

Towards a Composite Index of Measuring Overall Corporate Performance: The Cost-of-Capital-Approach Expanded

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Abstract

Various methods have been developed to measure sustainability. When it comes to measuring whether sustainability issues are integrated in overall corporate performance, companies broaden their reporting from economic performance to "sustainability performance" and there are various frameworks around for benchmarking sustainability outcomes. A major emphasis, however, is on technical data. The main efforts were consolidated in the Global Reporting Initiative GRI. Each of the indicators prudently measures a well determined set of facts. However, one major discussion point is whether the reporting frameworks do really reflect the link between sustainability and economic value, and how they would properly connect to the information used by management for running the business on a day-to-day basis.

This paper tries to point out that one way out of the disconnectedness might be through expanding the concept of "Economic Value Added" (EVA[®]): Economic Value Added measures overall corporate performance by claiming that *shareholders gain* when the return from the capital employed in a corporation is greater than the cost of that capital. From there it is a short way to proclaim that *all stakeholders gain* when the value created by a corporation is greater than the cost of the capital employed *in* the corporation and the capital employed in whichever commonly available resources *outside* the corporation are used by its business. The expansion of EVA that is envisaged would be to enlarge the cost of capital by the costs which are caused by that part of "Public Goods" which is available to a corporation. There is one political and one theoretical obstacle in this: The argument is quite radical and complying with it would require some leadership from "big corporations"; and valuing public goods is a research field which has not yet reached the stadium of generally accepted applicability, at least with regard to aggregative monetary value. It is hoped, though, that new initiatives which are under way, e.g. the International Integrated Reporting Committee now formed, among others, by GRI, will unite sufficient brainpower to reach a breakthrough. The paper also reflects on the effects the new indicator would stimulate for businesses, their markets and their stakeholders.

Keywords

Sustainability Indicators, Economic Value Added, Sustainable Value Added, Public Goods

1. Introduction

Sustainable development and sustainability are to be dealt with through actions, activities and projects, and a broad array of methods has been developed to measure the outcome of these endeavors. Most of the methods are related to project management performance (Taylor 2008). When it comes to measuring whether sustainability issues are integrated in overall corporate performance, companies broaden their reporting from economic performance for shareholders to sustainability performance, and various frameworks are being adopted for benchmarking sustainability outcomes (Holliday 2001, Kennedy 2000). The outset having been environmental reporting (e.g. the EU Eco-Management and Audit Scheme, EMAS), a major emphasis, is on technical data. When the accounting and consulting sector, headed by KPMG¹, connected environment to health and safety, then adding social/community dimensions, a vast array of indicators was created. Those efforts were consolidated in the Global Reporting Initiative (<http://www.globalreporting.org>). Each of the indicators prudently measures a well determined set of facts. However, there is still an ongoing discussion about the value and credibility of sustainability reporting (for an overview see Visser 2009).

One major discussion point is whether the reporting frameworks which are presently in use do really reflect the link between sustainability and economic value, and how they would properly connect to the information used by management for running the business on a day-to-day basis. This paper points out that one way out of the dilemma might be through expanding the concept of "Economic Value Added" – EVA[®]: Economic Value Added, a well established measure of overall corporate performance², is based on the idea that *shareholders gain* when the return from the capital employed in a corporation is greater than the cost of that capital. From there it is a short way to proclaim that *all stakeholders gain* when the value created by a corporation is greater than the cost of the capital employed *in* the corporation and the capital employed in whichever commonly available resources *outside* the corporation are employed by its business. This would be equivalent to internalizing costs which are hitherto viewed as "external", thus shifting the costs from society to the private sector to those who are consuming public goods. Creating private value would consequently have to encompass creating public value. The expansion of EVA that is envisaged here would be to enlarge the cost of capital by the costs which are caused by that part of "Public Goods" which is available to a corporation. We need to find some exemplary corporations which will take the leadership in this direction, and which see the business case as well as the moral case for it. There is still a big theoretical obstacle: valuating public goods is a research field which has not yet reached the status of generally accepted applicability, at least with regard to aggregative monetary value. It is hoped, though, that new initiatives which are

¹ E.g.: www.kpmg.nl/sustainability and SustainAbility (<http://www.sustainability.com>), building on, among others, the United Nations System for integrated Environmental and Economic Accounting (SEEA; <http://unstats.un.org/unsd/envaccounting/seea.asp>).

² EVA[®] was developed by Joel Stern and Bennett Stewart, co-founders of the consulting firm Stern Stewart & Company.

under way, e.g. the International Integrated Reporting Committee now formed, among others, by GRI, will unite sufficient brainpower to reach a breakthrough³. The initiatives also foster what has been called the "micro-macro-link". This is based on the notion that while sustainability can be measured and implemented at site-level, industry-level, division-level, regional level and national level, sustainable development is mainly a macro-level concept at the global level (Jasch 2006). But the efforts so far have focused on environmental cost, and, in some cases, on the economic benefits of environmental management (Csutora 2008). Much less, though, has there been any sizeable attempt to include the aspects of social sustainability into the micro-macro-link (Brühl 2002, Spangenberg 2005). This strongly contrasts the common understanding that a necessary criterion for sustainable development lies with the existence of natural, human and man-made as well as social capital.

2. Preserving the capital base employed for sustainable development

2.1 The inward and the outward perspectives on business capital

Whichever approach is chosen to define sustainability, the concept of resources, and hence „capital“, becomes intrinsically ingrained: For Deloitte & Touche, to name another accounting firm, sustainability is equal to "adopting business strategies and activities that meet the needs of the enterprise and its stakeholders today while protecting, sustaining and enhancing the human and natural resources that will be needed in the future" (Deloitte & Touche, 1992). From there, we get to the 'triple bottom line' or 'Triple-P (People, Planet, Profit)' concept: "Sustainability is about the balance or harmony between economic sustainability, social sustainability and environmental sustainability (Elkington, 1997). Elaborating on this, Dyllick and Hockerts (2002), identify three key concepts of sustainability:

Sustainability is about integrating economical, environmental and social aspects.

This suggests that three dimensions are interrelated and therefore may influence each other in multiple ways. And although these interrelations are generally acknowledged, it should be noted that regional differences exist with regards to the relative emphasis placed on each pillar. In (Western) Europe, sustainability is mainly about environmental concerns, where in Africa the social concerns seem to be prevailing. In an increasingly globalized economy, however, these differences should diminish over time.

Sustainability is about integrating short-term and long-term aspects.

This element focuses the attention to the full life-span of the matter at hand. An important notion in this aspect is that the economical perspective, because of discount rates, tends to value short term effects more than long term effects,

³ The new initiative, launched in August 2010, brings together a list of organizations, including the Global Reporting Initiative (GRI), The Prince's Accounting for Sustainability Project, international finance and accounting standard setters, UN Global Compact, World Wildlife Fund, etc., and strives for a concise, clear, consistent and comparable integrated reporting framework, which also should Bring reporting closer to the information used by management to run the business on a day-to-day basis.

whereas social impacts or environmental degradation may not occur before the long-term.

Sustainability is about consuming the income and not the capital.

This aspect is a common realm in business from the economic perspective. From a social or environmental perspective, however, the impact may not be visible in the short-term, causing degradation of resources in the long run. The main implication, and the most referred to, implies that "the natural capital remains intact .. the source and sink functions of the environment should not be degraded .. the extraction of renewable resources should not exceed the rate at which they are renewed, and the absorptive capacity of the environment to assimilate waste, should not be exceeded." (Gilbert et al., 1996). But there is an identical implication for the economic and the social resources.

Each of the three concepts is versed both towards the inner and the outer perspectives of a business as it stimulates activities which concern the resources employed within a firm (and which the firm has acquired for sole possession) as well as those resources which are available to the firm outside its realm (and cannot be acquired and are only available for use, i.e. "public goods", like the systems of law and order, of education, waterways, but also clean air and access to water etc.). When it comes to the inner perspective there are resources which will be consumed, e.g. goods which are purchased by the firm to be processed in manufacturing. Still, in order to maintain its business, the firm will have to maintain a stock of those consumable resources (whether that stock is part of its assets or is warehoused by a business partner). This would bring us to the concept of capital maintenance. Here we are encountering a long standing accounting principle which states that earnings can be realized only after an organization's capital has been maintained at a predetermined level. So there is an immediate connection from firm-level accounting to what in the economics of sustainability has been called the constant capital rule.

2.2 The constant capital rule

At the heart of sustainable development is the concept of systems theory - that all elements of a system are interrelated and that the whole is greater than the sum of its parts. This interrelation poses the issue of distinguishing between qualitative and quantitative changes in the utilization of our natural resource base. Central to this distinction is the perception that technological advances may permit us to raise our standard of living by just maintaining the throughput of resources. Now, borrowing from the above-mentioned principle of business sector accounting, where maintenance of a capital stock yields an indefinite stream of output or "income", we may claim that maintenance of a constant natural capital stock (including the renewable resource base and the environment) would also yield an indefinite stream of output or "income." Implicit in this proposition is that we must, to the best of our ability, live off the "interest" on this capital stock and not draw it down⁴. If a part of this capital is consumed, it must be replaced by substitute capital. Here we are with the capital theory of sustainability economics, which seems to suggest a relatively

⁴ One highly well-aimed notion of the proposition that the current generation must leave to its descendents a stock of capital no less than is currently available, is the term "Transient Caretakers" created by Mervyn King (King 2009).

simple rule to ensure sustainability (e.g. Solow 1986), but which also has met considerable criticism because of this simplistic view (Brätland 2006).

The constant capital rule as referred to above has another implication that is also rooted in systems theory: Interrelation between the various forms of capital in a systems theory perspective would also indicate that the elements which form the whole may be substituted by each other: We can consume some of our natural capital (in the form of environmental degradation, for example) as long as we offset this loss by increasing our stock of man-made capital, making use of the technological advances mankind is continuously adopting. This way of dealing with resources has been called: "weak sustainability" as opposed to "strong sustainability" which requires that the resource structure must remain unchanged (Pearce and Atkinson 1993). The advocates of the "strong sustainability criterion" see nature as an indivisible heritage and they reject what they call "commodification" of the environment; hence they largely negate that the value of the environment can be expressed in money. In their view, the market functions as a collective action *against* sustainability, and extraction/ production of resources adapts nature to human technology and methods while it should be the other way round (Scherhorn 2004). But while there may be reasonable arguments as to whether substitution of man-made capital and natural capital is moral or not, it is commonly agreed that natural capital and man-made capital should be managed at optimal levels, which can be maintained over a very long time (Daly 1990). This leads into the direction of a "proper mix of natural and man-made-capital", and there certainly is room for either complements or substitutes. One famous example is bigger fishing nets that can't be substituted for a greater stock of fish, and their relation is complementary (Daly 1990). This may be paraphrased into improvements in mining and the stock of phosphate or copper ore. Maintaining the stock of natural capital is not an issue of the size of fishing nets or mining devices; if the stock is limited, economic logic requires investment in the limiting factors, and this would translate into encouraging the growth of natural capital by investing in projects to relieve pressure on this type of natural capital stock and by increasing the end-use efficiency of products. So we would be back again to substituting and, since primary extraction and end-use cannot be viewed at separately, we would also be back to the construct of aggregate natural capital (Engelbrecht 2009).

This paper does not intend to foster the controversy on Solow's neoclassical approach; anyhow, there is a conciliatory outlook: „The debate between weak and strong sustainability proponents ... has again drawn valuable attention to what physical limits to growth may exist because of limited substitutability, in concept or in practice. It has helped stimulate a new examination of the powers and limits of technical change as a means of relaxing these limits, as well as focus attention on how physical laws interact with economic principles" (Pezzey and Toman 2002, p. 214). Another conciliation must be sought between microeconomic accounting and the largely macroeconomic terms of sustainability theory. The fundamental question is why the obvious agglomeration of heterogeneous physical and immaterial items which constitute public goods should forever defy coherent quantifiable aggregation (Brätland 2006). Many ways have been sought to elude this dilemma: One is to negate aggregability at all and to concentrate on measuring isolated indicators,

another one is to introduce elements of private property rights into concepts of allocation, a third one chooses survey research on preferences of public goods' consumers (this very dominant approach is called contingent valuation including so called „choice experiments“; for an overview see e.g. Freeman 1993, Bockstael et al., 2000), and only a few ones provide avenues to aggregate measures (Ricci 2010, Johnson and Bourguignon 2006). Before presenting an outline of these approaches, it must be clarified in detail how the constant capital rule connects to measuring corporate performance.

3. Understanding Value Added

Going back to the business accounting principle of „capital maintenance“ we may set out from the concept of Economic Value Added: Maintaining the value of capital within a given period may be an important business objective, but it does not create value added. For this to happen, the (maintenance) cost of capital must be surpassed by what is the output of using the capital resources: In order to achieve Economic Value Added, profit must exceed the cost of capital. „Capital“, in this business-oriented nomination, is what the financial community (shareholders, banks, and other purveyors of finance) has invested in a corporation. When the cost of capital has been earned (including the dividends to be paid to the shareholders), the excess value is what increases the „wealth“ of the corporation (which is equal to an increase in the wealth of its shareholders. So far, none of the outside stakeholders (the civil community, the municipality, local and state authorities, the public at large) has had a share in this. From pure logic, if the *shareholders of a corporation gain* when the return from the capital employed in a corporation is greater than the cost of that capital, *all stakeholders of a corporation gain* when the value created by a corporation is greater than the cost of the capital employed *in* the corporation and of the capital employed *outside* the corporation (in whichever commonly available resources are used by its business).

Any well trained accountant will reflect on the two sides of a balance sheet: „capital“ must be equal to „assets“. So, like plant and property, machinery and inventory and other economic resources to be disclosed in financial reporting, there are assets available to a corporation which are not provided by the financial community but by the public at large. Hence they are public goods. The usual way is to categorize them into „social resources“ and „ecological resources“ as per the definition of sustainable development („integrating economical, environmental and social aspects“). Thus, if we extend the notion of „capital“, we extend the concept of Value Added: What we get instead of Economic Value Added would be „Sustainable Value Added“⁵:

Sustainable Value Added = Profit

⁵ The authors of this paper acknowledge that the term „Sustainable Value Added“ has been applied before by Figge and Hahn in "Sustainable Value Added. Measuring Corporate Contributions to Sustainability Beyond Eco-Efficiency", Ecological Economics 2004 (Vol. 48), pp. 173-187. Still, the authors of this paper have taken the liberty to use the term in parallel to Economic Value Added as per the definitions made above. Some implications will be given in section 3.1 below.

minus cost of capital employed in economic resources
(property, plant and equipment, intangible assets, inventory, receivables, etc.)

minus cost of capital employed in ecological resources

minus cost of capital employed in social resources.

Ecological resources would be access to water, to (clean) air, to minerals, feasibility to discharge effluents into public waters and gas emissions into the air, etc. In this context, macroeconomics has provided the term „externalities“⁶, which relates to production and/or consumption of goods and services for which no appropriate compensation is paid. It is often argued that the distinction between a public good and an externality lies in excludability: Highway availability can be considered a public good, but if a highway is congested, tolls may be raised in order to exclude excessive use. Thus, only when externalities are taxed, their costs (or benefits) would be borne by the parties which enter into an (economic) transaction with the provider of public goods. We will come back to „externalities“ in section 3.2 below. For now, it may suffice to note that while the subject of externality valuation and externality pricing has been extensively researched e.g. through the EU funded ExternE series (European Commission 2005), the focus is still narrow: It is primarily on a limited - though crucial - set of issues, i.e. those associated to the emission of air polluting substances, to accidents, to global warming and, concerning transport, to congestion. There is, however, no globally acknowledged framework (Ricci 2010), and while some externalities are accounted for, others are not: Businesses are debited with external costs for gas emissions and waste disposal etc., but many other externalities are altogether largely under-documented, such as e.g. community severance, alternative uses of land, visual intrusion, etc. The question is if the methodological approaches should be versed towards “punishing” the businesses for damages they cause and thus “internalizing” the cost for specific, but isolated, externalities (which seems to be the prevailing technique) or towards valuing aggregate externalities and then allocating their proportionate cost to businesses (Shioji 2001).

Social resources would be the availability of legal and of education systems, of a properly working labor market, of traffic infrastructure, of civil infrastructure in cities and other communities etc. With regard to valuation and to allocation of these resources to business activities, the restrictions are the same as those that were mentioned with regard externalities of „ecological capital“. The concept of social resources may appear to be even more intangible, especially when considering that the denomination of “social capital” has long been ascribed to a specific sociological concept, which, in a relatively new definition given by Fukuyama (2002), is “shared norms or values that promote social cooperation, instantiated in actual social

⁶ The term was created by Arthur C. Pigou („The Economics of Welfare“, London 1920), and the modern operability of this concept was first discussed by Ronald Coase („The Problem of Social Cost“. In Journal of Law and Economics, 1960, pp. 1-44).

relationships". This denomination is certainly much narrower than what is meant here by „social resources“, and one might say that it evades monetary measurement. Still, community development compellingly requires the elements of what sociologists called “social capital” (groups and networks, trust, collective action, social inclusion and communication), and, in recognition of this, various social capital measurement frameworks have been set up, e.g. in the U.K. (Harper and Kelly 2003). Their outcome will certainly have to be integrated into valuating the inventory of “social resources”.

3.1 Connecting cost-focused and value focused perspectives

Coming back to the concept of externalities and the view that their cost has to be “internalized” into businesses which produce marketable goods and services, it takes no wonder that the majority of approaches to assess sustainable performance is burden-oriented, concentrating on how costly or bad the use of a resource is. Figge and Hahn (2004) have introduced the first value-orientated approach. Rather than concentrating on how burdensome the use of a resource is, they look at the value that is created by the use of environmental resources. So what they measure is corporate contributions to sustainability. This is done by assessing the value of capital beyond economic capital (“sustainability capital”). The representation of opportunity costs is applied, and the efficiency of capital use by a company (micro level) is related to the efficiency of a benchmark (macro level): A company contributes to more sustainable development whenever it uses its bundle of different forms of capital more efficiently than another company would have used this bundle. At the macro level, the sustainable value approach expresses the excess value created by a company while preserving a constant level of capital use on the micro level.

“Sustainability capital” and sustainable value in the notion presented by Figge and Hahn is thus a monetary measure of sustainability. However, with the use of opportunity cost, i.e. the return that could have been generated through an alternative investment of capital, and with the use of an explicit benchmark, the approach is strongly tied to environmental impact of an explicit single issue, like carbon gas emission or the like. Even though multiple impact situations can be analyzed, and social impact issues can be added to the environmental impacts, like work-related accidents, the approach is far from being able to measure the overall value added by a firm to the community of public goods stakeholders⁷. But when it is the general consensus that “real economic efficiency implies including all resources that affect sustainable human well-being in the allocation system, not just marketed goods and services [...] and a new sustainable ecological economic model would measure and include the contributions of natural and social capital ” (Costanza 2009, p. 20), the pertinent indicators must be comprehensive and composite. So we are

⁷ It should be emphasized, though, that this overall aspect is not what Figge and Hahn have intended. Their approach is a substantial contribution to how specific environmental and sustainability performance can be measured in monetary terms and has been applied in several projects and case studies funded, among others, by the European Union. Still, a severe controversy has come up recently with regard to scientific validity (see, e.g. Kuosmanen and Kuosmanen 2009; Ang and Van Passel 2010).

still left with our problem of how to find a monetary value for the whole of public goods available to businesses. Here, an analogy to “aggregate externalities” might be helpful, since there cost and value notions are also interconnected. Before we turn to this, we present another value-related approach on micro-level sustainability performance, which is “Environmental Shareholder Value”.

The concept of „Environmental Shareholder Value“ (Schaltegger and Figge 2000) is directed towards assessing how environmental management contributes to increasing shareholder value. The assumption is that cashflow is affected by sustainability efforts - which holds true for quite a few cost and investment activities as they decrease cashflow and also for activities which increase cashflow by reducing inventory levels and expenses related to waste management. But it will prove difficult to expand this type of numerical measurement to other cause-effects-relationships like, e.g., employee training and performance improvement. Also, external effects are not taken into consideration here, and we are left again with an eclectic approach⁸. The same type of criticism, by the way, would apply to the „*Key Performance Indicators (KPIs) for Extra-/ Non-Financial Reporting*“ elaborated by DVFA Society of Investment Professionals in Germany (DVFA 2007). This list of metrics comprises environmental, social and governance criteria and a forth pillar entitled „Fitness for the future“ (Sustainability of Success), and it is still in the making. It does not seem, however, that it will integrate the concept of externalities.

3.2 Connecting to the concept of „Externalities“

The definition of externalities which is commonly used refers to „situations when the effect of production or consumption of goods and services imposes costs or benefits on others which are not reflected in the prices charged for the goods and services being provided“ (OECD Directorate for Financial, Fiscal and Enterprise Affairs 1993). This is directed towards one primary feature of externalities, i.e. that one entity's action (a production facility polluting the air) directly or indirectly changes the *options* available to other entities (the neighborhood of that facility) – or, as an example of a positive externality, the effects which may arise from the construction of a road on housing, commercial development, tourism, etc. Another feature is the issue of *burdening* the entity which causes a negative effect (or providing benefits to an entity which causes a positive effect), and a third feature is that *property rights* cannot be clearly assigned. (which causes the main obstacle for properly burdening a cost or crediting a benefit).

Abundant research has been carried out in the area of externality valuation, and what is calculated, in principle, is the monetary value of the effects generated by a definite externality. The methodology concentrates on providing bases to governments or supranational bodies for policies of promoting the selection of technologies in specific fields of impact, like, e.g. low-carbon investment (UNCTAD 2010). And if ever aggregate externalities are considered, like, e.g., alternative use of lands, the valuation is reduced to either costs and benefits of a given land use

⁸ The concept has been taken up in a report for the Danish Ministry of the Environment, which connects it to risk management. However, as the report says, it remains questionable these correlations are measurable at all. (Melchiorsen and Mogensen 2005).

option, or to assessing thresholds for the carrying capacity of land in terms of absorption of specific negative impacts associated e.g. to the growing of specific crops etc. The traditional calculation uses estimates of prices based on people's willingness to pay for a given environmental benefit or willingness to accept compensation for a given nuisance level ("stated preference methods"⁹). Still, there are attempts to outperform those techniques by new attempts which comprise Input/Output Accounting and Strategic Assessment (Ricci 2010) and would thus be closer to the methods applied in the world of business.

The business accountant, when he knows the cost of an input item, will be able to capitalize and thus arrive at the capital value – provided he can apply an appropriate rate of interest. So why not transfer this to the cost of externalities and thus arrive at their value? Parallel to this, the benchmark-concept on "sustainability capital" and sustainable value presented by Figge and Hahn (2004) also draws from the notion that the average value created by any form of capital in a market can be seen as its opportunity cost. The opportunity cost of different forms of capital thus corresponds to the efficiency of the use of these different forms of capital on the level of a benchmark. When this benchmark is the economy of a country, then this value corresponds to the net domestic product (NDP). The spread between the use of capital in the overall economy and its alternative use in a business „Value-Spread" (VS) would be (Figge and Hahn 2005):

$$VS = \frac{NVA}{C_i^C} \text{ minus } \frac{NDP}{C_i^E}$$

where NVA is Net Value Added achieved from the use of capital C_i in this business (C_i^C), and NDP, Net Domestic Product, is net value added achieved from the – external – use of capital C_i (C_i^E), in the overall economy. The micro-level return is the company's profit-rate, the macro-level return on investment (NDP: C_i^E) may be interpreted as the cost-rate of externalities. From there, the capital employed in an economy's ecological and social resources could be inferred. Figge and Hahn (2005), in their first case study on British Petroleum and the U.K. economy, have chosen a set of well definable externalities: *Nonfinancial assets, CO₂, CH₄, SO₂, NO_x, CO, Work Accidents and PM₁₀* (*PM₁₀ is „Particulate Matter"*).¹⁰ The question remains how this may be extended to comprise all or at least the most representative ecological and social resources.

The universal conjecture ("all resources") is definitely aiming too high, and all indices hitherto developed work with „proxys", and their construction and use is often viewed as highly problematic. There are numerous initiatives to promote some sort of standardization, e.g. the UNCTAD Manual which is directed towards preparers and users of eco-efficiency indicators in order to assist in producing internally consistent environmental and financial information (UNCTAD 2003). It has been found that

⁹ The most prominent of these is "contingency valuation" which will be dealt with in section 4 below.

¹⁰ This first approach to value *aggregate externalities* has brought considerable progress over what was attempted by predecessors like Huizing and Dekker's (1992) „net value added" and Atkinson's (2000) „Green Value Added", which are conceptually based on impact assessments.

almost all indicators reveal some degree of arbitrariness with regard to normalization, weighting, and aggregation (Böhringer and Jochem 2006). Still, an index that would try to link Economic Value Added and the cost of capital employed in ecological and social resources would have to work with one of the most widely used indicators, and the task would be to unite all feasible efforts to make improve the applicability of them. The authors think that the new GRI initiative would provide a most suitable forum for this because it combines an impressive roster of intellectual brain.

The following list of indicators comprises those that were researched by Böhringer and Jochem (2006), and it is exhibited here because their findings on variables selection, weighting etc. (Böhringer and Jochem 2006 pp. 14 ff.), might serve as a starting point to remedy the deficiencies:

Index	Reference	Countries	Variables
Living Planet Index (LPI)	WWF (1998)	n.a. ¹	1100
Ecological Footprint (EF)	Wackernagel and Rees (1997)	148	arbitrary
City Development Index (CDI)	UNCHS (2001)	125 ²	11
Human Development Index (HDI)	UNDP (2005)	177	4
Environmental Sustainability Index (ESI)	Esty et al. (2005)	146	76
Environmental Performance Index (EPI)	Esty et al. (2006)	133	16
Environmental Vulnerability Index (EVI)	SOPAC (2005)	235	50
Index of Sustainable Economic Welfare (ISEW) ³	Cobb (1989)	6	25
Well Being Index (WI)	Prescott-Allen (2001)	180	87
Genuine Savings Index (GS)	Hamilton et al. (1997)	104	5
Environmentally Adjusted Domestic Product (EDP)	Hanley (2000)	n.a. ⁴	(many)

1: LPI measures the number of individuals of specific species in a certain population (beyond national borders).
 2: CDI has been applied to cities, regions, and countries.
 3: Identical with the Genuine Progress Index (GPI).
 4: EDP is calculated through implementing SEEA (System of Integrated Environmental and Economic Accounting), and the number of countries that apply this has been rapidly growing during the last years.

Characteristics / Source of Sustainable Development Indices (Böhringer and Jochem 2006)

Remedying variables selection, weighting and aggregation will certainly help, but the next issue would be how to attain general application. On the other hand, if we turn to the economic measure of "Sustainable Value Added", we are still left with the dilemma of attributing monetary values to public goods. Even though this subject cannot be elaborated extensively in this paper, nor can the characteristics of the indicators listed above be analyzed altogether, some cursory remarks on the topic need to be inserted before we get to our conclusions.

4. Some cursory remarks on the dilemma of public goods valuation

The dilemma starts with “value” being not one, but several related concepts in the context of public goods. One conception is that natural environment and social resources have “intrinsic” value – or value in their own right, another one is about the *contribution to human welfare relative to other assets*. Many types of resources which contribute hugely to human welfare which cannot be traded in markets – many environmental resources (such as clean air) and ecosystem services (such as water filtration and flood prevention) are amongst the foremost examples of such “non-market” goods and services. Still, these goods are also allocated to production of goods and services, and monetary terms are needed.

A long-standing technique to arrive at monetary terms attempts to express individuals’ preferences for changes in the state of the environment (“contingency valuation”); another attempt is valuing the input of the natural environment to agricultural production, the effects of environmental amenity on property price, and from there the factors can be investigated which affect the choices people make between recreational sites and between different environmental outcomes (cost-benefit- and cost-effectiveness-analyses). On the level of national accounting we find alternative measures of prosperity to Gross Domestic Product (e.g. the Environmentally Adjusted Domestic Product as exhibited in the table above). The approaches have changed over time: one of the seminal publications of 1989, “Survey of Methodologies for Valuing Externalities and Public Goods” (Hayden 1989) widely refers to systems analysis and social fabric matrices while these marks are not mentioned at all in the more recent report prepared, among others, in the U.K. Department for Environment, Food and Rural Affairs (EFTEC and Environmental Futures Ltd. 2006). The overall message arising from this report would be that valuation methods are highly influenced by the intended use of the value evidence and that their main purposes remain policy appraisal. They do not provide an “inventory” information on either national levels or in a cross-border perspective. In addition, the proper selection of variables can be quite country-specific because sustainability requirements are viewed differently across countries. It is hoped, though, that a combination of the state of the art public goods valuation methods with those of national and social resource accounting will eventually provide the inventory values required to assess the cost of ecological and social capital employed by businesses. The “Beyond GDP Initiative”, started in 2007 by the European Union, the Club of Rome, OECD, and WWF, seems to strive for this objective, but the projects have yet to be elaborated¹¹.

At present, the “inventory” approach is certainly found in the United Nations System for Integrated Environmental and Economic Accounting (SEEA). It comprises

- flow accounts for pollution, energy and materials; these provide information at the industry level about the use of energy and materials as inputs to production and the generation of pollutants and solid waste;
- environmental protection and resource management expenditure accounts, which identify expenditures incurred by industry, government and households to protect

¹¹ <http://www.beyond-gdp.eu/download/bgdp-summary-notes.pdf>

the environment or to manage natural resources, based, in part, on existing elements of standard national accounts;

- natural resource asset accounts which record stocks and changes in stocks of natural resources such as land, fish, forest, water and minerals.

What is not accounted for in SEAA are social resources. A catalogue which also accounts for these capital items was not developed, to our knowledge, on a supra-national level. There is one example on a national level, which is the Swiss „National Commons Product“ (NCP)¹², and whose structure is shown below:

Weight	Class of Goods	Metric / Database
25% natural resources	40% renewable energies 20% water 20% land, sea 20% capacity of renewable energies (coal, etc.)	Capacity in GW/year Capacity in m ³ /year sq km of usable land/inhabitant world market prices
32% social resources	20% security and peace 20% health 20% education 10% information 10% law and order 5% public transport	Ranking in Global Peace Index percentage of population having free access sqm/inhabitant (% of all land)
15% volunteering and unpaid community services
7% religion
7% happiness / life satisfaction	...	World Database of Happiness
7% families with children
7% Lebenszeit		Lebenserwartung

This catalogue could serve as a model to “sum up” the components of natural and social capital. Still, numerical quantification is still an open issue. Yet, as compared to what statistical offices do in other countries, at least we have an attempt here. In Germany, for instance, the Federal Statistical Office (<http://www.destatis.de>) has published a set of 19 indicators on sustainable development, some of which are further disaggregated (Federal Statistical Office 2010). There is no way, however, and no intention officially, to compound these into a composite index. In Italy, there is a law-project that calls for introducing a panel of indicators in each county. Several towns have already developed their metrics. Some that have developed a panel of indicators are Rome, Torino, Modena but also the Lombardy region. For instance, the Modena sustainability report, which was one of the first that were prepared, uses 30 indicators (Provincia di Modena e Regione Emilia Romagna 2004). In the U.S., the “Interagency Working Group on Sustainable Development Indicators” developed a framework of 13 economic, 16 environmental and 11 social indicators. The framework was published in 1998 (U.S. Interagency Working Group on Sustainable Development Indicators 1998). It incorporates variables which are highly aggregated, while others represent comparatively small numbers (children living in households with one parent present). The issue of attributing numerical

¹² Dill, Alexander: “Wealth beyond GDP - Composing a National Commons Product”. Basel 2009. English version: <http://commons.ch/english>

values that can be aggregated has not been posed there. After this, no federal effort to create comprehensive environmental accounts is either under way or planned. The work of the National Academy of Sciences' National Research Council which released its last report in 1999 (National Research Council 1999) was suspended due to budget restrictions. Even though these have now been lifted, to date no funding has been appropriated by Congress (<http://www.sdi.gov>).

5. Conclusion and Implications

A method for allocating ecological and social capital to businesses which use those commons, to continue from the preceding paragraph, is the essence of what this paper purports. And while the approach may seem radical, we think that in the long run there is no way out of shifting *all* the cost for consuming public goods from society to private businesses which use those goods. Partial approaches like burdening some industries with fees for carbon-dioxide emissions etc. will not do the job. The issue is that "free rides" on any of the societal commons must be penalized, and there must be a commonly acceptable method for this that is viable and logic. What has been coined *Sustainable Value Added (SVA)* here might serve this purpose, especially if connected to the „National Commons Product“ as presented above. In a first approximation, the objective might be achieved by the following equation

$$SVA = EVA \text{ minus } (WACC + EVA : NDP) \times (\text{Revenue} : NDP) \times NCP,$$

where EVA, WACC (weighted average cost of capital) and Revenue refer to a specific company headquartered in a given country, and NDP and NCP refer to that country's Net Domestic Product and "National Commons Product". The term "EVA : NDP" would reflect the spread of this company's use of common resources over the macroeconomic return, and the term "Revenue : NDP" would reflect the company's share of NDP in its homeland.

From that first approximation, we could improve by

- (1) disaggregating NCP into its ecological and its social components;
- (2) disaggregating the company's revenue into where it was produced (home and foreign locations)
- (3) incorporating the NCPs (if available) for the locations beyond the homeland of the company.

The implications of using this indicator range from concerns regarding „double counts“ and stimulating the wrong type of growth to practical issues of (dis-) aggregation and of connecting to the level of day-today decision making:

(a)

Expanding the concept of „Economic Value Added“ (EVA) by including the cost of capital employed in public goods requires adjustments to the accounting information where the „use of (some) public goods“ has already paid for. This would relate to taxes, excise, tolls, fees levied for discharging effluents and other imposts. These items would have to be eliminated from the profit and loss statement, which comes close to what is common practice already in calculating EVA and in disclosures following Global Reporting Initiative (GRI) formats. But there is more, especially with

regard to income tax: Income tax is not paid by a corporation which has no profit, but it still uses the public goods provided by the community (law and order, legal system, labor market, etc.). Thus, placing a burden on any entity for the benefits provided by those goods conveys fair treatment – nothing more, and nothing less.

(b)

The new metric would disclose that an enterprise does only create value for its constituency (which is all the stakeholders) if the outcome of its activities cover the cost of capital employed in economic, ecological and social resources. This type of value creation stimulates sustainable development because it enriches resources instead of depleting them. SVA, from its logical foundation, would have to be higher than EVA. Yet we should not apprehend that the enterprises will now tend to increase the prices for their goods and services (or force suppliers to reduce their cost without changing the character and the quality of its inputs. By calling for an SVA that is higher than EVA we stipulate that sustainable development can only be achieved if the resources available to any societal endeavor are persevered and ameliorated instead of being consumed, reduced or just maintained. Here we have the connection to risk management: An enterprise which aims to cover its equity against risk and loss will raise new capital and thus enable growth; likewise the risk of losing social and ecological resources will be reduced if we replace more than we consume of it. This would maintain enough public goods for fostering growth. In a closed economy, where the total of all EVAs produced equals economic growth (the growth of NDP), achieving a total of SVAs which exceeds economic growth would mean that the cost for public goods has been covered. If $\sum SVA > \sum EVA$, the economy has produced enough value for the increase of public goods (e.g. for improving education, legal frameworks and other infrastructure).

It goes without saying that valuation of public goods is a laborious task; however, there is abundant experience worldwide in institutions that have measured GDP and its components. Procuring research and harmonization in this field may produce an advantage over the search for purely micro-economic disclosure on environmental, social and governance matters, even though standardization might be feasible on at least some national levels¹³. The new metric would furthermore aid investment professionals to appraise the outcome of their analyses when they who perform specific firm assessments.

(c)

Anyone who advocates growth of public goods, which is equivalent to growth of welfare (and the new metric is an implicit advocate for growth), will have to deal with the argument that at least natural resources are limited. Here we are again with “strong” and “weak” sustainability and with the dispute on whether man-made capital can substitute natural capital (see section 2.2 above). But we would rather have to deal with the productivity of natural resources and not with their physical volume, and there is no doubt that technical progress has increased this productivity

¹³ International reporting convergence efforts are under way, especially by the World Intellectual Capital Initiative (WICI) which encompasses the OECD, the US Enhanced Business Reporting Consortium (EBRC) and Japanese METI (Ministry of Economy, Trade & Industry), among others. For an overview see: Bassen and Kovács 2008.

on many ends (three-liter-car, three-liter-house, etc.). Also, new resources will be found, and new uses for existing resources will be developed through ongoing innovation as has been done before. We do not negate that there might be negative effects of technical progress; however, isn't it one intrinsic feature of sustainable development that it eliminates these negative effects? Analogously, good governance will, in the long term, likewise eliminate negative effects of capital accumulation: EVA and SVA stimulate optimal use of economic capital, and this may well mean that equity must grow in private and in public business.

(d)

The first approximation of SVA as exemplified at the beginning of this section allocates overall public goods usage to a private enterprise by the relation of its EVA to NDP in one economy. The second approximation must therefore find a way to allocate public goods usage to an enterprise wherever it has a (productive) activity. If we look at what is structured as the „National Commons Index“ of the Swiss economy as exhibited above, it might be feasible to transfer this structure to public goods inventories of other economies. The third approximation would then decompose the index into its components, and it would also decompose the overall EVA into what comes from each business. We might thus direct the attention for sustainability to the shop floor and to the level where day-to-day decisions are made.

In all, pursuing the idea of a „composite metric“ might be a worthy undertaking in a time when business is seen more than ever as the agent of a wide group of stakeholders. This wider accountability implies that companies get aware of the magnitude of resources that are not reflected in their financials such as civic infrastructure, space, air and natural resources. If the journey goes towards integrating social, environmental, governance- and other relevant non-financial 'business-impacting' factors into a comprehensive report, the „cost of public goods capital“ approach would become one milestone on this road. But we might go even further: If no attempt is made by businesses to internalize the cost of public goods and to disclose a parameter which exhibits the magnitude of how they contribute to preserve and expand the societal commons, they will be confronted with ever growing agitation from pressure groups. Business representatives should be aware that they might be by-passed in the discussion on the issue of sustainability parameters that is taking place between those groups, standard-setters, governments and regulators.

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