could be seriously limited during the COVID-19 crisis; 4) There is also the issue of whether the world actually returns to 'business-as-usual' or whether COVID-19 would lead to long-term protectionism and/or hysteresis.

Figure 5
Projected path of log difference of GNI per capita, baseline forecast and scenarios, 2020-2030



Source: Author's calculation from United Nations Committee for Development Policy Secretariat, Time series estimates of the LDC criteria, 12 April 2020.

4 Conclusion

The COVID-19 pandemic is entailing huge costs worldwide, human and economic. To help developing countries formulate policy responses to minimize negative impacts of the COVID-19, the present paper attempts to assess the possible duration of the recovery in most vulnerable countries, i.e., LDCs and SIDS.

Evidence from the experience of the 2007-08 global financial crisis suggests that the income growth of LDCs and SIDS had not recovered to the pre-crisis rates even 5 years after the crisis. This suggests a long recovery period for those vulnerable countries, even though the G20 were able to quickly rebound in 2010, right after the crisis.

Looking at only the possible economic impacts caused by the COVID-19, LDCs and SIDS seem to need about 4 to 5 years for a return to the projected path under the baseline scenario with the absence of the COVID-19 crisis. This is a rather optimistic forecast because, in the forecasting model, the impact of the COVID-19 on G20 is assumed to be short-lived, no other country-specific shocks are included, and the economic resilience observed over the past 2 decades in LDCs and SIDS is maintained during this crisis. The possible impacts on LDCs and SIDS caused by COVID-19 are likely to be significantly larger, and the recovery period can be even longer in reality. Even if income goes up again, there could be longer-lasting distributional and economic restructuring effects, which requires additional country specific research.

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