

# Contribution Analysis and Estimating the Size of Effects: Can We Reconcile the Possible with the Impossible?\*

**Abstract** While contribution analysis provides a step-by-step approach to verify whether and why an intervention is a contributory factor to development impact, most contribution analysis studies do not quantify the ‘share of contribution’ that can be attributed to a particular support intervention. Commissioners of evaluations, however, often want to understand the size or importance of a contribution, not least for accountability purposes. The easy (and not necessarily incorrect) response to this question would be to say that it is impossible to do so. However, in this CDI Practice Paper written by Giel Ton, John Mayne, Thomas Delahais, Jonny Morell, Barbara Befani, Marina Apgar and Peter O’Flynn, we explore how contribution analysis can be stretched so that it can give some sense of the importance of a contribution in a quantitative manner. The first part of the paper introduces the approach of contribution analysis and presents ideas to capture the change process in theories of change and system maps. The second part presents research design elements that include ranking or quantitative measures of impact in the verification of the theory of change and resulting contribution story.

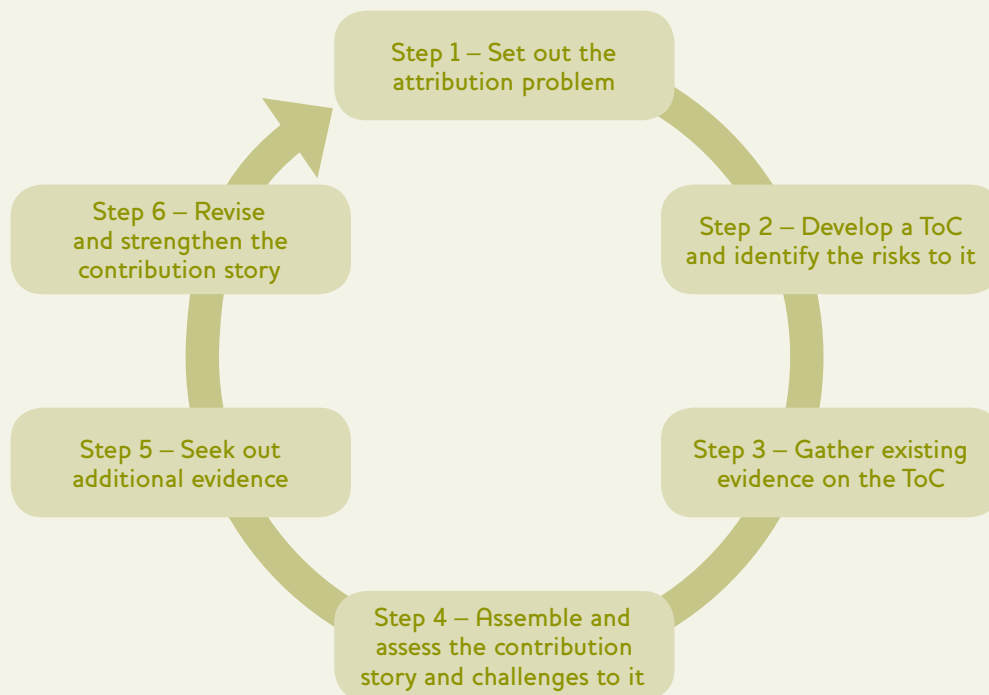
## 1 Contribution analysis

Contribution analysis is an approach to impact evaluation that can address this design challenge. It considers causality as a generative process where an intervention may change contextual conditions and, as a result, triggers a causal mechanism of change (Stern *et al.* 2012). Contribution analysis starts with a process to depict an intended change process as a sequence of events, with due attention to contextual influences. In analysing and verifying this theory of change (ToC), an evaluation that uses contribution analysis assesses whether an intervention is a contributory cause, and how and why the intervention made a difference. Contribution analysis provides a general framework rather than a detailed methodology, with six steps in an iterative cycle of reflection about and refinement of ToCs (see Figure 1). Each step implies different analytical steps that require rigour in methods. These six steps, outlined in Mayne (2008), are:

- 1 Set out the attribution problem to be addressed;
- 2 Develop a ToC and identify the risks to it;
- 3 Gather the existing evidence on the ToC;
- 4 Assemble and assess the contribution story and challenges to it;
- 5 Seek out additional evidence; and
- 6 Revise and strengthen the contribution story (return to step 4, or step 2).

Given that contribution analysis is based on analysing and verifying ToCs, it is clear that it requires good ToCs. However, what is a ‘good’ ToC? While widely used in evaluation, and generally understood as showing how

Figure 1 The iterative process of contribution analysis



Source: Authors' own.

intervention activities are meant to bring about expected change, there is little agreement on what comprises a good ToC or how to represent one. ToCs vary widely in the literature: it seems that anything with boxes and lines or arrows is considered a ToC.

We prefer the following terms and definitions when modelling the causal process of change:

- **Impact pathways** show the causal logic of an intervention, and the key steps along the way to impact. They are also called results chains, logic models, and intervention logic.
- **Theories of change (ToCs)** are more fine-grained, and add the assumptions behind the causal steps in the pathway to explain how and why the change will occur. Also known as programme theories, they can be nested and model the change process at different scales (micro, meso, macro).
- **System maps** are visualisations of interactions between components in a (social) system created to describe and communicate how the system is assumed to work. They are useful to acknowledge the complex system in which these ToCs take place.

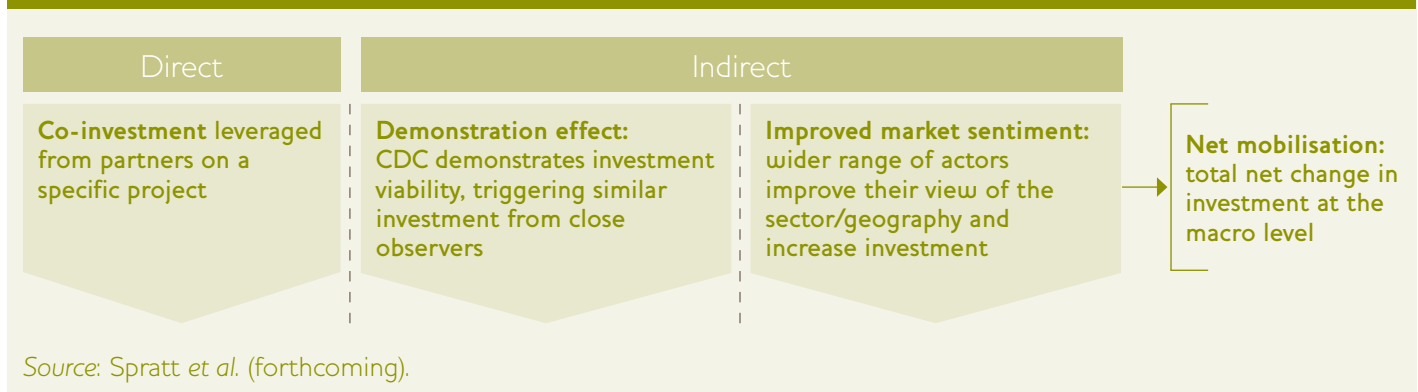
Ideas about the intentions, the process, and the dynamics of change will vary according to the experiences and perspectives of the stakeholders and beneficiary groups. When possible, we propose a participatory process to

identify and discuss these perspectives. Based on these insights, a schematic sketch of the ToC is developed to guide the contribution analysis. In a useful ToC, each arrow is an assumed causal link that connects the (likely) necessary conditions and events needed to bring about the change (effect). The assumptions about causal processes are not just beliefs about change, but should be justified by explicit reasoning and, where available, empirical evidence that supports this reasoning.

## 2 What is the impact of mobilising private sector investments?

In this paper we use CDC (formerly the Commonwealth Development Corporation) as an example of a complex intervention where contribution analysis is applied for answering specific evaluation questions. CDC is the UK government's development finance institution (DFI) with a mandate to mobilise private investments to address development challenges. CDC provides both long- and short-term finance to the private sector in developing countries, aiming to resolve constraints in the financial market and to unlock the potential for economic growth. CDC works to achieve a wide range of development impacts through these mobilisation efforts but has a core mandate to generate employment. CDC expects to mobilise private investment, either directly or indirectly through demonstration effects and by influencing market sentiment (see Figure 2).

Figure 2 Direct and indirect funding mobilisation by CDC



The CDC Longitudinal Study, commissioned by DFID, is a ten-year assessment of how and to what extent this funding mobilisation is achieved. The answer to these evaluation questions would help to strengthen the evidence for and rationale behind CDC's activities and contribute to a better understanding of the contexts and approaches that might improve the performance of CDC.

This paper is a discussion piece using CDC as an example to explore some common challenges in applying contribution analysis. The main evaluation design challenge is related to the complexities involved in the mobilisation efforts; CDC is clearly not alone in the complex configuration of factors that influence the mobilisation of investments. Moreover, often other conditions need to be in place before an investor decides to go ahead with an investment; for example, the co-investment with one or more other DFIs, or the introduction of certain legal provisions or tax regulation. It is unreasonable to attribute the total amount of funds mobilised to the CDC alone. CDC support does not yield effects on its own, and support activities are often combined with complementary support from other actors.

The case of CDC is also interesting because the mobilisation of investment funds is not its only goal, but is part of a multitude of factors that its investment teams consider when deciding to invest. Context matters. For instance, a CDC fund manager may not choose to co-invest with a private investor (although this would increase fund mobilisation) when the investor has different aims to the development mandate of CDC. Moreover, this mobilisation relies on a private sector that makes decisions in a dynamic context (such as markets, infrastructure, and legal systems). Interventions like CDC contribute to a context in which a firm makes investment decisions other than it would have done without CDC support. However, it is the intervention plus other necessary factors that bring about change.

### Contributions to changes in behaviour

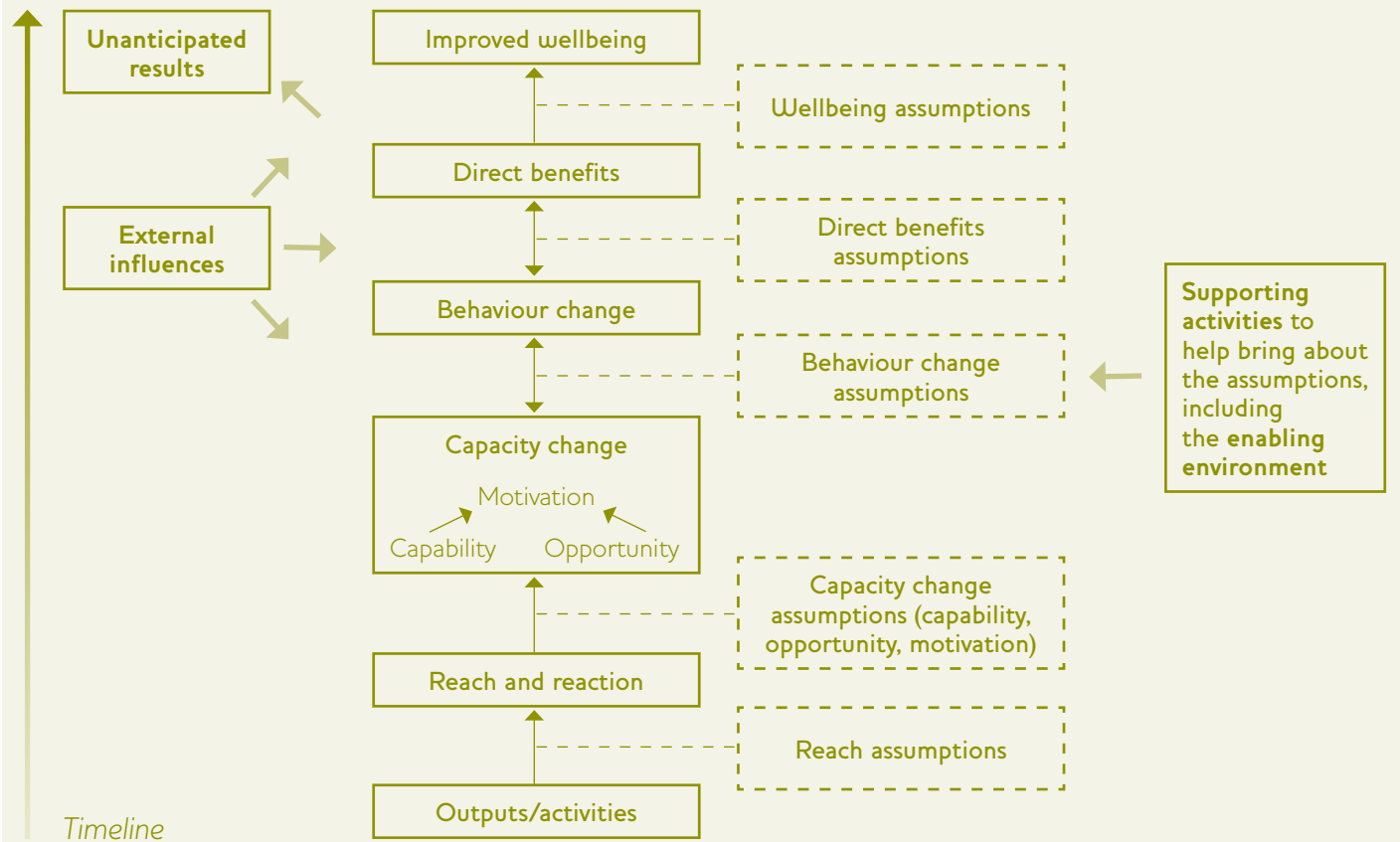
Contribution analysis starts and ends with a reflection on the ToC in iterative process (Figure 1). Most interventions aim at changing the behaviour of target groups and/or institutions. Certainly, this is the aim of the CDC mobilising

efforts, where investment teams need to convince firms to make investment decisions on business opportunities in challenging contexts and geographies. Our practical experiences with contribution analysis have shown us that a good ToC (1) needs to model this process of behaviour change in a way that intuitively makes sense for the stakeholders involved; (2) is supported by prior research – most planned interventions have similar precedents; and (3) is robust, i.e. plausible and structurally sound (Mayne 2017). There has been extensive social science research on behaviour change, and the recent work by Michie, van Stralen and West (2011) is especially useful. They set out a COM-B model of behaviour change: behaviour (B) occurs as the result of interaction between three necessary conditions: capabilities (C), motivation (M), and opportunities (O). The model is designed for individual behaviour change but also helps to model the changes in practices of task-oriented groups and institutions, including firms.

- **Capability** is defined as the actor's psychological and physical capacity to engage in the activity concerned. It includes having the necessary knowledge and skills.
- **Motivation** is defined as all the internal processes that energise and direct behaviour, not just goals and conscious decision-making. It includes habitual processes, emotional responding, as well as analytical decision-making.
- **Opportunity** is defined as all the factors that lie outside the actor that make the behaviour possible or prompt it (Michie *et al.* 2011).

A generic ToC inspired by this COM-B model is shown in Figure 3. The ToC shows capacity and behaviour changes as the expected outcomes, and the assumptions needed to bring about these changes. The changes in behaviour are expected to result in *direct benefits*, which will lead to *improved wellbeing*. Several feedback loops are shown, implying that the change process outlined is often not linear and can take time. The model includes the important step of *reach and reaction*: the intervention must be able

Figure 3 The COM-B theory of change model



Source: Adapted from Mayne (2018).

to get to those whose behaviour it is aiming to change, and the initial contact with them needs to be positively received and deemed worth further consideration. The model has an intuitive appeal and sets out steps in building different context-specific ToCs. Each of these contexts/activity areas has specific activities to reach a target group or groups and change their capacity so that an aimed-for behaviour change is realised. For a programme of projects, it is very useful to be able to identify a reasonable number of generic types of projects (investment contexts), and build generic ToCs for each. Building a good ToC is not a simple task; it requires careful thought, logical analysis, and participation (Koleros *et al.* 2018). An essential component of contribution analysis is the revision of each ToC over time when more is learned about how the intervention is working, or not.

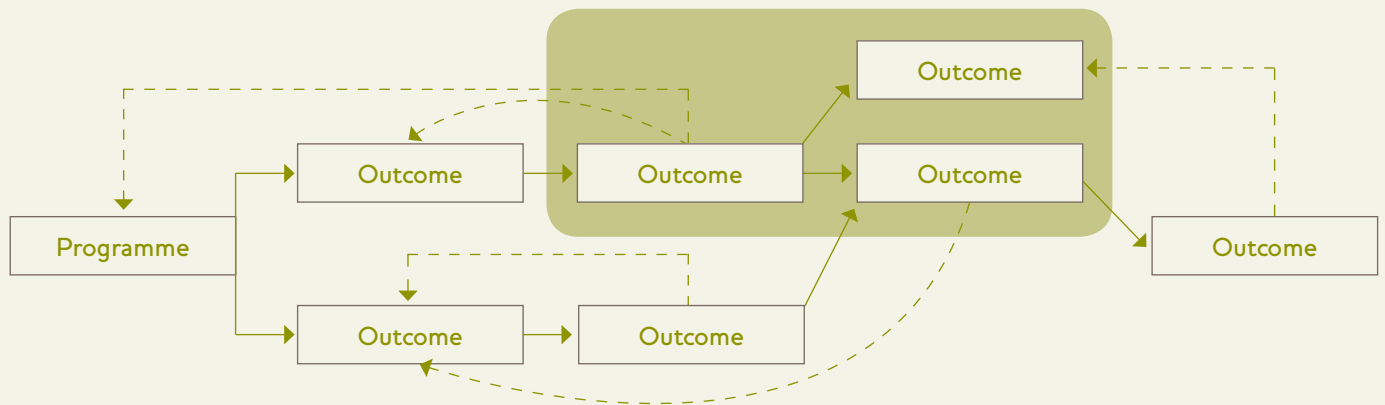
#### Contributions to changes in distant outcomes

In an evaluation that uses contribution analysis, the ToC is typically modelled as a sequential chain of expected outcomes. This linear layout reflects the fact that impact evaluation usually concerns a planned intervention with specific intended outcomes. The limitations of the model (ideally a one-pager) and the drive to learn on behavioural changes implies a focus on the detailing of changes in intermediate outcomes that are still within an intervention's

sphere of direct influence (Ton, Vellema and Ge 2014; Earl, Carden and Smutylo 2001), with less detail on the complexities of the change processes that are beyond this sphere. In complex settings, there are, therefore, reasons to be cautious (Morell 2010, 2018b). While learning about the effects of an intervention on these short-term and intermediate outcomes is essential for project implementers, the longer-term outcomes tend to provide the primary rationale for public funding (e.g. a project's contribution to the Sustainable Development Goals).

In our experiences of using contribution analysis, sometimes the drawing of a ToC alone is not enough to understand and assess the importance or relevance of an intervention's contribution to changes at a higher meso or macro level, and an additional system map of the non-linear dynamics and interactions between outcomes is helpful. For example, when analysing the relevance of CDC, we could draw a separate system map to understand the role of private investments in the macroeconomy. This may help to identify and specify the different pathways through which CDC is assumed to contribute to macroeconomic dynamics and compare CDC with other interventions that work in similar areas (Delahais and Toulemonde 2012, 2017).

Figure 4 Complexities in a ToC



Source: Authors' own.

Another important issue is the uncertainty of causal steps due to the presence of feedback loops (Morell 2018a, 2018b). As shown in Figure 4, the green box represents an area in which a planned intervention is working and where a causal model reflects the ToC. If the green box is moved over the model, wherever it is, it will capture links between short- and longer-term outcomes. However, the causal links within them would reflect the dynamics that take place outside the green space. The top right outcome in the green box has a solid 45-degree arrow: this may show a correct sequential causal relationship, but the actual behaviour of the outcome will be influenced by the feedback loop. As long as the focus stays narrow and the feedback loops and interactions between components of the system are virtuous cycles ('an increase in X creates an increase in Y, which increases X'), it is all probably fine. But as the coverage of the model (the green region) expands, and multiple feedback loops interact, amplify, or mute effects, the idea of verifying the effectiveness of an intervention by monitoring the sequence of outcomes needs to be reconsidered. In these complex situations with a high causal density (Woolcock 2013), with many causal influences and feedback loops, the impact results from a networking effect, and whatever a programme accomplishes, over time, would result from connections with other phenomena. Some of those phenomena may be other programmes, and some may be changes that would anyhow have taken place. In highly complex contexts, change can be emergent and cannot be explained in terms of the individual contributions of its parts.

When relations are modelled in complex social systems that are full of uncertainties, stakeholders may have especially divergent opinions and perspectives about the way that a ToC or system map should be drawn. Applying some good process principles to building a ToC or system map contributes to it being a learning exercise where different viewpoints help to refine understanding of how the intervention might work and what are the most apparent alternative explanations:

- 1 **Diversity matters:** the more points of view that question assumptions, the better.
- 2 **Scepticism matters:** both for individual relationships in the model and whole regions of the model, it is essential to keep looking for a contrary case that challenges the emerging dominant thinking.
- 3 **Do not force consensus:** models can represent different hypotheses as to why systems work as they do, and there is no reason not to have various, alternate models.

### 3 Ranking contributions and discarding alternative explanations

Contribution analysis does not answer impact questions with a yes/no answer, but rather by a series of logical steps, each 'increasing our confidence that the intervention had an impact' (Befani and Mayne 2014: 17). This involves a structured process of critical thinking to analyse other explanations of the change process, such as the activities of other interventions or contextual dynamics. To compare the contributions of different actors in a change process, contribution analysis needs to include methods to reflect on the plausibility of alternative explanations of the change processes taking place – this not necessarily being the intervention under study or the anticipated causal logic as depicted in the initial ToC. The result is a degree of confidence in a contribution claim, with some sort of hierarchy (Delahais and Toulemonde 2017). It results in a narrative that includes inferences like 'In country X CDC is the most important financial contributor to change Y because of Z'.

Of course, it is not possible to fully detail all factors that influence a change process, or the many incentives that drive human or firm behaviour. Therefore, checking causal assumptions in a ToC and analysing alternative explanations for all changes taking place is impossible, even in relatively straightforward change processes. Common issues include

Figure 5 The four tests used in process tracing

		Sufficient for affirming causal inference	
		No	Yes
Necessary for affirming causal inference	No	1 Straw-in-the-wind	3 Smoking gun
		a <b>Passing:</b> Affirms relevance of hypothesis, but does not confirm it	a <b>Passing:</b> Confirms hypothesis
		b <b>Failing:</b> Hypothesis is not eliminated, but is slightly weakened	b <b>Failing:</b> Hypothesis is not eliminated, but is somewhat weakened
	c <b>Implications for rival hypotheses:</b> Passing <i>slightly</i> weakens them Failing <i>slightly</i> strengthens them	c <b>Implications for rival hypotheses:</b> Passing <i>substantially</i> weakens them Failing <i>substantially</i> strengthens them	
Yes	2 Hoop	4 Doubly decisive	
a <b>Passing:</b> Affirms relevance of hypothesis, but does not confirm it	a <b>Passing:</b> Confirms hypothesis and eliminates others not confirm it		
b <b>Failing:</b> Eliminates hypothesis	b <b>Failing:</b> Eliminates hypothesis		
c <b>Implications for rival hypotheses:</b> Passing <i>somewhat</i> weakens them Failing <i>somewhat</i> strengthens them	c <b>Implications for rival hypotheses:</b> Passing <i>eliminates</i> them Failing <i>substantially</i> strengthens them		

Source: Barnett and Munslow (2014), CC BY 3.0.

having too many or too few alternative explanations, being unable to assess them deeply, and having difficulties in integrating this assessment of mutual alternative explanations in the overall analysis and report. Therefore, it is necessary to have a process to focus on the most critical alternative explanations (respecting and reconciling the different perspectives of the stakeholders) and prepare monitoring processes and complementary research that can provide data to verify these. In impact evaluation and comparative case study research (Yin 2013), this generally includes a reflection on the alternative explanation that the effects have little to do with the intervention, but would have emerged anyhow in the absence of the support.

Proving or disproving an alternative explanation has the caveat that it is often impossible to spend as much time evaluating each potential contribution than we do for the evaluated intervention, especially when there are many. A useful way to address part of the alternative explanations is to incorporate these explicitly as boxes in the ToC, or linked to the causal arrows of the ToC. In relatively simple settings, a way to decide on the importance of alternative explanations is to make a preliminary inventory, at the design phase of the contribution analysis, of the main ‘competing mechanisms’ and ‘influencing factors’ and prepare data collection to assess their importance (Lemire, Nielsen and Dybdal 2012). Mechanisms are the

causal forces – cognitive, social, or affective responses – and influencing factors are the contextual conditions that enable or impede these mechanisms. However, in more complex or dynamic settings, these mechanisms and factors cannot be predicted because they tend to emerge during the intervention period and become apparent during the research process and data collection. Sometimes the process of discarding alternative explanations is quite straightforward, applying some logical tests to evidence that we would expect to see when these alternative explanations would hold. Delahais and Toulemonde (2017) give the example of checking ‘chronicle consistency’: when the changes occurred before these contributory causes were in place, this explanation can be discarded.

Much like in process tracing (Punton and Welle 2015; Befani and Mayne 2014), a sequence of tests can be used to test causal explanations (see Figure 5). Hoop tests are the most common type of tests: they do not prove a cause but increase the probability that something is a cause. For instance, in the case of CDC, we could find evidence for a CDC contribution when documentation or interviews with firms explicitly mention its involvement and successes in this particular sector. Alternatively, interviews with investors might show that these mention earlier CDC-supported investments as one of the reasons that convinced them it was the right moment to invest,

even when no CDC funds were used. However, often this direct mention will not be available, not least because CDC may be invisible to firms; for example, when it invests in investment consortia or banks that have the direct contact with the firm.

Sometimes, it can be difficult to analyse each intervention separately. The interconnections between interventions can be too many to disentangle in any meaningful way. For example, when one DFID-supported intervention works on the investment climate and CDC stimulates fund managers to use these improved opportunities, it might be wise to consider CDC and this other DFID intervention together, rather than trying to make this other DFID-supported programme an alternative explanation to changes in investment behaviour that are also the focus of CDC. When learning about a specific implementation, modality is a central component of the impact evaluation; it is even better to analyse the impact of the type of intervention and delink it from who implements the intervention, be it CDC or another development finance intervention.

#### 4 Quantifying contribution

While contribution analysis provides a step-by-step approach to verify whether an intervention, such as CDC, is a contributory factor to development, most contribution analysis studies do not quantify the ‘share of contribution’ that can be attributed to a support intervention. Generally, in most interventions, there are multiple actors involved in the process of change, and it seems unreasonable and inherently impossible to attribute these effects entirely to one actor. However, commissioners of evaluations often want to have an idea about the size or importance of a contribution of one of the actors (the one they fund), not least because they need this information at an aggregate level for accountability to parliament. This creates the paradox that commissioners of impact evaluations pose legitimate but unanswerable questions, and impact evaluations need a way to reconcile the impossible with the possible.

As explained in more detail above, when fund mobilisations by CDC are crucially dependent on the presence of other support organisations, and vice versa, there are two logical answers to the question *What is the effect when compared to the situation without CDC?*:

- Both CDC and the other partner(s) could claim the full amount of funds as the fruit of their support – without the support of each of them there would have been no fund mobilisation at all.
- None of them can claim any amount of funds as the fruit of their intervention – none of them would have had a contribution without the other partner being involved.

Both logics pose a problem when one wants to aggregate results across different but interrelated support activities. It leads to multi-counting of the mobilised funding, which poses a problem for donors, like DFID, benchmarking efforts, like in the Donor Committee for Enterprise Development (DCED), or even for transparent ‘bonus systems’ for impact investors (Vosmer and de Bruijn 2017). Of course, the solution is for both to claim a part of the funds because they contributed together. But how much?

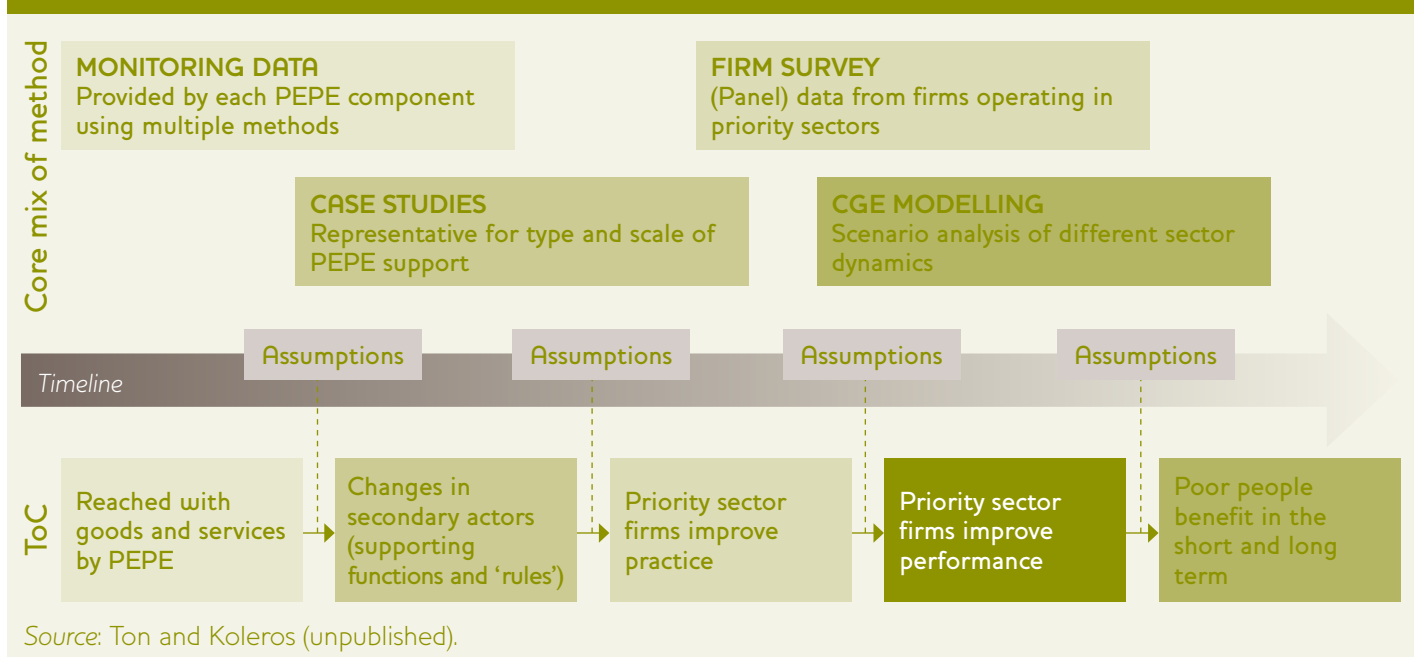
The easy (and not necessarily incorrect) response to the question of attributing quantitative effects to discrete interventions in complex change processes would be to say that it is impossible to do so in an uncontested objective way. However, we could also explore how contribution analysis could be stretched so that it can give some sense of the importance of a contribution in a quantitative manner. We present two examples of ways to do so.

#### Example 1: Updating the confidence in a contribution

One entrance point for quantification of contribution is the level of confidence in a causal claim. Bayesian updating provides a structured way to gradually increase the level of confidence in a judgement/causal claim about the relevance of the intervention or other factors following observations of empirical evidence (Befani and Stedman-Bryce 2016). The confidence in the causal model is quantified and updated according to a mathematical formula (the Bayes theorem). Befani (2018) provides an Excel sheet to apply this formula and derive a fine-grained confidence scale. She applies probability reasoning to the tests used in process tracing (Figure 5). It estimates two probabilities, one that a specific type of evidence would be there when the causal relation would exist, and the other that a specific piece of evidence would present itself when the causal relation would not exist. This thought process forces one to explicitly assess the possibility that a piece of evidence may suggest that things are unfolding ‘as planned’ in the ToC, while the ToC might actually be wrong.

This updating of confidence in a causal claim does not give an indication of the size of an effect. However, for very specific causal links, it may be used to do so. For example, in the case of CDC, where on a continuous basis fund decisions are made on proposals that can be successful or unsuccessful, Bayesian updating could help to quantify the ex ante expectations about (future) fund mobilisation. It could update the chance of success of new investment projects that are selected according to the same set of criteria, and be linked to other routines in CDC like portfolio risk assessment or due diligence. In financial institutions, the probability of success of a to-be-funded project is always assessed ex ante, in a risk assessment process. The Bayesian confidence estimate of the chance of success could be applied to estimate the funds that are likely to be mobilised successfully in a portfolio of similar projects when the funding decision is made.

Figure 6 Interlinked research design in PEPE evaluation



### Example 2: Interlinking research components to model plausible effect ranges

A different approach to address the quantification paradox, applied by Ton, Koleros and Taylor (2018) in the impact evaluation of the Private Enterprise Programme Ethiopia (PEPE), is the use of an interlinked research design, with various research components that verify subsequent causal links in the ToC. Inspired by previous experiences with this approach (van Rijn *et al.* 2018; Ton 2017), PEPE had many different activities, including the mobilisation of investments in service providers, producers, and processors in key value chains. The contribution analysis of PEPE includes a quantitative estimate of the additional jobs that likely resulted from this support. The research design made it possible to estimate the plausible lower and higher bounds of PEPE's impact on employment. The four interlinked and overlapping research components are depicted in Figure 6. The different tints of green indicate the methods of data collection in the upper half of the figure that are related with the verification of the causal step in the ToC, specified in the lower half.

The final quantitative estimate of PEPE's contribution to job creation resulted from scenarios applied on an established macroeconomic model (a Computable General Equilibrium (CGE) model) of the Ethiopian economy. The model computed lower and higher estimates of job creation in the Ethiopian economy based on assumptions about the improved technical efficiency of the supported firms.

The lower and the higher bound of this improved technical efficiency were based on the findings from a survey of firms. The survey asked questions about changes in business constraints and business practices as a result of the use of

specific services and inputs (from the secondary actors), and registered some performance indicators (employment, turnover, and profits). The survey results showed that when improved services were used, the firms showed a higher average growth rate of profits. Though it is impossible to discard that PEPE selects better performing firms for their support (selection bias), several factors that were likely correlated with this selection bias could be controlled for (e.g. type of commodity, role in the value chain, regional location, being selected for another support programme, etc.). The regression resulted in a confidence interval of the change in profits that was associated with being PEPE supported. This confidence interval was used as input for the low and high scenarios used in the macroeconomic modelling.

Moreover, the survey included a module with statements that asked for self-assessed impact estimates. We used these to elaborate contribution scores that consider the extent of the change in an indicator and the level of influence of the intervention as experienced by the firm. These contribution scores were used in a regression and resulted in an estimate of the change in profits that was associated with the improved service uptake. This second, independent estimate of PEPE's contribution to firm performance using only data from supported firms, helped to triangulate and refine the plausible range of effects detected in the earlier regression based on a comparison between supported and unsupported firms.

The case studies verified whether the service providers had indeed improved their services due to PEPE support, or would anyhow have provided these services to the firms. This research component comprised in-depth case



studies in the three most significant change processes, as reported by PEPE monitoring data. In each case study, the evidence behind the reported results was critically assessed mainly by reviewing the reporting and literature, and also through interviewing individuals who could be expected to give the evidence, when this existed, to falsify this assumed contributory role. We used a systematic process inspired by process tracing to assess the strength of the evidence. The case studies showed that PEPE only had performance-enhancing effects in a subset of sectors. This information was also used to decide on the scenarios in the CGE model, applying the improved technical efficiency only in the sectors where there was a clear and significant contribution.

## 5 Ways forward

We have explored how contribution analysis could be stretched so that it can give some sense of the importance of a contribution in a quantitative manner. In some situations, when factors or actors only work in combination and not alone, a quantitative estimate of the size of a contribution is impossible. However, in many evaluation contexts, it might be possible to find ways to give an idea of the probable, plausible range of effects that result from a contribution – especially when sufficient resources are available for the mix of research that is required.

We argue that it is crucial to develop a detailed ToC with the assumed impact pathways and influencing factors, with special attention to behavioural change processes that are on the boundary of the span of direct influence. Additionally, it is important to map the complex system outside the span of direct influence, to reflect on the areas where the contribution may influence larger system dynamics. In the situation of high uncertainty, the contribution analysis needs a process of revisiting and redrawing the ToC based on experiences with the unfolding change process, adapting the understanding and expectations of how the intervention works.

The process of mapping and simplification of complex reality that is inherent to both exercises may have different forms due to different perspectives, interests, and insights

## Endnote

\* This CDI Practice Paper is fruit of a workshop, held on 7 June 2018 at IDS, Brighton, UK, where practitioners of contribution analysis brainstormed to inform the design of the CDC Longitudinal Study (2018–28). The workshop was organised with funding from DFID as part of the inception phase. The ideas in the brainstorm have been combined, refined, and synthesised during the writing process of the paper. Therefore, this paper is a think piece that does not reflect in any way the final design for this study (Spratt *et al.* 2018).

of the stakeholders involved. Though highly useful, the result of a ToC, and even a system map, will always be incomplete and can always be contested on good grounds for being a simplification. In our view, this simplification is both their main strength and weakness.

Based on our practical experiences with contribution analysis, we argue that it is important to be clear about the contributions and main factors behind the expected changes. A focus on capabilities, opportunities, and motivation for behavioural change is helpful in elaborating useful ToCs.

When this ToC is sufficiently refined and acknowledges other contributors and contributions, a contribution analysis can give a sense of hierarchy between these contributors. In cases where an intervention is totally dependent on others, attribution of the outcomes to one of these contributors is impossible (but not necessarily needed). However, in some cases it is possible to give quantitative estimates of importance and size of the effects of a contribution. In special cases, where confidence in one causal step is indicative of performance, Bayesian updating can be useful to get a proxy for the size of the effects; for example, the amount of funding that is likely to be mobilised in a specific portfolio of projects. A combination of methods in an interlinked research design might also help to get a quantitative estimate of contribution, such as presenting a range that is indicative of the plausible lower and higher bounds of effects, instead of a point estimate.

We have presented the ideas in this CDI Practice Paper to help address a paradox. On the one hand, there are commissioners that ask for the size of the impact, and, on the other hand, we as evaluators are aware of the inherent limits to the attribution of effects in situations where an intervention relies on many other actors and factors in order to work. We recognise the need for some degree of quantification of effects of a contribution and argue that terms like confidence, importance, and probability provide entry points to do so. A well-designed creative mix of methods that registers and analyses the interlinked process of change, embedded in a high-quality ToC, may permit cautious estimates of the size of a contribution.

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“ In cases where an intervention is totally dependent on others, attribution of the outcomes to one of these contributors is impossible... However, in some cases it is possible to give quantitative estimates of importance and size of the effects of a contribution. ”

### Centre for Development Impact (CDI)


The Centre is a collaboration between IDS ([www.ids.ac.uk](http://www.ids.ac.uk)), Itad ([www.itad.com](http://www.itad.com)) and the University of East Anglia ([www.uea.ac.uk](http://www.uea.ac.uk)).

The Centre aims to contribute to innovation and excellence in the areas of impact assessment, evaluation and learning in development. The Centre's work is presently focused on:

- (1) Exploring a broader range of evaluation designs and methods, and approaches to causal inference.
- (2) Designing appropriate ways to assess the impact of complex interventions in challenging contexts.
- (3) Better understanding the political dynamics and other factors in the evaluation process, including the use of evaluation evidence.

This CDI Practice Paper was written by **Giel Ton**, **John Mayne**, **Thomas Delahais**, **Jonny Morell**, **Barbara Befani**, **Marina Apgar** and **Peter O'Flynn**.

The opinions expressed are those of the authors and do not necessarily reflect the views of IDS or any of the institutions involved.

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