

# Measuring Non-Financial Forms of Capital

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## Introduction

The previous chapters have given a general idea of how a company can and, we think, should move beyond the Friedman doctrine and adopt a holistic vision of creating value that is more than financial value. This vision requires redefining the *raison d'être* of a company as the pursuit of a purpose; orchestrating an entire ecosystem that places this purpose as its centre; and knowing how to identify and alleviate the pain points that constitute a barrier to the fulfilment of the purpose. These pain points can be of various kinds. They may relate to difficulties of a relational type between two or more stakeholders, such as a trust deficiency in their transactions (social capital pain points); they may be personal in nature and related to working conditions (human capital pain points); or they may relate to environmental conditions, such as unsustainable exploitation of natural resources (natural capital pain points). The pain points may even be purely financial—but in this case we at least know how to measure them and how to monitor interventions aimed at alleviating them. There is considerably less agreement about how to measure pain points relating to human, social, or natural capital.

Measuring these non-financial forms of capital corresponds to identifying those performance metrics of Chapter 7 that, when properly managed,

have a positive impact on the outcome. In this chapter, we describe our attempts to do this, largely based on our experience of analysing parts of the Mars ecosystem. A more in-depth exploration of each of these non-financial forms of capital is left to Chapters 10, 11, and 12.

## **Measuring Natural Capital**

Natural resources are an essential input for every production in the value chain, as well as for services and the infrastructure of economic systems in general. From a global perspective, an efficient use of natural resources is important, especially if we bear in mind that their availability is limited and shrinking per person due to the increasing world population. The Sustainable Development Goals (SDGs) have assigned an important position to resource efficiency, being directly reflected in SDG Goal 12: Ensure Responsible Consumption and Production Patterns. Therefore it is necessary to better evaluate and economize on the use of these resources.

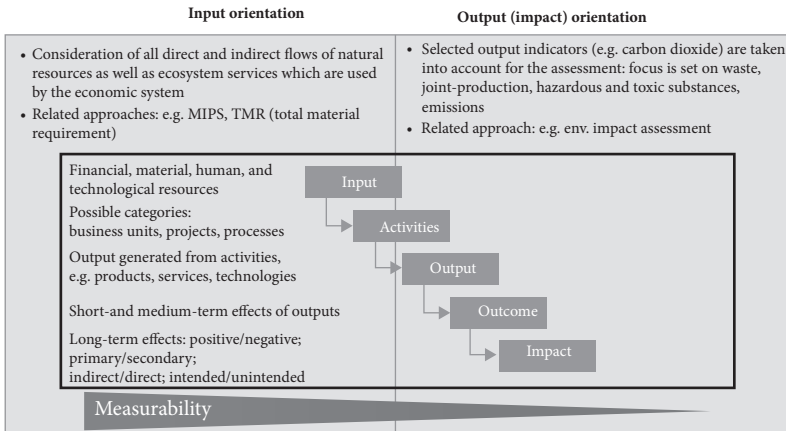
From a single business perspective resource efficiency is highly relevant. Maximizing material and energy efficiency has been identified as an archetype of a sustainable business model. Improving resource efficiency could lead to considerable cost savings. In many industry sectors, raw material costs represent more than 50 per cent of total costs (B20 Germany 2017); European industry could achieve overall savings of €630 billion per year (Greenovate Europe 2012). Companies can also benefit from circular economy strategies: for example, from reduced dependency on scarce natural resources and hedging against future price volatility (Circle Economy et al. 2018). Many companies have started to analyse and reduce the environmental impacts of their processes, products, and services, which has led to the development of various tools and instruments.

### **Measuring Inputs for Products and Services in a Coffee Value-Chain within Mars**

In the logic of the industrial metabolism, all industrial processes require natural resources as an input (e.g. raw materials) and, from those, produce

outputs (e.g. products, emissions, or waste). Following a model of causal chain analysis, ‘input’ refers to all resources that are used for a specific activity and ‘outputs’ are all direct and indirect effects of the activity. ‘Outcomes’ are the short- to mid-term effects caused by the outputs, while ‘impacts’ are defined as long-term effects of the outcomes. To generate electricity, for example, fossil energy carriers are used as an input. A direct output of the electricity generation activity is CO<sub>2</sub> emissions. An outcome of the CO<sub>2</sub> emission is the accelerated greenhouse effect in the earth’s atmosphere, while the impact of this enhanced greenhouse effect is global warming.

Outcome and impact are difficult to measure. Companies should therefore focus on analysing inputs since this information is easy to obtain (see Figure 10.1). For example, the quantity of energy carriers needed to produce one kWh of electricity is easy to measure and known to the electricity company. Since some outputs and impacts are not yet known, reducing the inputs can be much more effective in reducing the overall environmental burden than individual measures on the output side. By reducing the natural resources used in the manufacturing processes, environmental issues can be addressed at source.



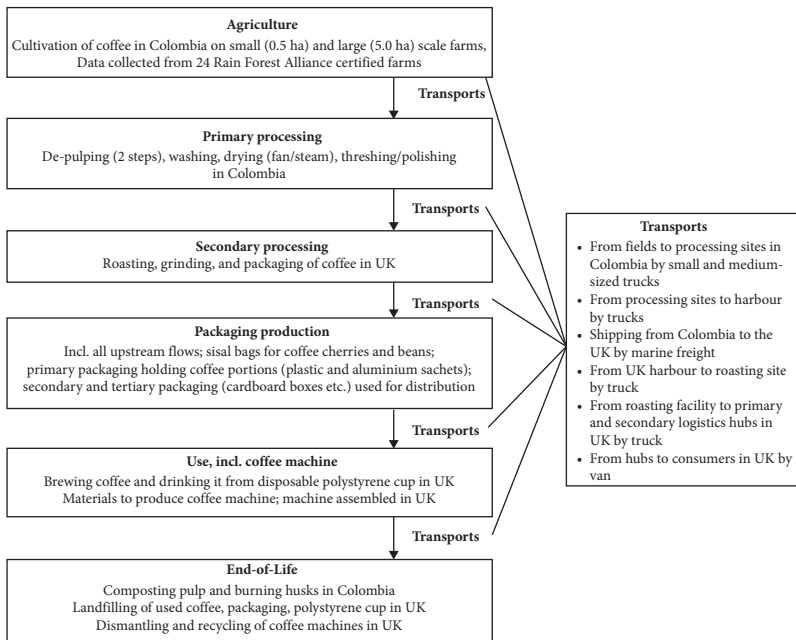
**Figure 10.1.** Relationship between input and output orientation alongside the representation of the casual chain from input to impact with a decrease in measurability

Source: Geibler et al. (2016).

Quantified and semi-quantified approaches can be used to enable the assessment of the products and services. In both cases, it is essential to specify the different phases of the product life cycle (Figure 10.2).

The quantified MIPS (material input per unit of service) approach, for example, has been developed as a material flow-based indicator for assessing product life cycles at the micro-economic level (Schmidt-Bleek 1994; Ritthoff et al. 2002; Liedtke et al. 2014). MIPS can estimate the potential environmental impact of a product used for providing a specific service or benefit (e.g. drinking 200 ml of coffee), and thus provides a measure of eco-efficiency.

Semi-quantitative approaches include hot spot analysis (HSA), developed as a screening method to identify key ecological challenges along the entire value chain in a quick and but reliable way. The results



**Figure 10.2.** Product life cycle for coffee

Source: Geibler et al. (2016).

highlight so-called ‘hot spots’ as aspects along the life cycle of a product with highly relevant resource use and environmental impact, which can be starting points for making improvements. Table 10.1 summarizes the steps needed to perform MIPS and HSA analyses.

Both MIPS and HSA have been applied in a mixed-method approach to a specific coffee value chain within Mars Inc., both highlighting the same relevant life-cycle stages (Geibler et al. 2016). The MIPS approach outlines the distributions of abiotic and biotic resources, water, air, and erosion. It helps to identify the critical phases in the life cycle of the cup of coffee: agriculture, usage, and packaging (see Table 10.2 below).

The results of the HSA for the cup of coffee also show relevant environmental impacts in the agriculture, packaging, and use phases. In the agriculture phase, raw materials, air emissions, impacts on biodiversity and land use are highly relevant. In the use phase, the raw materials, energy, and air emissions are critical (these impacts are related to energy consumption, which is used to heat water to brew the coffee) as well as water use and waste production. The packaging phase shows hot spots in the raw materials, water, and air emissions categories.

**Table 10.1.** Steps to perform MIPS and HSA analyses

Assessment elements	Methodological steps of MIPS	Methodological steps of HSA
Scope definition	1. Defining system boundaries, scope and service unit (life-cycle phases, resource categories, service unit)	1. Defining system boundaries and scope (incl. life-cycle phases, categories, product unit)
Data gathering and inventory	2. Data gathering 3. Calculating material input 4. From material input to MIPS	2. Data gathering 3. Category significance assessment 4. Life-cycle phase significance weighting
Interpretation of results	5. Interpretation and evaluation of results	5. Identification of hot spots 6. Stakeholder verification (optional)

Source: Geibler et al. (2016).

**Table 10.2.** Results of a MIPS analysis for a single-serve coffee (200ml) and most relevant life-cycle phases

Metrics	Input	Percentage of metric	Form
Abiotic	146 grams	75%	Packaging, distribution, drinking
Biotic	41 grams	96%	Agriculture
Water	3,4 liters	85%	Packaging, processing, drinking
Air	69 grams	68%	Agriculture, usage
Topsoil erosion	12 grams	100%	Agriculture

Source: Geibler et al. (2016).

## Measuring Social Capital

A comprehensive definition of social capital is given by S. Bowles and H. Gintis (2002):<sup>1</sup>

Social capital generally refers to trust, concern for one's associates, a willingness to live by the norms of one's community and to punish those who do not. These behaviours were recognized as essential ingredients of good governance among classical thinkers from Aristotle to Thomas Aquinas and Edmund Burke. However, political theorists and constitutional thinkers since the late eighteenth century have taken *Homo oeconomicus* as a starting point and partly for this reason have stressed other desiderata, notably competitive markets, well-defined property rights, and efficient, well-intentioned states. Good rules of the game thus came to displace good citizens as the *sine qua none* of good government.

Like physical and human capital, social capital can be accumulated, earns a return, and requires maintenance because of depreciation. However, it is more like a public good, i.e. non-rival (if you are using it other people still can use it) or, more precisely, a club good, because it is partially excludable (you can prevent others from having access to it). Moreover, it yields externalities to members of the club through transfers of knowledge

and technologies as well as by facilitating collective actions, which may be achieved, for instance, by shared trust, norms, and values.<sup>2</sup>

Questionnaires based on the World Bank's Social Capital Assessment Tool can be used effectively for measuring social capital. A multiple correspondence analysis can then be applied to questionnaire responses in order to create a social capital 'map': that is, the distribution of social capital, including where the survey distinguishes between structural (horizontal organizational density, decision-making processes, leadership, exclusion or acceptance of diversity, and collective action) and cognitive (trust-based relationships, solidarity, behaviour, and attitudes) social capital.

### Social Capital in Small-Scale Tropical Agriculture

A study of social capital in the context of impoverished and highly vulnerable farming communities yields some useful insights. The project aimed to develop a quantitative instrument to measure social capital across coffee and cocoa producers in the tropics. It investigated the relationship between smallholders' socio-demographic characteristics and social capital, and considered whether social capital is a key resource for higher agricultural productivity, looking at the low propensity to adopt more efficient agrarian practices and the obstacles to their diffusion. To address these questions, the researchers used the assessment tool to build a map of social capital in which farmers were located relative to one another according to the way they perceive the other members of the community in terms of shared understanding and the nature and quality of relationships.

The questionnaires were administered among coffee and cocoa smallholder households living in small communities in Ivory Coast, Papua New Guinea, Tanzania, and Indonesia over the period from 2011 to 2015. Unpacking the relationship between smallholders' individual characteristics and their social capital made it possible to differentiate sub-groups of smallholders according to their individual socio-demographic variables: kinship, natives versus outsiders, gender, age, religion, land rights, etc.<sup>3</sup>

Three dimensions emerged systematically: i) inclusion and cohesion; ii) trust, solidarity, and reciprocity; and iii) collective action and cooperation. Within each country, however, social capital varies substantially from one community (village) to another; and even within a community it varies greatly from one smallholder to another.<sup>4</sup>

The study shows that productivity (kg/ha) is positively correlated to social capital, in particular with the dimension reflecting trust/solidarity and reciprocity. On average, individual productivity is higher for farmers who are connected to their community through group membership or networks and trust-based relationships.<sup>5</sup> More specifically, the findings demonstrate something happening in cooperatives tending to favour the economic performance of a farmer (e.g. exchange of information, access to inputs). The performance is even higher when he is also a member of a family association or diaspora (e.g. access to credit). Additionally, the trust farmers place in their peers and compliance with values such as individual responsibility, altruism, and the solidarity farmers have with their peers, tend to make them more productive.

The results also suggest that, all other things being equal, there is a positive correlation between a farmer's social capital and his propensity to revise his farming practices. Through the process of social interaction, farmers adopt their organizations' values and practices. Having a network of diverse weak ties (bridges) through the participation in cooperatives or economic interest groups (versus clan or religious group) is highly beneficial to exchanging key information on agronomic practices and learning, eventually leading to a revision and improvement of agronomic practices.

To conclude, it turns out that where people are connected to their community through group membership and to each other through trust-based relationships, individual productivity is higher. Furthermore, a rather optimistic belief about community members' trustworthiness (relative to pessimistic beliefs) leads a farmer to be more proactive in seeking information and trusting those in possession of it like, for instance, representatives of agricultural organizations, family members, neighbours, and friends.



## Measuring Human Capital

As explained in Chapter 11, in the classical definition, human capital is the stock of skills and experience that an employee accumulates through education, or on the job at a company. However, well-being at work can be seen as a form of *specific capital* that pertains to the relationship between the firm and the employee and includes the working conditions that are of value to the employee. These features of the work relationship, in turn, have a clear return for the employer, as they potentially generate non-negligible returns in terms of commitment, productivity, and retention of employees.

Well-being at work has become a primary-order concern for employers, notably in view of the excessive turnover of workers, especially the ‘Y generation’, who are looking for good progression and learning prospects, and meaningful activities on the job. Promoting well-being at work is certainly instrumental in retaining the most dynamic employees. As illustrated by an abundant literature in social sciences, the experience of happiness stimulates productivity, creativity and cooperation, and reduces absenteeism. But what makes people feel happy at work?

A clear lesson of research is that workers’ well-being involves more than the traditional factors of wage and working hours. Workers are concerned by the degree of hierarchical ‘steepness’ in their firm, by the management style, by the dispersion of wages, their prospects for upward mobility, the corporate identity of their firm, and its social responsibility, among other things. These sources of well-being at work can be seen as human capital.

### Drivers of Well-being at Work for Mars

As part of a research study, researchers ran several tailored surveys, and used the Gallup Q12 survey, in different segments of Mars (drinks, petcare, chocolate, and Wrigley) in different geographies, and matched this information with Human Resources data. At the same time they analysed the impact of an empowerment programme for a population of entrepreneurs in Kenya (Maua).

Well-being at work is measured in several dimensions, including job satisfaction (based on Maslow's pyramid of needs and satisfaction), attitudes to wage inequality, prospect of upwards mobility, hierarchy and status, the intensity of corporate identity, the composition of corporate identity (values, beliefs), including PiA (social responsibility of the firm), and social capital (trust, networks).

Drivers of well-being at work in Mars could be divided into two groups: self-centred and group-centred.

In the self-centred category it is no surprise that wages are linked to well-being at work. However, the 'prospect of upward mobility' (POUM) motive (see Chapter XX) appears to be just as powerful a factor. In many of the surveys, employees display a strong preference for increasing wage profile over time, especially workers who stand lower in the formal hierarchy. In some emerging Asian countries, as well as China, it was clear that workers' job satisfaction was only affected by the progression of their pay and not by their current level of wage, suggesting that they were essentially interested in the dynamics of their wage profile. In several cases, the POUM motive also led Mars associates to accept a greater differentiation of wages inside the firm as long as they hoped to progress upward in the distribution.

On top of monetary compensation, status—that is, the symbolic part of a job, including power and prestige—is also important. Before it changed its organization, Mars had a formal system of hierarchy ('zones') that gave employees a manager status or not. The surveys revealed that being or becoming a manager was associated with higher job satisfaction. As expected (because status is about symbolic values), the impact of status was much stronger on 'higher' satisfaction domains (values, flourishing, and progress) than on basic needs satisfaction.

Of course, wage and status are overlapping concepts. In terms of magnitude, between one third and one half of the effect of having a manager status was (statistically) explained by the level of wages associated with that status. Employees appeared more sensitive to wages when they work in a division that, as Royal Canin, did not adopt the zone system. This points to the fact that status and wages are partly substitutes.

Other aspects of organization also proved to matter, including the strong impact of the line manager's personality on the well-being at work of his or her subordinates. The mobility of line managers seems to be detrimental to respondents' well-being.

Small divisions seem to be preferred: the larger the size of the division where people work, the lower their satisfaction and engagement scores. This observation comes from comparing individuals who work in different divisions (cross-section analysis), and individuals who change division over time (panel analysis).

Finally, feedback is a primary-order condition of well-being at work. For instance, within Mars, the regular engagement survey creates expectations that should not be disappointed. Workers who declare that the feedback session was not followed through by action score very low in terms of job satisfaction.

Group-centred drivers depend on the collective aspects of the work organization. Among those, trust, corporate identity, corporate culture, and wage distribution seemed to matter most.

One of the main findings of the study is the relevance of corporate identity measures. Identity was scored based on employees' degree of knowledge of Mars' specific language and property structure as a family firm. Unsurprisingly, those who scored high on the corporate identity scale were also more satisfied with their job and had higher levels of within-firm trust.

This indicator of intensity of corporate identity could then be used for a further exploration of the firm's corporate culture. At Mars, those with higher corporate identity scores responded more favourably to group incentives and group performance indicators than to individualistic management practices. They had a preference for clear and explicit rules and guidelines, and respect for hierarchies and managerial authority, as opposed to more informal and horizontal governance structures. Surprisingly, in some countries, such as China, the stress put on collective functioning went hand in hand with a wide acceptance of competition and wage differentiation based on performance, as well as a strong demand for the possibility to learn and grow from their job. Those with higher corporate identity scores cared more about their firm's socially responsible behaviour and were more likely to adopt socially responsible

practices as consumers. Moreover, they seemed to see no contradiction between social responsibility and corporate performance.

Choice experiments were used to elicit workers' attitudes to wage distribution within the firm. These consisted of asking employees to choose several times between two projects that yielded more or less unequal bonuses. They first chose 'behind the veil of ignorance', i.e. not knowing what their own bonus would be. Then they chose again knowing what their own pay would be.

In China, most people chose projects that could yield a higher pay-off and a higher total amount of bonuses, even if the bonuses were less equally distributed. This was all the more likely as employees:

- Declared a higher job satisfaction
- Expected a promotion or a wage rise
- Agreed that their job gives them opportunities to learn new skills
- Thought they had valuable skills
- Believed that large income differences are useful to incentivize individual effort
- Thought that competition is useful
- Believed that groups are more efficient than individuals
- Had a high level of firm-specific trust and social capital.

## **Conclusion**

Measuring forms of non-financial capital is a complex undertaking. Unlike financial capital, for which there are international standards for measurement and use in accounting, for non-financial capitals, consensus has not yet been reached either on their definition or on the methods for their measurement. In this chapter we set out to contribute to this endeavour by capitalizing on the countless studies done on the ground over the last ten years, based on data collected on several thousand participants in surveys in rural areas in the tropics, among the workforce within of Mars and among the entrepreneurs employed in the micro-distribution project in Kenya. We aimed to show that measuring natural, social, and human capital is possible and pragmatic:

1. In a parsimonious way: through a limited number of basic indicators that cover at least 80 per cent of the variance observed in the data collected
2. With stable and comparable results across different production sectors and different geographical areas
3. In direct relation to the economic outcome, whether it relates to agricultural productivity in cocoa farming communities or to productivity generated by an increase in well-being at work or as a direct result of a more efficient use of natural resources.

At the time of writing this book, we are undertaking further analysis of human and social capital on a larger scale that involves numerous actors within the same ecosystem. The results obtained so far confirm the above: alongside financial, human and social capitals emerge as essential components in the orchestration of an ecosystem in addressing the various pain points observed and to fulfil a pre-established purpose.

## Notes

1. 'Social Capital and Community Governance', *Economic Journal*, 112: F419–36.
2. The collection of articles compiled in *Foundations of Social Capital* (2003) edited by E. Ostrom and T. K. Ahn provide an insightful overview of the concept of social capital.
3. We highlight the importance of embeddedness (i.e. the insertion of the economic sphere into the social sphere) of land transactions in tropical rural areas, which crucially depend on the social relations between smallholder households within the community in which they live.
4. Interestingly enough, and similarly to inequality, intra-community variability is greater than inter-community variability.
5. These correlations are robust to differences in individual characteristics (gender, age, education, administration rights, risk of expropriation, born in village), and plot characteristics (tree life cycle, size, plantation material, origin of material). Quantitative results of our studies conducted in the various countries and in the associated communities are available upon request.