



A new paradigm for finance: From financial value maximalisation to integrated value balancing

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Abstract

The challenge for sustainable finance is to integrate sustainability into finance. Using a broad definition of sustainability (social and environmental), this integration requires a paradigm change from financial value maximisation to integrated value balancing. Integrated value combines financial, social and environmental value. The new finance paradigm can then be applied to the main fields of finance – corporate finance and asset pricing. This article shows the new corpus for sustainable finance, based on the integrated value paradigm.

The core finance methods remain the same, but they are loaded with social and environmental factors alongside financial factors. The integrated value paradigm results in different capital allocation, valuation and distribution decisions. This leads in turn to more sustainable outcomes.

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1. Introduction

This article highlights the new corpus for sustainable finance, based on the integrated value paradigm. In our first textbook *Principles of Sustainable Finance*, published by Oxford University Press in 2019, we formulate a vision for sustainable finance and provide an overview of the concepts, with a focus on sustainable investing and banking. In our second textbook, *Corporate Finance for Long-Term Value*, published by Springer in 2023, we offer an in-depth corporate finance manual. The second textbook is open-access to share these resources to teachers, students and practitioners. This facilitates sustainable finance education.

The key concepts and formulas are highlighted in this article. Further details and derivation of the formulas can be found in our open-access textbook, which is accompanied by online resources (chapter slides, exercises and case studies). We illustrate the key concepts presented in this article with examples from an integrated value case study of Inditex, the multinational fast-fashion company.

This article starts with discussing the goal function. The new goal function of integrated value is the defining feature contrasting traditional and sustainable finance. It means that social and environmental factors are included in the finance models, alongside financial factors. Only when one starts to aim for social and environmental objectives, they may become within reach.

Next, we move to corporate finance. During our sustainable finance journey, we have learned that companies take centre stage. They are the ones that most directly cause positive and/or negative impacts on society and the planet. A company's strategy and business model determine these impacts. So, the first question is how corporate finance decisions can help to improve the sustainability of a company's business model. The second question is how investors can apply asset pricing methods to select (and engage with) companies that pursue a sustainable business model.

2. The goal function of finance

When you open a conventional finance textbook, you may get the impression that the goal of finance is finance: profit maximisation for shareholders. Traditional finance focuses on financial return and regards the financial and corporate sector as separate from the society of which it is part and the environment in which it is embedded. This separation does not incentivise companies to act in a sustainable manner. An alternative view is to broaden the goal of the company to balancing integrated value (IV), which combines financial value (FV), social value (SV) and environmental value (EV). In that way, the interests of current and future stakeholders can be equal and aligned with sustainable development. Applying this new paradigm of integrated value is the real innovation of sustainable finance.

Corporate governance

There is a long-standing debate in the corporate governance literature about who should set the priorities for the company: shareholders or a broader group of stakeholders including shareholders. Friedman (1970) strongly defends the shareholder model arguing that companies should pursue profit while assuming that only government is responsible for achieving social and environmental value (by addressing externalities through regulation and taxation). Shareholder value maximisation fits in the tradition of classical utilitarianism that maximises aggregate utility (in this case financial value), that is to bring about the greatest amount of value without regard to distribution among stakeholders (Sidgwick, 1907).

In the alternative stakeholder model, companies are viewed to be part of wider society (Freeman, 1984). In a global survey, Bersoff, Sucher and Tufano (2024) find that the public expects companies to work towards solving major societal problems, such as climate change and poverty. This view has sparked a new literature on the responsibility of companies to balance profit and impact (Mayer, 2018; Edmans, 2020; Schoemaker and Schramade, 2023). A broad interpretation of stakeholders does not only include financial agents (shareholders and debtholders) and current social agents (consumers, workers, suppliers and local communities in which the company operates), but also future generations, who care about environmental damage. The stakeholder model fits in the rights approach of Rawls (1971). Applying the rights approach to the company means that the rights of all stakeholders should be respected (financial, social and environmental). It is not allowed to increase the benefit of one group of stakeholders at the expense of other less advantaged groups of stakeholders (even if this would increase the overall number of benefits, as in the consequentialist approach of utilitarianism where only outcomes count).

The shareholder versus stakeholder debate resembles the wider economic debate on GDP. The Stiglitz Report (2009) argues that governments should improve wellbeing, which contains material conditions (production of goods and services as measured by GDP), quality of life (the social dimension) and preservation of natural resources (the ecological dimension).

Sustainability challenges

Society faces multiple sustainability challenges. Before moving to the methods and techniques of sustainable finance, it is important for students to understand the theoretical frameworks of these sustainability challenges. The *planetary boundaries* framework defines a safe operating space for humanity within the boundaries of nine productive ecological capacities of the planet (see for example, Richardson et al., 2023). The framework is based on the intrinsic biophysical processes that regulate the stability of the Earth system on a planetary scale.

As to social challenges, mass production in a competitive economic system has led to long working hours, underpayment and child labour, first in the developed world and later relocated to the developing world. Human rights provide the essential social foundation for all people to lead lives of dignity and opportunity. Raworth (2017) defines the *social*

foundations as the twelve top social priorities, grouped into three clusters, focused on enabling people to be:

- 1) **well**: through food security, adequate income, improved water and sanitation, housing and healthcare;
- 2) **productive**: through education, decent work and modern energy services; and
- 3) **empowered**: through networks, gender equality, social equity, political voice and peace and justice.

Sustainable development combines the concept of planetary boundaries with the complementary concept of social foundations (Sachs, 2015). *Sustainability* means that current and future generations have the resources needed, such as food, water, healthcare and energy, without stressing processes within the Earth system (Brundtland, 1987).

Companies play an important role in the transition to a sustainable economy because social and environmental impacts are generated primarily in the corporate sector (Hart and Zingales, 2017). Many companies will survive the transition by providing valuable solutions; others will not, as their competitive positions are eroded. Sustainability is therefore also about corporate survival. Responsible companies can adopt the goal of integrated value creation, which unites financial, social and environmental value.

Current approach

The main approach to incorporate sustainability has until now been using ESG ratings (the middle column in Table 1). ESG stands for environmental, social and governance. However, ESG ratings are not able to really capture the sustainability of a company's business model. They may help indicate a company's level of environmental, social, and governance risks (that is a company's inward impact of ESG risks on financial value), but not a company's outward impact on society and the planet. At best, ESG ratings provide investors with a quick approximation of a company's ESG risk, but they are difficult to compare, since each rating agency uses a methodology which differs in terms of scope and measurement (Berg, Kölbel, and Rigobon, 2022). Finally, inserting ESG ratings does not measure companies' preparedness for transition.

The transition to a sustainable economy involves the phase-out of unsustainable activities and emerging niches of sustainable activities (the right column in Table 1). The goal function of the financial system becomes integrated value, combining financial, social and environmental value. A responsible company manages and balances financial value (profit) and social and environmental value (impact). Balancing means that when one of the three value dimensions is negative, a company needs to find a credible transition pathway in line with social and planetary boundaries towards positive value.

Risk measures move from historical volatility to forward-looking system risks. Given the limitations of historical or backward-looking risk measures, it makes sense to develop forward-looking risk measures that are able to take sustainability transitions into account.

Such measures include scenario analysis and real options analysis. For example, one could regard a company's negative externalities both as value destruction for society and as options written against the company's financial value. Moreover, one can replace historical parameters in models with forward-looking estimates.

Table 1: From traditional to sustainable finance

	Traditional finance	ESG ratings	Sustainable finance
Long-term vision	Business as usual	Need to reduce emissions	Change to stay within social and planetary boundaries
Route	Business as usual	Gradual change: ESG ratings, regulation and technology will save us	Disruptive transitions: emerging niches & phase out of unsustainable activities
Goal function	Financial value	Financial value	Integrated value
Definition of risk	Measures of historical volatility	Measures of historical volatility	Ecological risks represent system risks not captured in current models

Source: Loorbach, Schoenmaker and Schramade (2020).

3. Corporate finance

This section highlights the main corporate finance models. It starts with the goal function for valuation and discounting. It then discusses the implications for capital structure and investment decision-making.

3.1 Valuation

If we now consider that the goal function of the company is to maximise its integrated value IV :

$$\max IV = FV + b \cdot SV + c \cdot EV \quad (1)$$

Whereby FV refers to financial value, SV to social value and EV to environmental value. b and c are the parameters set by company management. In the basic setting for the shareholder model, $b = c = 0$ (integrated value collapses to financial value: $IV = FV$) whereas for the stakeholder model $b = c = 1$ ($IV = FV + SV + EV$). So, both the shareholder value model and the stakeholder model are special cases of a general value model.

To determine the financial value FV of a project or a company, the core model in corporate finance is the discounted cash flow (DCF) model:

$$FV = \sum_{n=0}^N \frac{CF_n}{(1+r)^n} \quad (2)$$

Whereby CF reflects the cash flows, r the discount rate (also called the cost of capital) and n the number of periods over which cash flows are discounted. The standard DCF model is used to calculate financial value FV .

We here argue that social (S) and environmental (E) issues can be added to this DCF model. The first step is to select material S and E issues (i.e. S and E issues that are most relevant to the company) and not to get lost in the calculation of multiple factors (such detail has little added value and obscures the big picture). The second step is to express S and E issues in their own units Q (e.g. life years saved by medical treatment, hours of payment below the living wage in the supply chain, or carbon emissions by using fossil fuels). The final step is to multiply these units by their respective shadow price SP derived from welfare theory. Welfare economics applies microeconomic techniques to evaluate the wellbeing (welfare) of individuals.

In our context, welfare is defined as the current and future value enjoyed by a company's stakeholders. Shadow prices are based on two welfare categories: respect of rights and wellbeing. The first category of rights include:

- **Human rights:** these refer to the rights of any individual as stated in the International Bill of Human Rights of the United Nations, such as the rights to life, liberty and personal security, to freedom from slavery or degrading treatment;
- **Labour rights:** these are the rights in the Fundamental Conventions of the International Labour Organisation, such as the rights to freely chosen work, to fair wages, to a safe and healthy workplace, to unionise and to freedom of discrimination;
- **Environmental rights:** these refer to the right to a healthy environment and to natural resources, as enshrined in international agreements of the United Nations, such as the Paris Climate Agreement.

The shadow price reflects the cost to restore the original situation or the cost to compensate for the damage done by the breaching of these rights.

The second category is based on the wellbeing of stakeholders. Wellbeing, also known as quality of life, refers to what is intrinsically valuable for someone. This includes wellbeing of employees, customers, and communities (social cohesion). Employment wellbeing is additional wellbeing experienced by employees resulting from their employment and education at the company; this wellbeing is additional to the salary received. Consumer wellbeing is calculated as the consumer surplus, which is the difference between the price of a product and what consumers want to pay for it.

The appendix of Chapter 5 in *Corporate Finance for Long-Term Value* contains a list of shadow prices. The shadow price for one life year, for example, is estimated at \$119,000 and the shadow price per 1 ton of CO₂ equivalent is estimated at \$224. The value flows VF are calculated as follows:

$$VF = Q \cdot SP \quad (3)$$

The social value flows SVF and environmental value flows EVF can be discounted with the DCF model to obtain SV and EV .

$$SV = \sum_{n=0}^N \frac{SVF_n}{(1+r)^n} \quad (4)$$

$$EV = \sum_{n=0}^N \frac{EVF_n}{(1+r)^n} \quad (5)$$

So, we obtain clear formulas to calculate SV and EV .

Discounting

The cash flows and value flows are in the numerator the DCF model. We now need to derive the cost of capital in the denominator to discount these flows. Let's start with the financial discount rate for calculating the financial value FV . A company is financed by equity E and debt D . The enterprise or company value V is represented by:

$$V = E + D \quad (6)$$

The cost of equity r_E and the cost of debt r_D equity are components of the overall cost of capital, which is known as the weighted average cost of capital (WACC):

$$WACC = \frac{E}{V} \cdot r_E + \frac{D}{V} \cdot r_D \quad (7)$$

Next, we introduce the social discount rate for social value SV and environmental value EV . The counterparty of companies' social and environmental value is the wider society, representing current and future generations. This raises two fundamental and ethical questions:

1. should current and future generations be treated equally?
2. what is the appropriate discount rate for society (the social discount rate)?

Many moral philosophers (e.g. Rawls, 1971; Krznaric, 2021) and economists (e.g. Stern, 2006) argue for an equal treatment of current and future generations. In economic terms, this means that the well-being of future generations gets the same weight as the well-being of the present generation. But there is more to social discounting than the time preference δ between current and future generations. Ramsey (1928) derives the social discount rate r^S for the appraisal of social projects:

$$r^S = \delta + \eta \cdot g + L \quad (8)$$

The growth rate g is driven by growth in consumption or productivity (i.e., innovations increase efficiency of production). The latter means that future generations have cheaper and

more innovative solutions than those in the present. A technical detail is that the growth rate is multiplied by the elasticity of marginal utility of consumption η . Finally, the risk parameter L reflects the extreme element of macroeconomic risk of rare disasters. The social discount rate is rather low at 2.2% (see Chapters 4 and 13 of Schoenmaker and Schramade, 2023). A lower social discount rate leads to a higher present value of social and environmental flows (positive or negative) than the present value of similar sized financial flows with a higher financial discount rate.

Applying integrated valuation

We can now apply our tools to calculate the integrated value of a particular company. We use the case of Inditex, the multinational clothing company, as of January 2021. It answers questions such as: how to calculate the integrated value of a company? Which company-reported data to use? How to fill the gaps from missing data in company reporting?

A stakeholder impact map outlines the company’s main stakeholders, their goals and the way the company helps them (positive impact) or hurts them (negative impact). Such an impact map structures the search for Inditex’s material social and environmental issues. Table 2 shows that Inditex’s positive social impact contains consumer surplus, employment satisfaction of its own employees and corporate taxes paid. Its negative social impact relates to poor wages in the supply chain and its negative environmental impact with high carbon emissions and waste.

Table 2: Stakeholder impact map for Inditex

Stakeholders	Goals	Helped or hurt?
Customers	Fast fashion at low prices	They get it – they are the company’s focus of attention
Own employees	Decent pay & working conditions	Reasonably, they meet the official standards
Employees elsewhere in the chain	Decent pay & working conditions	Poor wages & working conditions, left to local suppliers
Suppliers	Profitability, growth and stability	Profitability and growth probably better than alternatives, but not stability: unreliable as orders are easily cancelled
Nature (Inditex: environment)	Operate within planetary boundaries	Hurt by high GHG emissions and waste
Investors (Inditex: shareholders)	High financial returns	So far, yes
Governments (Inditex: community)	Economic activity & taxes	Yes

Some of the positive impact can be calculated using data from the annual report, and only carbon emissions are reported on the negative impact. So, for the remaining issues we need

to take short cuts, such as using data of comparable companies or industry averages. In this case, we look for apparel data elsewhere. A publication by Impact Institute (2019) on the true price of jeans shows the negative social and environmental impacts of jeans production. In the absence of better data, we extrapolate the jeans impacts to apparel in general to estimate value flows. Table 3 provides the resulting annual cash and value flows. For financial value, the cash flows are discounted at Inditex’s financial discount rate of 7.8%. For social and environmental value, the value flows are discounted at the social discount rate of 2.2%.

Table 3: Integrated value calculation for Inditex (in euro billions, 2021)

IV calculation	Annual value flows	Present value
FV (enterprise value)	3.3	79
Positive SV	4.1	283
Negative SV	-2.9	-137
Negative EV	-3.7	-183
IV	0.7	42

Source: Chapter 11 of Schoenmaker and Schramade (2023).

Note: FV is the company’s enterprise value, which is the sum of equity and debt value.

Figure 1: Composition of Inditex’s integrated value

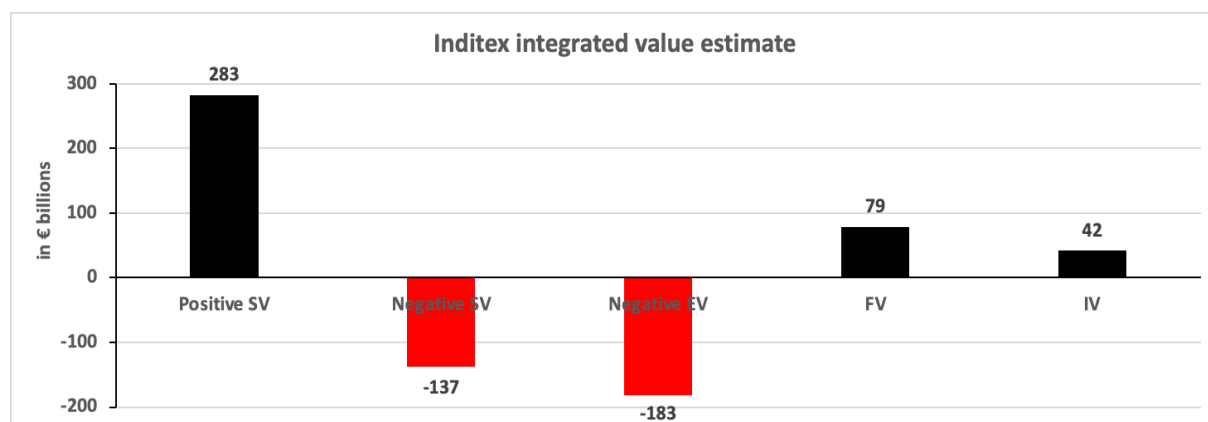


Figure 1 shows the individual value components. These results illustrate the importance of showing all components and not netting values (both positive SV and negative SV are very large). It is remarkable that the SV and EV dimensions are much larger than FV. Inditex’s fast-fashion business model has major impacts on society and the planet.

3.2 Capital structure

Valuation informs corporate decision-making, including decisions on a company’s capital structure. Capital structure is about the funding side of the company’s balance sheet. It’s an important topic, enabling a better understanding of a company’s risk profile and health. The Modigliani-Miller (MM) theorems (Modigliani and Miller, 1958) say that in a perfect world,

financial capital structure is irrelevant for financial value (MM1); and that the cost of equity increases with leverage (MM2). While financial capital structure does affect the cost of equity in proportion to risk, and the split in debt and equity value, it does not change total financial value. From that starting point, several imperfections (e.g. taxes, information asymmetries, bankruptcy costs, agency costs) are considered, that try to explain the conditions under which financial capital structure does matter to financial value.

Financial capital structure refers to the distribution of equity and debt that a company has outstanding. It is also referred to as leverage:

$$Leverage = \frac{Debt}{Value} = \frac{Debt}{Total\ assets} \quad (9)$$

whereby leverage is debt divided by the company's value or total assets. Companies with a high proportion of debt on their balance sheet are said to be highly levered (or leveraged), which is an indicator of a company's risk profile (given the volatility of a company's assets). Table 4 provides a financial balance sheet on market value basis for Inditex.

We can expand the standard financial leverage ratio to an integrated leverage ratio:

$$Integrated\ leverage = \frac{Integrated\ debt}{Integrated\ assets} \quad (10)$$

whereby integrated debt is the sum of S, E and F debt. Debt is basically a liability. Examples of F debt for a company are bank loans or bonds. In a similar way, S and E debt reflect social and environmental liabilities. An example of S debt for a tobacco company is the liability risk, when the company is held accountable for the healthcare cost or compensation to victims. On E debt, an oil and gas company can be held accountable for global warming. By contrast, an asset reflects current or future value. Integrated assets is the sum of S, E and F assets. An example of an E asset is the production of bioenergy that enables clients to save carbon emissions (compared to fossil-based energy). Training its staff is an S asset (human capital) for a company. Table 5 visualises the integrated capital structure of Inditex in an integrated balance sheet.

Table 4: Inditex's market value financial balance sheet (in € billions, 2021)

F assets	79	F debt	-3
		F equity	82
Total F assets	79	Total F liabilities	79

Table 4 shows that Inditex's equity is €82 billion and net debt is -€3 billion (net debt is debt minus cash; the minus sign indicates that Inditex's cash position is higher than its debt load). Inditex's financial leverage ratio is extremely conservative at -4% (calculated as $\frac{-3}{79} = -4\%$). The negative number is due to Inditex's negative net debt position.

Table 5: Integrated balance sheet of Inditex (in € billions, 2021)

F assets	79	F debt	-3
		F equity	82
S assets	283	S debt	137
		S equity	146
E assets	0	E debt	183
		E equity	-183
Total integrated assets	362	Total integrated liabilities	362

Table 5 gives Inditex's integrated balance sheet. Positive S or E impact is an asset, while negative S or E impact is a debt. Values are taken from Table 3: S assets are €283 billion and S debt €137 billion. S equity is then S assets minus S debt: €283 billion - €137 billion = €146 billion. For E there are no assets, only debt of €183 billion, so E equity is -€183 billion. The integrated leverage ratio is $I \text{ debt} / I \text{ assets} = (-3+137+183)/362 = 317/362 = 87\%$. This is a very high leverage ratio. Inditex's leverage looks very risky from an integrated perspective.

We get two diametrically opposed messages from the leverage calculations. The high integrated leverage ratio is caused by the high S debt (workers in the supply chain) and the high E debt (carbon emissions and other environmental damages). Inditex's high integrated leverage ratio raises the question of how to manage leverage from an integrated perspective. A first step for Inditex to address such a high leverage is to reduce liabilities. Given that Inditex has no financial liabilities, it can only reduce E and S liabilities, for example by lowering carbon emissions and improving working conditions in the supply chain (e.g. paying a living wage, abiding by health & safety standards, and respecting human rights). A second step is to increase equity to finance investment for this transition to a sustainable business model. As explained below, a direct way to increase equity is reducing annual dividend payouts (or alternatively issuing new equity).

Payout policy

The previous section was about capital structure and its implications for risk. While that section mainly discusses given *levels* of capital structure, this section focuses on deliberate *changes* in capital structure, i.e. those that do not follow directly from operations and their financial results. Companies can change the composition of their capital structure by adding (issuing) or reducing (paying out) types of funding.

In issues, cash is raised from providers of capital and their claim is increased accordingly. Conversely, in payouts, companies return capital to the financiers; payouts are therefore the opposite of issues. Payouts on equity can be in the form dividends or share repurchases (also called share buybacks). For companies, payouts are a potential use of free cash flow: an alternative to using free cash flow to invest in new projects or to build cash reserves. For investors, payouts in the form of dividends and buybacks are a way to get income from their invested funds.

We start with defining the *payout ratio*, as payouts divided by net income (net profit):

$$Payout\ ratio = \frac{Payouts}{Net\ income} \quad (11)$$

An explanation for the value relevance of payouts lies in their signalling role in alleviating the costs of asymmetric information. Since managers are supposed to have better information about the prospects of the company than outside investors, high and rising dividends effectively signal high company quality, as opposed to low-quality companies that cannot afford to make the signal. Companies may engage in dividend smoothing: they don't link dividends directly to earnings but make sure that they pay a dividend that is at least as high as in the year before. Companies establish long-run *target payout ratios*. Given these target payout ratios, managers prefer to smooth dividends (i.e. no changes to the existing payout ratio) except when there are good reasons which investors would understand (e.g. a major loss).

From an integrated perspective, this question arises: how to manage financial issues and payouts, when managing for long-term value? This perspective should help avoiding highly value destructive payouts. We therefore introduce the *integrated payout ratio*, defined as payouts divided by net integrated income:

$$Integrated\ payout\ ratio = \frac{Payouts}{Net\ integrated\ income} \quad (12)$$

The *net integrated income* is a company's integrated profit, which can be derived from its integrated flows. Similar to the financial payout ratio in equation 11, an integrated payout ratio that (structurally) exceeds 100% indicates payouts to financial stakeholders at the expense of social and environmental stakeholders. Table 6 provides the integrated value flows statement of Inditex for 2021. Net integrated flows are \$0.74 billion. Inditex's financial payout ratio is 67% (=2.19/3.25) and its integrated payout ratio is 296% (=2.19/0.74). The integrated payout ratio is far higher than the financial payout ratio, because the net integrated flows are lower than the net profit. While Inditex's financial payout ratio looks quite reasonable at 67%, Inditex's integrated payout ratio is 296%. The high integrated payout ratio, which is well above 100%, indicates that Inditex's large payout to its financial stakeholders is at the expense of other stakeholders, such as workers in its supply chain and future generations. In even more extreme cases, where companies make an integrated loss, the integrated payout turns negative.

Table 6: Integrated value flows statement of Inditex (in € billions, 2021)

	Flows	Source calculation
(1) Net profit (F)	3.25	Annual report 2021
(2) Net positive social flows (S+)	4.10	Table 3
(3) Net negative social flows (S-)	-2.88	Table 3
(4) Net negative environmental flows (E-)	-3.73	Table 3
(5) Net integrated flows	0.74	(1) to (4)
(6) Dividend	2.19	Annual report 2021
(7) Financial payout ratio	67%	(6) / (1)
(8) Integrated payout ratio	296%	(6) / (5)

The negative S and E flows make Inditex's high financial payout (67% of net profit) questionable. Would it not be better for management to cut the dividend and raise investments to fix the negative S and E flows? And ideally, this is done in such a way that the business model is changed to become resilient and future fit. This is not an extreme example: many companies have a seemingly reasonable financial payout ratio while consistently destroying value on E and/or S.

Ang and Lambooy (2022) argue that society should not tolerate that. They propose an *integrated payout test*: let payout policy depend not just on the level of financial capital (i.e. driven by financial metrics) but also on a test of the level of social and natural capital. This integrated payout test is based on financial, social and environmental metrics.

What kind of signal would a dividend cut by Inditex send to financial markets? It basically acknowledges that Inditex's business model is not sustainable in the long term. Investments are needed to futureproof Inditex's business model. The recently adopted Corporate Sustainability Due Diligence Directive in the European Union anchors human rights and environmental considerations in companies' operations and corporate governance. The new rules will ensure that businesses address adverse impacts of their actions, including in their value chains inside and outside Europe.

3.3 Investment decisions including M&A

When making investment decisions, companies need to be able to compare various investment opportunities. The famous net present value (NPV) rule states that investment projects with a positive *NPV* should be undertaken:

$$NPV = FV > 0 \tag{13}$$

The net present value is based on financial value FV . The next step is to integrate social value SV and environmental value EV in a so-called integrated present value (IPV) rule. The IPV decision model then becomes:

$$IPV = FV + SV + EV > 0 \quad (14)$$

The application of the IPV decision model is similar to the NPV rule in equation 13. Companies should only undertake projects that have positive integrated value. We illustrate the difference between the NPV and IPV rule with the aborted take-over of Unilever by Kraft Heinz in 2017. Mergers and acquisitions (M&A) are basically very large investment decisions.

Kraft Heinz is an example of a low sustainability quality bidder, which applied the standard financial analysis of synergies. Kraft Heinz's strategy was to maximise shareholder value, measured by EPS (earnings per share). Using EPS multiples, Kraft Heinz estimated the financial value of the synergies to be €46 billion. Table 7 presents this financial result in the first columns.

By contrast, an IPV analysis of the synergies based on a DCF model showed a very different result. The final columns of Table 7 present the financial, social, and environmental value creation; numbers are taken from Chapter 18 in Schoenmaker and Schramade (2023). The synergies were estimated at the time to be negative on all three dimensions: financial, social, and environmental value.

Table 7: Synergies for Kraft Heinz – Unilever takeover (in € billions)

Financial analysis based on EPS		IPV analysis based on DCF	
Value	Synergies	Value	Synergies
FV	46	FV	-11
		SV	-38
		EV	-13
NPV	46	IPV	-63

Source: Chapter 18 of Schoenmaker and Schramade (2023).

Note: FV is the company's enterprise value, which is the sum of equity and debt value.

So, the estimated synergies depend very much on how the valuation analysis is conducted. There are two main reasons for the differences. First, the IPV analysis includes not just financial value but all three value dimensions. Second, Kraft Heinz's financial analysis was based on its EPS maximisation strategy: achieving sales growth while cutting costs. Moreover, Kraft Heinz assumed that sales growth could be maintained (i.e. extrapolating these growth numbers to the future) delivering positive financial value, which appeared not to be the case

a few years later. In contrast, the financial part of our IPV analysis was based on Unilever's long-term financial value drivers, which would decline due to diminished attention for social and environmental factors (because of the cost cutting).

While the EPS rule would suggest that the take-over could go ahead, both the IPV rule and the NPV rule showed that the take-over should not go ahead. Unilever rejected the bid, saying that it "fundamentally undervalues Unilever". And many of Unilever's top shareholders said that the bid drastically undervalued the company's assets. Unilever's CEO, Paul Polman played the game well, effectively forcing Kraft Heinz to come out with a bid much earlier than planned. That bid was too low and easily rejected.

4. Asset pricing

Asset pricing studies the price formation process on financial markets and addresses questions such as: What are the determinants of the prices, and thus the expected returns, of securities? What is the trade-off of risk and return that investors face? How is information incorporated in prices (market efficiency)? The basic idea is that risk-averse investors ask compensation for higher risk, in the form of a risk premium on risky assets. We focus here on equity pricing (deriving the stock price), but integrated value also leads to adjustments in bond pricing (see Chapter 8 of Schoenmaker and Schramade, 2023).

4.1 Capital Asset Pricing Model

A key insight of *portfolio theory* is that a company's risk, at least as measured by the distribution of its historical stock returns, can be split into systematic or market-wide risk and idiosyncratic risk. As idiosyncratic risk can be diversified away in a portfolio, investors are only rewarded with a risk premium for the market risk component. The Capital Asset Pricing Model (CAPM) states that in equilibrium all investors hold a combination of the risk-free asset r_f , such as government bonds, and the market portfolio; and that expected returns only contain a risk premium for market risk as measured by beta.

The first step is to derive a stock's co-movement with, or sensitivity to, the market portfolio. This co-movement is the covariance of the stock with the market portfolio. A stock's beta β_i measures the sensitivity of that stock's return, to the return on the market portfolio. Beta thus measures the sensitivity of a stock to market-wide risk factors: to what extent are a company's revenues and costs related to general economic conditions? Next, the market risk premium RP_{MKT} is the expected market return $E[r_{MKT}]$ minus the risk-free rate r_f :

$$\text{Market risk premium:} \quad RP_{MKT} = E[r_{MKT}] - r_f \quad (15)$$

We can now estimate the cost of equity capital for a company. Remember that the investor is only rewarded for the systematic or market risk embedded in the company's stock price. The cost of equity r_i then becomes a combination of the risk-free rate and the market risk:

Cost of equity:
$$r_i = r_f + \beta_i \cdot (E[r_{MKT}] - r_f) \quad (16)$$

= risk-free rate + β_i x the market risk premium

Equation 16 is the central risk-return relationship of the CAPM. The calculation of the cost of equity depends on the time period for which the risk-free rate and the market risk premium are estimated. But historical risk-return analysis has limitations in accurately assessing current and future financial risk. Forward-looking measures of financial risk and return include scenario analysis and options analysis (see Chapters 12 and 19 in Schoenmaker and Schramade, 2023). Historical parameters in models can also be replaced with forward-looking estimates.

Stock prices react primarily to news about financial risks as reported by companies, as well as broader economic news. There is less attention for other risk indicators, such as social and environmental risks. These risk indicators are not themselves financial in nature, but could have financial implications. Following Lukomnik and Hawley (2021), we suggest including social and environmental risks as sources of systematic risk, to get a full picture of a company's financial performance and risk. Figure 2 illustrates the multiple sources of systematic risk.

Figure 2: Sources of systematic risk



Just like financial risk, social and environmental risks can be split into idiosyncratic (firm-specific) risks, which can be diversified, and systemwide risks, which cannot be diversified. An increase in temperature (due to climate change) or a loss of biodiversity now, may lead to lower economic growth (and thus lower financial returns or more financial risk) in the future. These environmental risks are then additional sources of systematic risks, which are priced with a risk premium in the cost of capital or discount rate. By contrast, an instance of water pollution by an individual company is an idiosyncratic risk, which is not priced because it can be diversified.

How to integrate the systematic aspects of social and environmental risks in our cost of equity capital calculations? In the risk-return relationship of the CAPM (equation 16), a stock's return depends on its co-movement with the market. The market risk premium captures a wide range of financial and macroeconomic risks in a single factor. We expand this single-factor model to a multifactor model by adding social and environmental risk factors as sources of systematic risk. In this multifactor model, a company's adjusted cost of equity capital r_i is:

$$\text{Adjusted cost of equity capital: } r_i = r_f + \beta_i^{MKT} \cdot RP_{MKT} + \beta_i^{SF} \cdot RP_{SF} + \beta_i^{EF} \cdot RP_{EF} \quad (17)$$

$$= \text{risk-free rate} + \beta_i^{MKT} \times \text{market risk premium} \\ + \beta_i^{SF} \times \text{social risk premium} + \beta_i^{EF} \times \text{environmental risk premium}$$

The social and environmental risk premiums RP_{SF} and RP_{EF} can be defined in a similar way as the market risk premium RP_{MKT} in equation 15. On the environmental side, Bolton and Kacperczyk (2023) find, for example, that there was no significant carbon premium right before the Paris agreement, but a highly significant and large premium in the years after the agreement. This suggests that the Paris agreement has changed investors' awareness regarding the impending regulatory changes to combat climate change.

The market beta β_i^{MKT} (as in the CAPM) measures the sensitivity of company i to financial and economy-wide risks. The factor betas, β_i^{SF} and β_i^{EF} , measure the sensitivity of the company's (financial!) cost of equity capital to social risk (e.g. public health; social inequality; safety and health of workers; low wages in supply chain) and environmental risk (e.g. carbon emissions; biodiversity loss; pollution; waste). The social and environmental beta coefficients can be interpreted as follows:

- $\beta_i^{SF}, \beta_i^{EF} > 1$ reflect relatively high exposure indicating that this company is not prepared for the sustainability transition
- $0 < \beta_i^{SF}, \beta_i^{EF} < 1$ reflect relatively low exposure indicating this company is partly prepared for transition
- $\beta_i^{SF}, \beta_i^{EF} < 0$ reflect that the company's activities will likely benefit financially from transitions

Please note that this analysis of the financial cost of equity capital integrates social and environmental risk into financial risk. It does not estimate the risk of integrated value (see Chapters 12 and 13 of Schoenmaker and Schramade (2023) on the estimation of integrated risk and the calculation of the cost of integrated capital).

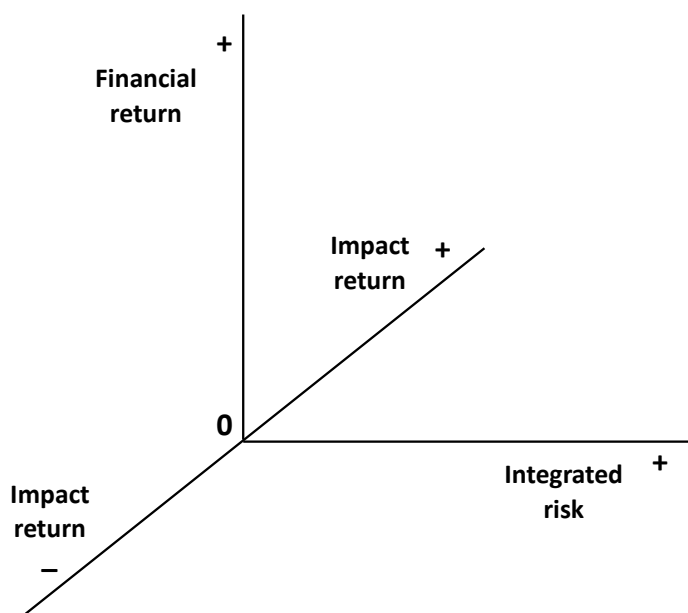
4.2 Impact investing

A new breed of impact investors is emerging. Starting off as a niche with specialised impact investors, it is now expanding to mainstream investors. Pension funds, as long-term investors, have started to expand the two-dimensional financial risk-return framework in equation 16

to a three-dimensional risk-return-impact framework of integrated investing (Figure 3). The rationale behind this trend is twofold. First, long-term investors see positive impact as a creator of long-term value and negative impact as a source of future risk. Second, institutional investors feel the moral responsibility to invest responsibly and to be accountable to stakeholders.

Figure 3 shows the three-dimensional nature of the integrated investment framework: (financial) return, (social and environmental) impact and (integrated) risk. Integrated risk is the risk of having a shortfall in financial return and/or a shortfall in impact.

Figure 3: Integrated investing



Impact investors look for financial return (profit) as well as social and environmental impact. Impact-adjusted return r_i^{iar} combines these dimensions: 1) capital gains (on stocks and bonds), dividend and interest; 2) monetised social impact; and 3) monetised environmental impact during a given year, divided by invested capital:

$$\begin{aligned} \text{Impact-adjusted return: } r_i^{iar} &= \frac{\text{capital gains} + \text{dividend} + \text{interest} + \text{social impact} + \text{ecological impact}}{\text{invested capital}} \\ &= \frac{\Delta FV + \Delta SV + \Delta EV}{FV} \end{aligned} \quad (18)$$

The denominator is invested capital, which is a proxy for the financial value of the company. This reflects the idea that equity and bond investors ‘finance’ the company. This ratio reflects the investors’ ‘bang for their buck’ in the widest sense: what do they get in financial and impact benefits for the capital they invested? The financial value of the company is the enterprise value. The calculation of the impact-adjusted return is straightforward: just list the three value dimensions at the start of the year and the changes realised during the year.

From the investor perspective, the impact-adjusted return in equation 18 expands the (realised) return on equity in equation 16 by adding impact (which can be positive or negative).

Table 8 provides the data for our case study of Inditex. The numerator takes the annual value flows in financial, social and environmental value. We take the free cash flows of €4.8 billion (instead of the capital gains, dividend and interest) for the financial value flows. The social and environmental value flows are also included in the right column. The denominator reflects the invested capital in Inditex of €79 billion in the middle column. The impact-adjusted return is 2.9%.

$$r_i^{iar} = \frac{\Delta FV + \Delta SV + \Delta EV}{FV} = \frac{4.8 + 1.2 - 3.7}{79} = 2.9\%$$

Table 8: Inditex value and annual value flows (in euro billions, 2021)

IV calculation	Value	Annual value flows
FV (enterprise value)	79	4.8
Positive SV	283	4.1
Negative SV	-173	-2.9
Negative EV	-183	-3.7
Invested capital	79	2.3

The financial return is $\frac{\Delta FV}{FV} = \frac{4.8}{79} = 6.1\%$. The financial return is higher than the impact-adjusted return. The lower impact-adjusted return reflects the overall negative annual social and environmental value flows of -€2.5 billion, which reduces the annual financial value flow (free cash flows) of €4.8 billion by more than a half to €2.3 billion. So, there is a big reduction in return.

4.3 Market efficiency

The idea that capital markets are information efficient is the bedrock of modern finance. The efficient markets hypothesis states that stock prices incorporate all relevant information instantaneously (Fama, 1970). The consequence of the efficient markets hypothesis is that investors cannot consistently beat the market.

The mechanism behind efficient markets is that a sufficient number of analysts pay attention to newly arriving information, judge it value relevant, and trade on that information. In that way, the new information gets priced in. But there is evidence that learning takes time and that adaptive markets are a better description than efficient markets. In particular, it seems

that analysts have been slow to pick up sustainability related information. Only after the high-profile Paris climate conference in 2015, have carbon emissions begun to be priced in to some degree. It is not yet clear to what extent other environmental factors, like water scarcity and biodiversity loss, and social factors, like labour practices across the value chain, are reflected in stock prices. The adaptive markets hypothesis states that the degree of market efficiency depends on an evolutionary model of individuals adapting to a changing environment (Lo, 2017). So, the more analysts start to pay attention to an issue, the more and faster it will be priced in.

Another implication of a renewed focus on companies and their transition preparedness is that the traditional tools do not suffice. Investors have to look at companies through a different lens, and go beyond traditional financial statement analysis. Inserting ESG ratings does not measure companies' preparedness for transition, as argued in Section 2. The transition preparedness' assessment requires an in-depth fundamental analysis of the social and environmental dimensions of company business models by equity analysts. Over time, sustainability reporting is expected to increase with new reporting initiatives like the EU Corporate Sustainability Reporting Directive and the International Sustainability Standard Boards. With this increased information, markets will adapt and thus become more efficient.

Access to impact information

However, stock prices only reflect the effects of (sustainability-related) information on the financial value of companies. There is no 'market' (yet) for the diffusion of information on the social and environmental value (impact) of companies. New regulations, scientific research, non-governmental organisations (NGOs) and ratings agencies do produce information on companies' social and environmental impact. Implicit markets on impact information and price-setting are evolving: product markets partly reveal consumer preferences for sustainable products; capital markets partly reveal investor preferences for impact investing; and elections partly reveal voter preferences for sustainable policies. These markets can be used to determine the willingness to pay for impact (and thus derive prices for impact). This is all very relevant to companies as well. Reporting regulations are going to require companies to report on their impact alongside their financials.

5. Long-term value creation

The overview of the new integrated value paradigm in this article provides several conclusions:

1. Applying the integrated value paradigm requires a multidisciplinary approach and mindset, drawing from finance (F), social science (S) and science (E).
2. The classic finance methods for valuation, risk and return remain the same. They are only expanded with social and environmental factors, alongside financial factors.
3. Monetising social and environmental factors with shadow prices can make social value and environmental value comparable to financial value.

4. Social and environmental data are gradually becoming available. New reporting regulations will speed up the availability of these data.
5. Fundamental analysis of company business models is important to assess the social and environmental impact of companies. ESG ratings provide a very imprecise, and sometimes even misleading, view of a company's sustainability.

The ultimate question is whether the integrated value paradigm leads to different outcomes. Throughout the article, we have provided several examples, including the lead case study on Inditex, showing that integrated value methods produce different capital allocation, valuation and distribution decisions. This leads in turn lead to more sustainable outcomes.

We coin this process as long-term value creation. In our dynamic world, regulations, advances in technology and changing consumer preferences accelerate the transition to a sustainable economy. Social and environmental value are indicators of future value creation (positive impact) and future company failures (negative impact). The integrated value paradigm thus contributes to long-term value creation by companies. The new paradigm recognises that companies are embedded in society and the environment. And it provides them the analytical tools to adapt their decision-making accordingly.

Future perspectives for long-term value creation

The financial industry currently operates in an anonymous way, with little responsibility taken by those who have the means to do so: companies have multiple, mostly anonymous, investors; and investors have thousands of companies ('stocks') in their portfolio, which they barely know. By contrast, long-term value creation is based on stewardship, a direct link between financiers and companies. These financiers and companies have a direct dialogue on targeting integrated value without intermediary actors. For banks, this suggests a stronger role for relationship banking. For asset managers and asset owners, it will likely include more concentrated ownership stakes, deeper engagement, and shorter investment chains, based on fundamental analysis of companies. Artificial intelligence (AI) may prove to be useful in company analysis. Experienced analysts can use advanced AI search tools to learn about the social and environmental profile of companies. But it all starts with a mindset and toolbox of integrated thinking.

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