THEMATIC SERIES
The ripple effect: economic impacts of internal displacement

This thematic series focuses on measuring the effects of internal displacement on the economic potential of IDPs, host communities and societies as a whole

POINTS OF NO RETURN

Estimating governments' fiscal resilience to internal displacement

MARCH 2019

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INTRODUCTION

Internal displacement is a global phenomenon that affects every region and nearly every country around the world. Each year, millions of people are forced to leave their homes because of violence, conflict, disaster, climate change or other reasons, moving to another area within their own country. Conflicts and violence led to 11.8 million new internal displacements, and disasters to 18.8 million, in 2017.[1]

The Internal Displacement Monitoring Centre (IDMC) has for the last 20 years been highlighting the damages caused by mismanaged displacement on affected people's rights and well-being. Simultaneously, the International Institute for Applied Systems Analysis (IIASA) has been examining the fiscal and economic cost imposed by disasters and climate change at all levels from national to global. IDMC partnered with IIASA in 2018, to produce the first assessments of another consequence of the factors which cause people to leave their homes: the economic impacts of internal displacement.[2] IDMC's first estimate of the global impact of internal displacement amounted to a staggering $13 billion a year.[3]

This paper presents IIASA's approach and methodology for estimating the fiscal gap that governments of countries affected by internal displacement may face because of future displacement crises. This methodology builds upon IIASA's previous work on Catastrophe Simulation modelling (CatSim) and on IDMC's estimates of the economic impacts of internal displacement and model of displacement risk in the context of sudden-onset disasters.[4] One of the main goals of this project is to assist budget and development planners to anticipate and prepare for contingent liabilities associated with internal displacement. An estimate of risk, delivered through an analysis of the fiscal gap, is a pre-requisite for making such liabilities explicit within budget preparation and development plans.

INTERNAL DISPLACEMENT AS GOVERNMENTS' CONTINGENT LIABILITY

Policies and interventions regarding internal displacement often focus on responding to an ongoing crisis and addressing emergency situations. But even when the needs of the people affected by these crises are met and responses planned efficiently, internal displacement damages social networks, mental and physical health, productivity, wellbeing and welfare. As a result, governments and other actors must also work to prevent or limit the scale, duration and negative impacts of internal displacement.

Preventing and limiting internal displacement's duration, scale and negative impacts requires longer term planning and a good understanding of the risk of internal displacement at the national level. IDMC developed a risk model that assesses the likelihood of future internal displacement associated with floods, earthquakes, storm, tsunamis and wind.[5] The model estimates the number of people at risk of being displaced by these events. Combined with IDMC's work on the economic impacts of internal displacement, this information can help assess the resulting fiscal burden for national governments.

Disasters are associated with nearly two thirds of the new internal displacements recorded in 2017, the remaining third being associated with conflict and violence.[6] There is no estimated number of displacements in the contexts of climate change, environmental degradation and other triggers, and the only displacement risk estimates in use relate to sudden onset disasters.

Probabilistic models such as IDMC's can help evaluate how likely a natural hazard is to occur, and how likely it is to lead to internal displacement.[7] These models take into account the intensity of the hazard to estimate the scale of the associated displacement, from two people displaced by a storm in Namibia to more than two million displaced by a hurricane, as happened when Hurricane Irma hit the Caribbean in August and September 2017.

The economic consequences of these displacements have never been comprehensively assessed. The subsequent reduction in consumption, diminution of tax collection, lost production and the costs of providing care to people whose health has been affected can be a significant share of a country's GDP and jeopardise the progress of socioeconomic development.[8] The economic impacts of internal displacement should therefore be considered a contingent liability for governments and should be part of the public budget planning process.

TABLE 1: Government liabilities: the fiscal risk matrix.[9]

Liabilities	Direct: Obligation in any event	Contingent: Obligation if a particular event occurs
Explicit: government liability recognised by law or contract	Foreign and domestic sovereign borrowing Expenditures by budget law	State guarantees for non-sovereign borrowing and public and private sector entities Reconstruction of public assets
Implicit: obligations of the government	Pension and health care expenditure Future recurrent costs of public investment projects	Default of subnational government or public or private entities Banking failure Disaster relief and recovery assistance including for Internally displaced people

Note: items in blue relate to disaster risk management

The fiscal risk matrix approach (Table 1) distinguishes the governments' direct and explicit, contingent and implicit liabilities. Contingent liabilities arise only when a particular event occurs while direct liabilities will occur with certainty. Explicit liabilities are recognised by law or contract, while implicit liabilities refer to obligations. Internal displacement and its cost qualifies mostly as an implicit liability taken on by a government due to its obligation to protect and care for the people within its borders.

A risk not prepared for coupled with weak financial resources can lead to substantial additional fiscal stress on a state, and can eventually reduce the capacity for public finances to fund other public investment projects.[10] To build fiscal space, a pro-active approach should therefore be adopted, for example by setting up appropriate risk management and finance measures based on reliable forecast data.

Historically, countries have planned for contingent liabilities and financed losses in a rather ad-hoc manner, for example using ex-post sources, such as diverting money from other parts of a national budget.[11] Escalating levels of losses caused by disasters in recent decades have led governments to shift towards a more proactive approach: aiming to tackle risks before disaster strikes. This involves governments moving at least part of their contingent liabilities into their regular budgets and using predictive and protective risk instruments, such as insurance, to safeguard against serious and lasting consequences being caused by necessary expenditure. Such approaches are now applied not only at the national level, for example Mexico which reinsured its Natural Disaster Fund in 2006, but also in multinational contexts, such as the Caribbean Catastrophe Risk Insurance Facility, which provides mutual insurance for Caribbean governments.

One pre-requisite for accounting for internal displacement as a contingent liability as part of a government's budget planning process is to be able to quantify the risk governments are exposed to. Using a methodology developed for disaster risk management and focusing on the fiscal resources of a country, this paper presents an analysis of the countries most vulnerable to fiscal risk associated with the costs of future internal displacement.

METHODOLOGICAL APPROACH

The methodology used in this paper combines estimates of the financial risk to which a country is exposed due to internal displacement, with an evaluation of the fiscal resilience of the government: its ability to access funding such as domestic or external savings.

Combining fiscal resilience with probabilistic losses allows the assessment of fiscal risk, a lack of government access to domestic and foreign savings needed to cover the costs associated with internal displacement. The shortfall in finance is measured by the fiscal resource gap (Box 1).

BOX 1: CALCULATING THE FISCAL RESOURCE GAP[12]

The monetary cost distribution for the government is labelled F. We will also call the government's instruments available to cover these costs 'k'. When an event occurs, some or all of the instruments are used to finance associated losses.

In the simplest case, one can assume that the finance instruments are ranked in a strict preference order, represented by an appropriate resource vector, in the following way: the first instrument (with given monetary resources) is preferred before all other instruments until it is fully depleted (x_1), afterwards the second instrument (with given resources) is preferred before all others until it, too, is completely exhausted (x_2), and so on.

The sum of all feasible instruments up to their full depletion is the maximum monetary amount available for a loss event. The loss financing scheme for an event with a return period of 1/y (this return period means that for a 100 year event 'y' would be 0.01) is the solution of depleting all resources in the respective order till the losses $F^{-1}(1-y)$ are fully covered.

The smallest return period of the event where losses cannot be fully financed even if all resources are used (i.e. the return period that satisfies the equation $F^{-1}(1-y_{gap})$) is called the fiscal resource gap year event or simply the fiscal resource gap $(1/y_{gap})$.

All return periods larger than the fiscal resource gap will be associated with losses the government cannot finance given its current financial resources.

The assessment presented in this paper builds on the CatSim modelling approach.[13] CatSim was originally developed to estimate the fiscal resource gap due to natural disaster risk at the national level.[14] Fiscal resilience to reduce possible fiscal gaps may take into account various financial resources available to a country, including ex-post options such as diversion from budget or deficit financing, as well as proactive instruments such as insurance, reserve funds or contingent credits. Table 2 provides an overview of measures that were incorporated in the modelling approach.

Budget diversion represents the amount of funding from the central government's budget available to be re-directed towards disaster recovery. It is calculated using a two step process. The first step is to determine whether the government has a deficit or surplus in its budget. This is estimated by comparing revenues and expenditures. CatSim estimates use the latest year data available from the World Bank's World Development Indicators. If expenditures exceed revenue by

more than five per cent, it is assumed that the government will be unable to divert funding into recovery. However, if there is a surplus or a smaller deficit, it is assumed that the government will be able to divert a portion, estimated here at ten per cent of total revenue, towards relief.

TABLE 2: Overview of fiscal resilience source baseline assessment for the modelling approach[15]

Measure	Description
Ex-post:	
Budget diversion	Maximum diversion is a fixed percentage of revenue
Multilateral financing institutions / International borrowing	Constrained by external debt sustainability indicator credit buffer
Ex-ante:	
Reserve funds	Case specific. Up to now only a few such instruments are in place for financing losses. Most of them are targeted for immediate help after a disaster, which is usually only a fraction of the total costs.
Sovereign insurance	
Catastrophe bonds	

There is also an estimate of how much a government would be able to borrow on international markets and from multilateral financing institutions (MFIs). Calculation of this value is based on numerous factors, which combine to affect the total available funding. The initial assumption is that a country cannot finance disaster losses past a point at which its debt as a percentage of exports reaches a value higher than 150 per cent. This value represents the point at which the country would be classified as a highly-indebted poor country and finding additional funding on open markets would be extremely difficult, due to the extremely high perceived risk to borrowers. Other determinants to this value include the country's classification as eligible for an International Development Association or International Bank for Reconstruction and Development loan, guaranteed by the World Bank, which may allow them to receive loans at concessional rates. For international borrowing, the country's debt rating has a high influence on the conditions of financing, and affects the amount of funding available. This rating is a major determinant for loan interest, amortisation, and grace periods for repaying interest and principal. For exact calculation of the first order estimate of this a loan package needs to be created which divides funding needs evenly between MFIs and international borrowing rates. These rates are determined by the country's national debt rating, whether it is eligible for an International Development Association or International Bank for Reconstruction and Development loan, as well as current interest rates. After determining the average properties for the loan package (based on the mean of the two interest rates, amortisation times, and grace periods) one calculates how much the country can borrow and remain under the initial limit of 150 per cent present value debt to export ratio. This

is data intensive and if insufficient data is available, Standard Drawing Rights are used as a proxy. They are taken from the International Monetary Fund database and also serve as an upper limit.

The CatSim approach as discussed above was originally developed for direct large scale losses at the national level and had to be further adapted for internal displacement costs. First, it is assumed that all the respective costs of internal displacement have to be borne by the government. Secondly, if internal displacement is due to sudden onset disaster events one must assume there will be additional direct losses the government is responsible to finance. Consequently, not all available resources can be used to respond to internal displacement. We therefore assume that only half of the total amount of resources available can be actually used for internal displacement costs. Given the high financial stress a government experiences after large disaster events, this is an optimistic assumption. Finally, we will not focus on ex-ante measures here, as these means to address internal displacement risk are rarely in place.

Internal displacement risk associated with disasters is expressed as the probable maximum loss, in $ million, for an event likely to occur every 20, 50, 100, 250, 500, 1,000 and 1,500 years. Events likely to occur more frequently are less intense and lead to less internal displacement risk. Risk is estimated at the national level for each type of hazard including earthquake, wind, tsunamis, floods and storms. A multi-hazard loss curve can also be produced for each country.

Fiscal risk is calculated by combining the direct multi-hazard loss curve with the government's maximum fiscal capacity, to estimate the fiscal resource gap. This is defined as the event return period after which the government will no longer be able to finance all the losses it is responsible for.

RESULTS AND DISCUSSION

This paper estimates the event return period, after which governments of 188 countries will no longer be able to cover the costs associated with internal displacement risk in the context of sudden onset disasters. For illustration purposes we give two examples.

In Yemen, an earthquake of a magnitude likely to occur every 10 years on average, would lead to around 15,000 people being displaced. Using the average economic impact per displaced person recorded by IDMC at $310 a year, the associated financial burden would be around $4.65 million per year of displacement. This estimate would be reduced if people are able to return home before one year, and expanded if they remain displaced for a longer period.

TABLE 3: Costs associated with internal displacement risk for five hazards per year (in $ million) for different return year events in Bangladesh and Yemen

| Event return period	Bangladesh	Yemen
2	5	1
5	273	2
10	1,023	4
25	2,506	52
50	4,060	89
100	5,901	132
250	8,013	234
500	10,032	353
1,000	12,484	521

Using similar calculations for all five hazard types and all return periods, the corresponding costs were used as an input to the modified CatSim model and connected with each country's fiscal resilience estimates. Table 3 illustrates these calculations for Bangladesh and Yemen. For each event return period, that is to say the period after which an event of a given intensity is likely to reoccur on average, the corresponding costs associated with internal displacement are expressed in $million per year of displacement. In Bangladesh, an event that is likely to occur every 50 years on average has an economic impact associated with internal displacement of nearly $4.1 billion per year. In Yemen, an event that is likely to occur once per century would result in an economic impact associated with internal displacement of around $132 million per year.

In Bangladesh, the estimated possible amount able to be diverted from other budget areas is up to $339 million and the estimated credit buffer is up to $675 million, adding up to slightly more than $1 billion of fiscal resilience. This threshold is reached for events with a return period of around ten years. This means that Bangladesh is likely to be unable to cover the costs associated with internal displacement in the context of events that occur every ten years, on average.

For Yemen, there is no possibility for any diversion of budget and the credit buffer is small due to the state's high levels of debt. The maximum is estimated at $35 million. The model however shows that the country should be able to cover the costs associated with internal displacement in the context of disasters with a return period of up to 17 years. Beyond this return period, for events that occur every 20 years for instance, the government will need support to cope with the economic impacts of internal displacement.

Results for another 186 countries are presented at the end of this paper. The baseline estimate of average cost per displaced person anywhere on Earth was set at $310. Figure 1 illustrates the results in a map on which, the countries for which the fiscal resource gap is the lowest, are coloured red. These countries are likely to reach the limits of their ability to cope with the economic impacts of internal displacement sooner, and more often, than the next most financially vulnerable countries, which are coloured orange. The most financially resilient countries are those coloured the darkest blue. Countries in low and middle income groups characterised by significant hazard risk show the highest fiscal vulnerability.

FIGURE 1: Global map of fiscal resource gaps linked with the economic impacts of internal displacement
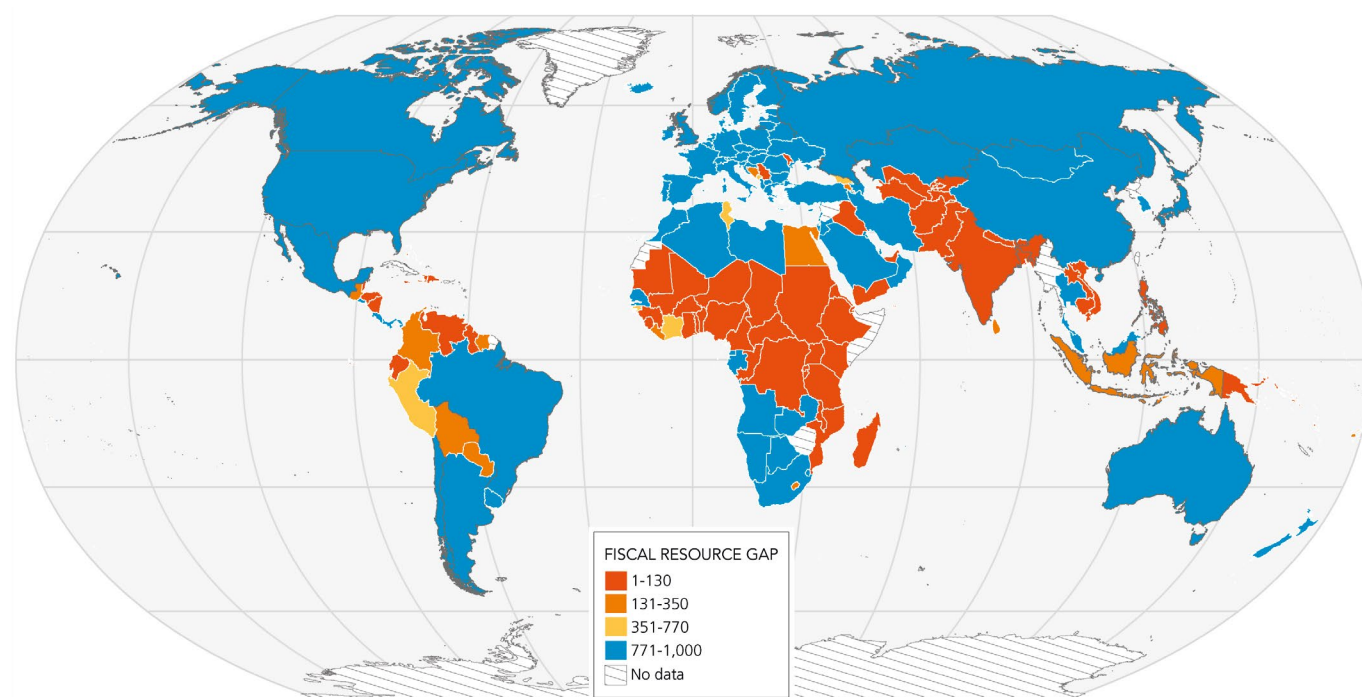
FINAL REMARKS

The approach presented in this paper demonstrates the informational value of using a risk-based model to support better budgeting at the national level, and better planning of humanitarian and development aid for managing and reducing the burdens from internal displacement in the aftermath of disasters associated to natural hazards.

The countries most at risk of being unable to counter the economic impacts of internal displacement in the short and medium term are precisely those already struggling with lower levels of development while being exposed to significant risk associated with natural hazards.

A number of caveats should be considered. The estimates presented in this paper are a first step and will be refined with more precise and comprehensive data on internal displacement risk, the financial resources available to governments and the economic impacts of internal displacement. The economic impact estimates used here measure some of the costs and losses associated with internal displacement's consequences on health, education, housing, income and security. They do not account for longer term or less direct effects, such as, for instance, the reduced consumption of families unable to work while they are displaced. For this reason, they should be considered underestimates.

Fiscal resource gaps only consider the economic impacts of internal displacement, not of the disaster itself, such as housing or infrastructure destruction. Adding these would mean the depletion of governments budgets even sooner than estimated here. Finally, this model only accounts for internal displacement risk in the context of sudden-onset disasters. Internal displacement in the context of conflict is also more likely to affect low and middle income countries, increasing the financial burden they face beyond the results presented in this paper. Displacement linked with climate change and environmental degradation is another risk that has yet to be accounted for.

| Annex: Country fiscal risk from displacement expressed as Fiscal resource Gap Return period Event

Country	Fiscal Resource Gap	Country	Fiscal Resource Gap	Country	Fiscal Resource Gap
Afghanistan	7	Bhutan	17	China	1000
Albania	1000	Bolivia	204	Colombia	388
Algeria	1000	Bosnia and Herzegovina	260	Comoros	455
Angola	1000	Botswana	1000	Congo, Dem. Rep.	10
Antigua and Barbuda	3	Brazil	1000	Congo, Rep.	108
Argentina	1000	Brunei Darussalam	1000	Costa Rica	1000
Armenia	250	Bulgaria	1000	Cote d'Ivoire	1000
Australia	1000	Burkina Faso	7	Croatia	1000
Austria	1000	Burundi	6	Cyprus	1000
Azerbaijan	1000	Cabo Verde	112	Czech Republic	1000
Bahamas, The	33	Cambodia	6	Denmark	1000
Bahrain	1000	Cameroon	11	Djibouti	54
Bangladesh	10	Canada	1000	Dominica	6
Barbados	813	Central African Republic	11	Dominican Republic	66
Belarus	1000	Chad	2	Ecuador	3
Belgium	1000	Chile	1000	Egypt, Arab Rep.	410
Belize	51			El Salvador	1000
Benin	61			Equatorial Guinea	1000

Country	Fiscal Resource Gap	Country	Fiscal Resource Gap	Country	Fiscal Resource Gap
Eritrea	11	Lao PDR	6	Panama	1000
Estonia	1000	Latvia	1000	Papua New Guinea	16
Eswatini	1000	Lebanon	1000	Paraguay	357
Ethiopia	9	Lesotho	368	Peru	667
Fiji	345	Liberia	368	Philippines	83
Finland	1000	Libya	1000	Poland	1000
France	1000	Lithuania	1000	Portugal	1000
Gabon	1000	Luxembourg	1000	Qatar	1000
Gambia, The	22	Macao SAR, China	1000	Romania	1000
Georgia	1000	Macedonia, FYR	1000	Russian Federation	1000
Germany	1000	Madagascar	3	Rwanda	21
Ghana	15	Malawi	3	Samoa	34
Greece	1000	Malaysia	1000	San Marino	1000
Grenada	36	Maldives	1000	Sao Tome and Principe	270
Guatemala	239	Mali	13	Saudi Arabia	1000
Guinea	42	Malta	1000	Senegal	1000
Guinea-Bissau	1000	Marshall Islands	1000	Serbia	37
Guyana	7	Mauritania	5	Seychelles	1000
Haiti	11	Mauritius	1000	Sierra Leone	84
Honduras	35	Mexico	1000	Singapore	1000
Hungary	1000	Micronesia, Fed. Sts.	137	Slovak Republic	1000
Iceland	1000	Moldova	26	Slovenia	1000
India	32	Mongolia	1000	Solomon Islands	6
Indonesia	508	Montenegro	730	Somalia	8
Iran, Islamic Rep.	1000	Morocco	1000	South Africa	1000
Iraq	11	Mozambique	11	South Sudan	5
Ireland	1000	Myanmar	4	Spain	1000
Israel	1000	Namibia	1000	Sri Lanka	385
Italy	1000	Nepal	10	St. Kitts and Nevis	35
Jamaica	142	Netherlands	1000	St. Lucia	27
Japan	1000	New Zealand	1000	St. Vincent and the Grenadines	13
Jordan	1000	Nicaragua	148		
Kazakhstan	1000	Niger	9	Sudan	12
Kenya	39	Nigeria	86	Suriname	171
Kiribati	1000	Norway	1000	Sweden	1000
Korea, Rep.	1000	Oman	1000	Switzerland	1000
Kuwait	1000	Pakistan	14	Syrian Arab Republic	253
Kyrgyz Republic	68	Palau	51		

Country	Fiscal Resource Gap	Country	Fiscal Resource Gap
Tajikistan	9	Ukraine	1000
Tanzania	1	United Arab Emirates	121
Thailand	1000	United Kingdom	1000
Timor-Leste	282	United States	1000
Togo	34	Uruguay	1000
Tonga	32	Uzbekistan	171
Trinidad and Tobago	1000	Vanuatu	12
Tunisia	1000	Venezuela, RB	30
Turkey	1000	Vietnam	7
Turkmenistan	13	Yemen, Rep.	17
Tuvalu	1000	Zambia	1000
Uganda	10	Zimbabwe	287

| NOTES

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