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## Commentary

## Not measuring sustainable value at all: A response to Kuosmanen and Kuosmanen

Frank Figge<sup>a,\*</sup>, Tobias Hahn<sup>b,1</sup><sup>a</sup> Queen's University Management School, 25 University Square, Belfast BT7 1NN, Northern Ireland, UK<sup>b</sup> Euromed Management School, Marseille, Domaine de Luminy – BP 921, 13288 Marseille Cedex 9, France

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## ABSTRACT

In their article in this issue of Ecological Economics, Kuosmanen and Kuosmanen [Kuosmanen, T. and Kuosmanen, N., this issue. How Not to Measure Sustainable Value (and How One Might). Ecological Economics.] aim to criticise the measurement of Sustainable Value as proposed in our previous research. By adopting a production perspective and based on a productive efficiency analysis, they claim that the proposed way of measuring Sustainable Value represents an invalid simplification that rests on restrictive and unrealistic assumptions. Our response is to show that their argument rests on a fundamental misspecification of the Sustainable Value approach. We identify three conceptual misfits: a mismatch in the perspective of the analysis, a misspecification of opportunity costs and the irrelevance of production functions. Ultimately, Kuosmanen and Kuosmanen's train of thought rests entirely within the realm of productive efficiency analysis, whereas Sustainable Value builds on the foundations of financial economics and consequently adopts a macro rather than a firm perspective. It is thus not surprising that the findings of Kuosmanen and Kuosmanen appear to contradict the Sustainable Value approach. However, this is due to their fundamental misspecification of the Sustainable Value approach. As a result, rather than providing novel insights into how Sustainable Value might be measured in a better way, they do not measure Sustainable Value at all.

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## 1. Introduction

Despite being developed and proposed only recently, the Sustainable Value approach (Figge, 2001; Figge and Hahn, 2004a, 2004b, 2005, 2008; Hahn et al., 2007) has attracted considerable attention and sparked at times lively debate (Klevas et al., 2009; Korhonen, 2008; Schmidt and Schwegler, 2008; Van Passel et al., 2007). Most recently, in an article in this issue of Ecological Economics Kuosmanen and Kuosmanen (2009-this issue) (henceforth KK) aim to criticise the Sustainable Value (SV) approach. More specifically, in their article KK examine the way we proposed to measure SV when we initially developed the approach (Figge and Hahn, 2004a, 2005) and fundamentally question the validity of the approach. By conducting a productive efficiency analysis they claim to propose novel insights into how Sustainable Value might be measured in a better way. In this response to KK we address the main points of their criticism. By doing so we find that KK fundamentally misspecify the underlying SV model that they claim to test. We identify three fundamental misfits that are at the source of this misspecification of the SV model. As a result, this undermines the relevance of the argument of KK.

We believe that the reason for the fundamental misspecification of KK's critique is due to the fact that it fully remains in the logic of the

individual firm by adopting a production perspective. KK conduct a standard productive efficiency analysis on the firm level, which has been carried out for decades. As SV builds on a completely different conceptual foundation than productive efficiency analyses, we argue that such an analysis is not suitable for testing the validity of the SV approach or the way it can be measured. The SV approach does not inscribe itself in the tradition of the theory of the firm. SV follows the tradition of financial economics. Financial economics differ from theories of the firm in three ways. "First, it is concerned with investors rather than manufacturing firms or consumers. Second, it is concerned with economic agents who act under uncertainty. Third, it [...] can be used to direct practice [...]" (Markowitz, 1990, p. 279).<sup>2</sup> The major contribution of SV as we have developed it consists in applying opportunity cost thinking from financial economics to the use of economic, environmental and social resources and the assessment of corporate sustainability. Up to this point the use of environmental and social resources has been discussed using models, theories and techniques that have their origins in the theory of the firm. With our SV approach we take a different view by adopting the perspectives, tools and techniques of financial economics.

In the light of this fundamental divergence and even if KK seek to build their argument on purely statistical and mathematical grounds, we need to focus on the conceptual foundations of SV. By doing so, we identify three fundamental conceptual misfits of their criticism. In the

\* Corresponding author. Tel.: +44 28 9097 1363; fax: +44 28 9097 5156.

E-mail addresses: [f.figge@qub.ac.uk](mailto:f.figge@qub.ac.uk) (F. Figge), [tobias.hahn@euromed-management.com](mailto:tobias.hahn@euromed-management.com) (T. Hahn).<sup>1</sup> Tel.: +33 491 827 313; fax: +33 491 827 983.<sup>2</sup> Please note that this quote from Markowitz's Nobel Lecture relates to portfolio theory. We feel that it can also be attributed to financial economics in a wider sense.

following, we will develop on these three misfits by addressing the key aspects of [Kuosmanen and Kuosmanen's \(2009-this issue\)](#) article. Regarding the first mismatch, we show the fundamental difference in perspective between SV and productive efficiency analysis. The second mismatch refers to the notion and role of opportunity costs. For identifying the third mismatch we discuss the relevance of production functions in the context of the SV approach. Finally, we briefly discuss some implications of our argument and KK's criticism for sustainability assessment and from the perspective of welfare economics before concluding our response.

## 2. Misspecification of perspective

In their article, KK claim to draw a sharp distinction between the conceptual idea of SV and the operational estimator to measure SV. As we will show in this section, such a distinction is futile if the estimator that is proposed by KK is based on a completely different perspective that has little in common with the logic of the SV approach. For this purpose we need to address the fundamental perspective the SV approach itself is based on and contrast it with the perspective that KK adopt for their analysis of the validity of the SV measurement.

As noted by KK, in our original article in *Ecological Economics* we introduced the If- and Where-matrix ([Figge and Hahn, 2004a](#), p. 176–177) to distinguish between two different rationales in the context of sustainability assessments. A sustainability measure that answers the If-question looks at whether the resource should be used at all. A sustainability measure that addresses the Where-question looks at where, i.e. by which economic entities the resource should be used. As explained in our article answering the If-question is desirable but not possible in practice as we need to know the absolute societal cost of resource use to answer the If-question. Unfortunately, reliable information on the external costs of environmental and social burdens is not available most of the time ([Tol, 2005](#)). Our SV approach follows the Where-logic of this matrix. We argue that this question can be answered based on opportunity costs. SV “[...] indicates *how much more sustainable* (in monetary terms) the use of the resource is in comparison to other entities” ([Figge and Hahn, 2004a](#), p. 177). As explained in our article we follow the logic of investment decision making in this context ([Figge and Hahn, 2004a](#), p. 176). SV is, similar to capital-oriented concepts like the shareholder value approach ([Copeland et al., 2000](#); [Rappaport, 1986](#)), based on efficiency. Companies that increase their efficiency will, *ceteris paribus*, also increase their SV. Answering the Where-question can help us to allocate resources even if we do not know if we should use the resource at all.

There is a logical follow on question once resources have been allocated, namely the How-question. The How-question looks at how resources are used once they have been allocated to an economic entity (e.g. a company). Companies can for example choose between different production technologies. Different production technologies will use different resources to a different degree to produce their outputs. It is useful to describe these production technologies using production functions. The efficiency of the resource use – including environmental and social aspects – *on the individual firm level* has been analysed for decades using productive efficiency analyses ([Callens and Tyteca, 1999](#); [Kuosmanen and Kortelainen, 2005](#); [Reinhard et al., 1999](#)). In this context, scholars analyse alternatives of a given production technology (and thus production function) in order to determine the best alternative technology option for every individual firm.

We decided not to discuss the How-question in our original article ([Figge and Hahn, 2004a](#)) because SV inscribes itself in the methodological tradition of financial economics and not of productive efficiency analysis. Financial economics deals with the Where-question. In contrast, the How-question is related to theories that follow the methodological tradition of the theory of the firm such as productive efficiency analysis. Even if both questions refer to the question of efficiency of resource use they are fundamentally different

with respect to their underlying rationale for optimising resource use and for assessing efficiency of resource use.

The perspective of the Where-question is based on the logic of financial economics. Financial economics are concerned with the questions how to allocate economic capital among different companies in order to maximise the overall risk-adjusted return on economic capital ([Modigliani and Miller, 1958](#)). Note that the rationale for optimising resource use does not reside on the individual firm level but *on the overarching perspective of investors who can diversify* by investing in different companies at the same time. As a consequence, financial economics are not concerned with optimising capital efficiency or even assuring survival of an *individual* firm. SV adopts this perspective of financial economics and extends it to environmental and social resources. The fundamental question SV asks is thus where environmental and social resources should be allocated in order to achieve an optimal overall return (Where-question).

The perspective of the How-question stems from the firm level. It asks how resources should be best used by each individual firm once resources have been allocated to different firms. Productive efficiency analysis is an important example in this context. It determines *for every individual firm* the best possible (= most efficient) technology for using the resources and assesses by how much each company falls short of achieving its individual optimal use of resources. Note that the rationale of optimisation resides entirely on the single company level and is different for every individual company.

It becomes clear that the Where-question refers to the allocation of resources between firms whereas the How-question addresses the technology choice or use of every individual company. This has far reaching consequences for assessment approaches that are based on either of the two perspectives. The fundamental difference in the assessment logic of the two perspectives can be illustrated using a simple example. In this example we assess the performance of two companies A and B. Both companies use one resource to produce their output. We assume that they use the same absolute amount of the resource to produce different levels of output.<sup>3</sup> To answer the Where-question we use the economy that both companies operate in as a benchmark. To answer the How-question we compare their production technology to the best available production technology as it is for example done by [Kuosmanen and Kuosmanen \(2009-this issue\)](#).

[Table 1](#) summarises the information that we have regarding both companies. We will first look at the Where-question and thus at the SV approach. SV is created if an additional return could be achieved by giving a resource to the company rather than the benchmark. In our simple example each unit that is given to company A rather than the benchmark (Where-column) results in a loss of € 50. Each unit that is given to company B results in a gain of € 50. B will thus be preferred to A, i.e. B will have a higher valuation than A.

We will now look at the How-question and thus productive efficiency analysis as proposed by [Kuosmanen and Kuosmanen \(2009-this issue\)](#). Note that according to productive efficiency analysis a company is rated higher the closer it operates to its individual efficiency frontier that determines the rationale for optimal resource use for the respective company. Company A could increase its performance from 100 €/t CO<sub>2</sub> to 120 €/t CO<sub>2</sub>, i.e. by 20%. By not operating at the maximum possible level € 20 is lost per unit of resource used. In the case of company B this amounts to € 100 per unit of resource and thus a 50% increase. In this case company A is preferred to company B, i.e. A will receive a higher valuation than B as it operates closer to its efficiency frontier.

The objective of the SV approach is to answer the Where-question. Recall that the Where-question is concerned with the allocation of resources between different firms. However, if this allocative question was answered on the basis of assessment following the logic of

<sup>3</sup> We restrict ourselves to one resource as well as to the same absolute amount only for convenience. The argument holds true analogously for more than one resource and for different absolute amounts of resource use.

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