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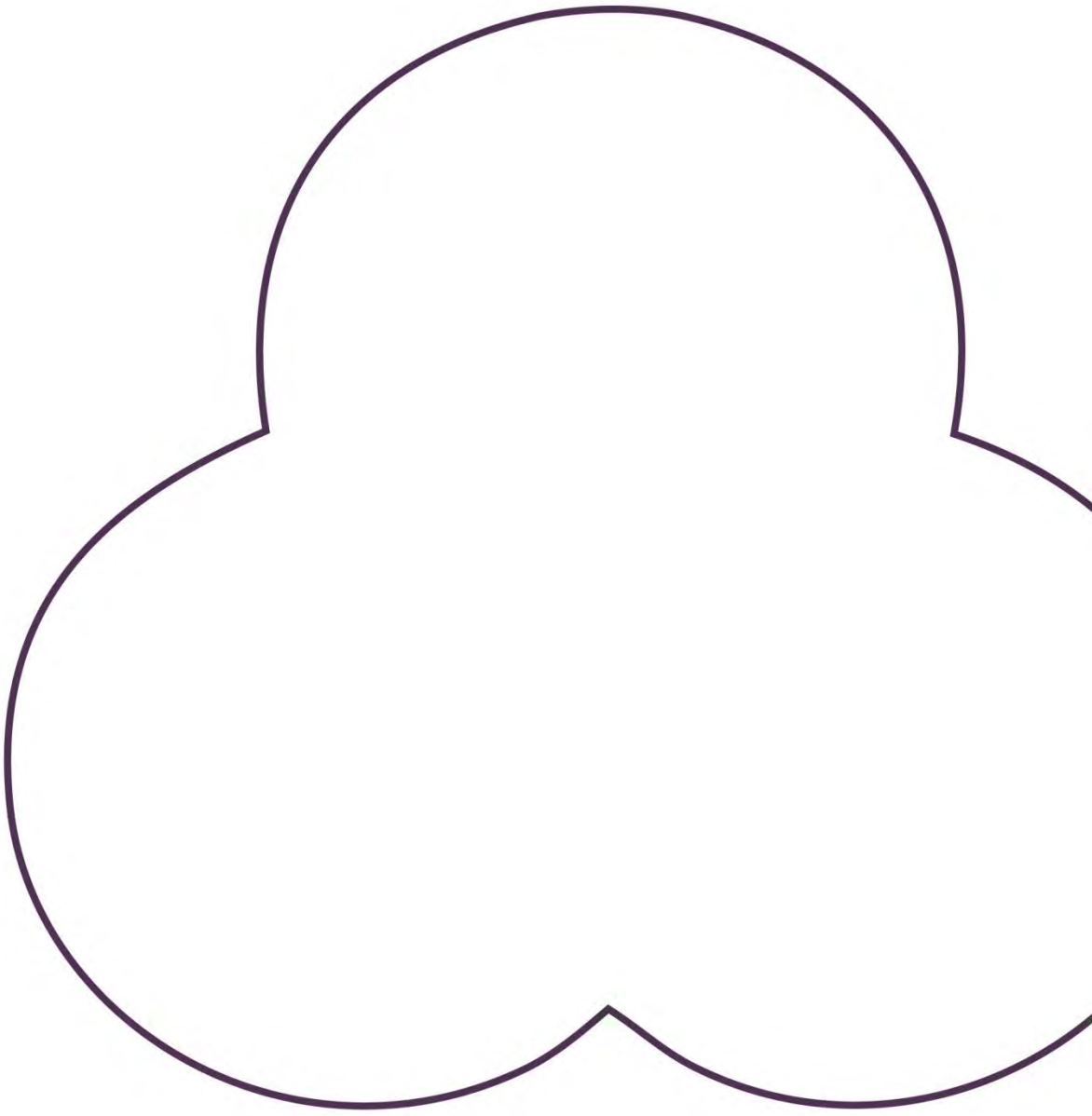

# Measuring the economic impact of Commonwealth Scholarships: Identifying Methodologies for Cost Benefit Analysis and Value for Money

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| **Title** | Measuring the economic impact of Commonwealth Scholarships: Identifying Methodologies for Cost Benefit Analysis and Value for Money |
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"It is absurd to think that we can derive the contour lines of our phenomena from our statistical material only. All we could ever prove from it is that no regular contour lines exist […] we cannot stress this point sufficiently"

Joseph Schumpeter (1939)

# Contents

# General introduction

## Context of the study

Although there are numerous studies dealing with the cost effectiveness of primary/secondary education interventions in developing countries, few - if any- studies have attempted to assess the cost effectiveness of financing higher education. This scarcity of extensive appraisal and evaluation studies is even more acute when researching the linkages between higher education investment and development at a project or programme level.

The lack of studies translates into a lack of measurable indicators against which the outcomes and impacts of higher education financing can be benchmarked and eventually evidenced. This poses a problem for public bodies, international organisations, donors and NGOs who finance programs and interventions of this type, without having the necessary tools to evidence the "value-for-money" (VfM) of their interventions.

Within this context, the Commonwealth Scholarships Commission (CSC) commissioned **nef** consulting to research and investigate how the cost effectiveness of its tertiary education grant schemes could be evaluated using VfM principles. For this purpose, the choice was made to focus on the PhD grants programme, i.e. investigating how VfM principles can apply to evaluate the effectiveness of providing PhD scholarships to students of the Commonwealth - with a particular emphasis on impacts/benefits accruing to developing countries and more specifically to Less Developed Countries (LDCs).

## The Commonwealth Scholarships Programme (CSP)

The commonwealth scholarships programme is available to any eligible citizen of developed or developing countries that are members of the Commonwealth. Applicants can choose to apply in any UK University that has a funding agreement with CSC. Numerous grants are given for a variety of tertiary education programmes/degrees including: master degrees, doctorates (Ph.D.), distance-learning master degrees, split-site PhD studies (e.g. between UK university and home country university) but equally academic and professional fellowships.

In addition to proposal quality and academic/professional achievements, further criteria for nomination includes the motivation and willingness of applicants to work directly or indirectly in key development areas of their home countries and although no formal quotas are in place nominating agencies are actively encouraged to take gender balance into account when nominating candidates. Along with an avoidance of "brain drain" effects, the former criterion aims to ensure that care is put both on personal development of candidates as well as socio-economic needs of their home country, while gender balance seeks to enhance equity in access to higher education.

In the case of PhD grants, successful applicants benefit both from a payment of University fees during their studies as well as living expenses. Likewise, their close family members (nuclear family) can join them in the United Kingdom – if needed. Finally, academic performance and attendance is regularly monitored via contact by CSC with the academic personnel of the respective university institutions.

As aforementioned, the aim of Commonwealth Scholarship Programme, including its PhD programme, is less about contributing to private/individual developments and more about using tertiary education investment as a vehicle for socio-economic development in the countries of origins. Evidently, both elements are not mutually exclusive. As such, CSC has already conducted extensive evaluation focusing

primarily on how personal developments have been intertwined with and channelled into key development sectors after return of successful participants to their home country (CSC, 2009 & 2012).

### Objectives and scope of the research

Whilst CSC has conducted extensive evaluation studies evidencing numerous *outcomes* brought about through its interventions, a next step is to try to evaluate the *impacts* of its scholarship programmes using a value-for-money (VfM) framework. This encompasses seeking to identify how the *economic impacts* of the PhD scholarship programme could be measured using quantifiable indicators and in view of comparing these "benefits" to the costs of financing its interventions. Measuring impacts is not done for its own sake. Rather, it can allow comparison between different delivery models aiming to achieve the same result i.e. should CSC provide grants for tertiary education in the UK or in developing countries or through direct aid to developing countries' academic institutions? Answering these questions requires an analysis of relative impacts.

While social cost-benefit analysis and its variants (e.g. social return on investment) are prominent tools used to assess the value-for-money of interventions, other methods detailed further in this report, such as cost-effectiveness analysis (CEA) and multi-criteria analysis (MCA), can be more suitable for the purpose of appraisal and evaluation of certain forms of interventions, e.g. when outcomes and impacts are impossible to "monetize".

The central questions this report aims to answer are thus the following: (1) what type of indicators have been or can be used to reflect the impacts of the scholarships programme? (2) Which VfM methods can be used for assessing the impacts of the PhD scholarships programme? (3) And what would each method entail in terms of data collection and resource intensity in view of constructing meaningful indicators that reflect the impacts of the intervention?

## Structure of the report

To answer these questions this report is structured as follows:

**Section 1** reviews existent literature that analyses the socio-economic impacts of higher/tertiary education investment on economic growth and development. It further investigates all possible routes through which higher education investment and international mobility of tertiary students can (or cannot, under certain conditions) contribute to development. Whilst most of this literature focuses on macro-economic impacts, we try to draw from it potential outcomes and indicators which could – or could not - be used on a micro level.

**Section 2** investigates the extent to which CSC's current evaluation framework can be improved in the light (1) of outcomes and impacts identified in section 1 and (2) of other evaluation studies. It recommends inclusion of additional outcome indicators as well as providing further guidance for capturing the attribution of and counterfactuals to the interventions.

**Section 3** investigates which methods and tools could be used to assess the economic impacts of the CSP, provides different alternative routes for evidencing these impacts and discusses the strengths and weaknesses of each option proposed. The three options proposed are not mutually exclusive and can be tested incrementally.

# Section 1. Review of evidence

Stating that higher education has traditionally been disregarded by development actors and donors is by no means an exaggeration. In 1994, for instance, a World Bank report stated the following:

*"Indeed, it is arguable that higher education should not have highest priority claim on incremental public resources available for education in many developing countries, especially those that have not yet achieved adequate access, equity and quality at the primary and secondary levels. This is because of the priority these countries attach to achieving universal literacy; because the social rates of return in investments in primary and secondary education usually exceed the rates of return on higher education and because investment in basic education can improve equity because it tends to reduce inequalities."*

Traditionally, highest priority has been placed on primary and secondary education, and this focus has often been disproportionate in funding allocation decisions. However, has the supporting evidence for these funding decisions been robust and unequivocal? One can doubt so. Indeed as Kapur and Crowley (2008) put it:

*"[…] while it is clear that there has been a substantial growth in higher education whether measured by the number of students or amounts spent, it is unclear just how meaningful this large growth is. Researchers have found it exceedingly difficult to get a good grip on two critical output measures – how to measure quality in higher education and how to determine the value added by higher education […]"*

Given the lack of meaningful and measurable outcomes, it appears that the evidence does not conclude that a disproportionate focus should be put only on primary education at the expense of higher education in order to enhance development.

Potential direct and indirect impacts of higher education on economic growth and socio-economic development are of particular interest when assessing the "value added" of higher education. To this respect, although the literature is contrasting, it is possible to understand many possible routes through which higher education is critical for developing countries – and particularly LDCs. Highlighting these routes is a *sine qua non* for subsequently building a consistent theory of change against which investment in higher education can be mapped, measured and eventually evaluated. We thus successively review the macro evidence, the micro evidence and finally case studies aiming to evaluate higher education investment programmes.

## 1.1. The conventional approach: "rates of return to education"

Since the 1980s, the most prominent instrument used to make allocation decisions in education has been the so-called "rate of return" analysis – originally formulated by Psacharopoulos et al (1986) and subsequently proofed by Psacharopoulos and Patrinos (2002). These analyses researched the private and social rates of return on educational investment across 98 countries. Overall, their findings suggest that in developing countries both private and social returns to primary and secondary education are significantly higher than for tertiary education. In their 2002 study, for instance, Psacharopoulos and Patrinos (2002) find that while the social rate of return is of the order of roughly 18.9% for primary education, the return on tertiary education is of just 10.9%. These findings imply that the effectiveness of targeting primary and secondary education is higher.

Largely used to justify a much stronger focus on primary education this method has, nonetheless, numerous limits. Firstly, private rates of return can be considered inappropriate since they omit the broader socio-economic impacts of tertiary education. Secondly, the so-called "social" rates of return are

simply fiscal benefits accruing the public sector, and by extension, to society. This does not take into account, among other things, induced job creation, skills and knowledge diffusion, technological diffusion or entrepreneurship enhancement. If considered, these possible knock-on impacts imply that the actual social returns of higher education could be much higher than suggested by this stream of research.

Notwithstanding critiques, it is important to highlight the strength of these analyses, which has been (1) that they attempted to measure, albeit imperfectly, the relative impacts of higher education; and thus (2) that they managed to guide funding allocation through quantifiable evidence. Indeed, even projects or small-scale interventions could be assessed straightforwardly using this approach.

As such, a next question consists in whether viable alternatives have been formulated – notably alternatives taking into account the full effects of higher education on economic growth and socio-economic development.

## 1.2. Beyond "rates of return": The macro-economic dimension

Macro-economic and sectoral literature has investigated the possible links between higher education and economic growth by moving beyond a rate of return approach. Macro-economic models can indeed account for externalities (i.e. knock on impacts) of higher education on developing countries thus evidencing broader economic (and by, extension, societal) outcomes and impacts.

Broadly speaking, economists consider that economic growth can be explained by a combination of capital accumulation, human capital accumulation and a residual, which is usually denominated Total Factor Productivity (TFP). In other words, TFP is a measure of how society uses and channels human and physical capital accumulation – impeding or enhancing productivity growth. Although there is a lack of systematic understanding of what exactly is to be included in TFP, it is generally acknowledged that institutional development, know-how, knowledge, quality of infrastructures and political conditions can be encompassed. Albeit being a "residual", it is often found that TFP can explain a considerable part of economic divergence between nations and thus different development levels.

Two streams of literature explore the relationship between economic growth, and higher education investment and level. The first stream uses regression analysis to determine whether higher education enrolment rates and investment have an impact on economic growth. The second stream focuses on researching the impacts of higher education on TFP by using frontier production functions. The latter approach invites investigation into whether higher education increases the speed at which new technologies are adopted, thus increasing TFP and growth potential. Key findings of "flagship studies" belonging to respective methodological streams are briefly presented below.

(1) Barro and Sala-i-Martin (1995) find that male educational attainment, particularly secondary and tertiary education, had significant positive growth effects. An increase in average male secondary schooling of 0.68 years raises annual GDP growth by 1.1 percentage points, while an increase in tertiary education of 0.09 years raises annual growth by 0.5 percentage points. Studies that are more sectoral include among others, the research on Lin (2004) in Taiwan. He finds that, throughout the post-war period, a 1% increase in the amount of population having completed any higher education degree led to a 35% increase in industrial output/production. Similarly, he finds that a 1% increase of the amount of population having completed any higher education degree in natural sciences and/or engineering led to a 15% increase in agricultural output/production – controlling for other factors through econometric techniques. If

one accepts these findings, then higher education seems to have played a decisive role in Taiwan's economic development.

(2) Bloom et al (2006) estimate that current African production level is 28% lower than its potential production frontier due to poor technological "catch up". By fixing the stock of human and physical capital, this method can be used to estimate the so-called "productivity" lag of the region. The authors estimate what an increase of education years would imply in terms of (a) technological catch-up (b) productivity and (c) output for the region. One of their key findings is that only tertiary education can induce a technological catch-up. Overall, an average one-year increase in tertiary education would boost output growth by 0.39 percentage points per year and incomes would increase by between 3% and 12%. Their results are even higher when modelling a doubling of average tertiary education years or a regional convergence with average tertiary education years of South Africa.

Numerous other studies have reached similar conclusions, both in the developing and developed world (for a review see Bloom et al, 2006; and World Bank, 2010). Compared to the rate of return analysis, these have the merit to consider the external and indirect effects of higher education of developing countries' economies, although, admittedly, they nonetheless take a narrow economic dimension by focusing only on GDP growth and output. Overall, stating that higher education has an overall positive impact on growth is non-controversial – with cautionary footnotes. Indeed some research considers higher education as "a necessary but not sufficient condition" for growth, given other types of constraints – most prominently institutional development and political environments (de Meulemeester & Rochat, 1995), addressed in the following section.

There are, however, some lessons that cannot be derived from these studies: (1) it is impossible to determine the relative effectiveness of investing in higher education versus primary and secondary education; (2) it is equally impossible to derive "mechanical" conclusions regarding the links between higher education and development – given that there are numerous other forms of constraints which can impede segregating the social benefits of higher education; (3) it is impossible to determine an arbitrage between different forms of higher education investment.

## 1.3. Tertiary education, governance and institutional arrangements

Beyond the arguments set forward by the "returns to education" literature, the additional recurrent economic arguments against prioritizing tertiary education are:

1. Due to their specialisation in low value added products, low-income countries cannot use the skills of highly skilled graduates – which labour markets cannot absorb anyway. Under this rationale, prioritizing primary and secondary education would be far more effective in addressing the needs of developing countries' labour markets and productive specialisation.
2. Poor institutional development impedes highly skilled graduates to exploit their capacity and thus their countries to reap the benefits of higher education. In this case, priority should be placed on governance quality and institutional development – considered by the institutional economics school to be a *sine qua non* for development.

Whilst it is true that both market specialisation and poor institutional settings could explain why numerous countries have not observed the benefits of educational investment, these arguments assume that individual agents passively respond to incentives and disincentives present in their societies – both productive and institutional ones. Such is not necessarily the case: institutions (and productive conditions)

are equally shaped by societal conditions and therefore agents can be both passive and active actors within their institutional surroundings. Research suggests that this is even more so the case for highly educated individuals.

For example, Bloom et al (2006) conducted a cross-country analysis that finds a positive and statistically significant correlation between higher education enrolment rates and numerous governance quality indicators. Most notably, they find that lower education enrolment rates are associated with corruption levels and ethnic tensions. Inversely, they find a statistically significant correlation between higher education enrolment rates and quality of public service delivery. In spite of the difficulties to determine the direction of causality between these different variables, overall findings support the idea that institutional settings are both influencing and being influenced by agents, and by extension, by highly educated individuals.

Similarly, despite a specialisation in low-value added products, highly educated individuals engage more in innovative entrepreneurial activities and can thus drive a productive upgrade of their countries. Bloom, Hartley, and Rosovsky (2006) find firstly that more educated entrepreneurs tend to create a larger amount of jobs than less educated one; and secondly that there is a higher probability of highly educated individuals to engage in entrepreneurial activities compared non-highly educated ones. Moreover, higher education is statistically significant in explaining research and development (R&D) intensity in developing countries and R&D is, in turn, positively correlated with economic performance (Lederman & Maloney, 2003).

In short, if the impacts of higher education investment can be adversely affected by labour market conditions and institutional/governance conditions in the country of origin, an increase in higher education enrolments and quality can also be a driver of change, meaning a transformation of both economic and institutional structures.

## 1.4. Socio-political dimensions

The social and distributional impacts of higher education investment have also been object of debates. For some academics, investing in higher education in LDCs is perceived as an essentially “regressive” policy serving. Brenann (2002) calls this “social *reproduction* [of the elites] rather than social *transformation*”. Nonetheless, as Kapur and Crowley (2008) argue, it is precisely the lack of higher educational investment that might have prevented the slow birth of a middle class – and thus permanence of high inequalities. This argument has equally been supported by development economist Easterly (2001) in his magisterial *The Elusive Quest for Growth*. Research conducted in the United States, indicates that the social return to higher education includes (beyond increased tax revenues) increased intergenerational mobility, lower welfare costs as well as increased income for non-college graduates through a “trickle down” effect (Rizzo, 2006).

## 1.5. Higher education, international mobility and development

A trend of tertiary education in developing countries is that a large amount of higher education students undertake their studies abroad (OECD, 2008). This trend applies directly to the CSC PhD Scholarship programme, which has chosen to provide grants for studying in UK higher education institutions.

Despite difficulties of estimating the number of tertiary students coming from developing countries (due to lack of sufficient data), there is a wide acknowledgment that this number is on the rise (OECD, 2008). The effects of this peculiarity have also incited debate.

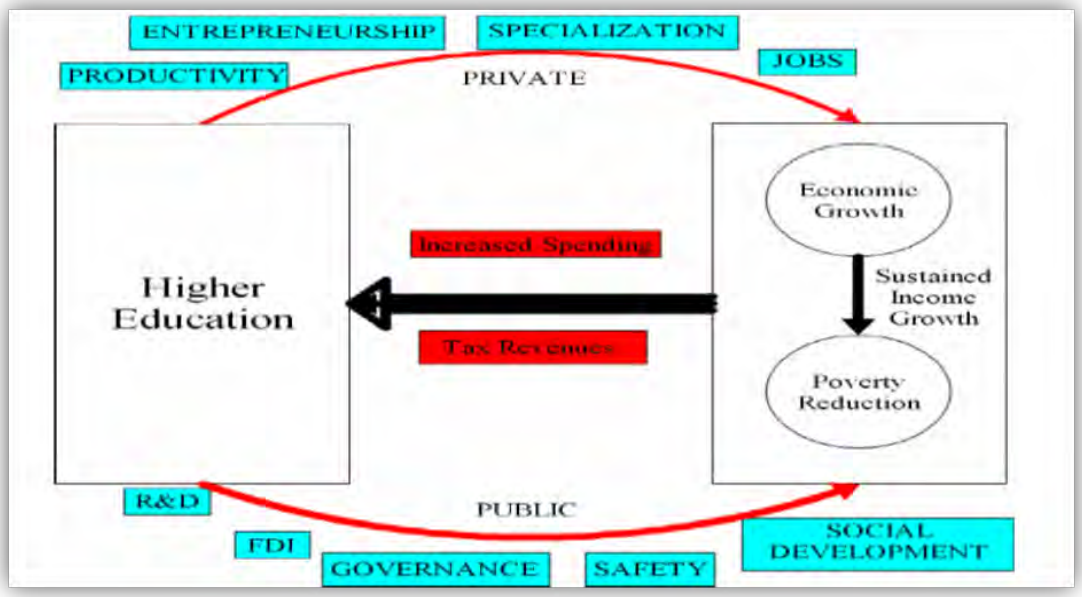
- On the one hand, international mobility of students can have numerous positive knock-on impacts on developing countries. These include: (1) Know-how transfer, both directly (as a consequence of education abroad) and indirectly (via contacts with foreign institutions); (2) a positive correlation between foreign direct investment (FDI) and highly skilled labour educated abroad; (3) increased transnational social and cultural capitals benefiting both the individual and eventually society (e.g. impact of this social capital on institutions where the individual in question works); (4) Transfer of cutting-edge knowledge accruing as a consequence of studying in better institutions (Doquier & Rapoport, 2007); (5) Transfer of governance, organisational and institutional "know how".
- On the other hand, the "export" of students can have some pitfalls: (1) the formation of highly skilled individuals abroad can strengthen a "brain drain" effect, i.e. individuals will be more likely to stay in the receiving country and (2) the type of knowledge acquired abroad can be detached from the needs and characteristics of "sending" countries. Such is the case of agricultural research. Rosegrant et al (2009) for instance, consider that research in agricultural research conducted in developed countries is becoming less and less relevant to the needs of developing ones - particularly LDCs. If this is the case, then indigenous capabilities in research and development are critical; foreign academic institutions and research cannot "replace" indigenous academic formation and research. For example, Kapur and Crowley (2008) consider that "*an important reason why the Green Revolution was far more successful in Asia than in Africa was the greater domestic technological capabilities in the former, developed through local agriculture universities and research centres that could adapt the new green revolution technologies to local conditions*".

These elements imply that there are both positive and negative "externalities" associated with forming tertiary students abroad, and this should be taken into account when allocating investment funds to tertiary education. On the one hand, cutting-edge knowledge, know-how and technology transfers are evidently required to boost economic growth in developing countries. On the other, the sole reliance on this source of knowledge is problematic in particular because it can often be unsuited to local needs and characteristics. Similarly, local capabilities are critical for absorbing and tailoring transfers from abroad to local needs.

## 1.6. Synthesis and discussion

Although the literature on returns to education has been prominent in guiding funding decisions of development actors, the evidence suggests there are numerous additional routes through which higher education investment can contribute to economic growth and development. Figure 1 summarises the routes through which higher education can affect growth and development.

**Figure 1: A synthesis of tertiary education socio-economic impacts**




It is arguable that many of the "routes" evidenced in the diagram are difficult to quantify at a project level – not least for evaluating an intervention's effectiveness.

How is it possible to determine, for instance, the specific impacts of a tertiary education programme on governance or social development? Similarly, how is it possible to attribute the creation of a specific number of jobs to a tertiary education grants scheme? Macroeconomic studies have the peculiarity of not requiring to evidence all intermediate linkages in order to show final results; for instance, it is econometrically possible to establish the causal link between tertiary educational investment and economic growth without necessarily having to evidence all the intermediate causal sub-links to explain why this is the case. This is not necessarily the case when aiming to evaluate a specific intervention – such as providing grants for tertiary education.

It is possible to use macro evidence to analyse micro impacts as a "rough" analysis, but this omits all intermediate outcomes, impacts, and their linkages. Using data from Bloom et al (2006) for instance, it could be possible to determine average economic individual impacts. But this exercise entails numerous problems: (1) it would be applicable to sub-Saharan Africa only; (2) it would not distinguish among African countries (which present very wide differences and potentially very different returns on higher education); (3) using different macro studies for evidencing the impacts in different geographic areas is not an option since it would consist in essentially incomparable data (i.e. results based on different approaches, models and datasets.

Overall, we consider that establishing the specific empirical linkages for a precise tertiary graduates set with specific skills and specialisation appears challenging even at a conceptual level. This difficulty explains, to a large extent the prominence of the returns to education indicator in order to quantitatively evidence the outcomes and impacts of tertiary educational investment. The aim of the following section is to recommend improvements to CSC's existing evaluation framework so that this may facilitate capture of meaningful data and value for money analysis.

# Section 2. Improving the CSC evaluation framework

In order for a VfM framework to be applied to CSC's tertiary education grants, certain empirical data needs to be collected. This section reviews key aspects of the CSC evaluation framework and makes recommendations for evidencing outcomes, counterfactual and attribution of the PhD scholarships scheme. Recommendations are either based upon experience from other fields and from the Netherlands Fellowship Programme (NFP) evaluation scheme.

Empirical studies assessing the outcomes and impacts of investment in higher education in general, and of providing higher education grants in particular, are scarce. For instance, an evaluation of the Canadian Francophonie Scholarship Programme (CFSP) undertaken by the Canadian International Development Agency shows little evidence of wider societal outcomes of the programme (CIDA, 2005). Similarly, an evaluation study of the Austrian grants programme commissioned by the Austrian Development Agency concluded that "the relationship between scholarship programmes and Millennium Development Goals (MDGs) is complex and indirect i.e. depends on the impact of the programmes on capacity building and better access to modern technologies and economic growth" and hence that "beyond some success stories", claiming a "positive contribution e.g. on poverty alleviation is difficult to sustain" (OSB Consulting, 2007).

## 2.1. Improving outcome indicators and measurement

- **Brain "drain" and brain "gain"**

Both CSC and NFP evidence a high rate of return to the home country – therefore avoiding "brain drain". This is an outcome per se[1] which is well evidenced and needs no further proofing aside from recording any possible "secondary emigration" occurring, for example, in a few years after return.

- **Organisational and institutional effects**

CSC assesses impacts on governance by asking individuals *whether* they have a personal impact on the organisations they work in or work with. However, neither the *magnitude* of this impact nor its *nature* is determined. The main additional information the NFP evaluation provides is that its survey includes not only graduates of the scheme but also their employers. Whilst collecting this data systematically would be challenging, it would be possible to conduct a number of sample studies with employers.

One way to formulate the question could be asking both graduates and employers whether the institutional impact they perceive to be having is "above average" (i.e. compared to other employees).

In addition to this, it is interesting to consider not only "pull" but also "push" factor: an individual might not have an organisational impact, not because of a lack of personal potential, but due objectives difficulties to do so i.e. institutional inertia. A more subtle question could be to ask graduates (and eventually employers) whether they consider that, the organisation context in which they operate is "impeding" their potential organisational impact (e.g. in universities). This question can be asked to both employees and employers with multiple choice answers i.e. relative relevance/irrelevance of position relative to obtained

[1] This is a clear benefit of the project given that numerous developing country return emigration programmes (aiming to attract

skills, hindering due to existing organisational constraints or inertia or responsiveness of organisational structure.

- **Private economic outcomes**

Although the objective of CSC scholarships is not to enhance private economic gains but to maximize social wealth, numerous private economic outcomes are relevant for a wider socio-economic evaluation framework. For example, a poor economic condition of graduates after return to their home country can potentially impede them from remaining in their country. A weak sustainability of return can sensibly reduce wider societal impacts e.g. if the individuals choose to re-emigrate. Additionally, investigating whether the grants scheme enhances social mobility among participants (and particularly women) can be considered as an outcome per se.

Information concerning private gains brought about by the intervention is limited. The CSC questionnaire only asks for the economic condition (social strata) of the individuals (e.g. bottom 50%; top 10% etc.). Additional information to capture *evolution* in a dynamic way could consist in asking *the extent to which (e.g. in percentage terms) the economic condition of graduates has improvement* compared to prior conditions. This is the route chosen by the NFP evaluation.

We propose two adjustments: (1) the first is to ask about the economic condition of individuals before participation and after completion; (2) the second is to ask for the income evolution (for instance in form of percentage). Ideally, CSC could directly ask for income (before and after completion) but this is likely to be unanswered or replete with biases (i.e. “strategic” answers not reflecting actual income).

- **Labour market effects**

CFC does not include any labour market impact in its evaluation framework. This is nonetheless a key aspect of higher education investment and scholarships provision.

In the context of highly educated individuals in developing countries, key labour market outcomes are less about knowing whether the individual is employed or not, and more about knowing whether the individual’s skills and specialisation are responding to labour market shortages. This includes universities: evidence suggests that shortages of professors and researchers are very high in numerous countries for various specialisations (World Bank, 2004). On the other hand, surplus of academics has been recorded in specific fields – such as agricultural sciences in some countries. Designing questions responding to this outcome can notably evidence whether ex ante selection criteria respond to perceived labour market needs in respective countries.

For addressing potential labour market outcomes, two solutions can be envisaged:

1. The first solution concerns individuals working in academia, for which the following questions are suggested: (a) whether individuals have launched a new department; (b) whether they have developed new courses/classes; (c) whether the classes they teach were taught by someone else before them; finally (d) an estimation of the amount of vacancies in their department (as objective criterion).

2. The NFP has conducted extensive fieldwork asking directly employers of graduates: (a) whether they are experiencing personnel shortages; (b) whether they consider that graduates participating in NFP cover shortages and finally (c) which are the strategies used by employers use when facing shortages. This information is collected through multiple choices questions.

The first solution covers labour market outcomes for academia while the second addresses effects on the wider labour market (including both public and private sectors).

- **Innovation**

CSC has one question on innovation, i.e. *whether the individuals have published or not academic papers – including the amount of publications*. NFP does not suggest any particular indicator for capturing this outcome. Nonetheless innovation of any form can constitute a key outcome – both for academics as well as for private or public sector employees.

We recommend that in addition to CSC question, additional indicators could include: (1) whether the individuals have submitted a patent for any innovation; (2) whether individuals working in academia have developed a new department or new course which did not exist prior to their return; (3) whether the individuals have started a business; (4) whether they have applied any innovative techniques (detailing which). For question four, an additional specification required could be to know the impact of this innovation technique in the workplace, for each field (say, on a scale of one to ten; or for instance in terms of hours of labour saved as a consequence of this innovation).

- **Knowledge, skills and "know how" transfers**

CSC addresses "brain gain" by directly asks graduates whether they "accessed equipment and expertise not available in [their] home country" - and to what extent. Perhaps this question can be asked in a more straightforward manner e.g. To what extent *do you consider you could have acquired a similar level of skills/knowledge in Universities of your home country?* For instance, on a scale of one to ten.

Similarly, an additional question linked to "international immersion" could consist in asking graduates the extent to which their contacts with foreign institutions or individuals (e.g. researchers) are critical for their work and professional development. Multiple possible answers can be proposed when asking this question.

- **Wider development impacts**

Unlike NFP and most evaluations of grants programmes, CSC considers wider socio-economic impacts through a direct question outlined in table 1. This is an extremely useful question that can be a basis for further expansion.

Proposed expansion should be based upon the principle that an *impact magnitude* is required. For those who state either "helping government thinking" or "contributing to wider socio-economic impacts" the analysis should stop there. For those stating "having been involved in projects" the analysis should proceed by asking: (1) whether the involvement was direct (project design, delivery, implementation etc.) or indirect (e.g. consulting). Subsequently (2), a magnitude of change should be asked – for instance: *(a)* "*on a scale of one to ten, how much of the socio-economic impacts of the projects or intervention can be attributed to your work?" (b) "do you think you could have had the same impact on the project without having carried a PhD?"*

**Table 1: CSC's question on wider development impacts**

*Please look at the following table and indicate your level of involvement in the leadership/ development priorities listed, including both professional and voluntary activities. Please tick all boxes that are applicable to you (you may select multiple statements and areas).*

| Leadership/Development Priorities | I have been involved in one or more specific projects in this field | I helped influence government thinking and policy in this field | I have contributed to wider socioeconomic impact in this field |
|---|---|---|---|
| 1. Health | | | |
| 2. Agricultural/ Rural Productivity | | | |
| 3. Quantity and Quality of Education | | | |
| 4. Governance | | | |
| 5. International Relations | | | |
| 6. Poverty Reduction | | | |
| 7. Social Inequalities and Human Rights | | | |
| 8. Physical Infrastructure | | | |
| 9. Environment Protection | | | |
| 10. Conflict Resolution / Humanitarian Assistance | | | |
| 11. Scientific and Research Applications | | | |
| 12. Job Creation | | | |
| 13. Other leadership / development priority | | | |

Table 2 summarizes suggested improvements in outcomes and impacts data collection system.

**Table 2: An overview of suggested indicators improvement**

| Outcomes/Impacts | CSC existing framework | Improvement potential (examples) |
|---|---|---|
| **Governance** | Perception of governance impact in organisations currently employed (number of people) | 1. Employer's perception of organisation impacts *via* NFP questionnaire<br>2. Scale application ("impact intensity") |
| **Social development** | Perception of impact on DfID priority areas (binary – "yes" or "no") | 1. Ask whether involvement direct/indirect<br>2. Scale application ("impact intensity") |
| **Relevant knowledge transfer** | Not directly tackled. Indirectly, question on perception of impacts of PhD on personal knowledge etc. | 1. "Could you have acquired the same knowledge and skills in your country?<br>2. Ask employers for relevance of knowledge and skills acquired (as per NFP) |
| **Social capital (+transnational)** | Self-stated types of contacts with foreign institutions and/or individuals | 1. Although the types of contacts already indicate intensity to an extent, scale can also be applied e.g. > 10 times a year<br>2. Determine whether contacts bring funds/work to University or country |
| **Innovation** | Published academic papers. Indirect information through University case studies in impact evaluation | 1. Patents submitted / or not – and amount<br>2. Opening of new departments/courses |
| **Other "External" socio-economic impacts (e.g. employment)** | Virtually no information | n/a because these are indirect (i.e. induced) rather than direct |

## 2.2. Measuring net impacts: attribution and counterfactual

The above improvements are mostly suited to evidencing gross outcomes and impacts. A next step is to investigate the extent to which attribution (amount of credit) of the programme and counterfactual (amount that would have happened anyway) can be represented in order to obtain a net outcome/impact figure.

- **Attribution**

Numerous questions asked by CSC tackle attribution in an indirect form. The same applies to NFP evaluation framework. We suggest more direct questions: ask applicants directly about the contribution of their PhD studies on their professional development. This question, nonetheless, needs to account for all other potential factors influencing their current professional development, as illustrated by table 3.

**Table 3: Example of an attribution question**

*Which of the following elements have helped you with your professional development? Allocate 100 points between the following actors in accordance with their contribution on your professional development.*

| Experiences (examples) | Attribution/Contribution |
|---|---|
| **Yourself** | |
| **Undergraduate studies** | |
| **PhD** | |
| **Social contacts in home country** | |
| **Social contacts abroad** | |
| **Socio-economic background** | |

- **Counterfactual**

The current CSC system provides some evidence of counterfactual by asking whether participants would have undertaken a similar course study (1) either *in the UK* (2) or *in their country* of origin. An additional improvement could consist in following the evolution of rejected candidates – if and when possible. This procedure has the merit of not being based upon a hypothetical question ("*what would you have done, if?*") but on actual behaviour of rejected candidates.

Combining an attribution question with the additional indicators presented in this report will allow CSC to gain a more realistic understanding of the outcomes and impacts achieved through its work. Concretely, this approach can be applied across the board, permitting an appreciation of *net impacts*, by subtracting

that for which CSC cannot claim credit. Whilst this remains a "rough" figure, since there might be outcomes or impacts for which attribution might be higher or lower, it provides more meaningful data that is currently collected.

To appreciate the *net impact* of the scholarships programme further specific counterfactual questions need to be asked for outcomes/impacts of high interest, i.e. those related to development activities. To capture this information, the follow is required:

- In the absence of a "control group" this can only be done by measuring the so-called "distance travelled" (i.e. the amount of change experienced) by comparing conditions and involvement of the individual prior and after PhD completion;
- In turn, this requires a retrospective questionnaire, asking for prior involvement (and intensity) in DfID key areas. The question can either be asked *ex post* (asking graduates what their perception of prior involvement is after PhD completion) or *ex ante* (asking candidates to determine their degree of involvement at the moment when their candidature is accepted).
- Each option entails its own response biases. Regardless of the approach, obtaining this figure would allow determining net impacts with a credible counterfactual and measure the amount of change that can be attributed to CSC PhD grants.
- Net impacts can therefore be understood as follows: the prior-to-PhD enrolment engagement can be considered as a baseline and the counterfactual (i.e. the change that would have happened anyway) would be the number of respondents stating they would have undertaken a PhD anyway.

The same logic can be applied to other outcomes or impacts if and when necessary to obtain more detailed figures.

## 2.3. Existing evaluation frameworks and economic analysis

When analysing the advantages and disadvantages of existing evaluation indicators, particularly for the purpose of an impact assessment, it is first important to ensure that these indicators are meaningful in a self-standing way i.e. regardless of whether they can be inserted, or not, in a quantitative framework.

A further question resides as to whether these indicators can form the basis of an economic impact assessment. More precisely, the question is whether one can derive induced development impacts even if we assume that (a) net effects and (b) subjective scale of effects (aforementioned "intensity") were obtained.

Unlike "classic" development interventions that directly target poverty factors, vulnerability or other forms of socio-economic deprivation, the impacts of higher education are, to a large extent, indirect and induced. This entails numerous difficulties in terms of attributing the impacts of specific highly qualified individuals on growth and development. Whilst numerous PhD graduates are indeed participating to policies and interventions having a developmental component, determining their impact contribution would require (a) determining the impacts of the interventions in which they participate and (b) secondly attributing part of these impacts to respective individuals. Taking into account that such analysis should be replicated for each one of the interventions to which graduates are participating. The obvious difficulties of this approach are discussed further in section 3.

A specific discussion point is whether CSC could use simple “proxy” indicators that reflect outcomes and impacts “across the board” (i.e. finding a least possible denominator) or whether it should unearth actual impacts by trying to investigate them in detail. Each approach entails specific difficulties and advantages/disadvantages further dealt with in section 3.

# Section 3: Applying VfM options to the CSC PhD scholarships programme

When wanting to evidence the full stream of costs (financial, economic, social and environmental **inputs**) and benefits (financial, economic, social and environmental **impacts**) two approaches are possible, depending on data availability and nature of an intervention.

The first is conducting a full impact assessment; the second is using a "proxy" analysis. The former is possible when the full stream of impacts is quantifiable; the latter is useful when it is not possible to evidence the full stream of impacts either due to inherent complexities of the intervention or as a consequence of lack of reliable data (which would render a full impact exercise extremely data intensive or replete with "shaky" assumptions). If this is the case, the choice can be made to focus on some key quantifiable indicators that can be used to *represent and reflect*, rather than accurately predicting, part of the identified impacts in view of generating meaningful quantitative results. If choosing a "proxy" approach, then additional outcomes and impacts (those not reflected in the quantitative analysis) can be presented qualitatively alongside the quantitative analysis.

It is also important to distinguish direct (immediate) from indirect (induced) impacts. Sometimes indirect/induced impacts, albeit offering a more holistic perspective, are difficult to evidence since they imply further layers of complexity in the analysis. In this case, the choice can be made to identify more direct impacts for a preliminary analysis while conducting case study analyses for investigating indirect ones.

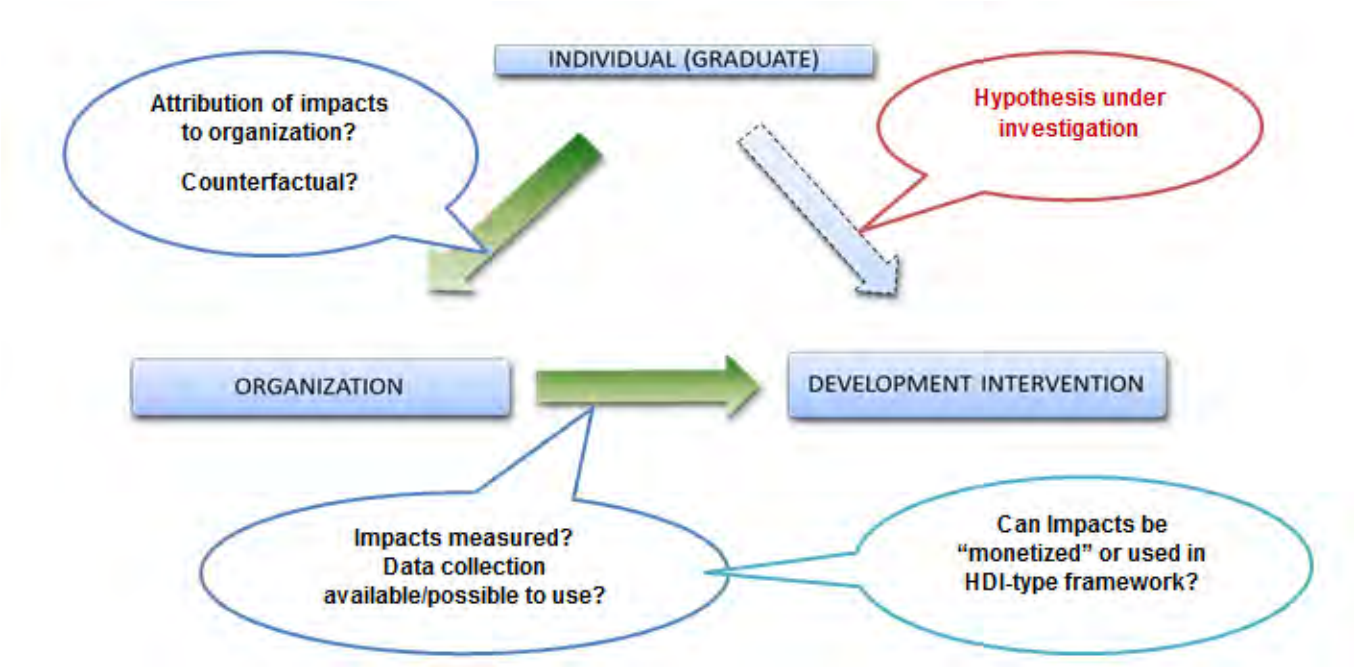
There are three principal methods used for evidencing VfM from an outcomes and impacts point of view: (1) cost-effectiveness analysis, (2) social cost-benefit analysis and (3) multi-criteria analysis. These are respectively outlined in appendixes 1, 2 and 3. MCA is less relevant for evaluating the impacts PhD scholarships but is included as an appendix for potential applicability on other programmes.

In this section we explore numerous routes through which an economic impact analysis can be conducted. We present the main hypothesis under investigation, three suggested options starting from the simplest (and less "holistic" one) in 3.3 and moving to more complex approaches. Excluded possibilities are briefly outlined at the end of the section.

## 3.1. The hypothesis under investigation

Figure 2 outlines the principal hypothesis explored by CSC: graduates return to their home country and participate, via their affiliated organisation, to development interventions – notably DfID priority areas.

**Figure 2: A "holistic" perspective on development impacts**




It is essential to re-state the difference between direct and indirect impacts when applying VfM methods to CSC programmes. Impacts can be more direct when some graduates are directly involved in organisations (public sector, NGOs, international organisations) which specifically undertake development work and projects. Impacts are more indirect for graduates working in academia or research. Academic research and University institutions, for instance, can have development impacts on the medium to long term (e.g. through quantity and quality of tertiary graduates), but assessing their direct impacts on DfID key areas or on Millennium Development Goals is certainly more elusive – since there is no direct development impacts against which the return of graduates can be benchmarked. For instance, a patent applied by a research centre might not have a direct impact on, say, child poverty reduction but can nonetheless have an indirect impact on economic growth – and subsequently on child poverty reduction. In short, whilst the framework outlined in figure 2 is valid as an overarching framework, there cannot be a "one size fits all" approach for all types of graduates when it comes to determine evaluation criteria and indicators; both the former and the latter need to account for socio-professional differences among graduates.

The framework outlined in figure 2 requires three distinct analytical steps:

(1) Determining the extent to which the organisations in question have impact data on respective intervention(s) in which graduates participate;
(2) Attributing part of impacts to the individual in question, including a credible counterfactual;
(3) Valuing the impacts (either human development impacts or impacts on DfID key areas) – if these are to be included in a cost-benefit analysis.

It is worth noting that this framework contrasts with the literature presented in section 1 in that it primarily targets human development indicators rather than thinking higher education as a mere instrument for economic growth.

Overall we consider that, ideally, meaningful impacts should be assessed under this framework. Yet, we also consider that this might not be feasible, or might be realistic for a case-study approach but not for an "across the board" VfM evaluation framework. Indeed, this is the most complex option of the ones we investigate.

## 3.2. A simple analysis using cost effectiveness analysis

The simplest and least data intensive option we investigate is a cost-effectiveness (CE) analysis, detailed in appendix 1. We consider that this method is useful only insofar as (1) it is possible and feasible to compare CE ratios obtained with CE ratios of a viable alternative to the intervention (in order to evidence its relative value-added) and (2) it is desirable to do so. If CSC and donors are not interested in potential alternatives then this option is evidently not appropriate. For instance, the literature reviewed in section 1 demonstrates that there can be a debate as to whether development actors should focus on providing grants for studies (e.g. PhDs) in developing countries or in developed ones. If wanting to assess the relative impacts of each option then a CE analysis can be useful for decision-making.

In section 1 we found that one of the numerous routes through which tertiary education – and academic institutions in general – can impact on growth and development is innovation, including both R&D as well as more fundamental research. Equally, reviewing empirical literature on the poor performance and constraints which the academic institutions of developing countries are facing, we found (1) that most academic institutions in developing countries face high levels of personnel shortages (expressed in terms of unfilled vacancies), especially in LDCs (World Bank, 2010); (2) that universities have a very poor record in terms of scientific publications (King, 2004; World Bank, 2000); (3) that R&D levels and patent applications performance are extremely poor (World Bank Databank, 2012). These figures vary across developing regions, with Sub-Saharan Africa having the weakest record and Asian developing countries the strongest one.

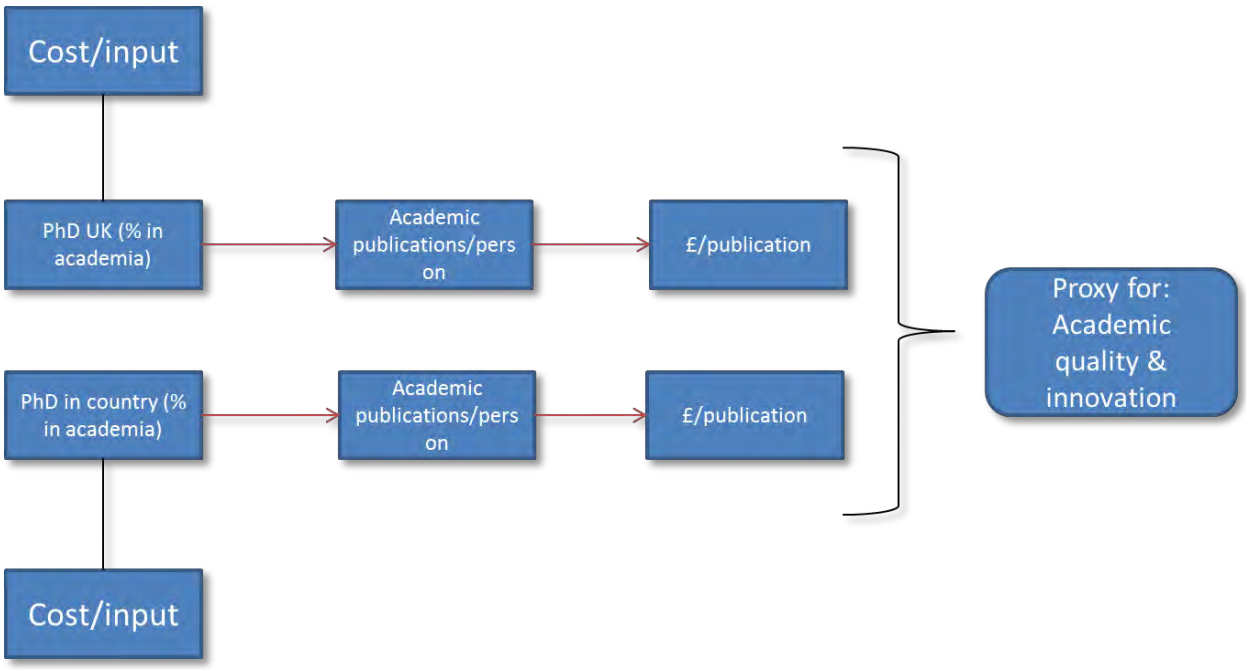
Given that innovation is considered a critical element for enhancing growth – and development, directly or indirectly – and given identified available secondary data, we propose a "proxy" approach using CEA. "Proxy" in the sense that the indicators we propose are not final development impacts *per se* (as per an ideal impact assessment) but rather a fair representation of further potential development impacts by using quantifiable data.

This proposal consists in the following:

- The World Bank hosts statistics on scientific and technical journal articles published per country, i.e. by the country that hosts the academic institution to which the researcher is affiliated. Combining this data with the social science database developed by UNESCO, it is possible to determine the average amount of publications per researcher for each Commonwealth country (World Bank Databank, 2012; UNESCO, 2008).
- World Bank data can equally be used to calculate (1) respective public spending per head in tertiary education as well as (2) an approximate figure of the number of graduates formed in indigenous institutions – for respective countries. This data can allow determining a rough approximation of the number of PhD graduates having been trained in their country of origin.
- Compiling this information would allow us to calculate the cost spent per academic publication in the country of origin, for individuals having completed their PhD in the country of origin.

- Through a sample of alumni, members CSC could subsequently ask for the amount of papers and articles published by PhD graduates. Ideally, this would be needed only for PhD graduates who subsequently went on to work in academia – as is the case for the majority of them. This would allow us constructing a cost per academic publication figure.
- In fine, a comparison between both CE ratios, i.e. cost per publication for PhD students graduating in the home country vs. cost of publication for PhD students who benefited from CSC scholarships, would allow us to determine the relative effectiveness of the two options, i.e. financing scholarships in the home country or financing scholarships for studying in the UK.

**Figure 3: Option 1 cost effectiveness model**




- **Advantages:** the principal merits of this approach are that it would be based upon an objective indicator that goes a step further than a simple output measure; as well as being feasible with a reasonable amount of resources required – not least in terms of data collection. This approach can be applied "across the board" (for PhD graduates working in the academic sector) without needing to dig into each academic specialisation.
- **Disadvantages:** firstly, this is arguably a very "gross" measure for a whole variety of reasons – such as the fact that other innovation means are not captured, e.g. patents. Secondly, it is a reductionist perspective in the sense that it captures only a small amount of potential outcomes and impacts (see: Sections 1, 2 and 3.1.). Thirdly, publishing academic material is not necessarily synonymous of a know-how that is relevant to the country of origin (see: Section 1). Fourthly, it doesn't take into account numerous additional forms of constraints impeding a sole focus of returnees on academic research, e.g. low wages can push academics towards focusing more on consulting services rather than on academic research per se. Overall, this approach is a very "narrow" one which cannot be further proofed and enhanced with additional indicators. CE analysis is not tailored to represent multiple indicators.

## 3.3. A limited social cost-benefit analysis

A simple cost-benefit analysis would entail a quantification of what is directly or indirectly quantifiable in economic terms. Instead of a "full stream" approach outlined in section 3.1 the objective is, in this case, to investigate the quantification of direct rather than indirect and induced impacts, i.e. impacts on human development, on climate change resilience etc.

This requires using also a "proxy" approach rather than trying to evidence the full stream of development impacts.

As part of the development of this option we conducted extensive research on the extent of data availability and data gathering for potential impacts, rather than looking for ideal impacts. Some of these impacts are relevant for PhD graduates while others can be more relevant for master degree (or other) graduates. A list of impacts includes: innovation (Research & Development) indicators, employment indicators, economic impact indicators, academic indicators and one indicator reflecting for internationalization of research. Means of measurement and "valuation" are presented in Table 4. It is arguable that some of these can be considered being "intermediate impacts" or outcome rather than final development impacts.

Compared to the "rates of return" approach, as well as to a CEA model, this option has the advantage of considering a wider range of induced effects. Figure 4 presents a graphical overview of option 2.

**Figure 4: Option 2 limited social cost-benefit model**

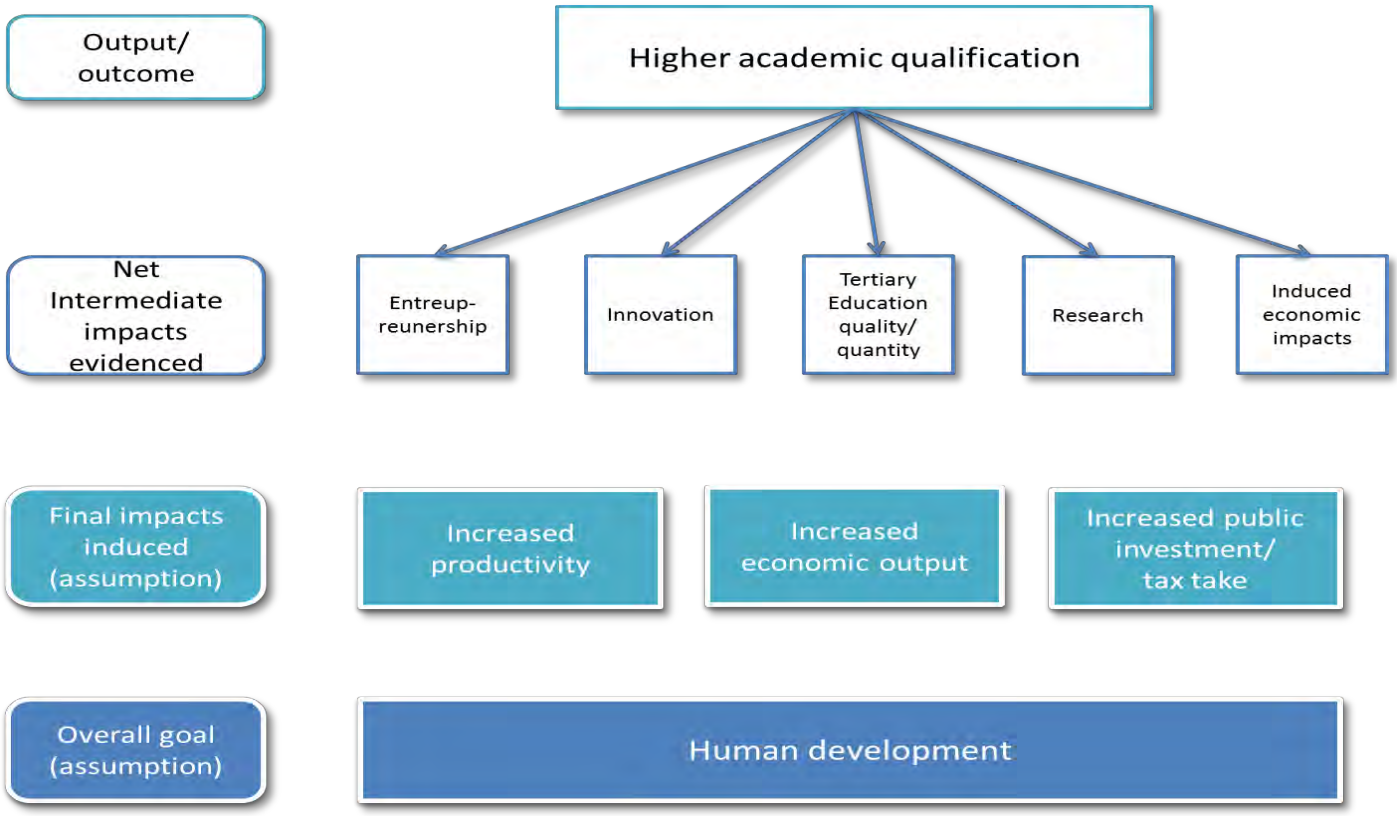


**Table 4: Possible indicators and valuation methods**

| Outcome / Impact indicator | Available methods of monetary valuation |
|---|---|
| **Patents applications (number)** | Sum of value of patents - price of property rights<br>(direct measurement + NPV calculation) |
| **Wage premium consumption multiplier**<br>**(wage before minus wage now)** | Consumption multipliers<br>(secondary literature e.g. IFPRI input-output) |
| **Number of students in new University department/course** | Either: Consumer surplus approach, i.e. willingness-to-pay for course or dept. enrolment<br>Or (if "free"): benefit = opportunity cost of participating to the course (wage if worked)<br>Or: student's private returns to education<br>(Patrinos and Psacharopoulos, 2002; WB dataset) |
| **Wage premium tax income (State)** | Either: wage currently minus wage before and tax rate (research secondary data) if individual worked before<br>Or: wage currently minus average master degree wage (research secondary data or consult) in country |
| **Academic publications (number of)** | No available means of valuation. If direct data available then possible to check the price of the issue number divided by the number of papers in it (very imperfect measurement albeit possible) |
| **New business creation** | Gross value added of business (increased output) minus an assumed displacement rate<br>(secondary data on country basis)<br>+ State tax intake (e.g. corporate tax/NI contributions etc.) |
| **Participation in international research project** | % o budget flowing to other University members or researchers |

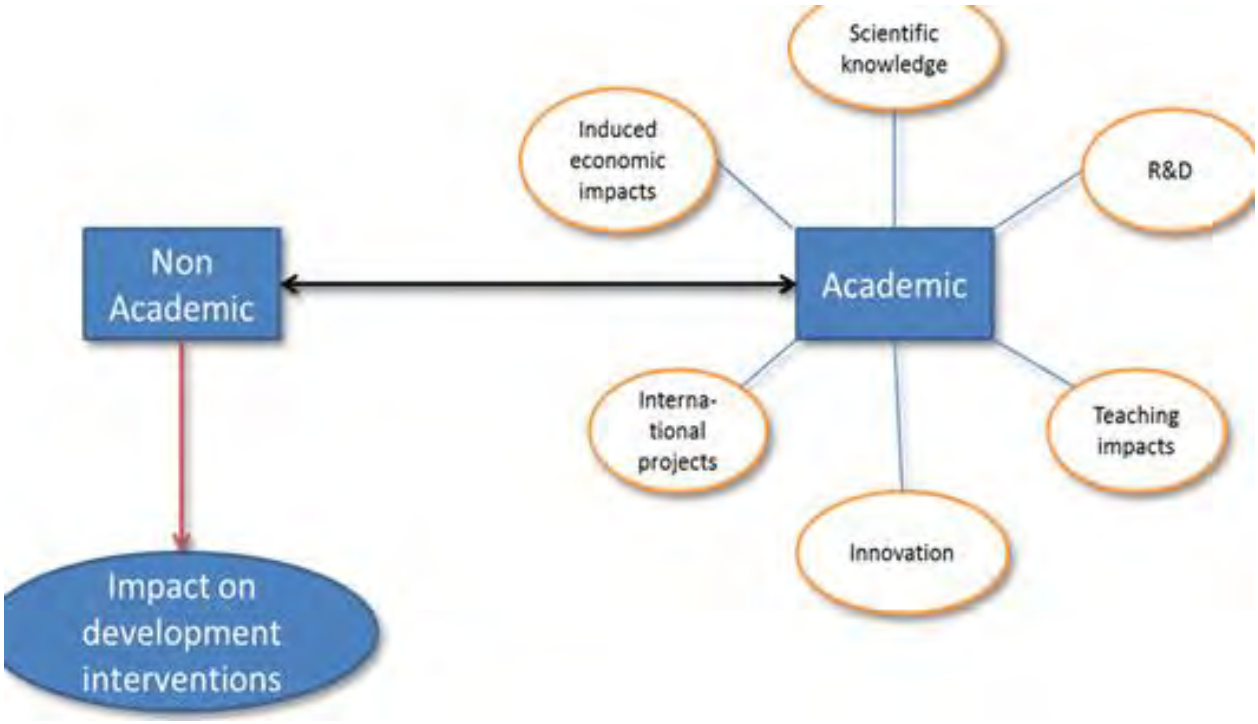
- **Advantages:** the strengths of this approach are that (1) it precisely measures what can be measured; (2) it expands "social returns" definition to include, among others, induced multiplier impacts, employment effects and innovation data; (3) thus it can represent a more accurate account of the economic impacts of the PhD grants scheme and (4) it can be expanded to represent additional impacts if the evidence collected allows so in the future. This is an evident "flexibility" advantage.
- **Disadvantages:** The weaknesses of this approach are the following: (1) it excludes more medium to long term impacts; (2) it completely excludes some impacts from the quantitative analysis (notably institutional development and governance); (3) requires some degree of secondary assumptions and data collection (including direct collection); (4) does not aim to measure "intangible" or less tangible

("soft") social impacts but targets what can be measured with relatively high confidence; (5) it eludes all forms of impacts on development – notably those induced by probable extra-academic activities.

## 3.4. An extended social cost-benefit analysis

A more sophisticated version of social cost-benefit analysis can *complement* (rather than *replace*) the framework presented in section 3.3. As figure 5 illustrates, the objective of this extended version is to go beyond strict economic impacts and try to capture development impacts, for example, as per DfID target areas.

**Figure 5: General framework of an extended social cost-benefit analysis**




We conceive that extended social CBA can only be conducted for a case study approach and is virtually impossible to carry "across the board". As a consequence of the subtleties involved in this approach, we successively outline the concrete steps, data collection and analytical levels that would be required for applying it:

- Identify **which individuals directly participate** in public or private institutions having a development impact or undertaking development projects.
- Establish a **contact with institutions in order to identify who tracks the impact of** projects, programmes or policies they undertake or have undertaken. For example, it is likely that numerous institutions undertaking development projects (in particular the public sector) keep data tracking performance according to the MDGs.
- Determine **in which of these projects the individual in question has been involved** and through which role. This evidently entails selecting a sample of graduates/alumni who are willing to participate in such a case study.

- **Analysing the, and scrutinizing the quality of, impact data** transmitted by these institutions. This would notably entail a **monetary valuation of development impacts**. Although this might not be feasible for all impacts, it is highly likely that many of these can be valued monetarily – this is notably the case for the following interventions: climate change (mitigation or adaptation/resilience); health; infrastructural interventions; poverty reduction; education (i.e. primary and secondary education). On the other hand, impacts related to governance improvements or international relations are less likely to need to be valued in this way[2].
- A harder step would then consist in determine the extent to which **a fraction of this change can be attributed** to the individual in question. A direct, multiple answer, question needs to be asked to the employer of the organisation in question. This question can include numerous factors leading to the success/impacts/design of this intervention – including the value-added of the graduate in question. A further question for attribution can be asking whether the intervention would have had the same amount of impact without the individual in question; and if not, how much less on a scale of one to ten. Attributing change to one individual is evidently difficult and replete with uncertainties – but we conclude that no other viable options is available.
- Thereafter, a further difficulty will consist in **determining a counterfactual**, i.e. what if the individual/graduate in question did not participate to this intervention. Section 2 already outlined further questions that could be asked (to employers) in order to identify labour market shortages etc. A counterfactual would require the same type of information: firstly asking the employer whether finding a person of similar qualifications could have been found in the national labour market; and if not, then asking whether another person (albeit with lower qualifications) available in the national labour market could have provided the same value added to the intervention/organisation.
- Following these steps, a **net impact amount** can be established

Albeit considerably more holistic, an extended social CBA approach presents both advantages and disadvantages. This approach is more tailored to analysing the impacts of graduates outside academia (and for sectors such as medical professions, engineering or extra-university teaching) than within it.

- **Advantages:** Unlike other approaches, this method can allow capturing socio-economic "external" impacts in a much more holistic way. If this kind of analysis is replicated for a sample of professional categories in a sample of countries, then more "across the board" figures could perhaps be derived – at least for some socio-professional categories.
- **Disadvantages:** Beyond being inapt for an "across the board" analysis (and thus being useful only for in-depth case studies), the main disadvantages of this exercise are its numerous biases (induced by questionnaires for such complex questions such as attribution) and assumptions. Care needs to be put in minimizing these disadvantages when designing questionnaires and stakeholder engagement. Similarly, sensitivity of results to assumptions is required– notably to avoid over-claiming.

[2] This is due to the inherent challenge of measuring the impact of governance outcomes. Qualitative research is better placed to understand the impact and potential value of positive governance outcomes.

# Conclusions and recommendations

In the light of existing literature, this report has (1) provided guidance for future improvements of the current evaluation framework and (2) identified three main options through which the socio-economic impacts of the CSC PhD programme can be evidenced in a VfM framework. These three options deliberately focus on "effectiveness" rather than "efficiency" of the 3Es definition[3], as a stronger measure of value for money.

Whilst there no "silver bullets" approaches to ascertaining VfM for CSC, two options present themselves:

- A simple cost-effectiveness approach can be used relatively easily in terms of data collection and analysis. Nonetheless, unlike the other two options, it is extremely restrictive in terms of evidencing impacts.
- Applying social cost-benefit analysis requires considerable primary and secondary data collection. This will inevitably entail a set of assumptions – to varying degrees. Yet, social cost-benefit analysis is far more apt to evidence a wider variety of outcomes and impacts (albeit so-called "secondary impacts") and can potentially entail a quantification of development impacts in its most sophisticated versions.

Overall, we consider social cost-benefit analysis to be the optimal methodology. This is because social CBA can be incrementally applied and improved along the journey as more outcomes and impacts are collected. As such, CSC can kick off with a relatively simple model and increase in sophistication over time.

Our final recommendation is that CSC develops a simple social cost-benefit analysis approach (option 2) alongside a more extended form of social cost-benefit analysis (option three) to explore its theory of change and wider socio-economic impacts. In this immediate term this requires integrating the indicators and processes required to capture data. In the medium term, this requires selecting samples and individuals for case studies that are representative of CSC's scholarships and DFID's key focus areas. Once a critical mass of case studies per development area is reached it will be possible to "upscale" the results across all of CSC's PhD scholarships.

Irrespective of the quantitative method chosen, it is worth remembering that a fundamental principle of socio-economic analysis and true VfM is to measure what matters and make these outcomes measurable. Increasingly, valuation techniques allow us to measure less tangible outcomes and impacts. Nonetheless, it should be acknowledged that outcomes such as institutional development and governance will probably not be included in such an analysis. It is therefore critical to improve current data collection for the CSC evaluation framework, regardless of the quantitative analysis. This strengthening will allow CSC to capture net, rather than gross, impacts in a more systematic way.

The suggested evaluation improvements and VfM methodology should be piloted, refined, learned from and implemented across CSC's work if it is to understand, in a meaningful sense, the VfM its PhD scholarships programme on international development.

[3] 3Es: Economy, Efficiency and Effectiveness

# Appendix 1: Cost effectiveness analysis

Cost effectiveness analysis (CEA) consists in comparing the costs of an intervention relative to one identified and pre-established outcome. Numerous interventions target one principal goal and objective although having numerous side-effects and knock-on impacts. The idea is therefore that the impacts of an intervention can be measured relative to a "flagship" outcome which overall captures the main outcomes/impacts of an intervention.

The main stages involve:

- A costing analysis, either financial (actual inputs of the project/intervention) or economic (full input stream of societal resources used in the project).
- The selection of a significant outcome; it is usually preferred to use an outcome which has already been used by other studies/scholars in order to have comparative data. This can include DALYs/QALYs, school years gained/loss, infant mortality etc.
- Collection of data to evidence the impact of the intervention on the pre-identified outcome.
- Finally, modelling the impacts. It is worth noting that when modelling the impacts, (a) the counterfactual and (b) attribution need to be considered in order to avoid over- claiming (see: section 3 on SROI for details).
- Results will be a cost-effectiveness ratio, e.g. $Cost/DALY gained. This ratio is meaningless on its own. It needs to be benchmarked against other studies/other interventions or against the same intervention in another area. League tables can eventually be created in order to explore or evidence the relative effectiveness of the intervention compared to other interventions or across different sites and geographic areas.

CEA is widely and mostly used for appraising and evaluating health and education interventions. Nonetheless it can be expanded to cover other areas; provided that comparative data exists or that the analysis covers the impacts of the intervention in other areas. In a nutshell, CEA can be useful insofar as one outcome can capture the most significant parts of an intervention's impacts. Alternatively, if an intervention's impacts are numerous and split between equally important outcomes (e.g. health + education + productive enhancement) then CEA becomes unsuitable or too restrictive.

CEA is without doubt the least intensive of all methods used in appraisal and evaluation – although this depends on the quality and scope of the CEA. Indeed, data collection systems can be easily adapted to capture one flagship outcome rather than requiring a full impact analysis across a range of direct and indirect outcomes. The only difficulty can reside in analysing the counterfactual and measuring which fraction of the observed change can be attributed to your intervention. Overall this is a useful methodology in the sense that it can potentially be applied "across the board" to appraise and evaluate all projects induced by an interventions. – given its simplicity and the fact it is not too data intensive.

# Appendix 2: Social cost benefit analysis & Social Return on Investment (SROI)

Social cost-benefit analysis and its variants, such as social return on investment (SROI)[4], allow determining the effectiveness of an intervention on its own merits. Indeed, an intervention is considered efficient and effective if the overall benefits it creates to society outweigh its implementation and opportunity costs. Thus, social cost-benefit analysis can both (1) determine the effectiveness of an intervention without requiring comparative data as well as (2) comparing the benefits of one's own intervention versus that of a different delivery model to make the results even more meaningful - if needed. Finally, monetisation of outcomes allows encompassing numerous outcomes, rather than comparing unit costs to a single outcome figure. Evidently, this entails "social valuation", a method whereby "soft" (social) and "hard" (environmental) goods and forms of non-marketed capitals are "priced" and expressed in monetary terms. The following steps are entailed:

- **First, defining a theory of change** in order to illustrate, and eventually demonstrate, how the activities of an organisation create the expected outcomes, or change for the stakeholders involved. There is no 'one best' theory of change that can be selected, it is driven by the change and organisation or programme seeks to trigger, and the logical link between activities and intended change.
- **Second, measuring the outcome incidence** in order to understand how much change occurs for each stakeholder, and how this is calculated. Two steps are followed: the first consists of defining indicators to represent and measure outcomes. The second consists of collecting two types of data: how many stakeholders are affected, i.e. experiencing change, as a consequence of the programme; and how large that change is.
- **Third, defining proxy values;** this is a process of understanding the value of the change created by a programme by assigning (a) appropriate economic (rather than strictly financial) values to components that have a market price, and (b) monetary values to things that do not have a market price using financial approximations i.e. "proxy values". This process is generally referred to as "social valuation" or "environmental valuation" respectively for "monetizing" social or environmental wealth/capital. It is worth noting that while environmental valuation (e.g. of greenhouse gas emissions, ecosystem services, or other natural resources) is a relatively robust exercise, and has been mainstreamed throughout the past decade, monetizing social goods can be more challenging given a relative lack of robust studies to guide the valuation process.

The **overall value creation** observed is calculated by the combining outcome incidence with the monetary values of respective outcomes, outputs or indicators. How this is done in practice is influenced by the context in which the analysis is applied, as well as the available information. The value calculation obtained represents a gross figure of which, it can be deducted (a) which part can be attributed to other projects/organisations (attribution); (b) the change that would have happened even in the absence of project (counterfactual or deadweight) or even, and (c) those benefits which are offset by unintended adverse impacts.

[4] Lawlor et al (2009) *Guide to Social Return on Investment* London: Society Media

As such, the **attribution** process consists in defining which percentage of overall change can be considered to be triggered directly by the project. This requires the potential identification of other organisations, actors (e.g. local government or other NGOs) and projects that could have influenced the outcome incidence. Attribution thus assesses the proportion of credit that a programme can take for the change that has occurred - taking account of other actors involved.

A second adjustment to the overall value thought to be created by the initiative can occur when considering **deadweight**, defined as an assessment of the amount of change that would have happened anyway in a "no intervention" scenario. This requires the definition, conceptually and statistically, of a "business-as-usual" scenario.

A final adjustment to the overall value calculation needs to be made when considering **displacement.** This is an assessment of how much of the change (remaining after considering attribution and deadweight) can be considered as a net benefit (i.e. a new change), or is it the result of a movement or change from one place to another. In employment, for instance, if a group of individuals get jobs, it could be at the expense of others – i.e. these are not new positions being created, but rather different people in these jobs.

**After an analysis of displacement, attribution and deadweight** the **benefit period** is defined i.e. the length of time that a change lasts and the benefits associated with that change. This may be influenced by the duration of the activity or by other changes that occur. Similarly, the effects might last for a long period but be decreasing over time. A decreasing trend is defined as "drop off".

Last but not least**,** benefits – and costs **–** are **discounted to represent their present value**. In the UK, the social discount rate (as opposed to financial/market discount rate, which is generally higher) is provided by the treasury at a 3.5% level. This rate represents time preferences: the higher the discount rate, the greater the assumed preference for the present is assumed, and conversely the less a future stream of benefits ifs preferred. Whilst a high discount rate tends to favour projects which have high returns in the short run. Discount rate choice is a statement in itself of how a society values returns. As such, it is generally good practice to consider a range of discount rates, say for e.g. 1%, 3.5% and 10%. For projects in developing countries, upper bound discount rates (6% to 8%) are generally used.

# Appendix 3: Multi criteria appraisal

MCA is a substantially different method compared to CEA, CBA and SROI. Firstly, it does encompass multiple possible outcomes, impacts and objectives – thus going beyond CEA. Secondly, it avoids putting all impacts under a single metric, i.e. money, as CBA and SROI. Thirdly, it accepts that society is a field of "conflict" between competing objectives and aims. As such, any scarce resource (ranging from land and natural resources to use of public funds) implies competition among different stakeholder interests and options. The stages of MCA are presented below:

- Step 1: Understanding the broad objectives

The objective is to (a) identify alternative courses of policy action/options and (b) assess or appraise these using different criteria and objectives. Ideally alternative policies as well as different criteria and objectives [*points (a) and (b)*] should be stakeholder-based, i.e. defined by the interests in play. The reasons for taking action in the first place are usually the criteria by which options are assessed. Further, the objective is to determine a recommended course of action (e.g. one form of intervention) as derived by the findings of an impacts assessment of each option relative to some criteria. In some cases, it can be preferable to have (a) a single most preferred path; (b) a ranked preference of option; (c) a split between acceptable and unacceptable options – as per the impact assessment results. The choice between these three options can be done case by case, depending on the context and the objectives of the study.

- Step 2: Establish decision context

The first key step is to determine the key players and stakeholders involved and/or potential affected by a course of action, either policy of programme process. The second key step is to determine the objectives and aims of the course of action. This broadly assumes that, on the onset, there is one course of action chosen, either by a government, an NGO or another actor (e.g. the community itself choosing an intervention).

- Step 3: Identify options / scenarios

The next step is to define alternative possible courses (ideally aiming to tackle similar objectives) of action which can be named options or scenarios. If, for instance, a funder aims to increase women's rights by funding major pre-existing programmes or NGOs by integrating this objective within other actions, alternative courses could consist in (a) the direct funding of grassroots organisation focusing specifically on women's rights or (b) direct funding of the recipient State (ODA-type). In this case we would have defined two alternative courses of policy action competing with the main course originally chosen by one key player – all of these having the same aim.

- Step 4: Determine criteria and sub-criteria

Criteria respond to the objectives of the project as well as the aspirations and priorities of key players and stakeholders. As such, these vary depending on the type and scale of the intervention. It is equally possible to include unidentified criteria, e.g. environmental sustainability or cultural sustainability, if judged necessary. Broadly speaking the identification of criteria is highly dependent on an ex ante robust identification of stakeholders and their priorities and aspirations. If leaving out some potential key stakeholders, then the set of criteria could be more limited and thus less relevant – in turn critically influencing findings. Broad criteria (social, economic, financial, environmental) are then to be broken and narrowed down into tangible sub-criteria i.e. on which it is possible to apply some form of evidence,

regardless of whether the metrics are different (e.g. US dollars for financial costs and emigration rate for cultural sustainability).

- Step 5: Derive *performance* Matrix

A first matrix describes how each scenario scores on each criterion. At this stage, it is useful to harmonize impact scales assessed on different units. This can be done through various ways depending on the scope and depth of the approach. One solution is to assume that the higher impact for each criterion =100 and all other scores on the same metric are adjusted on a 100 scale. Another solution is to take the means of all unit results for each criterion, assume the mean =zero, and adjust all other units as being a deviation from zero. A less sophisticated solution is simply to rank the outcomes, 0 being the least preferred option and 5 being the optimal solution for a given criterion. This way of ranking without prior harmonization is nonetheless the least preferred solution. Finally the most sophisticated approaches include use of Linear Programming (LP) and Goal Programming (GP).

- Step 6: Assign *weights* and their harmonization

A second matrix deals with the importance different stakeholders attach on each criterion. Indeed, a participatory-led approach requires attaching a different weight to different criteria in order to evidence the contrasting priorities of different groups and stakeholders. Put simply, the methodology assumes that we do not value the same things (e.g. environmental sustainability) to the same extent (e.g. how important is it given trade-offs that need to be made?). As such, stakeholders are asked to rank each criterion and explicitly asked to respond in terms of trade-offs. Whilst this can be done using any scale, the amount the total amount they can place needs to be give (e.g. totalling 100, or 10, or 1).

At this stage, we will have obtained two matrixes: one (step 5) which evidences how scenarios score on each criterion, and another (step 6) which gives us the relative importance of each criterion for each stakeholder.

MCA can apply in numerous contexts ranging from natural resource management, public investment/transfers allocations to exploring the relative merits of different options. Overall, it is nonetheless more useful (a) at an appraisal stage (rather than evaluation), (b) at policy/strategic level of decision-making rather than project level (c) in situation in which there is a large number of non-monetary impacts to be considered (e.g. social or environmental). Indeed, MCA escapes the inherent problems linked to “monetization” of non-marketed goods.

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