

Special Feature C

Using Cost-Benefit Analysis In Developed And Developing Countries: Is It The Same?

by Euston Quah¹

Introduction

Nobel laureate and economist Simon Kuznets put forth the concept of gross domestic product (GDP) in response to a need for good data in public policy planning in the 1930s. Since then, policymakers have increasingly relied upon GDP and other national income indicators. If only one macro indicator is available in any given country, chances are the indicator is the country's GDP. However, as Kuznets himself and other critics of GDP have pointed out, national income statistics are not ideal measures of welfare (Kuznets, 1934). Of the many criticisms, two of the more prominent are the lack of consideration of equity and the fact that these statistics only measure economic activity and do not account for non-economic costs of growth (Kuznets, 1962).

It is a fact that costs of economic growth are often non-market in nature, often resulting in environmental harm or loss to psychological well-being. To properly account for the full costs of growth, all such items should be quantified and any changes to their levels should be meticulously recorded. Additionally, to utilise the data for trade-off analysis, it is necessary to assign monetary values to them. However, to maintain a complete record of changes in the levels of all non-market goods requires large costs which may prove too high for developing countries. Often, developing nations account for these costs by conducting the analysis at a micro level when considering public projects, differing from their developed counterparts in this respect. As such, there is a need to approach cost-benefit analysis in developing nations differently to account for both behavioral and executional differences.

The Need For Cost-Benefit Analysis In Developing Countries

There are three reasons why the need for cost-benefit analysis is especially pressing for developing countries. First, to catch up to developed economies, developing economies need to grow even faster. The shorter the time frame for convergence, the faster developing countries need to grow. The OECD estimates that 60 years could be shaved off the catch-up process if least developed countries grew at a rate just one percentage point faster. Second, most of the

world's natural resources are concentrated in developing countries. International pressure on developing economies to take on greater responsibility for sustainable development and for these nations to bear future responsibility for reducing their carbon emissions is growing. Lastly, governments of developing economies face significantly greater budgetary constraints than their developed world counterparts. Therefore,

¹ Euston Quah is Professor of Economics and Head, Division of Economics at the Nanyang Technological University, as well as an Adjunct Principal Research Fellow of the Institute of Policy Studies at the National University of Singapore. The views in this article are solely those of the author and should not be attributed to MAS.

given these reasons, developing countries have to be extremely prudent about their choices of projects and face the need for optimal

decision-making. Thus, there is a great need for developing nations to adopt cost-benefit analysis to ascertain the net benefits of proposed projects.

Differences Between Developed And Developing Countries

It is also essential to note the need for a different approach to cost-benefit analysis for both developed and developing economies. Cost-benefit analysis must account for all benefits and costs of direct and indirect effects, including externalities, with valuation being as accurate as possible, reflecting the true social costs and benefits. Distortions in prices due to taxes and subsidies, as well as opportunity costs, must be accounted for while transfer payments should be ignored. However, in applying principles, certain valuation techniques commonly used in developed countries are not appropriate for developing countries and these differences may result in erroneous cost-benefit analysis.

Labour Markets

One example of this difference is within labour markets. Unlike developed nations, the majority of the workforce in developing nations is employed in agriculture. Though this will not necessarily distort a cost-benefit analysis, a significant portion of these agricultural workers are employed in name only and paid a token wage despite making no marginal contribution to the production process. Cost-benefit analysis requires that items be valued at their opportunity costs. Traditionally, any project that results in a labourer moving to another position paying the same wage would see the new wage being counted as the cost for a project. In this instance, there is no opportunity cost associated with that labourer's prior position and hence, the cost is overestimated.

Additionally, levels of household production in developing nations are higher than in developed nations. In developed economies, household production can be priced because labour markets are generally efficient and reflect opportunity or market replacement costs but in developing economies, labour markets are largely incomplete and households undertake most household

production. This creates a valuation problem as techniques that rely on market behaviour will be inadequate due to the incomplete market for hired help. Moreover, higher household production also means that cost-benefit analysis, which does not incorporate this production, is biased and inaccurate, skewing the accuracy of cost-benefit analysis in valuing non-market work. The same argument can be made with the underground economy.

Goods Markets

Another major difference is that the goods markets in developing economies are likely to be less efficient than those of developed economies because of information asymmetry. Also, distortions brought about by taxation, subsidies or other forms of governmental intervention mean that prices do not reflect the true values of goods. Therefore, using prices to value input items would likely result in an inaccurate cost-benefit analysis in a developing country.

Apart from directly calculating the costs, inefficiencies and distortions, goods markets also create issues with the valuation of intangibles and externalities. Typically, in developed economies, intangibles and externalities are valued in relation to consumption through a revealed preference approach. However, the credibility of such revealed preference techniques breaks down when a goods market does not produce prices that reflect the true value of a good, leading to distorted demand curves and the inability to properly use cost-benefit analysis.

Nevertheless, there has been a general consensus on using shadow prices when accounting for market distortions. However, a problem arises as exchange rates are required in the calculation of shadow prices for tradable goods and the rates for developing economies often fluctuate widely and

may not be appropriate. This exacerbates the issue of accuracy when using cost-benefit analysis, especially the technique of shadow price calculation.

Financial Markets

Financial markets in developing economies are also weaker than those in developed economies, with private banks often wielding considerable monopolistic power. As a result, interest rates are usually higher than what a free market would produce (Yildirim and Philippatos, 2007), giving rise to the issue of discounting. As social discount rates take into account both the opportunity cost of capital and a society's time preference, the artificially higher interest rates result in a higher social discount rate than is appropriate for measurement. Consequently, both future benefits and costs are then heavily discounted, causing bias in favour of projects that yield short-term benefits and incur long-term costs.

Due to shorter lifespans and lower incomes, which are social and economic characteristics of developing economies, populations from developing nations often have a higher preference for current, rather than future, consumption when compared to the preference of populations in developed countries. This difference in preference further raises social discount rates, albeit not as a result of some inefficiency in the market, but more reflective of genuine differences in individual preferences. However, where interest rates are inefficiently high because of the market power exercised by local banks, use of the market discount rate will bias results against projects with long-term benefits as well. Thus, both the opportunity cost rate and the social time preference rate used as discount rates in most cost-benefit studies need adjustment downwards.

Behavioural Economics And Cost-Benefit Analysis

In addition to fundamental differences between developed and developing countries with regards to discount rates, differences in behaviours also affect experimental design and results. This difference in behaviour detracts from traditional cost-benefit analysis, suggesting that both gains and losses have to account for psychological as well as physical attributes.

Loss Aversion

In practice, the study of loss aversion is the most common example which alters measurement values in cost-benefit analysis. Theoretically, gains and losses should be identical in nature and hold the same valuation when it comes to measurement. In the case of gains, it is the maximum amount that a person is willing to pay while losses account for the maximum payment that a person is willing to accept for the loss. Results of cost-benefit analysis should then be a summation of the respective valuations of gains and losses, with the end results being similar (Henderson, 1941; Mishan and Quah, 2007).

Yet, there is a significant disparity when measured, with values that accounted for a person's willingness to accept being far larger than his willingness to pay (Putler, 1992; Knetsch and Sinden, 1984). Knowing that differences do arise when considering people's valuations of losses and gains, failing to account for this will create inefficient and often biased decision-making. This is especially the case when analysing developing countries where the majority of the population is often poor, making them more risk-averse since their margin for error is lower as compared to individuals in developed countries.

The Choice Of Measurement

Another debate would be the use of appropriate methods of measurement. Due to loss aversion, the use of the willingness to pay criterion, a method of measurement in cost-benefit analysis, may sometimes not be appropriate for situations where willingness to accept measures should have been implemented instead, leading to systematic undervaluation of the actual costs (Knetsch, 2013).

This presents a danger in policymaking in developing countries as policies that aim to counter actions that have negative externalities such as pollution are likely to be under-weighted and there may be an undue encouragement of activities that have negative consequences. This explains lax environmental standards especially since the benefits of economic growth are quantitative while the costs are subject to measurement bias.

Sunk Costs Or No Sunk Costs

Another behavioural oddity is that of sunk costs. It appears that behavioural economics shows that many people consider such costs while conventional neoclassical economics does not.

This has serious implications for the evaluation of infrastructure expansion. For example, should an old ferry's capital cost be included when deciding a new ferry or alternative transport mode? Behavioural economics, in considering sunk costs, may seem to say so whereas standard economics may not.

In developed economies, this may not pose a major problem with a larger budget but in poorer developing countries, it makes a big difference as to whether the old ferry is kept or scrapped. The correct decision based on cost-benefit analysis is that as long as the old ferry can still cover its operating cost, the decision to have the new ferry should not be affected by this. In other words, cost-benefit analysis does not consider sunk costs.

Challenges In Applying Valuation Techniques In Developing Countries

Valuation techniques in cost-benefit analysis may be broadly classified into two categories: revealed preference approaches and stated preference approaches. Revealed preference approaches are indirect methods that attempt to discern the values of items by observing how people behave in the market. Hedonic pricing and travel cost methods are the prototypical examples of the revealed preference approach whereas the contingent valuation approach dominates the stated preference approach.

Still, most revealed preference approaches require strong assumptions of rationality, perfect information, and perfect mobility to be valid (Quah and Ong, 2009), while stated preference approaches, including the contingent valuation method, are susceptible to a large number of behavioural effects (Kahneman and Knetsch, 1992; Carson *et al.*, 2001) and methodological biases. The lack of trained interviewers in developing nations worsens the bias as well (Hanley and Barbier, 2009), with the inability of both interviewers and interviewees to differentiate between willingness to pay and ability to pay. Misunderstandings are further exacerbated by cultural and linguistic differences while the capacity for proper experimental design is limited

given cash-strapped governments. Thus, particularly for developing nations, these two valuation techniques have obvious pitfalls which may render results dubious.

A third valuation technique, the paired comparison approach, avoids the obvious flaws of the other two methodological classes (Quah *et al.*, 2006). The paired comparison approach uses a survey to elicit individual preferences for public and environmental goods. It avoids the need for the strong assumptions required by revealed preference methods and also overcomes the key behavioural effect that plagues contingent valuation methods. However, it is argued that this method does not provide a measure of the net benefits derived from a project though this concern can be addressed by including monetary items in the paired comparison choice set. Nonetheless, in conducting cost-benefit analysis, caution is still needed when choosing the most appropriate valuation method in order to avoid distortions.

Limitations Of Cost-Benefit Analysis For Developing Countries

A serious criticism of cost-benefit analysis is that it may result in foregoing equity in the pursuit of efficiency. In a typical cost-benefit analysis, the value of a dollar does not reflect who receives the benefits of a project or who pays its costs. In a developed nation, governmental channels such as progressive taxation redistribute wealth and prevent the income gap from widening too much or too quickly. Developing nations lack such channels, finding themselves a victim of prevalent corruption, which results in most of the benefits accruing to the rich and costs being borne by the poor, thus worsening inequity.

Still, the argument in support of cost-benefit analysis suggests that weights should be applied to reflect the relative importance of monetary values

to different social classes. While this principle is basically sound, the application of this weighting is highly problematic. For instance, there is the technical issue of determining what weights should be employed to adequately address inequity. While it is clear that the greater the importance attached to inequity issues, the larger the weights should be, the appropriate calibration is often difficult. Also, there is the possibility of abuse, with equity weighting being manipulated to produce any desired result simply by adjusting the weights attached to a particular group's welfare. This is made worse in developing countries due to prevalent corruption, thus reducing the ability of cost-benefit analysis to take into account equity issues in these economies.

Conclusion

As this discussion indicates, there are both similarities and differences between cost-benefit analyses conducted in developed and in developing countries. While the fundamental principles underlying cost-benefit analysis remain unchanged, the methodologies that are most appropriate in each context may differ due to behavioral and economic characteristics. In addition, the overall merits and limitations of cost-benefit analysis shift depending on the state of economic advancement, though the need for cost-benefit analysis is more pressing for developing economies, especially since they must contend with a number of conflicting and yet critically important goals.

On the whole, cost-benefit analysis can only fulfill its potential if three important issues are taken into account. First, cost-benefit analysis is only meant as a guide and should not be the final or

only arbiter of project proposals. Second, in conducting cost-benefit analysis, the appropriate valuation techniques must be selected. Finally, potential equity issues must be independently considered and treated as an imperative complement to a robust cost-benefit analysis.

This feature has argued that cost-benefit analysis can, and should, be used by the developing world. However, conducting the analysis requires one to consider several aspects such as proper measurement techniques, the end-users and stakeholders, what the appropriate investment decision criteria are, and whether there are constraints on the results. The need for systematic decisions that make use of consistent and transparent methodologies will be deemed valuable in formulating public policy in both developed and developing countries.

References

- Carson, R T, Flores, N E, and Meade, N F (2001), “Contingent Valuation: Controversies and Evidence”, *Environmental and Resource Economics*, Vol. 19, pp. 173–210.
- Hanley, N and Barbier, E B (2009), *Pricing Nature: Cost-Benefit Analysis and Environmental Policy*, Edward Elgar Publishing.
- Henderson, A M (1941), “Consumer’s Surplus and the Compensation Variation”, *Review of Economic Studies*, Vol. 8(2), pp. 117–121.
- Kahneman, D and Knetsch, J L (1992), “Valuing Public Goods: The Purchase of Moral Satisfaction”, *Journal of Environmental Economics and Management*, Vol. 22, pp. 57–70.
- Knetsch, J L (2013), “Behavioural Effects and Cost-Benefit Analysis: Lessons from Behavioural Economics”, pp. 84–98, in Quah, E and Toh, R, *Cost-Benefit Analysis: Cases and Materials*, Routledge, Taylor & Francis Group.
- Knetsch, J L and Sinden, J A (1984), “Willingness to Pay and Compensation Demanded: Experimental Evidence of an Unexpected Disparity in Measure of Value”, *Quarterly Journal of Economics*, Vol. 99(3), pp. 507–521.
- Kuznets, S (1934), “National Income, 1929–1932”, *NBER Bulletin* 49, pp. 1–12.
- Kuznets, S (1962), “How to Judge Quality”, *The New Republic*, Vol. 147(16), pp. 29–31.
- Mishan, E J and Quah, E (2007), *Cost Benefit Analysis*, Routledge, Taylor & Francis Group.
- Putler, D S (1992), “Incorporating Reference Price Effects into a Theory of Consumer Choice”, *Marketing Science*, Vol. 11(3), pp. 287–309.
- Quah, E and Ong, Q (2009), “Cities and Happiness in Environmental Goods”, pp. 277–298, in Ooi G L and Yuen B (eds.), *World Cities: Achieving Livability and Vibrancy*, World Scientific.
- Quah, E, Choa, E and Tan, K C (2006), “Use of Damage Schedules in Environmental Valuation: The Case of Urban Singapore”, *Applied Economics*, Vol. 38(13), pp. 1501–1512.
- Yildirim, H S and Philippatos, G (2007), “Efficiency of Banks: Recent Evidence from the Transition Economies of Europe 1993–2000”, *European Journal of Finance*, Vol. 13(2), pp. 123–143.