

## RISK-INFORMED FINANCE FOR DEVELOPMENT – ENHANCING RISK MANAGEMENT AND RESILIENCE THROUGH GDP-LINKED OFFICIAL LENDING

### 1. INTRODUCTION

Managing external public debt constitutes one of the main tasks that governments around the world have to contend with on a daily basis. It is also a challenging one for many developing countries and emerging economies.

In a context where domestic financial resources are scarce, accessing international finance, private or public, is critical to fund developing countries' development efforts. Yet, managing international financial flows can be a testing job. External shocks, to which developing countries are overly exposed and vulnerable, can easily undermine developing countries' ability to pay back their debt and can potentially lead to costly sovereign debt defaults. Debt obligations, on the other hand, have a strong pro-cyclical component: they are easier to meet during times of economic growth when government revenues increase, while becoming relatively more onerous to service during recessions and economic slowdowns. This makes it harder for governments to pursue countercyclical fiscal policies to smooth growth and development trajectories.

In this context, indexing developing countries' external public and publicly guaranteed (PPG) debt with official creditors to their GDP performance can help these countries improve external debt management and contribute to minimize the risks of debt default, thereby increasing their resilience to external shocks.



State-contingent financing could help countries manage risk and deal with shocks more effectively. Photo: UNDP in Sierra Leone

### 2. GDP INDEXED DEBT: THEORY AND PRACTICE

The idea of indexing debt payments to a country's economic performance is not new. It follows a well-established body of academic and policy research going back to the 1980s literature on sovereign debt defaults (e.g. Krugman, 1988; Sachs, 1989), and is heavily influenced by the work by Robert Shiller (1993) on *Macro Markets*; i.e. the possibility of establishing financial markets in which to trade on macroeconomic income aggregates.

Proposals to link developing countries' debt to their GDP performance gained traction in the early 2000s, following the analytical work on these issues by the IMF (see Borensztein and Mauro, 2002) and the more policy-oriented activities of the United Nations (Griffith-Jones and Sharma, 2006). This latter stream of work saw the organization of several expert group meetings in 2005 and 2006 with market operators, government officials and representatives from multilateral organizations to

examine the practicalities of adopting this type of debt financing. More recently, the Eurozone debt crisis and Greece's issuance of GDP-linked warrants in 2012 has led to a renewed interest among analysts and researchers in GDP debt indexation. Much of this work, however, has so far focused on the case of GDP-linked sovereign bonds, although the principles of GDP indexation can be applied to all forms of debt.

The underlying idea behind GDP debt indexation is simple: a factor determining a country's ability to service its debt is its economic performance. This is captured in the well-known debt-to-GDP ratio, a standard measure of a country's debt sustainability position. Thus, growing economies generate additional income and, other things equal, additional tax revenue, allowing governments to meet their full debt obligations, both domestic and external. Linking debt payments to GDP performance can therefore contribute to improve debt management outcomes. Under such an arrangement debt service payments would increase in times of high economic growth, when governments are able to generate additional tax revenue, and they would be allowed to drop during periods of economic slowdown, when government revenue typically drops. Ultimately, this would help reduce the risk of (costly) sovereign defaults.

In many ways, GDP-linked debt securities operate like an equity or shareholders agreement, in which creditors buy into a country's economic performance. This allows debtor countries to share with debt holders the risks associated with macroeconomic management. On the other hand, it provides creditors with an opportunity to partake from the proceeds of growth. From a debt management perspective, indexing debt to GDP operates like an ex-ante, preventive mechanism to deal with debt distress situations, by reducing the likelihood of such episodes happening in the first place. This contrasts to other state-contingent debt arrangements that are increasingly found in sovereign debt issuances, such as collective action clauses (CACs) and contingent convertible bonds (CoCos), which are mainly conceived as debt crisis resolution mechanisms that only come into effect in the event of debt distress.

While the possibility of indexing external public debt to GDP has attracted significant attention in academic and policy circles, its practical application has been limited, despite the benefits that in theory could be derived from the adoption of this type of debt financing. In this regard, only a few countries have issued GDP-linked debt securities, mainly as part of debt restructuring programmes. This is, for instance, the cases of the Argentinian and Greek GDP-linked bond issues of 2005 and 2012, or of the earlier performance-based bonds issued by Costa Rica (1990), Bulgaria (1994) and Bosnia and Herzegovina (1997).

### 3. CHALLENGES EXTENDING GDP INDEXATION OF DEBT

Several factors have been put forward to explain the limited application of GDP debt indexation in the real world. These include:

- ❖ **Moral Hazard problems:** In theory, GDP-linked securities can create incentives for debtor countries to pursue growth reducing or growth dampening policies, as a way of limiting interest payments on their debt. Aware of this possibility, investors would be weary of investing in such debt securities, knowing that returns could be lower than initially expected.

An important concern in the earlier sovereign debt literature of the 1980s, most analysts writing on GDP-indexed securities have remained skeptical on the scope for such behavior. Among other things, it is argued that the costs (economic, social and political) of suppressing growth would outweigh any savings on GDP-linked debt service payments derived from reducing economic growth.

- ❖ **GDP measurement and Underreporting:** A more serious concern is the potential problems arising from GDP measurement and reporting, which could also discourage investors from buying into this type of debt instrument. Thus, producing reliable GDP figures is a complex task involving a significant amount of estimation and therefore prone to all types of measurement problems. It can be a particularly challenging task in developing countries, where statistical capacities are often weak and large parts of these economies are informal, or based on subsistence production. Moreover, even when GDP statistics meet accepted international standards, these figures are often reported with a lag and may (and often are) subject to regular revisions, which could make it difficult to determine in a timely and precise way GDP-linked interest payments. Adding to these concerns, there is always the possibility that debt issuing governments underreport GDP figures, in order to reduce interest payments on their GDP-linked debt.

Ultimately, addressing these problems can only be achieved through efforts to improve statistical capacities and statistical reporting, efforts that might take years to bear fruit, which could hold back the

emergence of GDP-indexation as a regular feature in financial markets. Still, these concerns need to be viewed in perspective. First, these problems affect in a similar measure other variables that are regularly used to index debt securities, such as inflation, something which does not seem to have troubled financial markets. On the other hand, the risk that governments underreport their GDP figures has to be weighed against the negative political connotations typically attached to poor economic performance. Finally, other measures of a country's ability to pay that are less prone to this type of problems could be used for indexation purposes. This is the case of export figures, which can be collected from importing countries, circumventing the risk of underreporting. Export statistics are also mostly based on administrative (i.e. customs) data and, therefore, are more accurate and easier to produce.

❖ **Political economy considerations:** Another set of concerns with GDP-indexed bonds relate to the politics of debt management. Thus, while GDP debt indexation might be desirable from a long-term macroeconomic management perspective, voters might focus more on the short term 'costs' of GDP-linked financing, politically penalizing incumbent governments. This could happen, for instance, during episodes of high economic growth, when debt service payments would most likely increase, or if markets decide to place a 'novelty' premium on GDP-linked debt securities to cover for the uncertainties attached to this type of financial instruments. For these reasons, governments may find GDP-linked borrowing a politically unattractive financing option.

❖ **Missing markets, coordination failures, liquidity, tradability and pricing of GDP-linked securities:** A main challenge that the adoption of GDP-linked debt faces is the absence of fully developed markets in which these securities can be traded. The absence of such markets reduces these debt instruments' liquidity, making them riskier for potential investors and, therefore, a more expensive financing option for issuing governments, who may end up paying an additional risk premium. This, in itself, could discourage the creation of such markets, despite the known long-term, system-wide benefits that both issuers and investors can derive from adopting this type of financing. A related problem is that of pricing. Thus the absence of markets impedes investors from

pricing these securities, for instance by comparing yields of different GDP-linked bond issues.

Addressing this type of coordination failures preventing the development of markets in which to trade on GDP-indexed securities is likely to require concerted efforts by governments, in both advanced economies and developing countries, and multilateral financial institutions to push for the creation of GDP-linked securities markets.



Helen Manvoi with two of her four kids in front of her destroyed outdoor toilet house in Port Vila, Vanuatu's capital. Photo: Silke von Brockhausen/UNDP

#### 4. GDP-INDEXATION OF OFFICIAL EXTERNAL DEBT

Many of the concerns with GDP debt indexation boil down to the uncertainty surrounding the final payouts for debtors and creditors arising from a debt financing modality in which interest payment streams are partly determined by a country's future economic performance, a variable which for the most part is an unknown. However, many of these problems are not applicable to external debt with official creditors. Focusing on this debt modality could therefore offer the best prospects for the generalization of the principles of GDP debt indexation. If successfully adopted by debtor countries and official creditors, it could also have a demonstration effect over other forms of debt financing, contributing to make GDP indexation a regular feature in international finance.

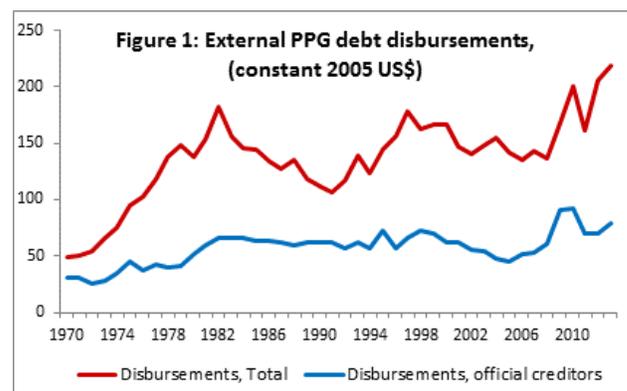
Thus, official debt typically involves two sovereign states, or a sovereign country and an international financial public institution, in the case of multilateral lending. Therefore, it does not require the intermediation of financial markets, making the absence of markets in which to trade in GDP-linked securities irrelevant. It also involves a much smaller number of contractual parties – typically the governments of debtor and creditor

countries, as well as multilateral lending institutions – which, as public entities, tend to operate with longer time horizons and are therefore able to factor in better the long term and economy-wide benefits of GDP debt indexation. This makes it easier to overcome coordination problems. It also makes it easier to come up and agree on contractual arrangements that provide a clearer picture of future payment streams for both debtors and creditors, while preserving the debt-management benefits of debt indexation to GDP. Moreover, most, if not all, official creditors have an agenda for international development and may see in the adoption of GDP-linked debt a way of supporting global efforts to increase and improve the quality of finance for development.

These traits can be particularly useful in dealing with debt service payment gaps arising from differences between interest paid on GDP-linked securities and interest paid on fixed-rate debt, differentials which constitute an important shortcoming of GDP debt indexation holding back its wider use in international finance. While the sign and magnitude of these interest payment gaps cannot be determined *ex-ante*, it is possible to devise mechanisms to deal with them *ex-post*, while maintaining the debt management benefits of GDP indexation of external debt. For instance, official creditors can agree to pay back to debtor countries ‘excess’ interest charges collected on this debt, if debtor countries’ economies grow above their growth potential, and to do so when more convenient from a debt and macroeconomic management perspective. Likewise, debtor countries for which such debt schemes results in interest savings – due for instance, to lower than expected GDP growth – can agree to pay the full vanilla-equivalent interest over a longer period of time, for instance by extending the maturity of their debt.

Focusing on external debt with official creditors does not only make practical sense, in terms of increasing the prospects that GDP debt indexation becomes a common feature in international finance. It could also make an important difference to developing countries, given its weight in these countries’ external debt portfolio.

Flows of external debt with official creditors have seen a steady increase over the past 4 decades (see Figure 1), with debt disbursements to developing countries of this type increasing from an average \$US 35.9 billion per year in the 1970s to \$US 66.1 billion per year between 2004 and 2013, and reaching a historical peak of \$US 91.8 billion in 2010, measured in constant 2005 US dollar terms.



Source: Warren-Rodriguez, Alex and Conceição, Pedro (2015) ‘Risk-Informed Finance for Development: Can GDP-linked official lending to emerging economies and developing countries enhance risk management and resilience?’ UNDP discussion paper, UNDP, New York.

While its weight over total developing countries’ external debt has dropped over the years – a positive development, on the other hand, denoting greater access to international financial markets – external debt with official creditors still constitutes a key source of government finance in many of these countries. In 2013, for instance, it accounted, on average, for 36.2% of total public and publicly guaranteed (PPG) external debt disbursements to developing countries, share rising to 53.4% for lower middle income countries and 84% for low income economies. Much of this debt – 60.3% for developing countries as a whole – is given on concessional terms, most of it (62.3%) provided by multilateral financial institutions (see Table1). India, Indonesia, Brazil, China, Mexico, Turkey, Pakistan, Argentina, Egypt and the Philippines have historically been the main recipients of external debt flows from official creditors.

Table 1. Key debt management indicators, external official debt (2013)

	LIcs	Lower MICs	Upper MICs	Total
(2013 Billions of current US\$)				
PPG External debt stocks (Bn US\$)	120.3	629.1	1,207	1,956
PPG stocks, official creditors (Bn US\$)	112.0	417.9	384.6	914.5
Concessional	105.0	294.2	151.7	551.0
Non-Concessional	7.0	123.7	232.8	363.5
Bilateral	38.2	187.4	118.8	344.5
Multilateral	73.8	230.5	265.7	570.0
PPG Ext. debt disbursements (BnUS\$)	16.8	85.9	189.8	292.4
PPG disburs., official creditors (Bn US\$)	14.1	45.9	45.9	105.9
(2009-2013 Country grouping median values)				
Debt stock / GNI (%)	22.8	19.4	9.4	17.6
Disbursement/Revenue (ex. Grants) (%)	14.3	10.9	6.1	9.7
Disbursement/net ODA (%)	20.1	72.3	167.6	59.9
Disbursements/net FDI (%)	66.0	55.1	34.1	51.2
Debt Service/Exports (%)	2.7	3.1	2.1	2.7
Debt Service/Revenue (ex. Grants) (%)	3.5	6.3	3.3	3.9
Debt Service per capita (current USD)	3.7	23.7	56.9	20.2

Source: International Debt Statistics, World Bank

External debt with official creditors is also important in more general development terms. For example, in 2013, official debt disbursements to developing countries was equivalent to 9.7% of developing countries’ government revenue (excluding grants), 59.9% of net ODA disbursements and 51.23% of net

FDI inflows into these same countries, measured in median terms. While these percentages varied considerably by country, in all cases external debt with official creditors played a significant financing role.

Developing countries' debt service payments to official creditors, on the other hand, constitute an import variable for macroeconomic and macro-financial management. Thus, between 2009 and 2013, median debt service payments by developing countries reached 20.2 US dollars per person. In total, these payments were equivalent to 2.7% of these countries' median exports of goods and services during the same period of time. They also took up a considerable share of government revenue: an average median percentage of 3.9% between 2009 and 2013 for developing countries as a whole, percentage which increased to as much as 6.31% for lower middle income countries.

It is important to recognize that a large part of official debt is given for non-developmental purposes, both on non-concessional and non-concessional terms. This, however, does not diminish the case of GDP-indexation of debt with official creditors. Thus, in a context in which government financial resources are fungible, benefits granted for a specific debt instrument going to a specific expenditure item automatically spillover to other areas of public finance. Moreover, the benefits derived from linking debt, whether developmental or not, to economic performance (i.e. reducing the likelihood of debt distress episodes, creating greater space for countercyclical policies) are of an economy-wide nature and therefore also affect a country's development prospects.

## 5. INSIGHTS FROM A SIMULATION EXERCISE LINKING OFFICIAL DEBT TO GDP PERFORMANCE

The practical implications of adopting GDP indexation for developing countries' debt with official creditors UNDP can be better understood by simulating the macroeconomic and public finance effects of such a measure. We report here on the results of such an exercise, undertaken by UNDP as part of its work in the area of finance for development, which provide some valuable insights.

This exercise consists in simulating the financial outcomes of GDP debt indexation, had developing countries adopted such a measure (in agreement with their creditors!) for all its debt payments to official creditors between 2004 and 2013, and comparing these results with what actually happened during this same period.<sup>1</sup> The results of this type of simulation are highly sensitive to the GDP indexation specification adopted. In

general, the more restrictions are imposed to limit the degree to which interest rates are allowed to move with changes in GDP, the smaller the debt-management benefits that are derived from such an indexation scheme.

Our choice of GDP indexation method for this simulation is based on the cases of Greece's and Argentina's GDP-linked bond issuances. In defining this specification we sought to minimize overall interest payment gaps, while introducing additional elements of concessionality for concessional loans. The overall objective was to come up with a 'reasonable' GDP indexation specification that helped illustrate the potential benefits of GDP debt indexation. Table 2 and Figures 1 and 2 present a summary of results.

Our GDP indexation specification involves adding a premium to implicit interest rates paid between 2004 and 2013 on developing countries' official debt. This premium is equal to the difference between actual GDP growth in a given year and average GDP growth during the preceding 4 year-period, a measure of a country's trend growth. We add a cap on this premium, equivalent to 50% of this trend growth rate, so that developing countries are able to retain a share of the excess income generated on debt payments during episodes of growth acceleration. For non-concessional loans, interest rates are zero-bound. Rates on concessional lending, however, are allowed to be negative, for instance during recessions, denoting an element of additional concessionality granted on this debt. Finally, we impose a GDP threshold value, so that interest payments only take place if real GDP in a given year is higher than its value in 2004, at the beginning of the simulation period.

On aggregate, the financial impact of adopting GDP indexation under this contract design is relatively small. Overall, total interest payments drop by US\$8.95 billion for the full simulation period, compared to the interest actually paid during this same time, equivalent to a 4.92% drop. This decrease is somewhat smaller when looking at total debt service payments: 1.76%. By country group, low income countries would be the main beneficiaries from this GDP indexation specification, with total interest payments dropping by 9.23%, followed by upper middle income countries, for which interest payments would fall by 8.75%. Lower middle income countries, though, would see, as a whole, their interest payments increase by 0.37%, driven by the simulation results obtained for non-concessional debt.

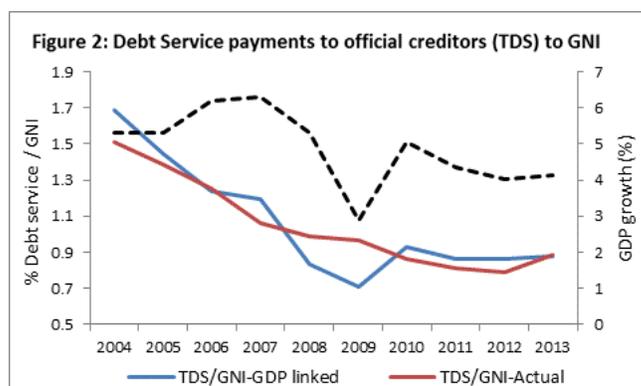
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<sup>1</sup> See Warren-Rodríguez and Conceição (2015) for full methodological details, including a discussion of caveats and weaknesses.

Table 2: Main simulation results – GDP-linked external debt with official creditors

	LICs		Lower MICs		Upper MICs		Total	
	Real	Sim.	Real	Sim.	real	Sim.	Real	Sim.
<b>Weighted Average Interest Rate (%)</b>								
Concessional	0.91	0.78	1.73	1.77	2.34	2.18	1.73	1.68
Non Concessional	2.70	2.82	3.43	3.35	3.90	3.57	3.70	3.47
<b>Correlation coefficients: GNI Growth vs. ....</b>								
Debt service/GNI	-0.36	-0.26	0.36	0.37	0.67	0.81	0.51	0.62
Debt Serv/Revnuce	0.13	0.29	0.48	0.54	0.67	0.82	0.50	0.73
<b>Total Interest paid on debt (Bn US\$)</b>								
Concessional	7.89	6.88	45.51	46.40	28.15	25.17	81.5	78.44
Non Concessional	2.05	2.15	31.55	30.94	66.87	61.54	100.5	94.62
<b>Total Debt Service paid on debt - BnUS\$</b>								
Concessional	25.49	23.68	165.81	164.83	113.4	110.11	304.7	298.62
Non-Concessional	5.80	5.90	129.66	128.65	282.1	276.39	417.6	410.93

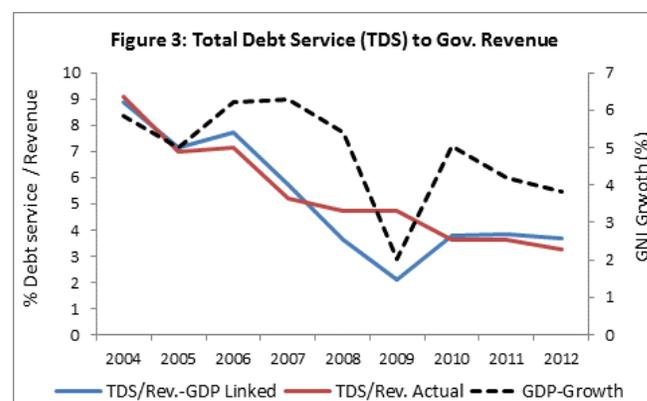
As discussed above, it would be possible to include contract clauses to deal with these interest and debt service payment gaps, and even eliminate them, while maintaining the debt management benefits of indexing debt to a country's economic performance. For instance, debtor countries for which such an indexation scheme led to interest savings, could agree to pay the full amount of interest over a longer period of time, for example, by extending debt maturity periods. On the other hand, official creditors can agree to pay back 'excess' interest charges collected from debtor countries' whose economies have grown above their growth potential, and to do so when more convenient from a debt and macroeconomic management perspective.



Source: Warren-Rodriguez, Alex and Conceição, Pedro (2015) 'Risk-Informed Finance for Development: Can GDP-linked official lending to emerging economies and developing countries enhance risk management and resilience?' UNDP discussion paper, UNDP, New York.

Beyond its financial costs and savings, the adoption of such a GDP debt indexation scheme would result in important debt management benefits. Thus, the correlation coefficient between GNI growth and developing countries' total debt service-to-GNI ratios over the simulation period increases, as a whole, from 0.51 to 0.62 (Table 2). In other words, by adopting GDP debt indexation, developing countries' debt service-to-GNI ratios move more closely to their GNI, which would imply and improvement in their ability to pay their debt. These gains would be greatest for upper middle income economies, followed low income countries and lower middle income countries.

These gains are perhaps best visualized in Figure 2. Thus, for developing countries as a whole, actual median official PPG debt service-to-GNI ratios between 2003 and 2014 (captured by the red solid line) remained insensitive to changes in median GNI growth rates during this time, captured by the black dotted line. This was especially the case during the 2008-2010 sub-period, when developing countries' GNI growth experienced a sharp decline due to the impact of global financial crisis. For this sub-period, these countries' official external debt service payments-to-GNI ratios actually increased slightly, meaning that their debt service burden increased during this recession period. However, median debt service-to-GNI ratios evolve more closely to median GNI growth when simulating the adoption of GDP-linked official external debt (blue solid line), co-movement that is particularly pronounced during the 2008-2010 sub-period.



Source: Warren-Rodriguez, Alex and Conceição, Pedro (2015) 'Risk-Informed Finance for Development: Can GDP-linked official lending to emerging economies and developing countries enhance risk management and resilience?' UNDP discussion paper, UNDP, New York.

GDP debt indexation also relaxes the constraints imposed by external debt management on the adoption of countercyclical policies. Thus, the correlation coefficients between median GNI growth and median 'Debt Service payments-to-Government Revenue (excluding grants)' – a measure of the amount of revenue governments need to set aside to pay back their debt – also increases, and in this case in a greater measure: from an actual correlation coefficient of 0.50 to one of 0.73 under GDP debt indexation (see Table 2). In other words, debt service-to-government revenue ratios evolve more closely with GNI growth rates, so that, when GNI growth drops this ratio falls in a greater measure. This means that, other things equal, governments have to set aside a smaller amount of revenue to service their external debt, 'surplus revenue' that can be devoted to countercyclical expansionary policies.

These results can be better visualized in Figure 3: the co-movement over the 2003-2012 period between median GNI growth rates (black dotted line) is much stronger for median Debt Service-to-Government Revenue ratios when external official debt is indexed to GDP performance (blue solid line)

than when it is not. In fact, during the 2008-2010 sub-period, at the height of the global financial crisis, we observe that real median Debt Service-to-Government Revenue ratios actually increased, suggesting that, on average, debt service payments during this time actually reduced developing countries' fiscal space to adopt countercyclical (in this case, expansionary) fiscal policies. As a reference, in 2009, at the height of the global financial crisis, the median share of developing countries' government revenue going to debt service payments on official external debt for reached 4.72%. Our estimates, is that adopting our GDP debt-indexation specification would have brought down this proportion to 2.10% of government revenue.

## 6. GDP DEBT INDEXATION AND POST-2015

Our analysis of GDP indexation of debt with official creditors comes as policy actors around the world – governments, civil society organizations, private sector associations, etc. – are working out the details of the new Post-2015 International Development Agenda that will replace the MDG framework from 2016 onwards. An important part of these discussions revolve around how to ensure that financial resources, both public and private, are available for sustainable human development, and are supportive of the transformational agenda the Post 2015 process is advocating.

Adopting GDP indexation of debt can go a long way in improving the financial outlook faced by developing countries, by improving debt management and debt sustainability outcomes. It can also assist governments pursue risk-informed policies that promote more balanced and sustainable growth paths that increase developing countries' resilience to external shocks. Focusing on GDP indexation of external public debt with official creditors perhaps could provide the most effective route of achieving this. All that is required to make this happen is for governments in both debtor and creditor countries to take action.

## FURTHER READINGS:

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