

A General Procedure for Computing Unitary Financial and Non-Financial Bottom Lines

A White Paper
By Mark W. McElroy, PhD.
Center for Sustainable Innovation

Introduction

Ever since John Elkington introduced the Triple Bottom Line (TBL) concept in 1997, the term has been widely used in a metaphorical sense, but never in a literal sense. That is, people have spoken in general terms about the social, economic and environmental performance (i.e., sustainability) of organizations, but no corresponding tool or method has ever been developed to actually measure and report the TBL performance of an organization in a systematically quantitative way, such that unitary bottom line scores or measures are produced for non-financial bottom lines. Certainly this has not been done for non-financial bottom lines, in particular, as has been done for financial bottom lines.

Here it is important understand that there is a difference between financial bottom lines and economic bottom lines. Indeed, we take the position that the economic component of Elkington's TBL is not the same as the financial bottom line. The former refers to an organization's impacts in the economy at large, whereas the latter refers to its profits and losses.

Thus, there are actually four bottom lines to consider, one financial and three non-financial. The three non-financial bottom lines are the social bottom line, the economic bottom line, and the environmental bottom line. The subject of this paper, then, is how to numerically compute non-financial bottom lines in a way that is similar, if not identical, to the manner in which financial bottom lines are determined. We contend that there is a 9-step procedure for doing so as we explain below.

The Theory

Starting Principle

We believe that an organization's sustainability performance is best thought of as a function of its impacts on vital capitals, relative to what its impacts ought to be in order to ensure its stakeholders' well-being. Such vital capitals, in turn, are associated with each of the four bottom lines. Thus, determining the bottom line performance of an organization boils down to measuring its impacts on only the vital capitals associated with the particular bottom line in question, a model for which is shown in Figure 1. The general procedure we propose, and the examples we provide below, should all be viewed in light of this model.

	Financial Bottom Line	Social Bottom Line	Economic Bottom Line	Environmental Bottom Line
Monetary Capital	✓			
Human Capital		✓	✓	
Social Capital		✓	✓	
Constructed Capital		✓	✓	
Natural Capital				✓

Figure 1 – The 4 bottom lines and their capitals

A 9-Step Process

- 1) Identify bottom line domain of interest and corresponding type(s) of capitals involved (i.e., monetary, human, social, constructed and/or natural).
- 2) Identify stakeholders to whom duties and obligations are owed relative to ensuring their well-being.
- 3) Determine which specific duties are owed to each stakeholder group, expressed in terms of normative impacts on related vital capital types (i.e., monetary, natural, human, social or constructed).
- 4) Develop quotient-type metrics for each duty owed, and express in terms of impacts on vital capitals (numerators) relative to what such impacts ought to be in order to help ensure stakeholder well-being (denominators), in accordance with step 3 above.
- 5) Organize metrics into relevant categories of capital (i.e., into sub-bottom line categories of financial, social, economic and environmental capital, or sub-sub-bottom line categories within them, as appropriate).
- 6) Determine fungibility or substitutability of impacts on vital capitals for all of the metrics identified in step 5 relative to one another within each QBL domain, or within each underlying sub- or sub-sub-bottom line category, as the case may be. [Note, such substitutability will rarely, if ever, be possible *between* QBL domains.]

- 7) Compute impacts on vital capitals for each metric, adding and subtracting impacts in cases where substitutability exists. Then populate numerators of quotient metrics, accordingly.
- 8) Populate denominators of resulting quotient metrics with values determined per step 3 above, and compute quotient scores.
- 9) If desired, compute unitary blended scores for each QBL domain for which single scores were not possible due to substitutability issues. Do this by computing 'quotients of quotients' scores, by which measures of minimally compliant (i.e., sustainable) scores are expressed relative to what a perfect score would be in each case (i.e., where all individual sub- and sub-sub-bottom line scores are ≥ 1.0 for a QBL domain).

The Practice

In this section, we illustrate the application of the procedure set forth above to each of the four bottom lines: financial, social, economic and environmental. In each case, readers should simply correlate the numbered answers given below with the same numbered steps above. The answers given are abbreviated.

The Financial Bottom Line

- 1) Financial bottom line: monetary capital only.
- 2) Shareholders.
- 3) To generate revenue that at least meets or exceeds expenses. Expressed in terms of impacts on monetary capital only, per step 1 above.
- 4) Revenue receipts (numerator) / expense subtractions (denominator).
- 5) All metrics pertain to a single category of capital: monetary.
- 6) Impacts are fully fungible and substitutable.
- 7) Compute numerator of quotient metric developed in step 4 by adding up all revenue and then subtracting all expenses, resulting in a single numerical figure (total revenue minus total expenses).
- 8) Populate denominator of quotient metrics defined in step 4 by adding up all expenses, resulting in a single numerical figure (total expenses); compute quotient score, resulting in a single numerical figure. [Note that this score is not the same as a measure of *profitability*; rather, it is a measure of *sustainability* expressed on a sustainability performance scale, where any score of ≥ 1.0 signifies sustainable performance, and any score of < 1.0 signifies unsustainable performance.]
- 9) No further computations involving 'quotients of quotients' are required in this case, because all measures taken in steps 7 and 8 (i.e., revenue and expenses) were fully fungible and substitutable.

The Social Bottom Line

- 1) Social bottom line: human, social and constructed capital (i.e., *anthro* capitals).

- 2) Potentially many stakeholder groups including employees, customers and communities.
- 3) To help produce or at least maintain anthro capitals at levels required by stakeholders to ensure their well-being.
- 4) Actual impacts on (anthro) capitals as discussed in step 4 above (numerator) / normative contributions to (anthro) capitals as discussed above in step 3 (denominator).
- 5) All metrics pertain to as many as three types of capital (see Figure 1): human, social and constructed capitals (i.e., three sub-bottom lines).
- 6) Impacts between sub-bottom line categories are not fungible at all (i.e., the value of impacts on one cannot be added or subtracted to the value of impacts on another). Even within such sub-categories, impacts might not be commensurable. Within constructed capital, for example, impacts on helping to build roads would in no way offset the need for hospitals or schools. The one is not substitutable for the others. So there will likely also be many sub-sub-categories with an equal number of 'sub-sub-bottom lines' for the social domain of performance.
- 7) Compute the numerators for each of the quotients developed in step 4 above.
- 8) Compute the denominator for each of the quotients referred to in step 4 above, and then calculate the quotient scores for each of the many metrics associated with the three anthro capitals, and their underlying sub-bottom and sub-sub-bottom lines. [Note, as was the case for the Financial Bottom Line calculation above, any score of ≥ 1.0 signifies sustainable performance, and any score of < 1.0 signifies unsustainable performance.]
- 9) In this case, a 'quotient of quotients' score is needed if one wishes to conclude with a single numerical score, since there were many incommensurable scores produced along the way. In order to arrive at this score, one would first need to determine whether there were any sub-sub-bottom line scores computed for any of the three anthro capital categories. If so, those scores must be included in the 'quotient of quotients' calculation. For capital categories in which there were no sub-sub-bottom line scores, only the sub-bottom line scores for that category should be included. Next, all such sub- and sub-sub-bottom line scores should be factored into a 'quotient of quotients' calculation as follows:

$$\text{Total number of scores that were } \geq 1.0 / \text{Total number of scores}$$

Any score resulting from this quotient of ≥ 1.0 signifies sustainable social performance; any score of < 1.0 signifies unsustainable social performance, at least to some degree. Thus, just as was the case for the Financial Bottom Line, the Social Bottom Line can be rendered in the form of a single numerical score on a common performance scale, with a common demarcation point used to determine sustainable versus unsustainable performance.

The Economic Bottom Line

We take the position that the economic bottom line is merely a type (or slice) of the social bottom line. It is a type that focuses on only the *social economic* impacts of an organization, and not its other social impacts. Thus, the procedure for computing the economic bottom line is the same as the procedure given above for the social bottom line. Here it should also be clear that the economic bottom line has nothing to do with the financial bottom line, as explained in the *Introduction* above.

The Environmental Bottom Line

- 1) Environmental bottom line: natural capital only.
- 2) Potentially many stakeholder groups including employees, customers and communities; and also non-human stakeholders if so desired, although meeting the needs of non-human species can be interpreted as essential to meeting the needs of humans.
- 3) To help maintain natural capital at levels required by stakeholders to ensure their well-being.
- 4) Actual impacts on (natural) capital as discussed above in step 4 (numerator) / normative impacts on (natural) capital as discussed above in step 3 (denominator).
- 5) All metrics pertain to only one type of capital, natural capital (see Figure 1), but may be broken out into several sub-bottom lines (i.e., some for impacts on air, others for water, others for land, biodiversity, etc.).
- 6) Impacts between sub-bottom lines may or may not be fungible or substitutable, and should be determined on a case-by-case basis.
- 7) Compute the numerators for each of the quotients developed in step 4 above.
- 8) Compute the denominator for each of the quotients referred to in step 4 above, and then calculate the quotient scores for each of the metrics associated with natural capital, and its underlying sub-bottom and sub-sub-bottom lines, if any (i.e., air, water, land, etc.). [Note that contrary to the other bottom lines, the scoring convention for environmental bottom lines reverses such that any score of ≤ 1.0 signifies sustainable performance, and any score of > 1.0 signifies unsustainable performance. This is because environmental sustainability is a function of not exceeding a threshold (e.g., not exceeding a level of water use, for example), whereas financial, social and economic performance is a function of not falling below a threshold (e.g., revenues should meet or exceed expenses; wages paid to employees should meet or exceed livable wage standards; contributions to charities should help meet or exceed needs, etc.)].
- 9) In this case, a 'quotient of quotients' score will again be needed if one wishes to conclude with a single numerical score, since there were potentially many incommensurable scores produced along the way in the form of several sub- and sub-sub-bottom line metrics. In order to arrive at a unitary score, then, one would first need to determine whether there were any sub- or sub-sub-

bottom line scores computed for natural capital. If so, those scores must be included in the 'quotient of quotients' calculation. Next, all such sub- and sub-sub-bottom line scores should be factored into a 'quotient of quotients' calculation as follows:

$$\text{Total number of scores that were } \leq 1.0 / \text{Total number of scores}$$

Any score resulting from this quotient of ≥ 1.0 signifies sustainable social performance; any score of < 1.0 signifies unsustainable social performance, at least to some degree. Thus, just as was the case for the Financial, Social and Economic Bottom Lines, the Environmental Bottom Line can be rendered in the form of a single numerical score on a common performance scale, with a common demarcation point used to determine sustainable versus unsustainable performance.

Summary

In this paper, we have shown that it is, in fact, possible to compute unitary non-financial bottom lines, just as it is possible to do so for financial bottom lines. Moreover, we have shown that such financial and non-financial bottom lines can be computed using the same general methodology in the form of a 9-step process we provide.

Here we should also acknowledge that there are some important differences between the manner in which unitary bottom lines are calculated for financial versus non-financial measures. These differences stem from the fact that the capitals involved are varied and are different in most cases, and therefore the units of measurement and degrees of commensurability or substitutability are similarly variable and problematic.

Commensurability between constructs, however, can almost always be achieved by simply raising the level of abstraction to a higher place. In this case, while it is true that monetary units, for example, are difficult to reconcile with non-monetary units, the fact that all four bottom lines are measuring performance against standards of performance makes commensurability possible at a higher level. That higher level is simply a measure of the extent to which an organization is fulfilling its duties and obligations, the answer to which for each variable can be a simple 'yes' or 'no'. All sub- and sub-sub-bottom lines as we have defined them can be held to this test, and by that means unitary bottom lines are possible to produce on all four QBL fronts of interest to us, not just the financial one.