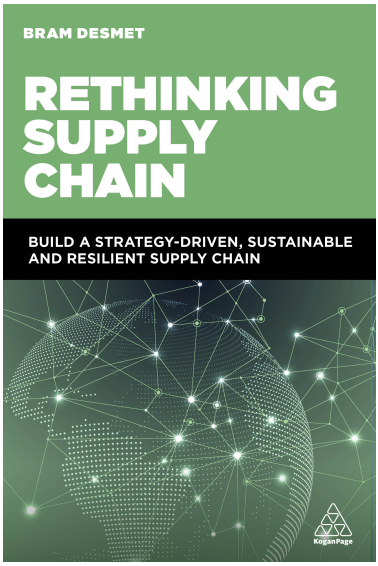


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Rethinking Supply Chain: Build a strategy-driven, sustainable and resilient supply chain

by Bram DeSmet

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01 The sustainable triple triangle: balancing people, planet and profit

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Introduction

In this chapter, I recap the concept of the Supply Chain Triangle of Service, Cost and Cash, and I use it to illustrate the imbalances I have seen during and after the Covid-19 pandemic. I recap how the triangle links to financial metrics, which makes it in essence a 'profit' triangle. Both are treated in more detail in my previous books. I discuss how H&M uses the triangle as the foundation of its supply chain and as a compass to design, operate and control it.

Next, I introduce a People Triangle and a Planet Triangle, next to the Profit Triangle, to come to a Triple Triangle, as the equivalent of the triple bottom line. I use the Triple Triangle model to analyse the reasoning behind and the impact of the massive offshoring during the 1980s. I also explore the impact across people, planet and profit of the more recent reshoring trend.

Environmental-Social-Governance (ESG) seems to be a more recent terminology to describe sustainability thinking and practices. I extend the Triple Triangle to the Quadruple Triangle putting governance at the heart of the Triple Triangle. I use the case of Médecins Sans Frontières (MSF) to illustrate how the Quadruple Triangle works in explaining and designing non-profit supply chains.

I start this chapter by introducing how the inclusion of sustainability is a next step in supply chain thinking. I describe different generations of supply chain thinking and how we are currently moving into a fourth generation supply chain.

Get ready for the 5D or fourth generation supply chain

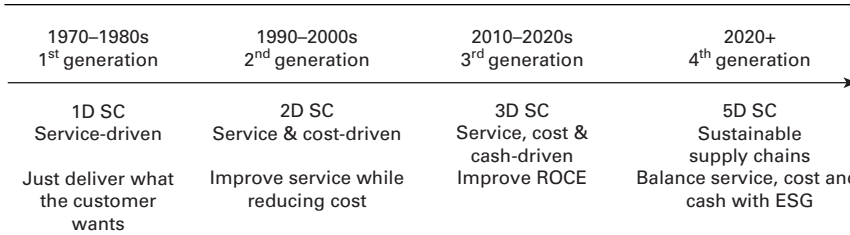
In this book, I will try to show that supply chain management as a discipline is in full evolution. One way to illustrate and better capture that evolution is to talk about how supply chain is shifting from a one-dimensional (1D) to a five-dimensional (5D) operation. Along these lines I can also introduce how we are evolving into a fourth generation of supply chains and supply chain thinking. The different steps are summarized in Figure 1.1.

In the past, the 'first generation supply chain', life was simple, you just (tried to) deliver what the customer asked. Supply chains were service-driven or 1D. In sales-driven and highly profitable companies this can still be the case. Supply chain is seen as a purely operational role, just there to deliver, a necessary evil, not expected to mingle or cause problems.

The supply chain thinking of the 1990s as exemplified in the books of Martin Christopher[1] and John Gattorna[2] was about the promise to increase service while reducing cost[3]. By connecting otherwise disconnected processes through S&OP (sales and operations planning), and by doing more thoughtful engineering and design of supply chains, for instance by implementing supply chain segmentation, we could do the AND-AND, AND more service, AND lower cost. Supply chain was equivalent to delivering more of everything and was providing the magical answer for companies

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Figure 1.1 From a 1D to 5D supply chain, from first to fourth generation supply chain



under pressure. Customers were ever more demanding. They wanted more service at a lower price, and the second generation supply chain was promising to deliver exactly that. The second generation supply chain was the 2D supply chain, one eye on service, one eye on cost, and improving on both at the same time.

Improving on service and cost has been and will always be possible, depending on your starting point and maturity level. Implementing the best practices from the second generation supply chain gurus allows us to deliver exactly that. There is a big problem, however. As supply chain has been delivering the AND-AND over the last two to three decades, their colleagues in marketing and sales or finance, have never been trained in trade-offs. Our service promises and the complexity of our product portfolio went up, but we all assume that at the same time we will be able to lower the costs and the inventories. The AND-AND has also kept supply chain away from the strategy table. Many strategy processes are pre-occupied with the 'business' or 'commercial' strategy. How will we grow the business, how will we compete. Even if it is about more service, we simply expect supply chain to deliver it at a lower cost. The second generation supply chain thinking has gridlocked supply chain into its current 'operational-tactical' position.

When I first introduced the Supply Chain Triangle in my 2018 book *Supply Chain Strategy and Financial Metrics*[4], without really knowing it, I introduced the 3D supply chain and the third generation supply chain thinking. What I brought to the table is fundamentally different from the above in two ways. The first is that I explicitly introduced the third dimension of cash (working capital), or more broadly the capital employed (working capital + fixed assets), and the resulting links to return metrics like ROCE. The second is, I explicitly introduced strategic choices, the OR-OR. You can't have the gross margin of Kroger or Carrefour with the inventory levels of Aldi or Lidl, it's either one OR the other. The Supply Chain Triangle basically ends the period of AND-AND, and starts the period of strategic supply chain trade-offs, the period of OR-OR. As elaborated in more detail in my second book, *The Strategy-Driven Supply Chain*[5], to make the correct strategic trade-offs, we need supply chain at the strategy table. This third generation or 3D supply chain is pulling supply chain out of the 2D gridlock it has been in for 20–30 years.

And the world of supply chain moves on, at high speed, as in this book, merely six years after first introducing the triangle, we will be expanding from a 3D into a 5D supply chain. We need to understand the impact of our

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decisions on the environmental (4D) and social (5D) metrics and objectives we have put forward. Understanding that broader impact requires a further broadening of the interest, knowledge, skillset and involvement of the supply chain professional. The external pressure on understanding and managing the environmental and social impact of our supply chains is mounting fast. It will further increase the strategic relevance and impact of supply chain as a discipline. As such we are quickly moving into the fourth generation supply chains where we need to manage five dimensions: service, cost, cash, environment, society.

I will start this chapter by doing a recap of our Supply Chain Triangle, providing recent examples of how companies have been using it as a foundation to organize and steer their supply chain. Next, I will expand the triangle thinking to include environmental and social aspects and provide a new foundation for building and steering sustainable supply chains.

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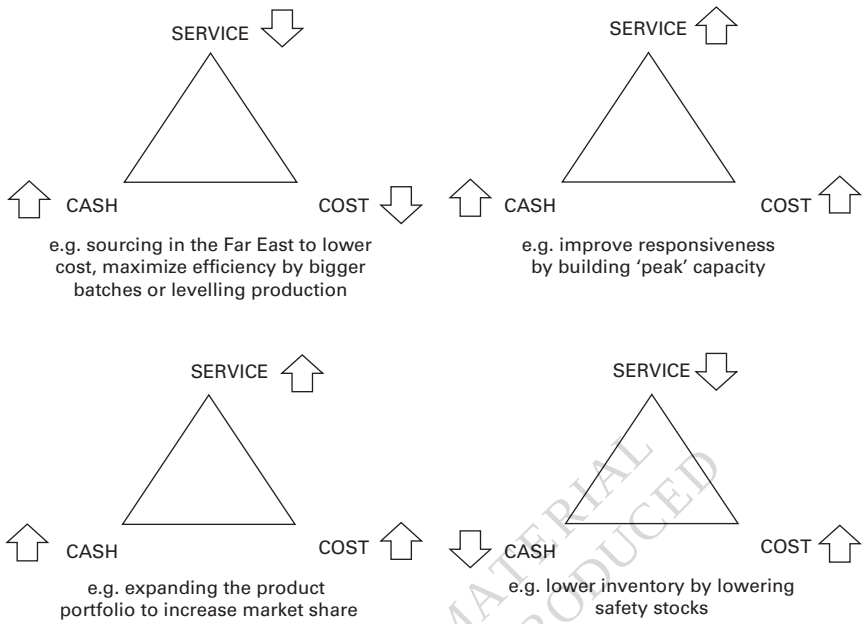
The Supply Chain Triangle

The Supply Chain Triangle captures the struggle in many companies to balance three, often conflicting, objectives: service, cost and cash. Cash in the narrow definition equals working capital, which equals the inventory plus the accounts receivable minus the accounts payable. When we add the fixed assets, the cash can be extended to the capital employed. In this book I will assume a thorough knowledge of these basic financial metrics. For a quick recap, I encourage you to read the 'accounting basics'. A free download is available from my website[6].

The original examples, illustrating the dynamics in the Supply Chain Triangle, are shown in Figure 1.2. Let's start at the top left. By sourcing in the Far East or producing in bigger batches, companies may be able to reduce the cost per unit but it typically comes at the expense of extra inventory. At the same time we become less responsive (because of the longer lead times) and we increase the service risk (think about what happened when the Ever Given blocked[7] the Suez Canal in 2021).

At the top right, when you are in a tender-driven environment, you may decide to improve your responsiveness by investing in extra 'peak' capacity. That should obviously be good from a service and sales perspective, but you'll have to spend cash (CAPEX) on investing in extra fixed assets and operating your assets in peaks is typically less cost efficient, which is negatively impacting the cost side of the triangle.

Figure 1.2 Traditional imbalances in the Supply Chain Triangle



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Continuing bottom-left, in general I see that people in sales and marketing are eager to expand the product portfolio. It improves service to the customer as it gives more choice. It will also be beneficial from a sales and a market share perspective. The insidious thing is that, when we introduce 20 per cent new products, the top-line is typically not going up 20 per cent. This implies that we create fragmentation, lose more time on changeovers, which will negatively impact the cost. If we want all these items to be available on stock, it also creates a long tail of more slowly moving products, which negatively impacts our stock rotation.

Finally bottom-right, every five years we witness companies in an 'inventory crisis' situation. They significantly miss their inventory targets and as a result have new and even more aggressive targets for the following year. They launch an inventory reduction programme with multiple projects. Purchasing will look at MOQs, supply chain will look at the safety stock settings, improve the forecast accuracy, and so on. Around March to April, the company realizes that out of say 10 projects only three have really started, as they lack the appropriate resources. Around June they realize that none of the projects are really bringing the benefits anticipated. By September, there is sheer panic and they resort to lowering the safety stocks in the planning system. By lowering the safety stocks in the planning, the inventory

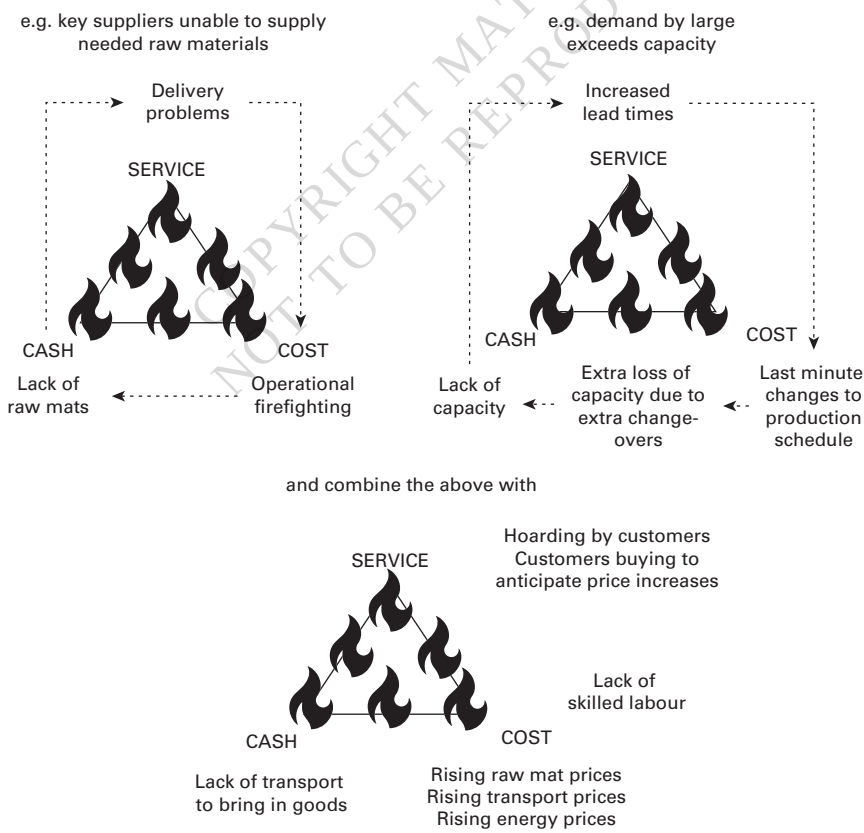
will go down, but service issues will appear all over the place, which leads to all kinds of operational firefighting. It is not what I recommend, but I have seen it many times.

Little did we know about the potential impact of unbalance in 2018, when I published my first book. At that time, the world was dormant, addicted to cheap and ample supplies, steady growth in many markets and low interest rates. The disturbances in the triangle were like ripples on a flat ocean. Little did we know how our world was going to be shook up by the Covid pandemic, that started at the end of 2019 and in multiple waves continued to disrupt the world for multiple years.

Figure 1.3 summarizes some of the effects. After the initial lockdowns, for many industries, the demand came back much faster and much stronger than anticipated. That quickly led to massive shortages of critical components, like micro-electronics, and key raw materials, sometimes even

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Figure 1.3 The Supply Chain Triangle during Covid-19



packaging. That propagated down the chain and created delivery problems in virtually every product in every sector. Supply chains were on fire and a lot of operational firefighting was done, such as continuous changes to the production schedule based on the latest confirmed material availability, and last-minute expediting.

As companies, we were stretched way beyond our limits. Even if we had all the raw materials we needed, the demand was often largely exceeding our production capacity. There was a kind of craze in the market, customers buying 'just-in-case' instead of 'just-in-time'. The hoarding of customers was fuelled by anticipated price increases ('let's buy some more before prices go up'), and companies were improvising on how to deal with this. In many sectors the customer order lead times went up from a couple of weeks to a couple of months or over a year. It was more like 'showing their commitment' and 'trying to reserve their piece of the pie' rather than knowing what they would really need over that time-frame. What it implies is that, when the orders came into the operational horizon, there was still a lot of rescheduling to be done. We were rescheduling all the time, both from the demand side as well as from the supply side. We were not concerned about efficiency. We just tried to make the puzzle work.

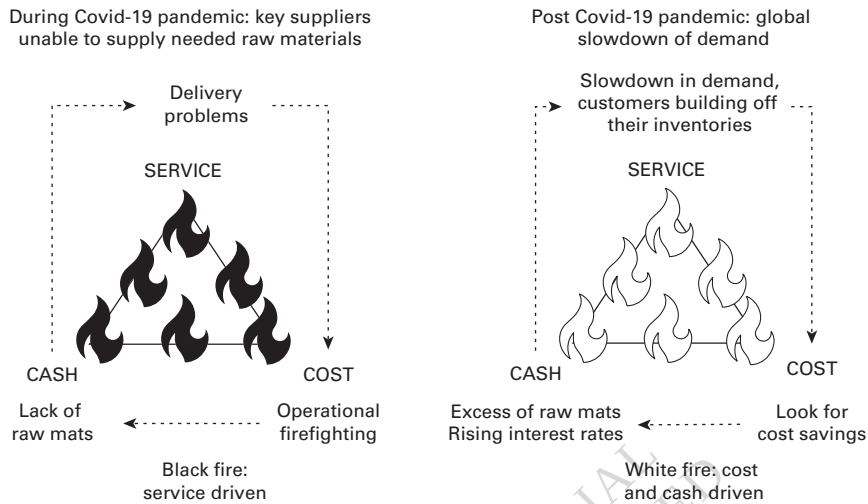
And I could continue stretching. Even if we had all the raw materials and the capacity we needed, we probably lacked sufficient skilled labour, as some of our labour force was affected by illness, or we were lacking the drivers and the transport to get our products in or out. Or maybe we were lacking something else. The constraints were overwhelming and they were everywhere.

And when there is scarcity, prices go up. Prices of everything were rising. IMF figures[8] show the cost of shipping a container on the world's transoceanic trade routes increased seven-fold in the 18 months following March 2020, while the cost of shipping bulk commodities spiked even more. Though the price of everything was going up, companies were buying whatever they could at whatever price as they knew they were able to charge it to their customers who were also willing to pay whatever price to get their customer served. There was huge pressure on closing the service gap. Supply chains at this time were service driven, and companies were willing to make extra financial expenses and take on extra inventory or working capital risks to close the service gap.

And what goes up, must come down. So, in the second half of 2022, I saw many companies becoming concerned about a possible downturn in their markets. The shortages in the supply chain were increasingly resolved, lead times were being normalized and many industries saw a gradual slowdown in their demand. Instead of being service driven, we

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Figure 1.4 The Supply Chain Triangle during Covid versus post Covid



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became cost and cash driven. Many of us were now trying to deplete the expensive overstocks that we had built up during Covid-19. That was adding to a further slowdown of the upstream demand, which was further reinforcing the cost and cash focus in companies focused upstream. At one of the companies I worked with senior executives were talking about rumours that their competitors were massively cancelling orders at their suppliers, and there was an intensive debate on whether they had to do the same. Decelerating a supply chain is as hard and can be as chaotic as accelerating a supply chain. It could be a white flame instead of a black flame but it equally puts the triangle on fire. I have illustrated those different flames and fires in Figure 1.4.

Balancing the triangle is about optimizing value as measured by the return on capital employed

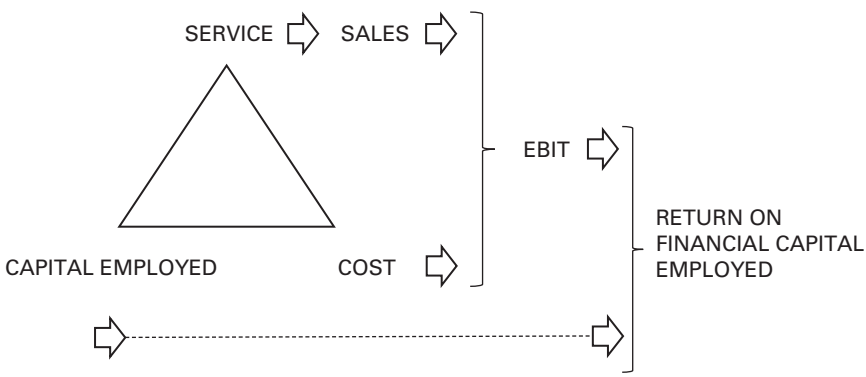
When first using the triangle to explain conflicting priorities to companies, people asked me 'We understand and recognize the dynamics in the triangle, but is this not how companies work? Won't there always be conflicting objectives between sales, operations and finance? And will different departments

not always speak a different language? And is the shifting focus between service, cost and cash indeed not linked to the economic cycles we go through?' Well, my answer is no, it is not just OK, or how companies should work. And yes, priorities can change throughout economic cycles, but to me it feels like many companies lack a proper understanding of how the different corners of the triangle connect, causing unintended harm to customers, employees and the financial results.

To understand why the balancing is important, in my first book, I took an investors perspective. As shown in Figure 1.5, service is basically a driver for the top-line. If we improve the service towards our customers, for instance by expanding our product portfolio, shortening lead times or increasing product performance, we expect to either sell more or to sell at a better price. However, as an investor, I'm concerned with more than just the top-line or a top-line metric like growth. At least in the long-run I would like to see a margin. Well, as illustrated in Figure 1.5, if I combine the top-line with the cost, I can get to a margin, for instance the EBIT. And even then, and this is where it becomes more tricky, as an investor I'm concerned with more than just the margin. The reason is the following. Assume that I have two companies generating 50 million of EBIT, the first requires 50 million of capital employed, whereas the second requires 100 million of capital employed. In which case I obviously prefer the first company. So, as an investor, I'm driven by what is the margin being generated over the capital employed, in financial terms, the 'return on capital employed' or 'ROCE', in spoken language it is the bang-for-the-buck. I invest 1 dollar (buck) in your company, what do you give me as a margin (bang) in return.

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Figure 1.5 Balancing the Supply Chain Triangle equals optimizing the ROCE



So balancing the Supply Chain Triangle is about optimizing the financial value we generate, as measured through the ROCE or the bang-for-the-buck. That implies that the balancing isn't optional, it is mandatory. It also connects supply chain and finance, both functions basically have the same objective, though I believe that is poorly understood on both sides.

In my previous two books I explored alternatives to EBIT as a margin metric and to ROCE as a return metric. In the outline I try to summarize why, still today, I am a fan of ROCE as a metric for supporting supply chain design and analysis. I tend to challenge supply chain managers that they should demand finance to measure them on ROCE, as opposed to individual and often conflicting service, cost and cash metrics.

Alternatives for ROCE

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In *Supply Chain Strategy and Financial Metrics*, I analysed different alternative metrics for the margin in detail such as gross margin, EBITDA, EBIT and net profit. Gross margin is a good indicator of the strategy of the company, the more differentiating the position, the higher the premium a company can drive. That premium is needed to cover the higher costs and capital employed that are needed to drive that strategic positioning. The gross margin accounts for the cost of goods sold (COGS) but still excludes the sales, general & administrative (SG&A). As a 'bottom-line' metric I prefer EBIT over net profit as it includes all operational costs (cost of goods sold and the SG&A) while it excludes financial costs such as interest and taxes. As the D&A are relatively fixed, I'm less concerned with the difference between EBIT and EBITDA, and as EBIT leads to ROCE, I usually look at EBIT.

In my second book, *The Strategy-Driven Supply Chain*, I analysed alternative return metrics like the return on assets (ROA) and the return on equity (ROE). From a supply chain perspective I prefer ROCE over the other metrics as the capital employed is so tangible, it is the working capital plus the fixed assets, things that I, as a supply chain and operations professional, have a direct and material impact on. The ROE starts from the net profit (which includes the interest and taxes) and looks at the equity instead of the capital employed (which is influenced by my debt versus equity structure). ROE may be relevant from a financial perspective but is harder to control from a supply chain and operations perspective. I prefer

to work with ROCE over ROA for the two following reasons. First, ROA, like ROE, calculates profitability based on net profit, whereas I prefer to work with EBIT. Second, if I can compensate an increase in receivables with an increase in payables, my ROCE (and my cash flow) will remain constant while my ROA will go down, as my total assets go up. Or vice versa, if I'm under pressure from my suppliers to reduce payables, my ROCE (and my cash flow) will remain constant, if I can compensate it with a reduction in receivables or inventory. My ROA in this case will go up, as my total assets go down. From my perspective, there is no real value creation in both situations. We're rather compensating short-term liabilities with short-term assets. ROCE reflects that 'status quo', whereas ROA would report value creation or value loss. Hence, I prefer to work with ROCE over ROA.

In the second book I also showed that ROCE and leverage together drive the earning per share (EPS). I got that as a question from a senior operations executive at Henkel. In a benchmark study of around 30 FMCG companies I could empirically show that ROCE and the debt-to-equity ratio (D/E) together explain most of the variance in the EPS. I had already theoretically shown you can inflate your ROE (or EPS) by increasing the leverage (amount of debt) as long as the net interest (interest after accounting for the tax advantage) is lower than the starting ROE. Though valuable, that is the easy part I would say. The harder part is improving the ROCE, which requires us to improve the mastery of the triangle. It will be very hard to get to a decent ROE or EPS starting from a bad ROCE. ROCE is like the 'physical' and 'material' foundation on which a healthy EPS is built. For further reference, I have made the benchmark study available for free download from my website.[9]

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Case Study: H&M – the Supply Chain Triangle as a relevant part of the supply chain strategy, by Jesper Metz, Zaki Sarker and Erika Linton

H&M Group may not need a lot of introduction. It is a global fashion and design company with over 4,000 stores, in more than 70 markets and with online sales in over 60 markets.[10] All their brands and business ventures share the same passion for making great and more sustainable fashion and design available to everyone. Each of the brands, like H&M, COS, Weekday, ARKET, Afound, has

its own unique identity. They complement each other and strengthen H&M Group, to offer customers unbeatable value and enable a more circular lifestyle.

The Supply Chain Triangle of Service, Cost and Cash, has become a relevant element for H&M, steering its supply chain. The triangle is a key starting point for the supply chain strategy team, for the supply chain performance management, and it will be an active working tool for general supply planning tasks.

As part of their work, the supply chain strategy team have aligned their own version of the Supply Chain Triangle, shown in Figure 1.6. It contains the necessary elements to generally answer over 90 per cent of the questions they receive. Traditional network optimizations are often focused on cost minimization only. They may look at operational costs like warehousing and logistics and at the required investments (CAPEX), but, for example, they will not try to model the impact on sales revenues, they take service as a constraint like 'all online customers/stores need to be delivered within *x* days'.

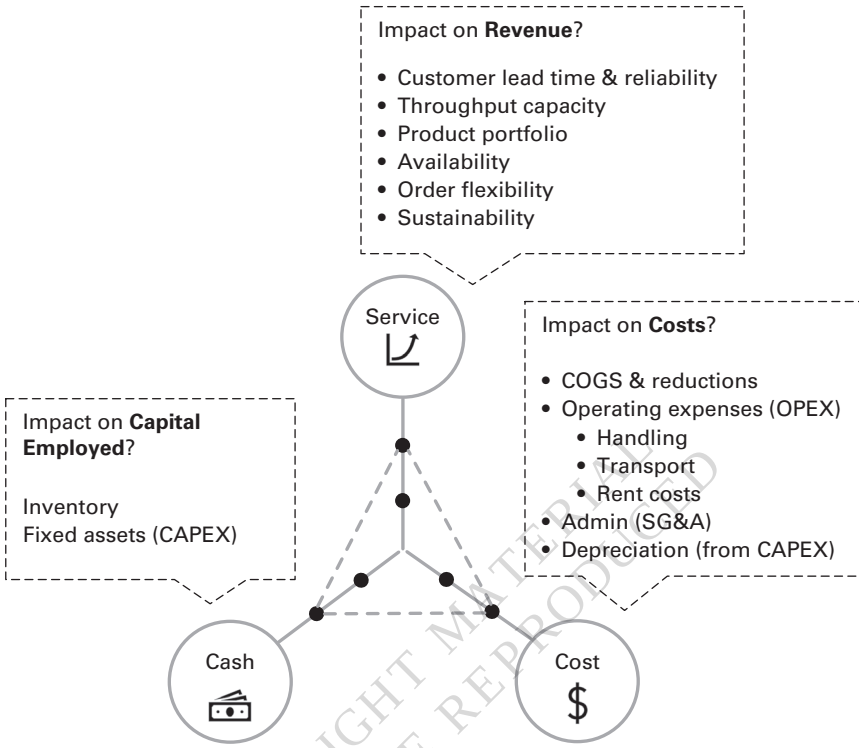
H&M's team has taken the triangle as a foundation to expand this traditional modelling. For instance, on the service side, they added questions like, what is the impact of customer lead time and reliability on the sales revenue? Can we model this from data? Can we test it in real life? Or what is the impact of throughput capacity on the year-end sales? Jesper Metz, Supply Chain Analytics & Modelling Manager, comments that:

> Even if we could not model the sales impact, at times we still went back to the stakeholders saying, just as an extreme example, "You'll need to increase the sales with 300 per cent if you want this to pay off". It is of course a mindset shift. From a modelling perspective service targets are rarely seen as hard requirements. We always model the impact on sales, and if needed we challenge the requirements and targets.

The traditional network design is also quite rough in the inventory modelling. It may make basic assumptions like we need 10 days of inventory for all items. Inspired by the triangle, the H&M strategy team started modelling the inventory in more detail, asking questions like, what is the inventory impact between different scenarios? The overall goal is always to evaluate scenarios not just on a cost level, but also on calculated sales revenues, on capital employed and as a result on the ROCE, exactly as introduced in Figure 1.5.

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Figure 1.6 The H&M version of the Supply Chain Triangle



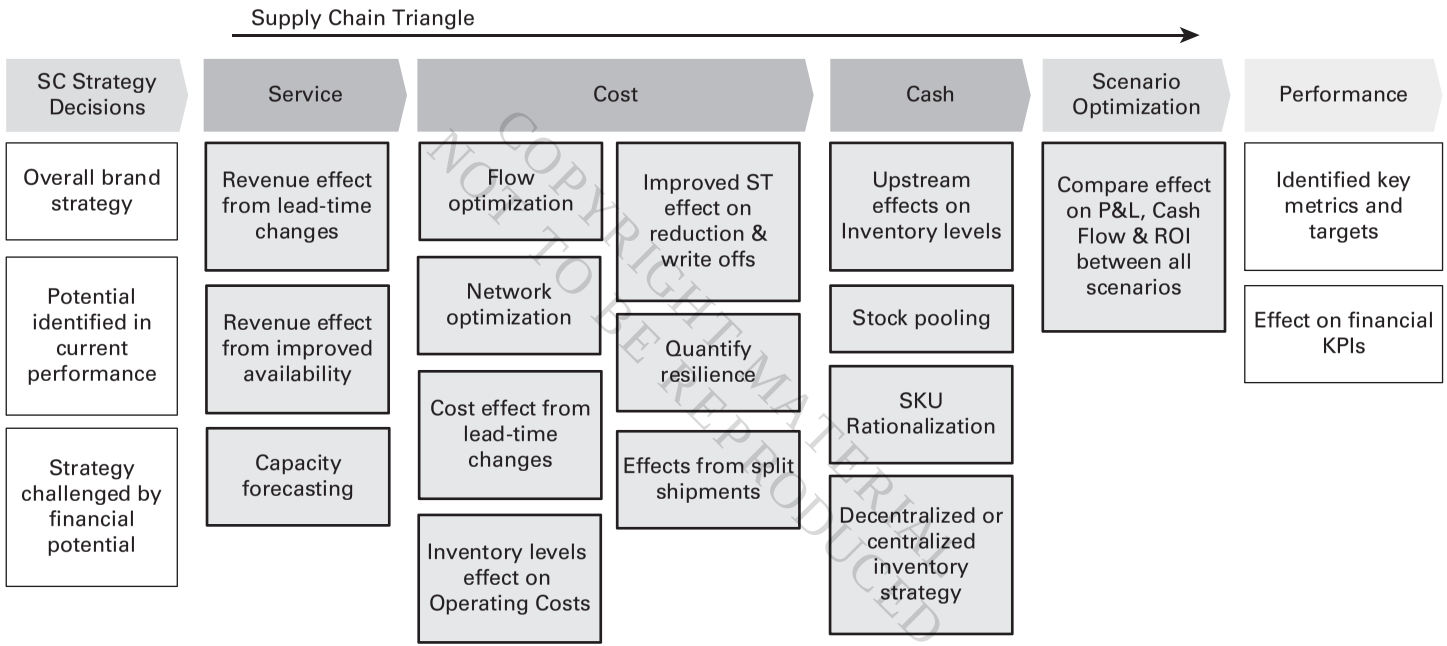
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Figure 1.7 shows the methodology the supply chain strategy team at H&M has built around the triangle. It starts with the overall strategy or hypothesis, and as Jesper Metz comments:

> It is also about helping to refine strategies overall, which may not always reflect all necessary trade-offs & effects along our supply chain. It is not uncommon to see aspirations of wanting and trying to improve all aspects at the same time. From the modelling approach, we can help the stakeholders to reveal the options and the necessary trade-offs.

The next steps in Figure 1.7 show how the H&M team models the impact of service scenarios on the sales, simulates alternative solutions from, for instance, a cost and inventory perspective, which allows it to compare scenarios from a P&L, a cash and a ROCE perspective. Another direct outcome from the modelling is which key metrics to monitor. Jesper comments that 'Once you know what the important drivers in the scenario are, for instance

Figure 1.7 The H&M methodology built around the Supply Chain Triangle



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lead times, it is also immediately clear that this is a KPI you want to track and monitor from an operational perspective.' In other words, it becomes easier to create a clear connection between planned operational performance and calculated financial success.

Figure 1.8 shows an example, investigating whether it could be reasonable to allow online customers to shop from a secondary warehouse. Compared to the baseline scenario of doing nothing, this could potentially lead to a positive effect on the sales and the resulting gross margin. As we start having split parcels and will travel longer distances with corresponding CO_2 emissions, the operating cost could go up. The question becomes 'by how much' and what is the impact on EBIT? Next, the H&M team questions the inventory impact. If we allow ordering from a secondary warehouse, we expect inventories to go down. The question once more is 'by how much, what is the impact on the total capital employed (= working capital + fixed assets), and what is the impact on ROCE (Return On Capital Employed = EBIT/Capital Employed)?

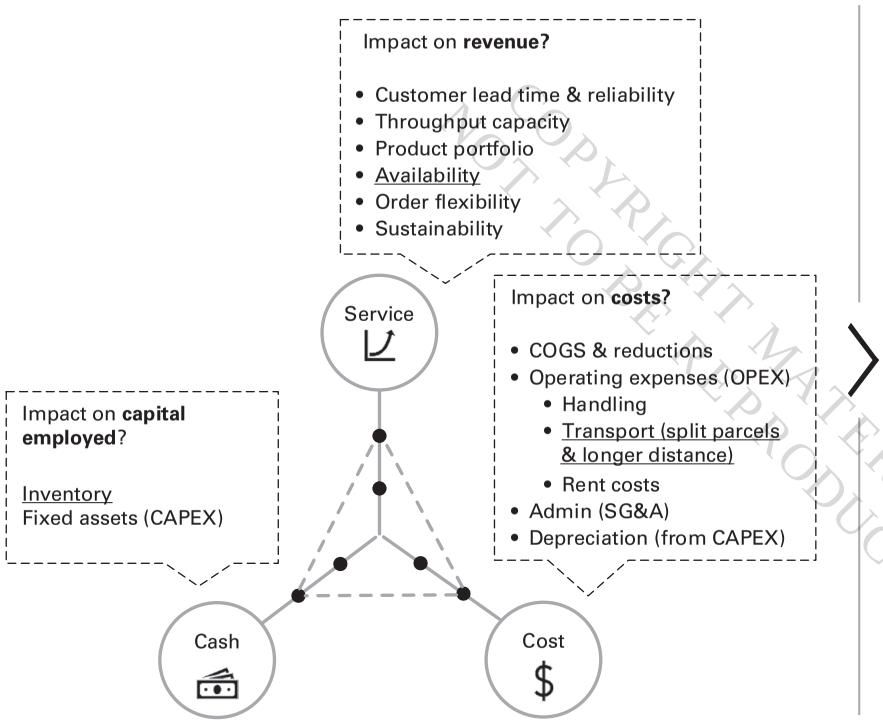
While H&M cannot disclose details, an example output is shown in Figure 1.9. The conclusion is obvious in this example, as both EBIT is going up and capital employed is going down. Jesper Metz comments that 'When you see that in one of the scenarios, for instance, the increase in transport cost is the challenge to making the scenario attractive, you then start looking into alternatives to realize the intended outcome but at a lower cost level. This type of modelling is an iterative process.' The supply chain team also has the possibility to test the conclusions of the models in real life. Do we see the anticipated sales impact? Can we measure the expected cost increase and the inventory effect? A good model makes you more targeted in what to measure and how to evaluate these type of pilots.

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One of the necessities for H&M was to introduce this way of evaluating scenarios at all levels. Jesper comments 'We included ROCE next to the more traditional investment metrics like NPV, in a broader scorecard'. That scorecard is shown in Figure 1.10. ROCE basically measures the value generation, whereas the NPV analyses the cash flows. Jesper comments that 'they tend to go in sync'. H&M also shows the impact on ESG, so that basically the three dimensions are used for comparing alternatives: value generation potential (ROCE), cash flow (NPV) and ESG impact (ESG score).

Where the use of the triangle may have started in the supply chain strategy, it has expanded into other areas like supply chain performance management. With a cross functional working group, H&M defined which metrics to

Figure 1.8 Example case: offering customers products from a secondary warehouse

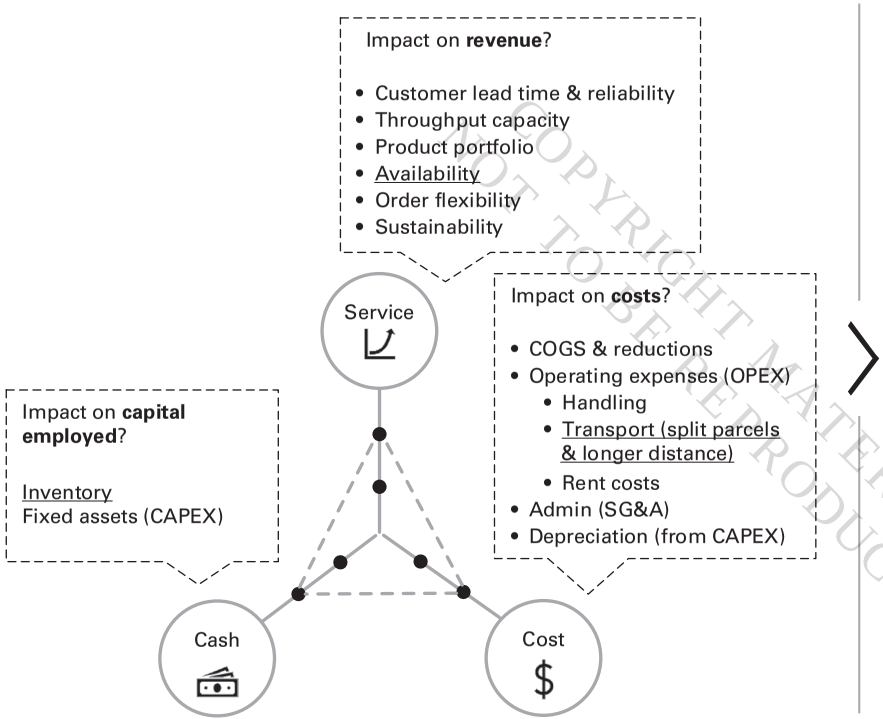


P&L – item	Scenario – change	Scenario – do nothing
Net sales	↗	→
Gross profit	↗	→
Operating expenses	↗	→
EBIT	?	→

Capital employed and ROCE	Scenario – change	Scenario – do nothing
Average inventory	↘	→
Capital employed	↘	→
Return on capital employed	?	→

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Figure 1.9 Example case: offering customers products from a secondary warehouse – order of magnitude



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P&L – item	Scenario – change	Scenario – do nothing
Net sales	+100 (+10%)	1,000
Gross profit	+50 (+10%)	500
Operating expenses	+45 (+15%)	300
EBIT	+5 (+2.5%)	200

Capital employed and ROCE	Scenario – change	Scenario – do nothing
Average inventory	–30 (–10%)	300
Capital employed	–30 (–5%)	600
Return on capital employed	36% (+3% pp)	33%

Figure 1.10 Broader evaluation criteria of scenarios



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follow up on a monthly basis. The starting point was the triangle. To consistently report service and top-line, cost and bottom-line, and working capital metrics, into one single integrated overview. H&M also added sustainability metrics to complete what you could call their balanced scorecard. 'Showing this type of dashboards changes the mindset,' comments Zaki Sarker, Head of Supply Chain Performance Steering at H&M. Jesper Metz adds:

> We always show all the components in our strategic analysis. Even if there is no impact on inventory, we still show the inventory in the results to strengthen joint learnings and be clear about one direction and parameters. That is how you change the mindset towards more integrated thinking.

Zaki Sarker comments that 'Understanding the relationships between all of the metrics is naturally a challenge'. We of course strive to improve on all KPIs and exceed also our goals, but that's normally not possible since trade-offs must be made. That also means that the targets themselves need to reflect those trade-offs and balance within the triangle to be relevant. Which brought us to the topic of planning. Can we define planning scenarios and how these potentially impact service, cost and cash?

Supply planning is an independent function within H&M. The supply planning organization is the element responsible for optimizing the quantities produced, as well as how to steer the inventory end to end. In this type of function, you need some metrics on how you will measure its performance. 'Those metrics are defined around the Supply Chain Triangle,' comments Erika Linton, currently the global Head of Supply Chain Strategy and Design.

'There are also other areas where the triangle is the starting point,' continues Jesper Metz.

> There are a lot more connections to the triangle beyond strategic work. Take tech as an example: all steering logics and engines that control and optimize our inventory flow. It should normally not be about optimizing towards 1 variable here, and another there. Overall, it needs to be about steering towards the optimal balance between revenue, costs (profit) and inventory efficiency. So, in the end, also here, it's also about optimizing the Supply Chain Triangle.

'It has been a very interesting journey so far,' Erika Linton concludes. 'The compass is an accurate way to describe how we use the triangle. It has been helpful, inspirational, and foundational for us. It really supports us to make the most out of our supply chain organization.'

From one to three triangles: the profit, the people and the planet triangle

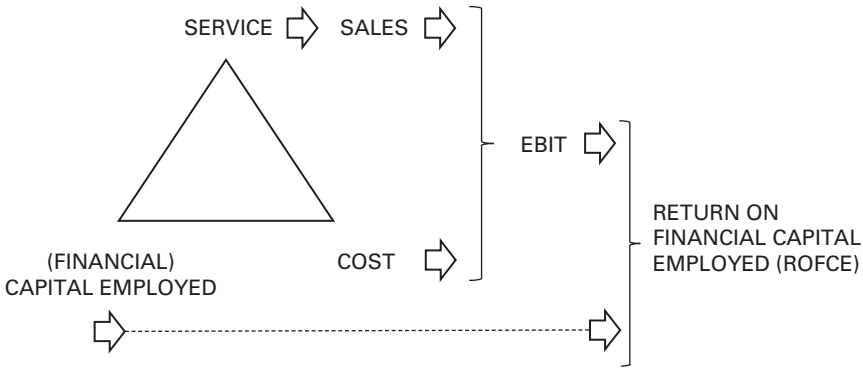
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Ever since I started talking about the Supply Chain Triangle, people asked me 'how can we link it with sustainability'? It took me a while and two books to fully understand and document the Supply Chain Triangle and how it links to strategy. I'm now most happy to try and tackle the following two questions: 'What actually is sustainability?' and 'How does it link to the Supply Chain Triangle?'

One of the cornerstones of the sustainability literature is the book *Cannibals with Forks* by John Elkington.[11] Elkington describes how in the 1970s, environmental concerns were still something for activist groups like Greenpeace and were considered by most managers as something that was at odds with the free enterprise. The assumed best tactic for businesses at that time was to limit transparency and try to operate below the radar of these activist groups.

Elkington continues to describe how gradually the mindset changed, in multiple waves characterized on the one hand by environmental disasters (Bhopal, discovery of ozone hole above the Antarctic, Chernobyl, Exxon Valdez, Brent Spar) and on the other hand by initiatives of pressure groups and the UN (Stockholm Conference, Montreal Protocol, International Earth Day, Earth Summit Rio De Janeiro). He elegantly elaborates how, slowly but surely, companies changed their way of thinking, to become more inclusive about both environmental and social aspects.

Figure 1.11 The Supply Chain Triangle as the Profit Triangle



Elkington defines sustainability as 'the principle of ensuring that our actions today do not limit the range of economic, social and environmental options open to future generations'. He makes it concrete by introducing a 'social bottom line' and an 'environmental bottom line' next to the 'economic bottom line'. In his vision, sustainable capitalism and the sustainable corporation is managing, not just one, but the so-called 'Triple Bottom Line'. That Triple Bottom Line is commonly referred to as the 3Ps: people, planet, profit. It is a good starting point to make the connection with supply chain thinking through the Supply Chain Triangle.

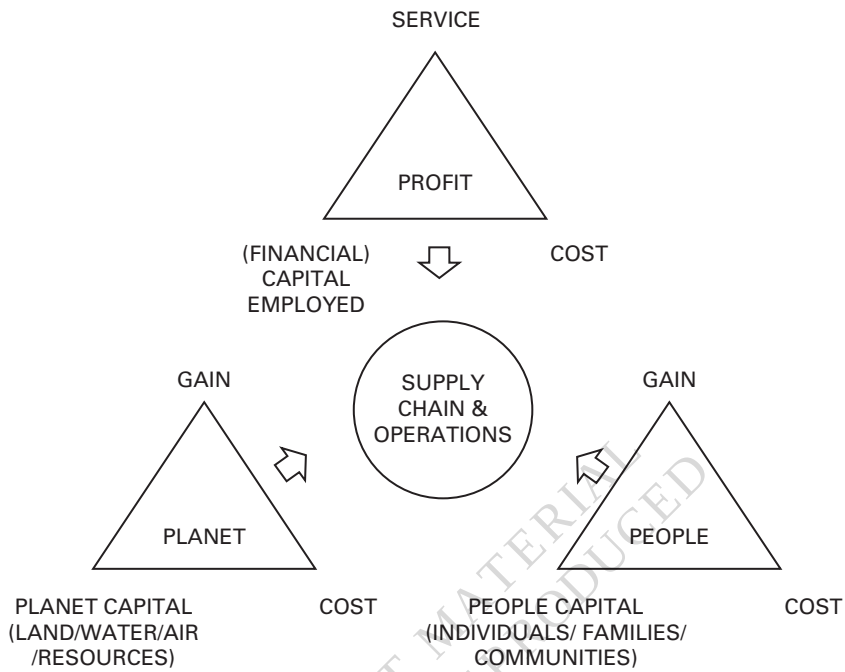
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First of all, when thinking about the triple bottom line, I realized that the Supply Chain Triangle is, in essence, a Profit Triangle, focused on the optimization of the financial profit, we generate on our financial capital employed, as is shown in Figure 1.11.

Next, I realized we can easily make the analogy for people and planet. As we use 'Financial Capital', in our supply chains, our manufacturing and distribution processes, we also use People Capital and Planet Capital. The People Capital, in the most direct form, are our employees, the people who work for us. Indirectly, it may be employees of our suppliers, or their suppliers, or it may be people working with our products, or the consumers consuming them. Through the individuals we may have an impact on their families, and more broadly the communities and societies they live in. As explained by John Elkington, companies increasingly understand they have a broader social responsibility, and they increasingly take care of it.

In our value chains, we also use Planet Capital, for instance in the form of land, water, air, fossil fuels or rare earth elements. In general, you could call it natural resources. One of the big questions in sustainability thinking is how to

Figure 1.12 Three triangles feeding our supply chain and operations



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decouple economic growth from consuming ever more resources or Planet Capital. Without changing our approach, we risk to both kill and deplete our planet. Kill, for instance through global warming, which is the result of the accumulation of greenhouse gases we release in the atmosphere, and deplete, as we are using increasingly more fossil fuels and many rare earth elements that are inherently finite. So, in summary, as shown in Figure 1.12, our supply chains run on three types of capital, financial capital, people capital (humans) and planet capital (natural resources).

During the usage of any type of capital we incur costs to it, which decrease its amount, its quality or its value. Common people costs are stress, burnout, unhealthy working conditions, which can lead to increased absenteeism, longer-term illness and potentially death. As we are impacting the individuals, we may impact their families, communities or society as a whole. Common planet costs include the depletion of non-renewable energy sources, pollution of air (CO_2, NO_2), pollution of land (with a lot of recent discussions on PFAS[12]), pollution of water (by all sorts of fertilizers), destruction of biodiversity.

During the usage of the people and planet capital, we can also increase the amount, the quality or the value. I will call those gains. There are plenty of examples from a people perspective. Through providing people with work, we also provide them with an income, which can lead to economic prosperity, which in turn can lead to increased health conditions. Through interesting work, we can provide people with happiness, or even with a purpose. We can also provide people with training and personal development. All of these increase the quality and value of the People Capital.

In the Planet Triangle, instead of 'gains', more of the examples could rather be called 'cost avoidance'. We may try to reduce our usage of land, water, energy or other scarce resources, which slows down the pace at which these are being depleted. We may try to reduce the pollution of air, water and soil. Think about improved filtering of the waste waters we release back in our rivers or the capturing of the CO_2 emitted by our plants, as was recently announced by Arcelor Mittal.[13] We may also switch to alternative sources, for instance green electricity or electric vehicles for our city logistics. And by making our supply chains more circular, we can extend the lifetime of our products by reusing, refurbishing and redistributing them. That lowers the net new consumption of scarce resources. We can also try to recycle more materials instead of sending them to the landfill, which lowers the net new consumption of resources and reduces the environmental costs generated by landfills.

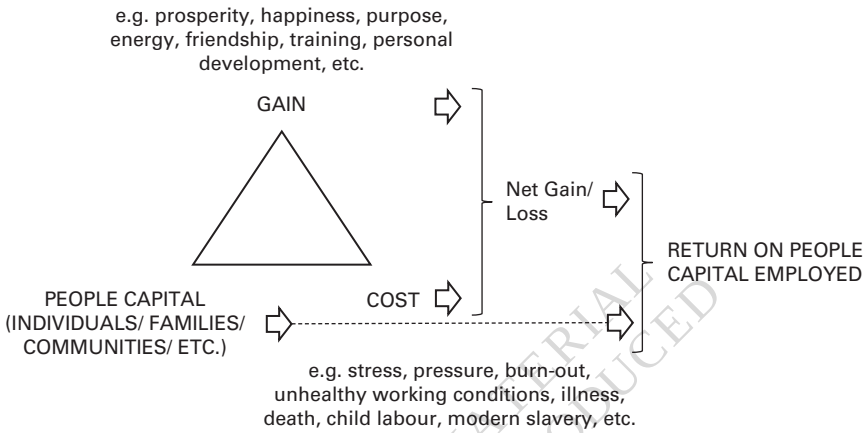
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When looking for purer 'gains' in the Planet Triangle, as a company we may decide to plant more trees on the land we own, or we may contribute to reforestation programmes. Some of the bigger initiatives to 'add' to the Planet Capital may currently be driven by governments or NGOs. Think about the 'Nature Restoration Law[14]' which was recently approved by the European Parliament, and which will oblige member states to 'bring at least 30 per cent of habitats in terrestrial, coastal, freshwater and marine ecosystems that are not in good condition, into good condition by 2030'.

And just like we can calculate a 'net gain' or 'profit' in the financial triangle and a 'return on the financial capital employed', as shown in Figure 1.11, we can calculate net gains in the People and the Planet Triangles, leading to a return on the people capital employed, and a return on the planet capital employed. Those resulting People and Planet Triangles are shown in Figure 1.13 and Figure 1.14. Though measuring the return may be impractical for now, I believe it is important from a conceptual point of view. As we

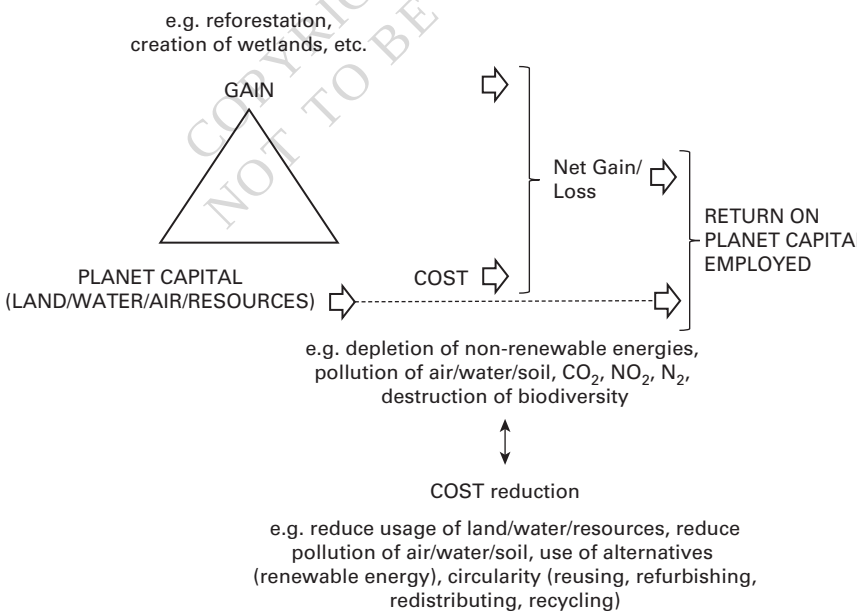
manage our supply chains, how are we getting the maximum out of the people, planet and financial capital we employ. That's what sustainable supply chains are about.

Figure 1.13 The People Triangle



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Figure 1.14 The Planet Triangle



Offshoring in the 1980s: impact across the three triangles

Now that I have created the individual triangles, I can start analysing the dynamics across the three triangles. For this, I borrow an example from Ed Weenk, from his book *Mastering The Circular Economy*[15]. He discusses the people and planet impact from the massive offshoring to China and Southeast Asia by European and American companies that took place in the 1980s.

This offshoring was driven by the Profit Triangle. The access to almost unlimited low cost labour gave an important cost advantage. It basically allowed companies to lower the price in mature markets for many products which gave a huge boost to consumption and to 'consumerism' in general. Instead of repairing consumer electronics it became common to dispose of them and just buy the latest greatest.

When looking at the financial capital (employed) impact of the offshoring, on the one hand, the longer lead times for production and cross-ocean transport required carrying more inventory. On the other hand, because the labour was so cheap, any increase in inventory was typically compensated by having less investments in expensive machines and automation. In Figure 1.15 I have assumed the net capital employed to go down leading to a triple positive effect on the return on capital employed: more sales, at a lower cost and with less capital employed.

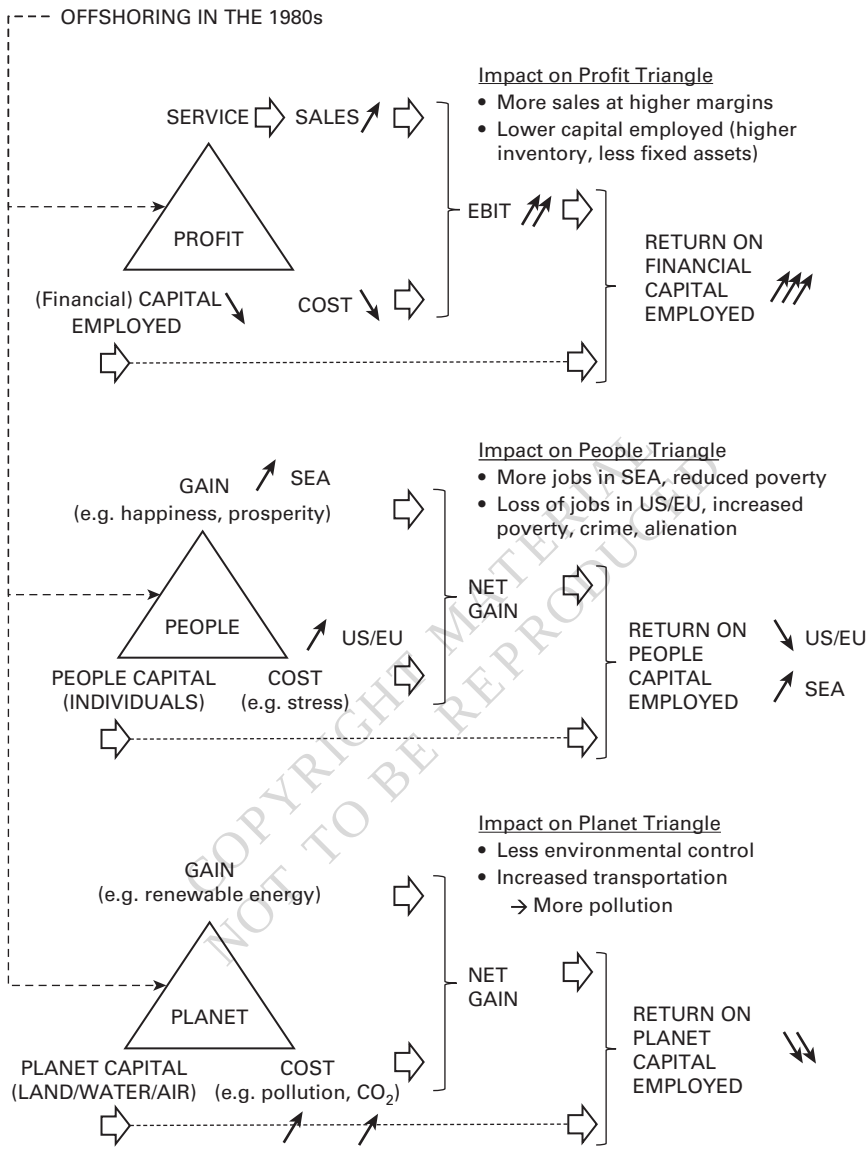
The impact on the People Triangle was double. On the one hand, the creation of jobs for sure helped to reduce poverty in Southeast Asia. At the other hand, it led to a loss of jobs in the US and Europe, leading to whole regions such as the American Rust Belt where manufacturing closed, and leading to an increase in social problems.

From the perspective of the Planet Triangle, as we moved production into Southeast Asia, we can expect that environmental controls, especially in the early years, were less strict. So, it is fair to assume that the offshoring had an unfavourable impact on all kinds of pollution. As many more goods had to travel across the ocean, we also safely assume it had an unfavourable impact on the amount of CO_2 emitted.

As John Elkington explains, companies in the 1980s were primarily driven by profit objectives and were less concerned about the social or the environmental impact than they are today. Given the important financial gains from offshoring, it explains its massive use by companies in that era.

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Figure 1.15 The impact on the three triangles of offshoring in the 1980s



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The Triple Triangle of people, planet and profit

If we align with the thinking of Elkington, then in the 1970s and the 1980s, the only real concern was the Profit Triangle and little consideration was given to the people or the planet impact. Whereas for sustainable capitalism,

and sustainable enterprise, a conscious and continuous balancing across the three triangles needs to be performed. Given the 'Triple Bottom Line' is such an iconic work, I thought it was natural to extend our model of the Supply Chain Triangle into the model of the 'Triple Triangle', as shown in Figure 1.16. The 'full' Triple Triangle takes the three triangles as shown in Figure 1.12 and then completes the individual triangles as shown in Figures 1.11, 1.13 and 1.14.

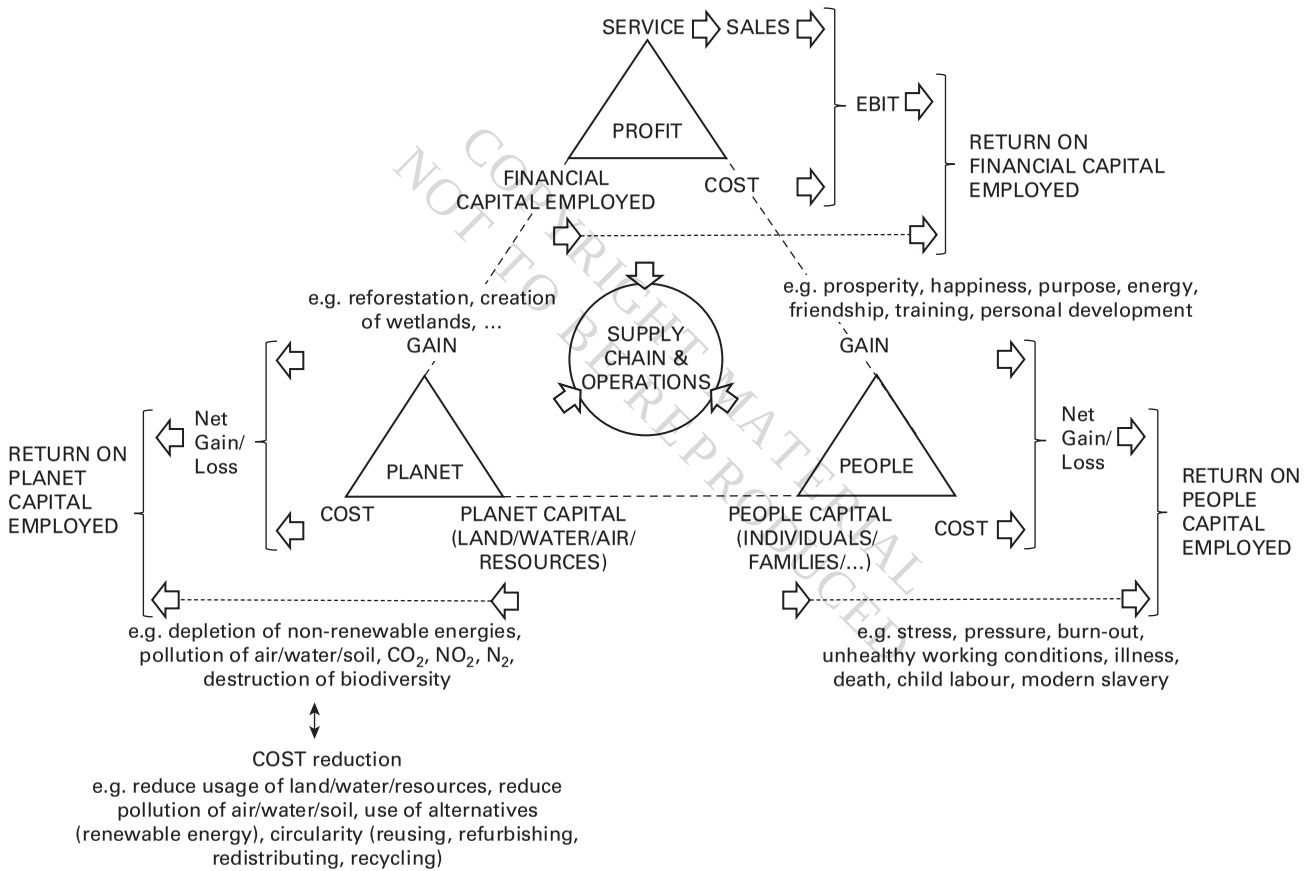
To understand the relevance of the 'Triple Triangle', let's apply it to the opposite example of offshoring: reshoring, an actual discussion in many executive teams and boardrooms. As a kind of 'hangover' from the Covid period, we suddenly seem to realize that we are overly exposed by a concentration of sourcing from China and Southeast Asia. As long as the supply is reliable, and the cost of transport is low, the offshoring works well. The Covid period has been a wake-up call in both aspects. Add to that the increased political tensions between China and the US, and it has caused companies to reconsider their options. In response to the experiences during the Covid period, there is an urge to make our supply chains more 'resilient'. We could say that resilience starts from the service side of the Profit Triangle. We want to be more resilient to ensure we can serve our customers and realize our growth plans. Regional sourcing and production are options considered to improve our resilience.

If we extend the analysis to the People Triangle, reshoring to the US or Europe is considered positive. It is bringing back jobs that have been 'lost' in the past, which politically is a popular argument. It will also be beneficial from a planet perspective, less kilometres travelled means less CO_2. Both are reinforced by legislation like the 'Inflation Reduction Act[16]' in the US. On the face the IRA is about boosting clean energy, reducing healthcare costs and increasing tax revenues. There are concerns in Europe however, that it is also a campaign to 'buy American[17]', as the Act contains requirements for local US or North American contents and production.

The big 'but' of reshoring is the financial impact. Local resources are expected to be more expensive. If we want to do the reshoring, we will need extra investments in local assets. Nevertheless, the double win on resilience and sustainability, together with the legislative push, seems to push companies towards the reshoring option. The reshoring question is probably the more current example of how thinking across the three triangles is needed to come to decisions today.

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Figure 1.16 The Triple Triangle: profit, planet, people



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Linking supply chain with ESG: the quadruple ESG triangle

Where the 'Triple Bottom Line' may be one of the fundaments of sustainability thinking, talking about 'people, planet, profit' seems to be less in vogue. The current talk is 'ESG' or 'Environmental, Social and (Corporate) Governance'. The term ESG is more heavily used in the context of (ESG) reporting/ratings/regulations and (ESG) financing/investing and has essentially taken over as the term to describe sustainability efforts within companies.

While planet and people easily translate into environmental and social, ESG more explicitly adds the 'G' or the 'Corporate Governance', which includes factors such as corporate structure, board composition, business ethics and anti-corruption. According to the World Economic Forum,[18] Corporate Governance predates environmental and social risks as a corporate priority and, as such, many key Corporate Governance indicators may already be included in corporate disclosures. Nevertheless, the WEF continues,

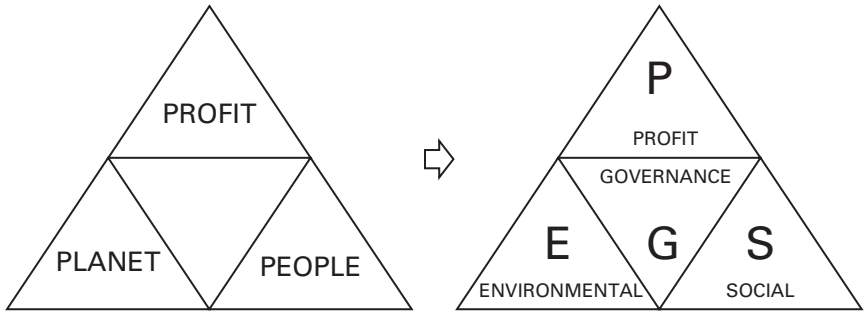
> 'the G is foundational to the realization of both the E and S. Behind each breach of a company's environmental or social commitments lies ineffective corporate governance, be it inadequate anti-corruption practices, perverse incentive structures, contradictory lobbying activity, or ill-equipped leadership. Further, corporate governance affects the integrity of ESG disclosures, determining whether ESG indicators are ethically pursued and reported.'

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To link supply chain to ESG, we can easily extend and transform our Triple Triangle as shown in Figure 1.17. If we bring the three triangles (profit, planet and people) together, replace planet and people with environmental and social, and then put governance at the heart, we get to the Quadruple ESG Triangle, with objectives in the profit, environmental and social dimension, and with the governance piece at the heart as the regulating mechanism.

Whether it is about the Triple Triangle shown in Figure 1.16, or the Quadruple ESG Triangle shown in Figure 1.17, the initial feedback from people is that this is complex. When you truly master a subject, you can explain a complex matter in a simple way. So this means I'm not yet there. At the same time, it feels to me that our new business and supply chain reality is complex, it is increasingly about balancing multiple objectives in parallel without having a good understanding on how they are connected.

Figure 1.17 Linking supply chain with ESG: The Quadruple ESG Triangle



In any case, building models is a balancing act. Any model needs to be simple enough so that people can easily relate to it, but it also needs to be complex enough that it captures the key dynamics. I chose to include the models AS IS, for two reasons, to describe where I am in my thinking and my journey, and because I do believe the models are helpful. To illustrate so, I will use the Quadruple ESG Triangle to answer a long-standing question from my to-answer list 'How does the Supply Chain Triangle work for a non-profit like Médecins Sans Frontières (MSF)?'

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Case Study: MSF – measuring output in the social triangle

Médecins Sans Frontières[19] (MSF), or Doctors Without Borders, is a non-governmental organization of French origin, which provides relief to populations in distress, to victims of natural and man-made disasters and to victims of armed conflict. In 2022, 7,823 health professionals, logistics specialists and administrative staff of all nationalities departed for assignments in medical programmes, to work with more than 40,000 locally hired staff in over 75 countries.[20]

MSF has an associative structure, where operational decisions are made, independently, by six operational centres: Amsterdam, Barcelona, Brussels, Geneva, Paris and West and Central Africa. In 2011, MSF International was registered in Switzerland and the first annual MSF International General Assembly (IGA) was held. The IGA comprises two representatives of each MSF association, two representatives elected by the individual members of MSF International and the International President. The IGA is the highest

authority of MSF International and is responsible for safeguarding MSF's medical humanitarian mission and providing strategic orientation to all MSF entities.

Julio Victoria, logistics manager at MSF Supply in Brussels, comments that

> 'the supply chain of MSF is complex. The international catalogue of products counts around 20,000 references. MSF Supply, based in Brussels, and one of the three supply centres, next to Bordeaux in France and Amsterdam in the Netherlands, manages an inventory with around 3,000 SKUs on stock, with the other items purchased to order. Delivery lead times depend on the mission and/or product. Emergency responses to wars or natural disasters are obviously hard to plan and require a highly responsive supply chain. Programmes like HIV Antiretroviral (ARV) treatments can be planned and organized more efficiently. The speed of delivery depends on country specific policies and conditions in the field. One can imagine that delivering to war zones, take the Gaza strip in 2023, is an especially difficult and dangerous operation.'

When first drawing the Triple Triangle from Figure 1.16 or the Quadruple Triangle from Figure 1.17, I realized I could finally answer one of my long-standing questions: how does the Supply Chain Triangle work for a non-profit organization? If we limit ourselves to the traditional 'Financial' Supply Chain Triangle from Figure 1.11, we get stuck. MSF is not selling any services or products. That means there is no sales revenue, which means there is no EBIT and no ROCE as a balancing criterion, as shown in Figure 1.18.

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Figure 1.18 The non-profit Supply Chain Triangle

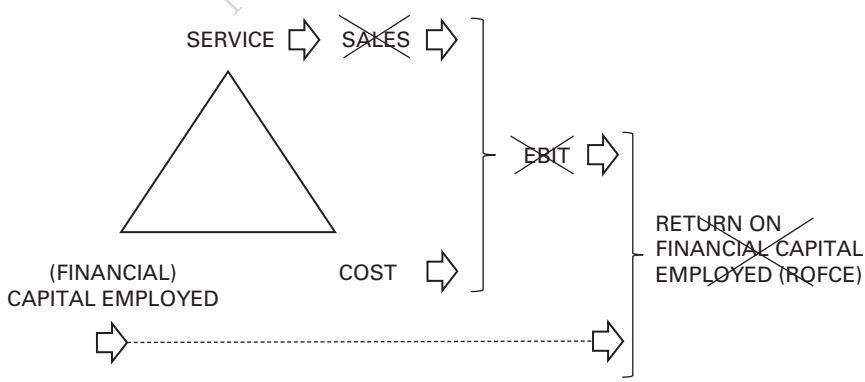
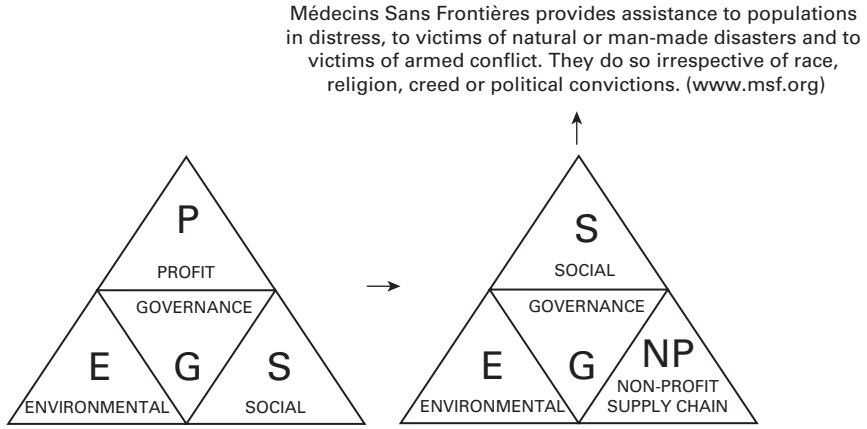


Figure 1.19 The Social Triangle leading for MSF

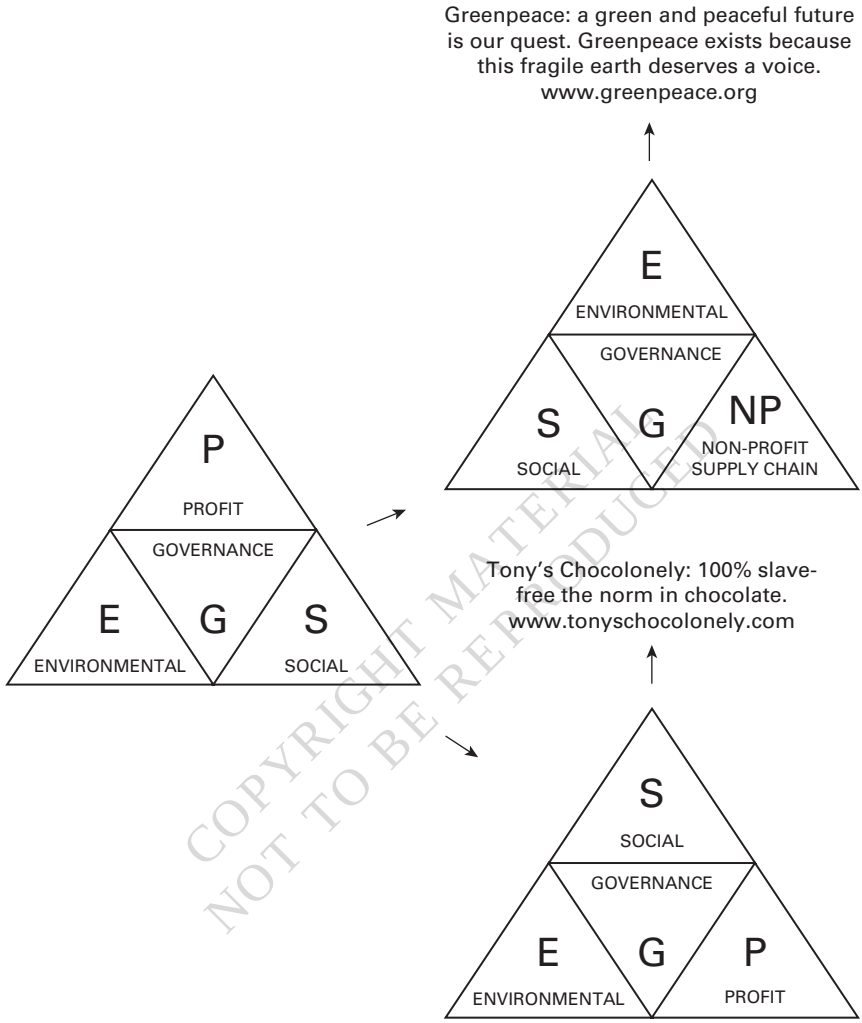


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When zooming out and taking the Quadruple Triangle view, it becomes obvious that the objectives of MSF don't lie in the financial triangle. The objectives of MSF lie in the Social Triangle. The primary objective is to provide relief to people in distress. Given that the primary objectives lie in that social triangle, it is also more logical to put that triangle on top and put the 'Non-Profit Supply Chain Triangle' as a supporting triangle at the bottom, as I have done in Figure 1.19.

A non-profit such as Greenpeace has an environmental mission, in which case we could put the environmental triangle on top. In Chapter 5, I will introduce an 'impact company' like Tony's Chocolonely, that is striving for a world with only slave-free chocolate, and states that it is making a profit as a result. At Tony's, the financial success is a way to grow their impact. It allows to grow the company and pay a fair wage to a bigger share of the cocoa farmers in countries like Ghana and Côte d'Ivoire. So for Tony's, we could put the social triangle on top, but it will be supported by a for-profit supply chain, which is helping it to lift its impact in the social triangle. At a non-profit organization like MSF, the goal is to have a P&L at 0 as an average over the years, with the financial reserves allowing to swallow years with losses, without impacting the operations too much. In Figure 1.20 I have shown the example of Greenpeace and Tony's, you can imagine other examples or combinations, or even combinations where two triangles are leading on equal footing and one is following.

Figure 1.20 The environmental and social triangle leading for Greenpeace and Tony's Chocolonely



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Also notice that there is a difference between ESG from a 'mission' and from a 'footprint' perspective. The mission of MSF can be in the social dimension, but it also has and manages its own social and environmental footprint. William Vannier, the supply chain director for MSF Belgium, comments that

> 'on the social dimension, MSF for instance has a very limited salary tension, which is the difference between the lowest and the highest salary. In Belgium the tension is a little above 3, meaning our lowest salaries are well paid and our highest salaries are lower compared to the market. We are also putting

effort into controlling our supplier base, ensuring there is no hidden form of child labour or slavery, and we are investing in becoming a real DEI (Diversity, Equity, Inclusion) and Anti-Racist Organization. On the environmental side we aim to reduce our carbon emissions by 50 per cent by 2030 compared to 2019. As MSF our mission is in the social dimension, but in the context of ESG, we also take our responsibility to manage our social and environmental footprint.'

Likewise, the mission of Greenpeace can be in the environmental dimension, but from an ESG perspective it will need to consider and manage its social and environmental footprint. In Chapters 5 and 6, I will include this type of trade-off into the heart of the strategy process of an organization. What is my mission or purpose, where do I want to make the difference, which dimension is leading, and which dimensions are following? As we have learned from John Elkington, in for-profit companies, the shareholder value and profit was for long the sole and most important objective without a lot of regard given to the social or the environmental dimension. Not only do these dimensions become more important, they become a potential source of differentiation, as we will explore in more detail in Chapters 5 and 6 using cases like Tony's Chocolonely, Patagonia, Interface or The Body Shop.

In Figure 1.21 I further analyse the 'Non-Profit Supply Chain Triangle'. As introduced, the MSF supply chain is a complex supply chain. It also means it is a costly and heavy-investment supply chain. The financing needs are the same as those of a for-profit supply chain. There are operational expenses that need to be covered (OPEX), there are investments in property, plant and equipment, think about tents, medical devices (CAPEX), and there may be swings in working capital (for instance increases in inventories of medical supplies) that need to be financed (WORKING CAPITAL). As MSF is not selling anything, the OPEX, the CAPEX and the changes in WORKING CAPITAL need to be financed from the FUNDING received. So, the objective in the non-profit Supply Chain Triangle becomes to maximize the 'service output' (e.g. availability of key materials, speed of response for new missions) within the limits of the funding (which should cover OPEX, CAPEX and changes in WORKING CAPITAL). Supply chain is challenged to optimize the output in the triangle while minimizing the inputs.

William Vannier comments that '25 per cent of the overall cost is cost of goods, with another 15 per cent cost of distribution of the goods (storage, transport and all associated costs until the place of delivery / dispensing),

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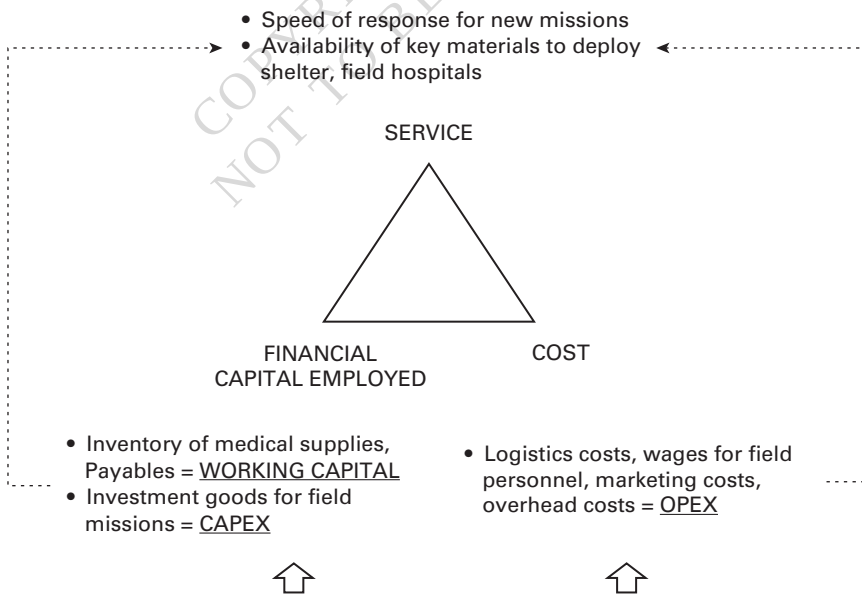
meaning that the supply chain easily accounts for 40–45 per cent of the operational expenditure'. He continues that:

> 97 per cent of the funding is fully private, which is a big difference with other NGOs, and MSF has built some financial reserves over the years. When we need to do a major CAPEX, we can draw upon those reserves to do so. Other NGOs may depend on institutional funds, which typically means they also need to go and ask for the funds and the CAPEX. Thanks to our private funding, MSF can fulfil its mission more autonomously.

In a for-profit supply chain, we can judge the service or service options by the margin they generate, and the capital employed needed to deliver them. Think about the expansion of the product portfolio, what is the impact on sales, on costs, so on EBIT, and what is the Capital Employed (working capital and/or fixed assets) needed to deliver that expansion. In a non-profit supply chain like the one of MSF, the service options should be judged by the contribution they bring to the objectives in the people triangle or the social triangle, in that of Greenpeace, they should be judged by the contribution they bring in the environmental triangle, in short, they should be judged by the contribution they bring to your purpose or mission.

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Figure 1.21 Balancing the Non-Profit Supply Chain Triangle at MSF



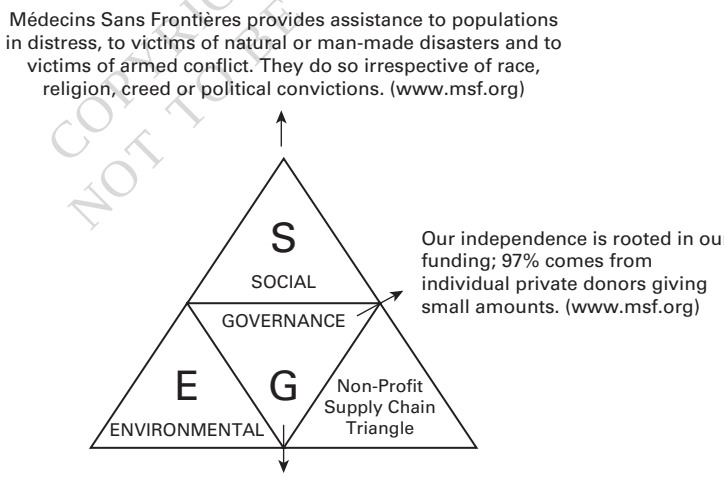
The 'funding constraint' in the Non-Profit Supply Chain Triangle of Figure 1.21 seems hard, but in our experience the Free Cash Flow constraint can be equally hard in a for-profit supply chain. So, in our view, the difference is less in the cash flow aspects, they are the same, the true difference between for-profit and non-profit supply chains is in the way we measure the value of the services offered, and the way we (strategically) design the service side of the Supply Chain Triangle.

The case of MSF can also be used to illustrate the Governance aspects of the Quadruple Triangle. As shown in Figure 1.22, neutrality and impartiality are key principles for MSF, as is the ability for full and unhindered freedom in the exercise of its functions. As MSF is operating in conflict areas, having clear and strong governance principles is key. That same neutrality and impartiality requires independence in the funding, for which MSF states 97 per cent is coming from individual private donors giving small amounts.

'Our customers,' William Vannier comments, 'are the donors, not the beneficiaries in the strict sense of the term. Indeed, donors 'pay' for us to deliver a service, although they are not the direct recipient of the service. We are in a competitive environment.' As an example of that, he refers to the ICRC, the

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Figure 1.22 Governance rules in the Quadruple Triangle of MSF (www.msf.org)



International Committee of the Red Cross, that has announced to reduce 430 million CHF in global costs over 2023 and 2024.[21] It will impact the job of approximately 1,800 people worldwide and 26 out of their 350 locations around the world will close while others will be substantially reduced. Reasons mentioned are several end-of-year pledges in 2022 not coming through at the anticipated level, increased operating costs due to inflation and difficult global financial and economic trends making it increasingly challenging to raise unearmarked funds. William Vannier continues:

> If we have been supporting migrants in the Mediterranean, it had an impact on our donors. Some people did not like it, so we lost a lot of donors, while other people did like it, so we luckily also won a lot of donors. In our executive team, at MSF Belgium, we don't make choices in function of how it could impact our funding. We start from our mission and our governance principles, and we are confident that our private donors will keep following us based on that. With so many smaller independent donors, we are in a privileged position compared to other NGOs.

When I first thought this through, I was, and I still am, enthusiastic about how a case like MSF can be easily captured in the Quadruple Triangle. It feels like I have been able to connect two worlds, that of the for-profit and the non-profit supply chains. Connecting the two exposes the full continuum in between these two extremes. It more fully exposes the question how companies want to balance for-profit (financial) objectives with non-profit (non-financial) objectives and how we want to build a governance around that. So where the models may look complex at first, my feeling is they do capture some key dynamics that simpler models might not allow.

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EXERCISE

Sustainability risk mapping

Gather your executive team, or a team of cross-functional experts. Ensure the different functions such as sales, marketing, R&D, operations, supply chain, procurement, finance, HR, IT are represented.

Introduce the Triple Triangle shown in Figure 1.16.

Hand out sticky notes and ask people to write down what they see as major disruptive risks. Ask them to take an extended view of the supply

chain, from the suppliers' supplier down to the customers' customer, and let them think about the broader ecosystem the company is embedded in, including governments, banks and shareholders, pressure groups.

Ask them to think through the three dimensions of the regular 'profit'-driven Supply Chain Triangle, the People and the Planet Triangle.

Corporate Governance is a lot about 'identifying and managing risks'. This exercise can be an integral part of your governance work.

EXERCISE

Sustainability materiality mapping

Another key topic in sustainability thinking is to investigate your materiality impact. As a steel or cement company, you may have a material impact on CO_2 within your Scope 1. As a supply chain consulting organization, you may have a material impact on the work-life balance of your consultants, when looking at CO_2, you may have a material impact on the CO_2 emitted by the customers you consult. When defining sustainability objectives, you first try to narrow down to those aspects where you have a material impact.

Gather your executive team, or a team of cross-functional experts. Ensure the different functions such as sales, marketing, R&D, operations, supply chain, procurement, finance, HR, IT are represented.

Introduce the Triple Triangle shown in Figure 1.16.

Hand out sticky notes and ask people to write down where they believe the company has a material impact. Ask them to take an extended view of the supply chain, from the suppliers' supplier down to the customers' customer, and let them think about the broader ecosystem the company is embedded in, including governments, banks and shareholders, pressure groups.

When looking for materiality, we may primarily be looking to relieve pressure from the People Triangle and the Planet Triangle. When doing this, we might try to understand what the options are to do so and how they could impact the Profit Triangle.

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Conclusion

In this chapter I introduced two models to integrate sustainability thinking into our supply chain thinking and vice versa. A first is the Triple Triangle of people, planet and profit, in analogy to the triple bottom line. A second is the Quadruple Triangle, which links in ESG, Environmental, Social and Governance. I show how H&M uses the Supply Chain Triangle as the basis for designing, operating and controlling its supply chain. I show how a non-profit supply chain, like the one from MSF, can benefit from the concepts of the Triple and the Quadruple Triangle to better understand its supply chain design trade-offs. In the next chapter, I will explore extra models for incorporating sustainability into supply chain thinking and I will discuss the relevance of the different models introduced.

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