



Juggling the 3P's: dealing with sustainability in the Supply Chain¹

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Introduction

Operations & Supply Chain Management are multifaceted topics. In all of my courses in this area, I typically start from the business dimension, because I find it important that participants understand and experience how the corporate context of for example strategy, segmentation, value propositions and business models are not just interesting, but in fact a key input for the technical dimension of Supply Chain strategy and details about supply, production, distribution and so on. In addition, I then cover the leadership dimension, talking for example about decision making in the case of complex trade-offs and cross-functional alignment. My book Mastering the Supply Chain (2019) follows the same logic, addressing each of the three aforementioned dimensions.

With Sustainability now also entering powerfully into the Operations & Supply Chain area, this logic may need a sense-check as to how well the “conceptual classics” I cover in my courses and in the book would still hold within this new context. Are they still meaningful or would a future course in the OPS & SCM area need a new focus as well as new concepts?

For the sake of this text, I will be looking less into how our supply chains and decision rules may actually change due to the inclusion of Sustainability into the equation. This will very likely be the topic of a next article, but first I want to focus mainly some of the key concepts and frameworks we currently

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use to capture and describe our Operations and Supply Chains and their context and check how well they are suited for adding Sustainability.

In the following pages, I want to share some first observations and thoughts, as well as references to sources I consider interesting and relevant. My intentions are modest and I cannot claim to be exhaustive nor necessarily complete within the limited format of this text, but I do aim to inspire and to add something constructive to the conversation. At the same time, I hope readers will also see it as an invitation to join the conversation.

*Spoiler-alert: most OPS & SCM concepts seem to me to hold fairly well, but we definitely have a lot of work to do and still some important gaps to fill, as well as to think about what the Sustainable Supply Chain would actually look like and what the new decision logic may need to be... for example solving the issue of the '3P-business case'. I call this "**juggling the 3 P's**".*

The next frontier for Supply Chain Management: Sustainability

OK, so the world has now finally seen the importance of properly working worldwide Supply Chains. Although I would personally have preferred that people would learn about this by experiencing Supply Chain successes, unfortunately it has been through seeing Supply Chain problems occurring because of a global health crisis, the Covid-pandemic. In any case, it seems that Supply Chain is definitely on the agendas now. But while we are still busy fixing the pandemic and its Supply Chain consequences, let's also look forward to the next challenge coming up: the *Sustainable Supply Chain*, presenting a whole range of new decisions and trade-offs to be looked at, in addition to the business-as-usual complexities we all know.

Supply Chain Resilience, with all due respect, was already developed many years ago, as were the conceptual foundations of the bullwhip effect, but we needed a big health crisis to demonstrate why those concepts actually make sense, revealing at the same time to what little extent companies apparently have taken them seriously for all of those years. In the case of Sustainable Supply Chain, let's try and be a bit more proactive when it comes to resolving those very complex sustainability challenges.

The three P's, SDG's and ESG

Like risk & resilience, sustainability in itself is of course not a new topic either and in our latest book *Mastering the circular economy*, my co-author Rozanne Henzen and I start with giving an extensive historical overview, thus sketching the necessary context for understanding why circularity actually is now on the agenda of governments, NGO's, businesses as well as citizens. I think that large part of the context for circularity is also valid for the more general topic of sustainability.

In terms of how I see Sustainability appearing in the business world, there are a few concepts that seem to dominate and stand out at this moment. First of all, there is the concept of so-called Triple Bottom Line (TBL) of *People, Planet & Profit (3P)*, coined by John Elkington already back in 1994 in California Management Review (Elkington, 1994). Even though Elkington himself did a 'recall' of his

triple bottom line concept in a Harvard Business Review article in 2018, to date the term '3P' or 'TBL' still appears very often in company policies, as well as in academic research. More specifically related to Supply Chain, Carter & Rogers (2008) in fact took the Triple Bottom Line concept as the starting point for their framework of Sustainable Supply Chain Management.

Secondly, there are the United Nations' *Sustainable Development Goals* (SDG's, as described for example in UN, n.d.). As can be observed on the websites of many (multinational) companies, like 3P, also the SDG's strongly resonate in the corporate world, but as I can perceive in the courses I deliver at universities and business schools, the SDG's also flourish among students.

Thirdly, there is the term of *ESG* (Environmental, Social, Governance), which is appearing more and more frequently in corporate discussions, particularly in connection to disclosure and reporting. This trend can even be appreciated when simply Googling the term ESG in conjunction with words like 'business', 'company' or even 'supply chain', but also in mainstream media, business associations and academia (for example WBCSD, 2021, Chin & Holger, 2021, Serafeim & Yoon, 2021)².

My perception is that even though the aforementioned topics have been on the agenda for quite some time, all is still fairly immature in terms of concrete and widespread application in companies, but a lot of developments seem to be going on in parallel as well as very fast lately.

A basic framework for Operations and Supply Chain Management

One of the main storylines I use in *Mastering the Supply Chain* and also in most of my basic Operations & Supply Chain Management courses is "*the story of WHAT? and HOW?*", in one way or another based on the framework by Visser & van Goor (e.g. 2011) and alluding to the fact that part of a company's activities is to define and sell a promise to the customers (the 'what?') and that another part of a company's activities is to deliver on that promise (the 'how?')³.

² Also interesting to observe: even though most search hits in this case will indeed be related to ESG & business, most of the ones appearing high on the list are either by consultancies offering ESG-related services or software companies selling ESG-reporting solutions, rather than about the content of ESG. Not sure what I should be making of this and if it's good or not, but it does at least indicate that something important is moving.

³ There is in fact a second storyline running through *Mastering the Supply Chain* and my OPS & SCM courses, which is "the story of simple, but not easy", expressing that most of the relevant concepts of Operations and Supply Chain Management are relatively straightforward and in most cases not even that difficult to understand, but that this doesn't make their application any easier, for example because many different options exist. In addition, it's not about the individual concepts at play in isolation, but it's the complexity of many factors at play at the same time. I believe that this will still strongly hold when adding Sustainability to the equation.

OPS & SCM: the story of **WHAT?** and **HOW?**

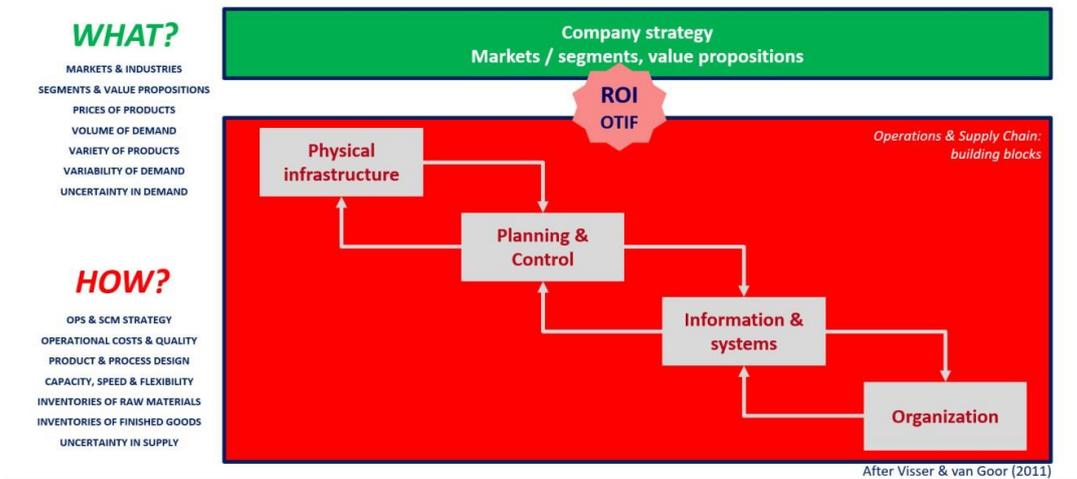


Figure 1: The story of **WHAT?** & **HOW?** (central framework after Visser & Van Goor)

Following this logical sequence, I want to start this article with adding Sustainability to some basic concepts related to corporate strategy, value propositions and finance. With those being an input to Supply Chain decisions, I then move on to Supply Chain strategy and the key Supply Chain activity of “managing trade-offs”. What would this look like in the future when Sustainability enters the equation?

Sustainability and Corporate strategy & Value Propositions

With 3P, SDG’s and ESG gaining importance in business and academia, one of the major questions on the table for the Sustainable Supply Chain is what these concepts actually mean for the field. In my view, this then starts with the implications for basic business concepts such as strategy and value propositions, which normally form the basis for developing specific operations and supply chain strategies.

Although arguably it also clearly links to the increasing popular notion of ‘Company Purpose’, my current thinking is that most likely Sustainability will not require a structural reconsideration of classical strategic positioning frameworks, to which we also often refer in the Supply Chain practice. For example, taking Porter’s generic strategies of cost leadership and differentiation (Porter, 1985) and adding sustainability to it, then the cost leadership strategy would probably mean something like ‘sticking to the legal and socially acceptable minimum standards’, while differentiation would be the

strategy for sustainability leaders, making the planet and/or the people dimensions into additional ways for differentiating themselves from the competition⁴.

In a similar way, other strategy frameworks such as the ones laid out by Treacy and Wiersema (1995) or the notions of Blue Ocean strategy (Chan Kim & Mauborgne, 2005) or even disruptive innovation (Christensen, 1997) seem to me to also allow for adding sustainability to the equation.

Probably, for the concept of Value Propositions something similar can be argued. For example, the well-known and often-used strategic value proposition framework by Crawford & Mathews (2003) is still very much valid, and seems to be easily adaptable to include Sustainability, as Desmet argues in his recent essay (Desmet, 2022). He suggests to add the dimension of “sustainability” to the other dimensions of value propositions such as price, access, services and so on. Probably, for many occasions this is a fine solution.

I would argue that “sustainability” can even be split into “*Social Sustainability (People)*” and “*Ecological Sustainability (Planet)*” in order to be able to distinguish the true global sustainability champions from those companies who decide to play mainly on one of the sustainability dimensions (think for example of a company whose central selling point would be “slave free products” thus prioritizing social over ecological).

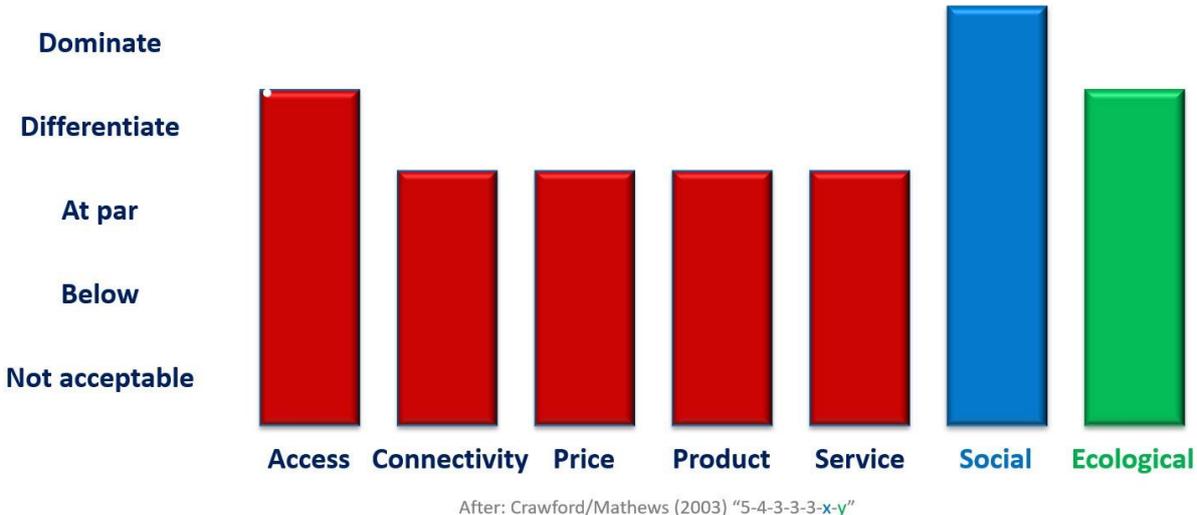


Figure 2: Crawford & Mathews’s 5-4-3-3-3 concept incorporating social and ecological sustainability

All in all, I agree with the argument of Desmet that linking Sustainability to existing frameworks of strategy and value propositions, at least as a starting point for developing suitable Supply Chain solutions, doesn’t have to cause great issues. For the Supply Chain people this strategic context is

⁴ In addition, I think it would be a fair assumption that these legal and socially acceptable minimum standards would most likely become more strict over time.

most likely good enough for them to work from and this is a good thing, because it means we can further build on already known foundations and frames of reference.

Sustainability and Finance

Before we move on to more detailed strategic and tactical decision making in the Supply Chain, let's also take a brief look at Finance (as expressed by ROI in Figure 1). In *Mastering the Supply Chain I* briefly address the basic concepts of the Income Statement (“*earn & spend*”) and Balance Sheet (“*own & owe*”). In order to have learners capture the importance of these concepts, I point the discussion to specifically exploring those Revenues, Costs, Assets and Investments which are caused by Operations and Supply Chain activities.

Coming directly from the numbers in the Income Statement and the Balance Sheet, Return on Investment (ROI) or Return on Capital Employed (ROCE) are often used as overall indicators of corporate success. But how does that work if Sustainability is added? If everything related to People and Planet can also be expressed in financial terms, then there should be no problem of maintaining the Income Statement and Balance Sheet (and arguably also the Cash Flow Statement) as the main reporting frameworks for overall company performance. The question is if that really holds. My current take on that is '*probably not (yet)*'.

The financial statements mainly capture the overall aggregated results as a consequence of many detailed decisions taken and implemented over time in each of the functional areas of a company. Of course, many supply chain decisions are not mentioned explicitly in those statements either, but the underlying decision making typically does take the financial impact on revenue and/or costs and/or capital explicitly into consideration.

How is that in the case of decisions taken to improve sustainability? One the one hand the same can be argued as in the case of supply chain decisions: the financial statements show the results, but not necessarily all the detailed decisions that caused those results. On the other hand, however, it is not so clear at all if in sustainability decision making the main focus is also on the financial impact on revenue and/or costs and/or capital. Or, maybe, whether financial considerations actually play an important role in those sustainability decisions at all.

Since 3P and ESG are in the focus of attention now, a company's stakeholders do want to know in more and more detail what was done to improve sustainability performance. In that sense, companies are already required to present more and more 3P-, or ESG-related reporting. But typically these are in addition to the financials and not integrated into the financials. Such sustainability-oriented add-ons to Corporate Annual Reports have in fact been around for quite some time, many focused on qualitative descriptions of what was done and achieved, and seemingly more and more including quantitative data to support the argumentation. Most of the quantification in those reports, however, is not expressed in financial terms, but in topic-specific units of measure (e.g. kilograms of CO₂, number of accidents, and so on).

So, where in the case of supply chain decisions the financial statements do present relevant information as to whether the company is going into the right direction ("*better supply chain performance*" as directly and positively related to revenues, costs and/or working capital), this cannot be said so straightforwardly about sustainability decisions. It is not so easy to read from the standard financial reports if the company has indeed improved sustainability-performance. The same can actually be argued for sustainability decision support itself and the role the financials play there, but more about that later, when covering the topic of trade-offs and business cases.

Supply chain strategy and typologies

Following once more the framework from Figure 1, we now move on and take corporate strategy and value propositions as we touched upon before as an input for designing Operations & Supply Chain solutions. In this context, I typically first talk about supply chain strategy and typologies, before going to the details of designing the physical infrastructure, planning & control and so on.

The classical framework of reference for supply chain strategy and typology is probably the one from Fisher (1997), defining the "*efficient supply chain*" on the one end of the extreme and the "*responsive supply chain*" on the other. Other variations have been developed over time, for example by Lee (2002), Pérez (2013), Gattorna (2015) or Chopra & Meindl (2016) among others. Obviously also directly linked to for example the aforementioned value propositions, the key operational characteristics at play here are variability and uncertainty of demand as well as of supply. More variability and/or more uncertainty in demand and/or supply favor a more responsive supply chain.

Now, would adding sustainability to the equation justify new supply chain typologies beyond the efficient-responsive spectrum? Referring back to the Crawford & Mathews framework for value propositions as mentioned before, if the focus of a company is competing mainly on the non-sustainability aspects, with ecological and social at par with the market, then probably the efficient-responsive typology will still work. If ecological and/or social sustainability are the dominant factors in the value proposition, then this becomes much less clear.

For example, local sourcing is typically associated to a more responsive strategy and it goes well together with reducing your carbon footprint (less distance means less transport means less CO₂). Producing in large batches is typically associated with a more efficiency-driven strategy, but arguably also goes well together with reducing carbon footprint (less changeovers means less startup losses means less waste means less CO₂). So, when sustainability becomes more prominent in the value proposition, the classical efficiency-responsiveness spectrum may be less suitable because both the efficiency-driven strategy and the responsive strategy have elements that may be favorable (and arguably also some elements against) sustainability.

The good news is that the framework by Melnyk, et al. (2010) can be of help here. In their approach to 'outcome-driven supply chains' they already identify sustainability as one of the 6 performance dimensions (cost, resilience, security, responsiveness, innovation, sustainability). Furthermore, they argue that "*in practice, effective supply chains are often hybrids - reflecting various combinations of*

the six". This would effectively provide a conceptual basis for defining OPS & SCM strategies that include sustainability aspects.

Making decisions in Operations & Supply Chain Management: trade-offs and business cases

Moving to the next building block from Figure 1, we find the 'physical infrastructure', containing tangible topics like suppliers, production, storage, transportation, distribution, as well as for example physical characteristics of products. For sure, these topics will be affected by increasing concerns about sustainability, but at the conceptual level my current thinking is that these are mainly additional factors to be taken into consideration and not so much factors that will require totally new conceptual frameworks.

However, this seems to be different when we move on to actual decision making about the aforementioned factors and the complex trade-offs involved. Typically, when translating strategy and value propositions into tangible Supply Chain decisions about physical infrastructure, sourcing, inventory policies and so on, many trade-offs occur. The cost-service trade-off is one of the most well-known of these.

Of course, win-wins may exist, in which service can be improved, while maintaining or even reducing the existing cost levels. In many other cases, however, you can't have it all and there will be a possible downside to an identified upside. A classic example: if I centralize warehousing I may be able to reduce overall cost levels of warehousing and inventories, but on average I will be further away from the markets, thus most likely increasing lead times as well as transportation costs, potentially leading to an impact on customer satisfaction or even loss of sales. So, is this overall a good decision or a bad decision?

Fortunately, in 'classical' Supply Chain trade-off thinking, we would mostly be able to express all of these equations in money in some way or another, thus allowing for relatively straightforward adding up and subtracting in order to come to a final overall financial outcome. Typically, we would call this '*making a business case*': of a specific decision under consideration you list all of the relevant pros and cons you can come up with, then you try to quantify those in money either through simple calculation or through more advanced modelling and then you have a case that can be discussed for the overall OK⁵.

⁵ *In practice I see two main issues with these financially oriented business cases, but fortunately, they both have solutions. The first one is how to deal with cases in which the quantification can be understood conceptually and can be done technically, but where the exact data as an input to the equation is either not available at all or will take very long to be collected or where collection will be only be possible at a high cost. Typically, we solve this through making assumptions or developing scenario's.*

The second issue, in fact one of classical Supply Chain alignment, is how to deal with those cases in which the overall outcome of the business case may be (financially) positive for the company as a whole but where the pros and cons are actually unevenly spread over the various departments involved, thus playing to the benefit of the

TEAM: <u>SuperJuice</u> STRATEGY: <u>Low Cost</u> 	
BUSINESS CASE FOR: <u>CHANGE OF ORANGE SUPPLIER FROM MIAMI ORANGE (USA) TO ARANCIA D'ESPAÑA (SPAIN)</u> WHY? BECAUSE OF	
<p>PROS (QUANTITATIVE):</p> <p>Lead time from 30 to 10 days, shorter distance allows for cost-effective smaller shipments, i.e. smaller lotsize → less avg. stock ... EUR space saving (assumption: ...) ... EUR interest saving (assumption: ...)</p> <p>Shorter lead time allows for smaller delivery window: → less delivery uncertainty → less safety stock ... EUR space saving (assumption: ...) ... EUR interest saving (assumption: ...)</p> <p>....</p> <p>PROS (QUALITATIVE):</p> <p>Shorter leadtime allows for better synchronization between production intervals and component supply</p> <p>....</p> <p>....</p>	<p>CONS (QUANTITATIVE):</p> <p>Standard contract index from ... to ...: ...% increase on current ...k spending: ... EUR additional purchase cost</p> <p>....</p> <p>....</p> <p>CONS (QUALITATIVE):</p> <p>....</p> <p>....</p> <p>....</p>
PROPOSED DECISION:	

Figure 3: example of a financially oriented 'business case' template

For me, the skills and techniques of making business cases are a standard part of any Operations & Supply Chain training, not only in terms of explaining it conceptually, but particularly also applying it practically. First of all, addressing trade-offs and business cases increases the awareness and sensitivity of participants towards the topic and secondly, knowing how to actually create a compelling business case for a potential decision is a very useful skill to master.

All in all, the traditional focus in Supply Chain decision making and in dealing with trade-offs has been on the financial bottom line, in other words mostly on the 'Profit' of the 3 P's. So, if we now have to add the P's of *People* and *Planet* to the equation, will the simple principle of the pros & cons and finance-based business case still be a practical way for decision making or will we then run into barriers, for example in data collection or in being able to express everything in financial terms? And if so, what can be done to deal with these issues, to what extent do other solutions already exist? Which additional complexities may arise, for example related to alignment between departments, as is currently done in S&OP / IBP processes?

Solving 3P-trade-offs: what could a 3P-business case look like?

If traditional business cases center around expressing the potential impact of a decision through the financial dimension, then probably that is because the traditional focus of companies has been on

targets of some departments, but against some of the others. Processes of alignment like Sales & Operations Planning (S&OP) or Integrated Business Planning (IBP) have been developed and introduced in an attempt to provide a platform to discuss such asymmetries in a productive way.

financial profit maximization. Pretty much any decision contributing to higher profits for the company and within legal and ethical boundaries would then be a good decision⁶.

Following the spirit of the Triple Bottom Line, this focus should then shift to expressing impact on three dimensions, leading to triple bottom line optimization. But what does that actually look like, how to make a 3P-business case? So far, I have found some very different angles to the topic, which I want to address in the following paragraphs.

Sustainability as instrumental to business success: people / planet as business opportunities

In part of the business-oriented sustainability literature, the starting point is how firms can benefit from addressing societal concerns (for example Porter & Kramer's concept of Shared Value of 2011, Gao & Bansal, 2013). Central in many of these approaches is that sustainability is instrumental to a company's financial results, clearly looking for business opportunities in which win-win(-win)'s between the 3P's can be established. If such win-win(-win)'s are the starting point, then arguably business cases as a decision making instrument are slightly less relevant, because who would really need a business case if each of the P's ends up gaining anyway. Who could be against such a decision?

Another perspective related to instrumentality that can be observed is one in which the P's of People and/or Planet can or will only be applied under the condition that Profit is also satisfied. In other words, sustainability is fine, but only if it makes business sense, either through savings, improved customer offerings, obtained tax advantages, or similar. Again, in a way, sustainability as a business opportunity.

Generally speaking, it seems to me that if instrumentality is the central thought, then a 3P-business case should ultimately enable financially oriented decision making. So, how can we do this? I'll come to the complexities of that in a moment.

But first a little, but relevant side step. Although conceptually attractive, criticism towards the line of thinking of instrumentality also exists. First of all, some critics argue that the advocates of Shared Value assume win-win(-win)'s a bit too easily as an omnipresent starting point. According to these critics, in practice many situations may actually present win-win-lose cases, or lose-win-win, and so forth, and they say Shared Value doesn't really cover such realities, as for example argued by De Los Reyes, et al (2017) and Beschorner & Hajduk (2017). Seen from the perspective of complex Sustainable Supply Chain trade-offs, I would argue that particularly these non-win-win-win cases are the ones which require the proper approaches and tools for their satisfactory resolution.

Secondly, some critics question why sustainability should merely be seen as instrumental to a company's profits, in other words, to consider that sustainability is 'just' a means to a (financial) end.

⁶ *Yes, I know that unfortunately there are plenty of cases in which even these legal and ethical boundaries haven't been respected. Although I haven't done research into this particular topic, for the moment I would still like to believe that most companies have complied with such boundaries and that in the future due to 3P- and ESG-pressure it will become much more difficult to get away with non-compliance.*

They argue that sustainability is too important a topic to only see it as a means for companies to become more profitable. As Hahn & Figge (2011) state: “*Trade-offs between environmental, social, and economic aspects must be solved without any systematic predominance of any of the dimensions of sustainability*”. In a 2017 article, co-authored with Pinkse and Preuss, they even go a step further, talking about ‘an emerging paradox perspective’: “*a paradox perspective on corporate sustainability explicitly acknowledges tensions among different desirable, yet interdependent and, at times, conflicting sustainability objectives. [...] Moreover, a paradox perspective creates leeway for superior business contributions to sustainable development because it regards environmental and social concerns as an end in themselves, not just as a means to the end of profit maximization*”.

From my perspective this leads to two interesting, fundamental and, I think, currently still unsolved debates. First, if sustainability may be prioritized over profitability, we accept that there can and will be specific cases in which People and Planet simply go before Profit. Conceptually this is not a problem, but practically speaking, to what extent would accepting a financially lossmaking decision work in a corporate context?

Second, it seems to me that by stating that sustainability is too important to be seen as just instrumental, we run into the risk of mixing different levels or horizons of which it is not so clear (yet) how they can be reconciled:

1. the macro level of planet and society and the micro level of company policy and company sphere of influence. I can perfectly understand that people see sustainability as a gigantic planetary challenge which is indeed too important to leave it up to company profitability as the main decision criterion. But to what extent can such a macro issue of general ecological and societal wellbeing always be aligned with the micro challenge at the company level of financially sustaining your business and avoid going bankrupt under ever increasing competitive pressures? Practically speaking, how would that work in strategic, tactical and operational (supply chain) decision making, especially in those lose-win-win cases?
2. the generally much longer term horizon of 'impact' versus the much shorter / medium term horizon of financial results. Also here, the rationale can certainly be understood, but it's not so clear how to make this work practically. Doing something sustainable now which results in a direct increase of the short-term costs, but with the perspective of a long-term impact doesn't really fit with the way we do the bookkeeping nowadays. Potentially, we should consider the expenses in such cases as an investment rather than as a cost, as argued by Mayer and Roche (2021). What is less clear, though, is how for example a concept of depreciation as used in the context of investments on the balance sheet can be applied to sustainability costs, which are taken directly? I'm by no means a financial expert, but it seems to me that some work still needs to be done here to clarify how we could make this work in a convincing way.

Seen in the light of these complex sustainability trade-offs, there would obviously be important implications for the way we would need to build our 3P-business cases. As states Müller (2021): “*The addition of ecological and societal concerns to the entrepreneurial goal function may relativize the*

dominance of financial ratios, but by no means the need for rational and inter-subjectively comprehensible decision making. Rather, the balancing of economic goals and other goals requires that the latter are consciously and systematically integrated into one corporate management and rendered measurable. This is not a matter of documentation after the fact, but of adopting a forward-looking perspective – a challenge that many current practices in sustainability reporting with its focus on past events do not fulfil.”

How to achieve this, then?

Quantifying People & Planet?

I already briefly mentioned that companies have been reporting on their sustainability efforts for some years now, for example in the add-ons to their Annual Reports, in press releases and in dedicated sections on their websites. Over time, partly under pressure from governments, the investment world and other stakeholders, more structured and independent initiatives for sustainability reporting are emerging. For the moment, it seems that most of those do seek quantification of the various sustainability dimension reported on, but in most cases each dimension does carry its own unit of measure, making 1:1 impact comparison between different variables very difficult, if not impossible.

Some examples of concepts and frameworks I have come across while searching for quantitative approaches to express sustainability and which I've read with great interest are the following (warning: please note that the listed examples come from a variety of backgrounds and were not all created with the same objective in mind, so they are diverse in nature):

- **Measuring Stakeholder Capitalism**, WEF (2020). Backed by accountancies EY, PwC, KPMG and Deloitte, builds on earlier initiatives such as Global Reporting Initiative (GRI), Integrated Reporting (IR), Sustainability Accounting Standards Board (SASB), as mentioned below in the list below. Does address a wider scope of sustainability variables, but does not express all in financial terms⁷;
- **GRI**. GRI (2020) presents reporting standards for the Economic, Environmental and Social dimensions of a company. Not necessarily aimed at sustainability reporting as such and most indicators are topic-specific, not all in financial terms;
- **Integrated Reporting**. As captured by the International Integrated Reporting Council (e.g. IIRC, 2013), proposed the 6-Capital model, expressing performance not only in Financial Capital, but also in manufactured, natural, human, intellectual and social and relationship capital;
- **SASB (n.d.)** A fundamental contribution by SASB is bringing the notion of “materiality”, known from basic accounting practice such as the Generally Accepted Accounting Principles (GAAP)

⁷ Please note that criticism about the concept of Stakeholder Capitalism in general also exists, as expressed for example by *Bebchuk & Tallarita (2020)*.

to sustainability: only report on those topics which are relevant and impactful enough to truly matter. In addition to providing a basis for putting priorities, materiality should also provide criteria to avoid greenwashing, i.e. to avoid reporting on irrelevant matters with the objective to look good in the eyes of stakeholders (for example the cocoa trader proudly announcing the installation of solar panels on the roofs of their Global Headquarters, rather than talking about deforestation and labor conditions at farms related to the production of cocoa)⁸;

- **ESG Rankings** (e.g. MacMahon, 2020). ESG rankings are typically based on an ESG-risk profile created about the companies in question. Creating such rankings ultimately requires some sort of numerical support on each of the ESG-dimensions. However, like other types of audits they do seem to work, at least partially, on the basis of qualitative questionnaires and interviews;
- **ESG Strategy Map**. Developed by the Balanced Scorecard's Robert Kaplan, together with David MacMillan (2021). Building on Kaplan & Norton's original strategy map, now also including performance indicators for People & Planet. I think that its merit is that it does create a relatively simple, coherent and integrated view from each of the 4 balanced scorecard's dimensions, but still most indicators are topic-specific and not all in financial terms;
- **Triple Triangle**. By Desmet in a recent essay (2022), building on his concept of the Supply Chain Triangle® of service, cost and cash by adding a People triangle and a Planet triangle. Even though it doesn't aim at true (financial) integration of the 3 P's, the triple triangle does contribute to creating transparency and awareness, as is also stated in the essay: "*Even if it is hard to come to conclusions on all three dimensions, just listing them broadens the thinking process*";
- **TruePrice™**. Created by TruePrice Foundation and the Impact Institute (e.g. TruePrice, 2020). Its basic idea is to try and express the so-called externalities caused by a company's activities, such as environmental or social damage, in financial terms in order to add those to the going market price, thus coming to a 'true price'. I do find this a very interesting approach, although its added value is maybe more related to increased awareness of direct company stakeholders and the wider general public and for the moment less in the support of specific corporate decision making. For me, this is another example where the aforementioned macro and micro dimensions may mix: as long as the macro externalities are not paid for by the customers of the (micro) company, then the value of the true price for company decision making may be fairly limited (as said, even though the obtained insights may prove a very powerful instrument towards the company's stakeholders);
- **Opportunity costing**. As suggested by e.g. Hahn & Figge (2011). They present an attempt to find a quantitative and financial methodology for a 3P-business case, using the principles of

⁸ Another interesting materiality map, this one linking specific industries to the SDG's can be found in WBA (2019)

opportunity costing. An interesting approach in itself, it is based to a high degree on industry benchmark data, expressing 'the opportunity' against industry average (financial) returns. Data which in practice may be quite difficult to obtain, since it's not mainstream information we're talking about (at least not yet). In addition, it is not so clear to what extent the concept of 'materiality' can be incorporated, thus giving proper weight to the more important sustainability factors;

- **VBA Disclosure concept for material sustainability matters.** Created by the value balancing alliance (e.g. VBA, 2021), made up of a group of companies. Does present an attempt to come to an integrated financial approach, highlighting per topic the consequences in terms of Opex, Capex, value to society and value to business. The basis for the calculations still poses a large challenge, but the merit of the approach is that it puts (backward-looking) sustainability performance measurement in the perspective of risk and opportunities, leading to (forward-looking) strategy and target setting;
- **Hierarchy between the 3 P's.** The Stockholm Resilience Centre have created many interesting reports and graphical representations of sustainability related topics. Particularly in the context of the 3P business case and the challenge of priority settings and decision making, it find it interesting to highlight their view of 'hierarchy' between the 3 P's: biosphere is the basis of everything (Planet), on this planet we live as societies (People) and our economy is one of the elements of society, with businesses as part of that (Profit). See for example their so-called [SDGs wedding cake](#)⁹. A logical next step, then, is to deduce that trade-off resolution and decision making should most likely also take this hierarchy into consideration. In a different way, Barnett et al (2021) in a recent article in Stanford Social Innovation Review, also call for always putting planet (and people) first: "*[...] by following a business case rationale, firms typically put economic objectives above environmental objectives. Thus, the business case distracts corporate sustainability from the enormity of environmental crises that require more significant actions on a wide range of environmental issues.*" Indeed interesting thinking, and in fact totally comprehensible, but still, this hierarchy-thinking for me also links to the points of macro & micro and long term & short term I mentioned before: to what extent is it realistic, or even feasible and viable, to expect an individual company at its micro level to always put the macro levels of planet and people above profit and business continuity? And how can long term macro ecological and societal benefits be justified by taking short or medium term losses at the micro company level? Does it ultimately depend on a company's strategic positioning or what they have defined as their Purpose? Will all of a company's stakeholders actually buy into that? My impression is that these are still unanswered questions.
- **Purpose-led decision making.** A bit of a different approach is actually argued by Edmans in his 2020-book 'Grow the pie': "*Crucially, the pie represents social value, not profits - profits are*

⁹ <https://www.stockholmresilience.org/research/research-news/2016-06-14-how-food-connects-all-the-sdgs.html>

only one slice of the pie. A pie-growing company's primary objective is social value, and it views profits as a by-product. [...] the power of the pie-growing mentality is that it replaces calculations with principles, providing practical guidance for decision-making under uncertainty" and " pie-growing companies make decisions with judgment rather than calculation. The clearer the purpose, the easier it is to judge if an action will further it". A very interesting line of thinking and definitely something to explore further, although I still wonder if this would solve all of the win-win-lose cases satisfactorily.

The list above by far does not contain all sources I have found in my search into ways for measuring or quantifying sustainability and I'm well aware that the ones mentioned are diverse in nature, objectives and approaches, which may actually cause confusion to the reader (as it did to me, in fact, when I did the research). In fact, this also captures to a certain extent where we stand right now at this moment in time, because it seems that with every ongoing week, new approaches pop up, adding precisely to the confusion. It's about time we get our act together and settle on how we want to approach this...

In any case, in the quest for what the 3P-business case could look like as an instrument for sustainable supply chain decision making, I have the feeling that even those approaches that propose explicit financial quantification don't give a sufficiently practical basis for the 3P-supply chain business case (yet?)¹⁰.

Also interesting in this respect to observe the following remarks in the article by Hahn & Figge (2011): *"This brings up at least two fundamental concerns with regard to covering corporate sustainability using this approach, namely (a) the treatment of qualitative sustainability aspects and (b) the quality and suitability of quantitative data. [...] We believe that it is very unlikely that there will ever exist a single approach that will cover all aspects of a complex and multifaceted notion such as sustainable development."*

Seems to me that in the 10 years since Hahn & Figge wrote this, we have advanced a lot in sustainability measurement and reporting, but indeed we still haven't achieved to develop one overarching quantitative, single approach for integrated 3P-decision making.

Temporary solution: quali & visual?

So, what has become clear to me so far in the quest for the 3P-supply chain business case is that we're not in the position yet to make a purely financially oriented 3P-business case. However, I think that at the same time it's fair to say that many people are probably not even familiar enough with

¹⁰ *A similar discussion comes to mind for trade-offs of even a different order: the quantification of 'value of human life', for example in relation to triage, or when evaluating the costs of medical treatments paid by public health systems. The concept of "qaly" (quality-adjusted life year) has been introduced, but as you can imagine, judgment, perception and even ethical and moral aspects form a large part of the discussion. Very likely, that this would also be the case in discussions regarding sustainability aspects.*

“sustainability trade-off thinking” to even elaborate such business cases productively. It’s not only about the tools, it’s also about the awareness and thorough understanding of the topics we’re talking about.

Maybe for the moment it’s already a big step forward to work on the awareness first: what are the pros and cons of certain supply chain decisions, not only in terms of the financials, but also in terms of social and ecological aspects? In order to make a small step in that direction, I’ve been experimenting a bit recently with the graphical form of the radar / spiderweb diagram.

My idea is to express the relevant aspects on each of the 3 P’s for a specific business. Then add a zero-line in the middle of the spider-web, expressing the benchmark AS-IS situation so that both the consequences for the better and those for worse due to a certain decision can be expressed. One could envision for example a scale ranging from -5 to +5 for each aspect, with zero being the AS-IS value. The total surface comparison of the spiderweb area of AS-IS vs TO-BE would then express improvement/deterioration in terms of the overall 3P.

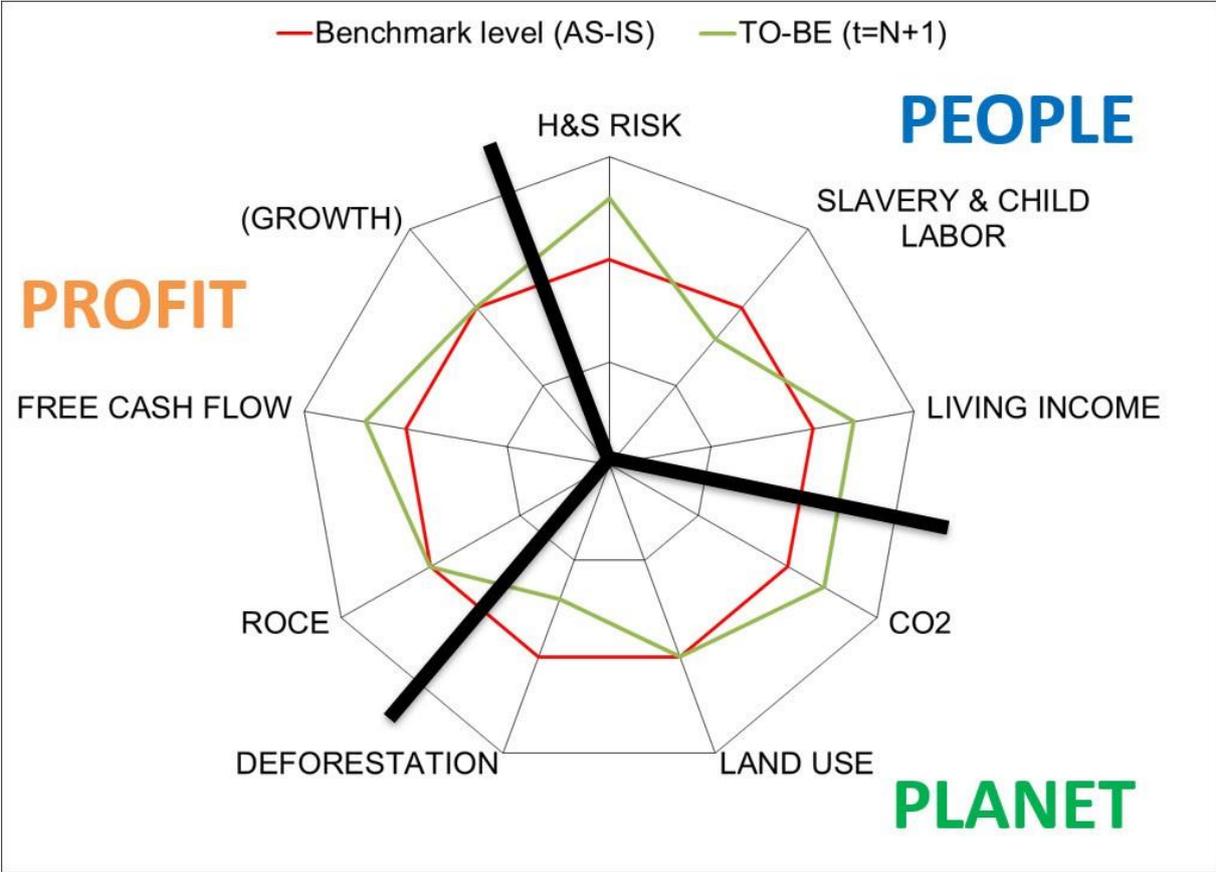


Figure 4: Example of a radar / spiderweb diagram applied to 3P-decision making

In this thinking, Company Purpose and strategic positioning will then need to provide the basis for defining concrete guidelines. Industry-specific materiality criteria, for example based on SASB standards, can be used as an input to translate this Purpose and strategy to specific sustainability aspects to be included in the diagram, as well as which specific KPI's to use for measuring them.

Also, it should be made clear how to go about decision making in the case the overall impact for potentially competing decision would be similar. For example "*does a win-win-equal decision with small financial benefit and large environmental benefit receive preference over a decision with a large financial benefit and a small environmental benefit, assuming that the particular decision would leave the social dimension unaffected?*".

Although by applying such a diagram still a degree of subjectivity remains and we still deal with incomparable units of measure ("*what's better, 10.000 kgs of CO2 reduction or one extra job safeguarded?*"), the advantage of this approach is that each aspect can be expressed in its own unit of measure with a reasonably objective expression of improvement/deterioration on this scale of -5 to +5. I know it's far from perfect, but I'm convinced that this approach at least would contribute to basic awareness of each of the 3 P's in supply chain decision making in one overall graphical view. And I believe that is certainly a big and important step forward.

Processes, systems & information and organization

Some topics from the diagram in Figure 1 have not been covered yet and in order to not make this text even longer that it already is, I will address these more extensively in a future text. However, I do want to at least scratch the surface already a little bit here in this brief section, before moving to the wrap-up of the article.

Processes. First of all, there are our S&OP / IBP processes, in my view a topic much related to the decision support tool of the business case. How would this work exactly, would S&OP / IBP require fundamental changes due to the integration of the People & Planet dimensions into decision making? My first thought would be: "*no, I don't see a compelling reason why these concepts as such should change*". What most likely will change, however, is the decision logic within the S&OP / IBP process, for example the criteria to be considered in decision making, which will no doubt be including sustainability aspects in the future (clearly linking to the previous business case discussion and the identified complexities).

Information & systems. Referring to the "Information & systems"-box from Figure 1, I would see some reason for concern there. As mentioned earlier on in a footnote, there are ESG-systems popping up everywhere. My feeling, however, is that it's not the systems which present serious issues, but, as almost always, it's the data to populate the systems with. If we don't even agree on how to measure things, then what types of data to collect? And where to find it? And what about data quality? As Sarah Murray described in an article in FT (2021), we're hardly in the position yet to create a coherent set of data across our supply chains even when it comes to the 'obvious' issue of CO2, let alone if we would expand this into other sustainability dimensions¹¹.

¹¹ In this respect, often the CO2-related terms of Scope 1-3 are used. Scope 1 refers to CO2-emissions due to activities within the own company, Scope 2 are emissions by your energy providers and Scope 3 refers to

And in relation to the increasing amount of voices in favor of automation and the use of AI/ML in supply chain decision making, how would that work? Are such systems able to make 3P-trade-offs in a well-informed and automated way? My current thought is: "*I wonder*", but who knows...

Organization. The last building block from Figure 1 is the organization we put in place. Would fundamental changes be necessary here? My first thought would be "*no, why?*". Possibly, more departments would need to be included in the decision making, because our internal sustainability stakeholders will also have to have a voice somehow and therefore the degree of interdependency will likely increase. An additional concern may be to find sufficient people with the right skills and mindset. The 'war on talent' is already visible in many areas related to OPS & SCM and this is likely only increasing if sustainability also enters the equation. In the medium to long term, let's hope that sustainability becomes so engrained in each employee's mind, that it would not need to be a 'separate' concern to address sustainability aspects. Currently, however, probably we should still work a lot on awareness, for example through training or by recruiting people with the desired mindset.

An afterthought about 'impact'

As an afterthought, and independent from Figure 1's framework, I wanted to briefly address the topic of perspective, or judgment, sometimes even related to personal ideologies or ethics, which is inevitably connected to 3P-decision making and to which we're maybe not so much used in the Operations & Supply Chain area.

This seems relevant to me in the challenge of putting priorities on any of the three P's in case of lose-win-win decisions, in other words: which P to sacrifice first in the case of a dilemma, for example "*accepting job losses in one country vs achieving supply security in another?*" or "*growing the business and thus creating jobs vs knowing that growth also implies a larger carbon footprint?*". Actually, even within one P this could happen: "*job losses in one country vs. job creation in another?*" or even "*job losses in one country vs. job losses in another?*". The evaluation of such tough decisions will obviously be influenced by the decision maker's personal perspective and view on the world and life in general, in other words, judgment and bias creep in.

Maybe the overarching concept we're touching upon here is "Impact", where a company's Purpose Statement should make it clear what kind of impact it aims to make. But impact is something we haven't addressed explicitly in the supply chain so far, so maybe it's time to start doing that as well.

And what does impact actually mean? How can it be expressed? And who is performing better: the sustainability champion putting People and Planet well before Profit, but maybe serving a small niche market or the 'eco-efficient' company developing sustainability initiatives always within the objective of making a Profit first, but at the same time bringing those (more modest) sustainability initiatives to a

emissions from other parties in your upstream and downstream supply chain. I would expect this Scope 1-3 thinking also to arrive to sustainability issues beyond CO2.

huge audience? Think of something similar to the 'low margin-high volume versus high-margin low volume' discussion.

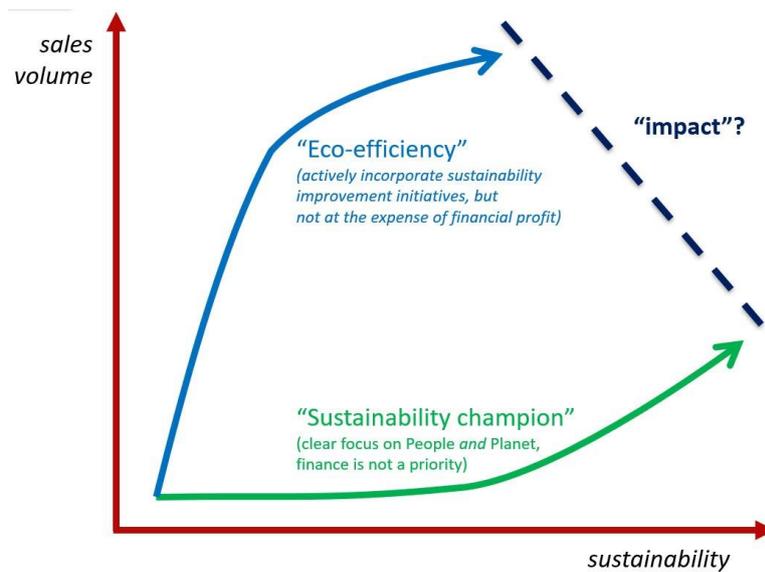


Figure 5: strategies vs impact (image by E. Haak of Inchainge, inchainge.com)

To answer these questions, much may actually depend on the (future) market size of 'sustainability-conscious consumers', which to me seems to be another one of the many unknowns¹².

Conclusions

Returning to the question I raised in the introduction of this text as to the extent to which the 'conceptual classics' I cover in my OPS & SCM courses and accompanying textbook would still hold within the new context of sustainability and if they are still meaningful or require fundamental changes? It seems to me that the good news is that many concepts and frameworks from the 'classical OPS & SCM' textbooks seem robust enough to allow for adaptation to include aspects of sustainability. At least, that means that the theoretical/ conceptual backbone of my courses doesn't need significant changes in terms of content... pfew...

At the same time, starting with the challenge of the 3P-business case, there are many unanswered questions as well. Some of these actually don't have so much to do with the frameworks as such for describing and capturing Supply Chains, which was the main focus of this text, but maybe more with what the future Sustainable Supply Chain would look like and if existing common decision logic within the given Supply Chain frameworks may need a change.

¹² Interestingly enough, it seems evidence is contradictory: some studies about willingness to pay a premium for sustainable products indicate a high percentage of people who would indeed spend the extra buck for more sustainable things, whereas other studies stating the question as 'would you buy the sustainable product if a cheaper, but less sustainable product would be available' indicate fairly low percentages switching to sustainable.

For example, it's probably not the concept of S&OP / IBP itself that may need to change, but additional stakeholders may be included into it, as well as the decision criteria may change to include People and Planet. And the time dimension may need a revisit: if we start considering sustainability impact in our supply chain decision making, should we then deal with longer time horizons to estimate such impacts and for determining the 3P-payback time for a certain decision? The same may be true for the scale dimension, which is often so crucial in competing for financial profit, will scale still be as relevant as we start including Sustainability, do scale and sustainable match and if so, how?

There's definitely still a lot of work ahead of us, or as I use to say to my students in my classes: "*we need a lot of supply chain brain in the future to help find practical solutions for all of these practical challenges*". And in my opinion, that's good news for all of us working in this fascinating area!

So, let's first work on making people aware of the many sustainable supply chain choices and dilemma's and in the meantime, let's do our utmost to come up with concrete tools and techniques and feasible and viable ways to collect the required reliable data, as well as a sense-checked set of sustainable supply chain decision rules, in order to truly be able to "***Juggle the 3P's***".

To be continued...

Ed Weenk, January 2022.

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References

- Barnett, M.L., Cashore, B., Henriques, I., Husted, B.W., Panwar, R. and Pinkse, J. (2021) Reorient the business case for corporate sustainability, *Stanford Social Innovation Review*, Summer
- Beschorner, T. and Hajduk, T. (2017) Creating Shared Value. A Fundamental Critique. In *Creating Shared Value – Concepts, Experience, Criticism*, 27-37, Springer
- Bebchuk, L.A and Tallarita, R (2020) The Illusory Promise of Stakeholder Governance, *Cornell Law Review*, December 2020
- Carter, G. and Rogers, D. (2008) A framework of Sustainable Supply Chain Management: moving toward new theory, *International Journal of Physical Distribution and Logistics Management*
- Chan Kim, W. and Mauborgne, R. (2005) *Blue Ocean Strategy. How to create uncontested market space and make the competition irrelevant*, Harvard Business Review Press
- Chin, K. and Holger, D. (2021) Providing Timely ESG Information Is Becoming More Crucial for CFOs, *Wall Street Journal*, February 9, <https://www.wsj.com/articles/providing-timely-esg-information-is-becoming-more-crucial-for-cfos-11612866601>
- Chopra, S. and Meindl, P. (2016) *Supply Chain Management. Strategy, Planning, Operation*, Sixth edition, Pearson Education, Harlow
- Christensen, C. (1997) *The Innovator's Dilemma. When new technologies cause great firms to fail*, Harvard Business Review Press
- Crawford, F. and Mathews, R. (2003) *The myth of excellence. Why great companies never try to be the best at everything*, Random House
- De Los Reyes, G et al (2017) Beyond the "Win-win": creating shared value requires ethical frameworks, *California Management Review*, Vol. 59(2)
- Desmet, B. (2022) ESSAY: The Triple Bottom Line and the Triple Triangle, <https://www.linkedin.com/pulse/essay-triple-bottom-line-triangle-bram-desmet>
- Edmans, A. (2020) *Grow the pie. How great companies deliver both purpose and profit*, Cambridge University Press, revised edition
- Elkington, J. (1994) Towards a sustainable corporation: win-win-win business strategies for sustainable development, *California Management Review*, 36(2)
- Elkington, J (2018) 25 years ago I coined the phrase 'Triple Bottom Line'. Here's why it's time to rethink it, *HBR website*, <https://hbr.org/2018/06/25-years-ago-i-coined-the-phrase-triple-bottom-line-heres-why-im-giving-up-on-it>

Fisher, M. (1997) What is the right supply chain for your product?, *Harvard Business Review*, edition March-April 1997

FT (2021) Complexity of supply chain emissions forces rivals to work together on net zero, Financial Times, <https://amp.ft.com/content/dd06cc6c-e1ea-421a-a05e-16ed4a4a9dd0>

Gao, J. and Bansal, P. (2013) Instrumental and integrative logistics in business sustainability, *Journal of Business Ethics*, 112(2)

Gattorna, J. (2015) *Dynamic Supply Chains: How to design, build and manage people-centric value networks*, Third edition, Pearson Education, Harlow

GRI (2020) Consolidated set of GRI sustainability reporting standards 2020, Stichting Global Reporting Initiative

Hahn, T. and Figge, F. (2011) Beyond the bounded instrumentality in current corporate sustainability research: toward an inclusive notion of profitability, *Journal of Business Ethics*

Hahn, T., Figge, F., Pinkse, J. and Preuss, L. (2017) A paradox perspective on Corporate Sustainability: descriptive, instrumental, and normative aspects, *Journal of Business Ethics*

IIRC (2013) The International <IR> Framework, International Integrated Reporting Council

Kaplan, R.S. and McMillan, D. (2021) Reimagining the Balanced Scorecard for the ESG era, *Harvard Business Review*, digital article

Lee, H. (2002) Aligning supply chain strategies with product uncertainties, *California Management Review*, edition Spring 2002

MacMahon, S. (2020) The challenge of rating ESG performance, *Harvard Business Review*, September-October

Mayer, C. and Roche, B. (2021) *Putting Purpose into practice: the economics of mutuality*, Oxford University Press

Melnyk, S.A., Davis, E.W., Spekman, R.E. and Sandor, J. (2010) Outcome-driven supply chains, *MITSloan Management Review*, Winter

Müller, H. (2021) Sustainability controlling in integrated value chains, in: Henke, E. and Kohl, H. (2021) *Sustainability in global value chains. Measures, ethics and best practices for responsible businesses*, Kogan Page

Pérez, H D (2013) *Supply Chain Roadmap: aligning supply chain with business strategy*, CreateSpace Independent Publishing Platform

Porter, M. (1985) *Competitive strategy: Techniques for Analyzing Industries and Competitors*, The Free Press, New York

Porter, M.E. and Kramer, M.R. (2011) Creating Shared Value, *Harvard Business Review*, February

SASB (n.d.) Financial Materiality Maps, <https://www.sasb.org/standards/materiality-map/>

Serafeim, G. and Yoon, A. (2021) Stock Price reactions to ESG News: the role of ESG ratings and disagreement. Working Paper, Harvard Business School

Treacy, M and Wiersema, F (1995) *Discipline of market leaders: choose your customers, narrow your focus, dominate your market*, Ingram Publishers

TruePrice, n.d. Principles for true pricing, <https://trueprice.org/principles-for-true-pricing/>

UN (n.d.) The 17 Goals, <https://sdgs.un.org/goals>

VBA (2021) VBA Disclosure Concept for Material Sustainability Matters, https://www.value-balancing.com/Resources/Persistent/7/2/a/2/72a28deeed4e259bc414148b2660e631e0dfe3d3/VBA_Disclosure_Concept.pdf

Visser, H. and van Goor, A. (2011) *Logistics: principles & practice*, Second edition, Hessel Visser, 's Gravendeel

WBCSD (2021) Reporting matters. Time for a shared vision, WBCSD, <https://www.wbcd.org/Programs/Redefining-Value/Reporting-matters/Resources/Reporting-matters-2021>

Weenk, E. (2019) *Mastering the Supply Chain. Principles, practice and real-life applications*, Kogan Page

Weenk, E. and Henzen, R. (2021) *Mastering the circular economy. A practical approach to the circular business model transformation*, Kogan Page

WBA (2019) Measuring what matters most. Seven systems transformations for benchmarking companies on the SDG's, World Benchmarking Alliance

WEF (2020) *Measuring Stakeholder Capitalism. Towards Common Metrics and Consistent Reporting of Sustainable Value Creation*, World Economic Forum