

**Summary:**

Assessment of progress towards sustainability is an important step towards meeting sustainable development goals. We carry out a comparative analysis between Brazil and India in terms of different sustainability indicators over the period 1970 to 2008. The data suggest that India is performing better than Brazil on most sustainability indicators, with the exception in the ecological deficit/surplus indicator. The results revalidate the fact that, across economies, there is a major compromise between economic development and the sustainability of the economy. Though intra-economic analysis shows that Brazil's economy is decarbonizing during the study period, nevertheless on a comparative scale Brazil's economy is creating more environmental externality than the Indian economy. Finally a projection based analysis revealed that India will be achieving the same level of human development as Brazil at a much lower environmental cost. Some policy recommendations that emerge in the light of this analysis are outlined in the end.

**Extended abstract:**

Since 1980s, when the Brundtland Commission formalised the concept of sustainable development (WCED, 1987), discussions around the idea of sustainability have dominated academic and political arenas. The main message derived from the emergence of this concept is that economic growth and preservation of natural capital are not two conflicting goals. On the contrary, economic growth can and must be achieved and at the same time the environment as a whole needs to be preserved. Notwithstanding the motive of sustainable development as a political goal has definitely entered in the political agenda of the vast majority of nations, this concept still remains elusive (Carter, 2001), which greatly compromises the measurement of progress made by nations toward sustainability. However, assessment of progress towards sustainability is an important step towards meeting sustainable development goals to which countries have implicitly or explicitly committed. This difficulty can be minimised with the use of sustainability indicators, which seek to present a brief outline on what extent a country or region can be considered sustainable.

In this paper we carry out a comparative analysis between Brazil and India in terms of different sustainability indicators over the period of 1970 to 2008. The primary rationale behind choosing these two countries is that in economies with rapid economic growth and/or intermediate income level, assessment of progress toward sustainability is even more relevant, since the results may indicate the extent to which the trajectory of these countries have been similar to that of currently developed countries, where economic growth was achieved with intense environmental externalities. The focus on these countries is even more relevant if we bear in mind that these nations still must strive for economic growth as to alleviate remaining poverty and to raise general quality of life standards of population. This is the case of Brazil and India, which are experiencing what mainstream economists call the 'catching up'<sup>1</sup> phase.

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<sup>1</sup> In economic theory, the catching up process generally refers to a convergence phenomenon in which developing countries tend to grow at a faster rate than developed countries.

The paper is divided into three sections, the first section provides a brief description of the Brazilian and Indian economic policies during 1970-2008 as well as an overview of the socioeconomic achievements made in both countries. The second section is intended to present our analysis on the progress achieved in Brazil and India using the following sustainability indicators: Domestic Material Consumption, Ecological Footprint and Adjusted Net Savings. The third section presents a comparative analysis between both the countries and recommends some policy implications for both the Brazilian and Indian contexts.

In the first decade of the study period, GDP as well as GDP per capita in Brazil grew significantly. In the rest of the study period, though GDP has registered a moderate growth, the growth in GDP per capita is minimal. However, according to General Progress Indicator (GPI) and Human Development Indicator (HDI) Brazil has shown improvement in the entire study period. In case of India the scenario is completely opposite. Throughout, Indian economy has consistently improved its GDP as well as GDP per capita. Moreover, the improvement in HDI and GPI is also stable and significant for India. In terms of policy shifts, Indian economy has experienced economic liberalisation during this period. For Brazil also there was liberalisation during this period; however the extent<sup>2</sup> of liberalisation may not be directly comparable with that of India.

To compare the performance of these two economies in terms of achieving sustainability, we employed the following indicators: the magnitude of domestic material consumption, the material intensity, the metabolic rate, the ecological footprint and bio-capacity, the ecological deficit/surplus, the adjusted net savings, and CO<sub>2</sub> emission per capita. Along with for determining economic progress, GDP per capita (GDPpc) is used and for measuring overall human development, HDI is considered. Initial trend in the data on these indicators suggest that India is performing better than Brazil on most of the sustainability indicators, with the exception in the ecological deficit/surplus indicator.

In further analysis, various inter-economy correlation coefficients showed that economic growth, especially for large developing economies, significantly undermines the capacity of an economy to be sustainable. Moreover, the very high positive correlation between GDPpc and HDI for both the economies also indicates the indispensability of economic growth for developing economies. Hence, both of these insights clearly points to the fact that world economy is completely embedded in a finite biophysical reserve and thus infinite economic growth can't be at all considered as a magic bullet for solving issues of poverty and to deliver human development with maintaining sustainability.

In the next step additional intra-economy correlation coefficients demonstrated that Brazil's economy is relatively decarbonizing and this clearly directs to the fact that, as though both these economies can be categorized under the same category of 'rapidly emerging economy'<sup>3</sup> still both of these are in two completely different phases of development. However,

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<sup>2</sup> For India in this liberal reforms, restriction on FDI has been taken off, along with tariff liberalisation especially in intermediary goods was accompanied with a significant devaluation of Indian Rupee (Mukherji, 2010).

However, for Brazil FDI driven import substitution policy was in place from the beginning of the study period.

<sup>3</sup> 'BRICS' is referred here.

correlation coefficient between GDPpc and Annual Net savings per capita for Brazil showed that Brazil's economy is leaving more externality on its environment than Indian economy. Also overall conclusion drawn from this section is that performance of a growing economy on sustainability scale primarily depends on the developmental phase of the economy, rather than the underlying policy shifts responsible for realizing that growth.

Finally a projection exercise is executed to show that India will realize similar human development with better sustainability performance than Brazil. More specifically in the year 2027, India is reaching Brazil's HDI of 2008, i.e. 0.716. However, the projected GDPpc, Ecological footprint upon bio-capacity and Domestic Material Consumption per capita for India are only 23%, 43% and 40% respectively of Brazil's 2008 standard. Proper reason behind this phenomenon needs more in-depth investigation and clearly is out of the scope of this paper. However one fact should be flagged in this regard is that India's GINI coefficient in the year 2005 is only 59% of the same for Brazil. This indicates that, the comparatively unequal society of Brazil might be the reasons for losing sustainability to achieve the same amount of overall human development.

As policy recommendation, Firstly, GDP growth at times is extremely necessary for developing economies to cater to the largely unfulfilled needs of its populations. However, considering the indicated strong trade-off between GDP growth and other sustainability indicators, a more 'sufficiency' based approach is necessary. Secondly, the importance of redistribution of wealth is absolutely imperative. Thirdly, the improvement on the technology front is undeniably essential as that can help to attain a substantial amount of growth of GDP without compromising the sustainability to a large extent. Fourthly, the population growth control must be included in the political priorities in both countries. As a very last word, by acknowledging the major limitations of this kind of macro-economic indicators based approach, the importance of this kind macro-scaled inter-economy study in providing insights for some alternative developmental models is highlighted.

#### **References:**

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