

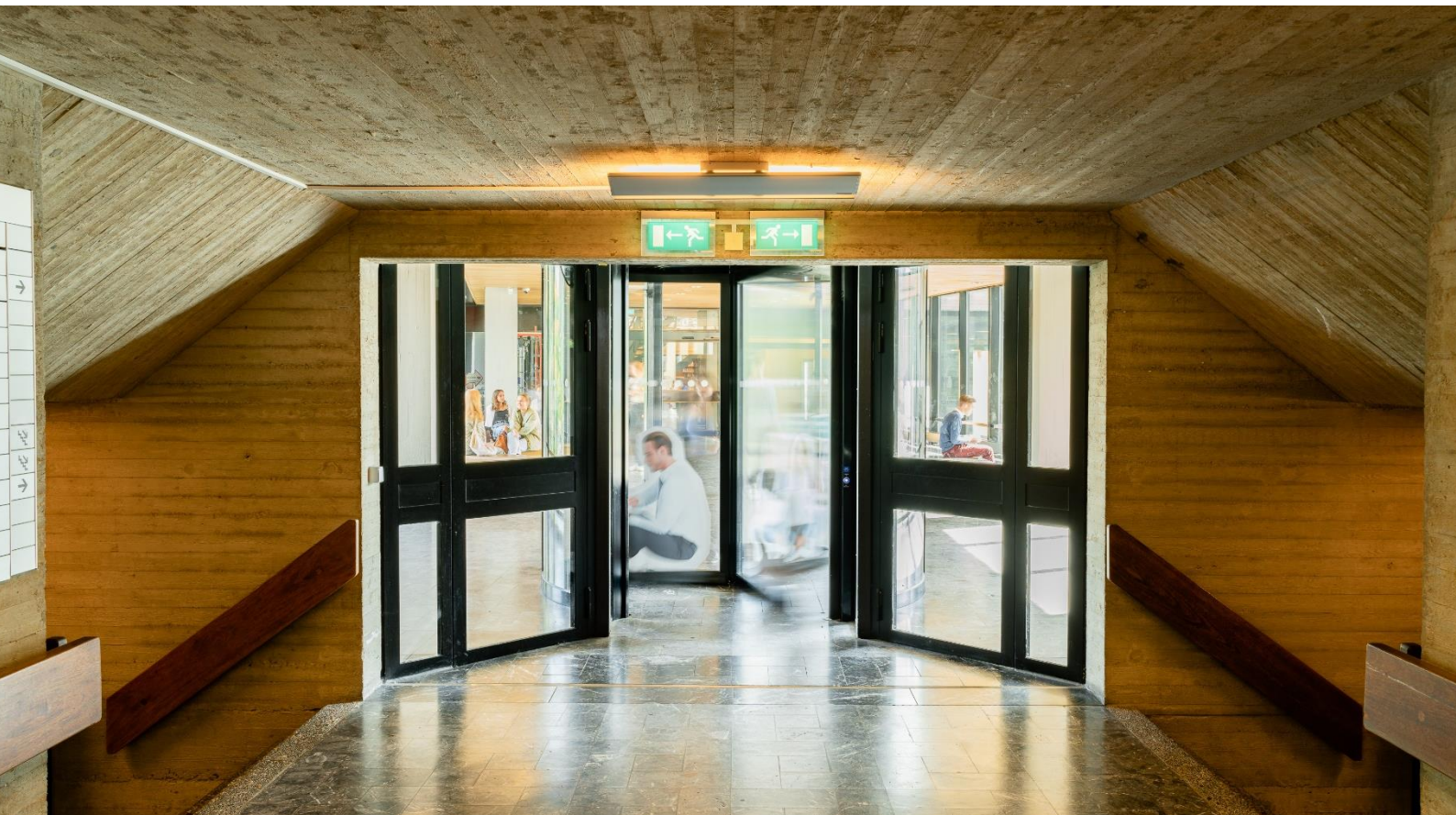


Working paper

Teaching finance for responsible management

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March 2025

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Abstract

The dominant shareholder value paradigm in academic finance is a major obstacle to responsible management. The methodology for responsible management education identifies three aspects to address: building sustainability knowledge, incorporating sustainability in an integrated way, and developing practical applications. Applying this methodology to academic finance education, and based on our own teaching experience, we propose three shifts to the current approach. First, courses should start with sustainable development as the goal, i.e. finance as a means instead of finance for the sake of shareholder value maximisation. Second, courses should offer an alternative perspective to shareholder value, not just slight modifications. We suggest using the integrated value paradigm, which estimates not only financial value, but also social and environmental value, which tends to be an eye-opener to students. Third, practical learning tools could enhance the interdisciplinary learning experience of students. To achieve these shifts, business schools need to show leadership with the right tone and incentives from the top.

Key words: responsible management, finance education, sustainable finance, shareholder value, integrated value

Acknowledgements: We would like to thank two anonymous reviewers, Nicolas Chevrollier, Wilfred Mijnhardt, Oliver Spalt, Peter Roosenboom, and Jan Willem Stoelhorst for useful comments and suggestions.

1 Introduction

Business schools are in a unique position to shape the thinking and decision-making of leaders in organisations around the world (Parkes et al., 2017). But the road to teaching responsible management, which seeks to develop people who will help their organisations create inclusive prosperity within planetary boundaries, is long (Heartle et al., 2017). A major obstacle is the leading paradigm in academic finance: the shareholder value paradigm, which says that the objective of the firm is to maximise the financial value of the firm for its shareholders (Jensen, 2002). The shareholder paradigm states explicitly that “Resolving externality and monopoly problems is the legitimate domain of the government in its rule-setting function” (Jensen, 2002, p.246). But social and environmental externalities are inextricably linked to industrial production and are difficult to overcome fully by external regulation, because of asymmetric information (Hart and Zingales, 2022). Companies know the precise consequences of their operations better than external parties and are therefore better placed to reduce or prevent negative effects by adapting their business models. Another assumption underlying the shareholder model is perfect competition, which leaves no scope for companies to address externalities. But in reality, (large) companies do have market power and political power (Hart and Zingales, 2022).

The shareholder value paradigm thus does not, and cannot, accommodate a broader perspective on value. Under the shareholder model sustainability efforts are only permissible as far as they are instrumental to ‘enlightened shareholder value maximisation’ (Jensen, 2002). Otherwise, these efforts are seen as costly and should not be undertaken – not even if they help avoid massive cost to society at minimum corporate costs. Typical examples of this view are found in asset pricing where it is widely assumed that ‘restricting the investment universe (by exclusions) reduces return’; and in corporate finance where the leading rule is ‘only when the NPV is positive, investment in sustainability should be done’.

Path dependency helps to explain the stickiness of the shareholder value paradigm in academic finance research and finance textbooks (Loorbach, Schoenmaker, and Schramade, 2020). Alternative approaches like the European-based stakeholder perspective (Stoelhorst and Vishwanathan, 2024) or environmental economics (Daly and Farley, 2011) have been ignored in mainstream academic finance. Even in Europe, where the stakeholder approach is culturally embedded and enjoys wide societal support, academic finance is purely shareholder value oriented. It is a standalone discipline with tenure track procedures based on publication in the top finance journals. Gasparini and Tufano (2023) show that these top finance journals have only very recently started to accept papers related to climate finance. By a lack of interdisciplinary research, finance academics are missing out on what is happening in other fields. These other disciplines, such as corporate strategy, accounting, social and environmental sciences, are more exposed to the dynamics of sustainable business practices and regulations. For example, Adams et al. (2011) already argued more than a decade ago that business schools have an important role in the development of leaders able to respond to climate change and sustainability challenges. Meanwhile there is a literature on teaching sustainability in accounting (e.g., Cottafava et al., 2019; Tran and Herzig, 2023), which is lacking in finance with a few notable exceptions (e.g., Belinga and Morsing, 2020; Belinga, Gond and Morsing, 2025). Another, and related, factor that might explain the stickiness of the shareholder value paradigm is fear of the unknown. It is safe to stay

within the realm of financial based models and data, because of familiarity with the field (“I am an expert on finance, but not on climate, biodiversity, living wage or inequality”) and experience in publishing in finance journals.

In this article, we posit that the leading shareholder value paradigm holds academic finance back from joining the trend of responsible management practices. Current efforts to incorporate sustainability focus on the use of ESG ratings to improve risk management (Edmans, 2023). ESG ratings examine the inward impact on company value (thereby staying within the shareholder value paradigm), while the aim of responsible management practices is to improve the outward impact of companies on society and environment (Dyllick and Muff, 2016).

We aim to answer the following research question in this article: *how to teach finance in a way that aligns with responsible management? More specifically, how to teach finance beyond shareholder value, while incorporating outward impacts?*

To answer this research question, we apply a methodology developed for responsible management education (de Paula Arruda Filho, 2017). This methodological approach distinguishes three phases for responsible management education. We operationalise these three phases by identifying bottlenecks in academic finance, and by building on our own experience in teaching finance from a stakeholder perspective. The first and most straightforward phase is building knowledge of sustainability. Sachs (2015) provides an excellent overview of sustainable development.

The second phase is to incorporate sustainability comprehensively into responsible management education. For finance, this means that the value function should measure and value social and environmental externalities alongside financial factors (Gasparini and Tufano, 2023). Calculating the integrated value, which combines financial, social and environmental value (Schoenmaker and Schramade, 2023), requires an interdisciplinary approach. This also requires a dynamic and multi-level perspective given the nature of sustainability transitions (Loorbach, Frantzeskaki, and Avelino, 2017). This is in line with a long-standing economic tradition of creative destruction (Schumpeter, 1942). Risk would move from backward-looking based on historical volatility to forward-looking risk measures, such as scenario analysis and real options analysis. Finally, shareholder primacy in corporate governance should give way to stakeholder-based corporate governance (Stoelhorst and Vishwanathan, 2024). This would align governance with the value function, the first element of the second phase.

The third phase refers to practical application. Perusso and Baaken (2020) review managerial learning experiences, among which cases, problem-based assignments and internships. In particular, the use of group assignments on the integrated valuation of a real company can be instrumental to advance student skills in an interdisciplinary setting (i.e. teams with students from various backgrounds), which we illustrate with the Inditex case study. This case study requires students to estimate not just financial value, but social and environmental value too, as well as the interaction between those types of value. This is bound to give them a more holistic view on company performance for all stakeholders (Belinga and Morsing, 2020) and entice plenty of discussion. When doing these assignments, students experience first-hand how difficult it is to perform an integrated valuation since some social and environmental datapoints are still missing. They also observe the wide divergence in outcomes. While the integrated valuation of some companies may be higher (e.g. in the health and

services sectors) than their financial value, the reverse is true for many companies (e.g. in oil and gas, manufacturing, fast-fashion, food or tobacco). In such sectors, the social and/or environmental value destruction typically dwarfs the company's shareholder value creation.

But a new knowledge-based paradigm is not sufficient to change finance. Muff, Liechti, and Dyllick (2020) show the importance of attitude, in particular related to ethics and values, and skills. Responsible leaders are needed in higher education, financial institutions and corporates to make the shift from the shareholder value to the integrated value paradigm happen. But that is a challenge in an 'econ' dominated environment. In a survey on the morality of a broad range of corporate actions, Iliewa, Kempf and Spalt (2024) find that participants with an econ degree are more likely than those without an econ degree to consider these actions as financial issues rather than moral issues.

This article is organised as follows. Section 2 analyses the critique on the shareholder value paradigm. Section 3 explores the elements of the new integrated value paradigm. Next, Section 4 applies a methodological approach to derive the key elements of the new paradigm in teaching as well as the student and employer perspectives of a changing paradigm. Finally, Section 5 concludes.

2 Critique on the shareholder value paradigm

2.1 Shareholder value paradigm

In finance, the goal is to maximise the value of the company V . The shareholder value paradigm stipulates that the goal of the company is to maximise the financial value of the company. This is the value of the securities provided by the financiers, i.e. shareholders and creditors. Shareholders are supposed to be in control of the company, because they are residual, non-contractual claimants (Jensen and Meckling, 1976). They get paid after all contractual claims to other stakeholders, such as creditors, employees, customers, and government, are paid. Shareholders thus maximise financial value FV in equation 1, after the other stakeholders are satisfied. Unfortunately, it is overlooked that shareholders have the power to squeeze those other stakeholders.

$$V = FV \tag{1}$$

A slightly more positive variant of the shareholder value approach is the refined shareholder value approach, also called enlightened value maximisation by Jensen (2002). In this refined version, companies may put systems in place for energy and emissions management, sustainable purchasing, IT, building and infrastructure to enhanced environmental standards, and all kinds of diversity in employment. However, the underlying objective of these activities remains economic. Though introducing sustainability into business might generate positive side-effects for some sustainability aspects, the main purpose remains financial, namely shareholder value. This typically involves reducing costs and business risks, improving reputation and attractiveness for new or existing human talent, responding to new customer demands and segments – all of that as means to an end: to increase profits, market positions, competitiveness and shareholder value. Business success is still evaluated from a purely economic point of view and remains focused on serving the business itself and its

economic goals (Dyllick and Muff, 2016). Despite the refinements, this is still very far removed from responsible management, and also disconnected from most companies' original purposes. Most companies are started to achieve some non-financial goal or purpose, but as they grow, they are often professionalised, external finance providers takeover, and they lose that original purpose. For example, Unilever's predecessor companies were started to provide better sanitation to poor people – not to serve the shareholder.

The shareholder value paradigm is consistent with the argument of Friedman (1970) that '*the business of business is business*'. Friedman (1970) proposes a classical division of labour, whereby the government takes care of these externalities and companies focus on production. But Zingales (2020) shows that two conditions are needed for the Friedman doctrine to hold. The first is that companies do not have market or political power. The second is that companies do not pose externalities or alternatively that the government could perfectly address these externalities through regulation. Both conditions are violated in practice. Large corporations are too big to regulate (Zingales, 2020). Moreover, governments cannot effectively regulate all companies' externalities due to asymmetric information between governments and companies. The result is massive social and environmental value destruction by corporations, legitimised by the shareholder value paradigm. Yet, many students of finance are not aware of this perverse role of finance, since they see shareholder value as the one and only model, with no alternatives. In addition, finance and economics are presented as 'values free', in spite of being founded on a belief system of perfectly competitive markets with no market failures. Moreover, in neoclassical economics, the economy is conceptualised as a closed system, without feedback loops to nature.

2.2 Backward-looking risk measures

The shareholder value paradigm is very narrowly focused, not just with a narrow concept of value, but also with a narrow concept of risk. The main risk measure in the shareholder value paradigm is the volatility of stock prices. Current efforts to incorporate sustainability are shallow and focus on the use of ESG ratings. Edmans (2023) rightly argues that the use of ESG ratings is part of proper risk management. ESG ratings have sparked a large empirical literature on the effect of ESG ratings on stock prices. Indeed, the focus of these ratings is squarely on the inward impact on company value, which means they stay within the shareholder value paradigm.

The traditional risk-return models are essentially based on patterns of historical financial returns and volatility. Using backward-looking statistics, the implicit assumption is that the risk-return relationships remain the same in the future. But that is subject to the Lucas critique. Lucas (1976) basically argues that the structure of historical relationships will change, when the nature of the assets changes due to policy changes. So historical relationships are not always a good guide for the future. Government policies, technological advances or stakeholder pressure to address sustainability challenges may well turn the tables on the stock market. Profitable companies in the past may become stranded assets in the future (see, for example, Engle (2024) on fossil fuel companies), while new companies providing solutions to the sustainability challenges rise in value (e.g. Tesla with its electric cars).

2.3 Shareholder-based corporate governance

As discussed in Section 2.1, it has been widely accepted in academic finance that shareholders are in control of companies. In the principal agency theory (Jensen and Meckling, 1976), shareholders (the “principals”) provide incentives in the form of stocks or options to company managers (the “agents”) to act in their interest.

The support for the shareholder model was recently reiterated by Bebchuk and Tallarita (2021). The main argument against the alternative stakeholder model is that the board is accountable to none in the case of multiple goals or masters (Bebchuk and Tallarita, 2021; Jensen, 2002), which would give the board the freedom to set its own priorities. We strongly disagree since balancing multiple goals is the normal state in all walks of life, whereas the single goal of shareholder value gives perverse incentives to exploit other stakeholders for worse overall outcomes.

Some try to fix agency theory by changing the principals. Sjøfjell (2024) proposes to add people, the environment and society as principals. In finance, however, the tendency is to try to fix agency theory within the shareholder model. For example, Hart and Zingales (2017; 2022) make a distinction between shareholder value, which aims for maximisation of financial value only, and shareholder welfare, which incorporates social and environmental externalities. An important assumption in their model is that these externalities are not perfectly separable from production decisions. So, companies face a choice in the degree of sustainability in their business model. The mechanism in the Hart-Zingales model to guide that choice is voting by prosocial shareholders, who care about welfare of others, on corporate policy. Prosocial shareholders do not only value profit, but also have a preference for clean companies and a dislike of sin companies (Hart and Zingales, 2017).

However, the preferences of shareholders are not representative for the preferences of a wider group of stakeholders (Döttling, Levit, Malenko, and Rola-Janicka, 2024). Moreover, shareholders face the free-rider problem in deciding on the company’s social and environmental priorities. That is, shareholders bear the full cost of prosocial choices, but only enjoy part of the benefits. This is likely to result in a limited weight for social and environmental priorities.

2.4 Why academic finance is stuck in shareholder value

So why is academic finance stuck in the shareholder value paradigm? Path dependency can help explain current academic finance practices. Modern finance came to prominence in the 1950s to 1970s. It builds on “Newtonian” economics with mechanical metaphors from physics (Bronk, 2009). The goal setting (i.e. shareholder value maximisation) fits in the tradition of neoclassical economics, which assumes that allocative efficiency is obtained through market exchange (Stoelhorst and Vishwanathan, 2024). This is often incorporated as the ‘perfect markets’ assumption. This mathematical approach and neoclassical worldview structure and bias the way in which economists see the world (Bronk, 2009).

Well-known theories of modern finance include the Modern Portfolio Theory (MPT) of Markowitz (1952), the Capital Asset Pricing Model (CAPM) of Sharpe (1964), the Arbitrage Pricing Theory (APT) of Ross (1976), and the Efficient Markets Hypothesis (EMH) of Fama (1970). The ultimate example of Newtonian economics is the Black-Scholes option pricing model (Black and Scholes, 1973).

On the corporate finance side, the Modigliani and Miller Theorems (Modigliani and Miller, 1958) and the Net Present Value (NPV) rule are key theories. The underlying principles in these models are no arbitrage and market equilibrium.

Current finance textbooks are still based on these theories which date back to the 1950s to 1970s. One of the early reference works is *Principles of Corporate Finance* written by Richard Brealey and Stewart Myers. This textbook is one of the leading texts that describes the theory and practice of corporate finance. It was initially published in October 1980 and is now available in its 15th edition (Brealey et al., 2025). Franklin Allen and Alex Edmans joined later editions to incorporate new concepts like asymmetric information, behavioural finance and, most recently, responsible business. But responsible business is discussed in a standalone chapter, whereby responsible business seeks to create shareholder value through creating value for society (the enlightened shareholder view discussed in Section 2). The basic set-up of the book remains the same. More recent textbooks, such as *Corporate Finance* by Berk and DeMarzo (2023), have a similar set up and contain the same main theories as the leading textbook of Brealey and Myers. On the asset pricing front, the picture is similar with the leading textbook *Investments* by Bodie, Kane and Marcus (2024). This book is in its 13th edition.

These ‘Newtonian’ or mathematical models have become the bedrock of modern finance. The Newtonian approach is based on closed systems tending to equilibrium as a result of the constituent parts of the system optimising financial returns. Finance field journals have been quite late in expanding to environmental issues. Gasparini and Tufano (2023) find that prior 2018, the top three finance journals (*Journal of Finance*, *Journal of Financial Economics* and *The Review of Financial Studies*) published very few climate finance papers. The bulk of work prior 2018 was published in journals outside of traditional finance, such as *Nature Climate Change*, *Ecological Economics*, and the *Journal of Environmental Economics and Management*, which often have high impact factors. This suggests that the editors of finance journals, as gatekeepers of the finance discipline, have been slow in picking up these new papers (Belinga and Morsing, 2020).

To achieve tenure track, leading finance departments require one or more publication(s) in the top finance journals. Given that these journals are not interdisciplinary, tenure track practices reinforce finance as a standalone discipline. This is one of the factors behind the path dependency in finance.

2.5 Implications for responsible management education

The main critique is that the shareholder value paradigm cannot deal effectively with social and environmental externalities (e.g., Schoenmaker and Schramade, 2023; Sjøfjell, 2024). When the company objective function remains first and foremost focused on shareholder value, social and environmental value take second place. Shareholder value maximisation fits in the neoclassical tradition assuming perfect markets. Responsible management education should make students aware of at least two things: 1) that standard finance theory is not ‘values free’ but based on a specific worldview; and 2) that there are alternative ways to look at value, risk, and corporate governance.

3 Teaching integrated value for responsible management

3.1 Integrated value

If the classical division between government for externalities and business for profit does not work, then what is the alternative? In a large survey among more than 75,000 people in 28 countries, Bershoff, Sucher and Tufano (2024) ask them about the role of business in society and how business is accounting for stakeholders' interests and performing on key issues. The vast majority (85%) of those surveyed acknowledges that the main job of business is to produce safe and reliable products and create jobs. But they find that its second job is nearly as important: their societal duties (including tackling climate change, addressing discrimination, supporting local communities) are also deemed central by 75% of respondents. The authors conclude that societal expectations haven't superseded traditional economic expectations but are just being added to business's duties. The next question is how business is doing on societal challenges. Bershoff et al. (2024) find a large performance gap of 47 percentage points, which is the difference between respondents that think business should take responsibility (76%) and those that think business is doing well on societal challenges (29%). Finally, despite shareholder primacy in academic finance, Bershoff et al. (2024) report that 73% of respondents globally indicate that the primary duty of a company is to benefit all stakeholders rather than to just maximise profits for its shareholders. That fits into the definition of responsible management education, which seeks to develop people who will help their organisations create inclusive prosperity within planetary boundaries (Heartle et al., 2017).

Hence, the challenge for corporate sustainability, and hence for responsible management education, is to incorporate social and environmental objectives alongside the traditional objective of shareholder value. Schoenmaker and Schramade (2023) develop a measure of integrated value IV , which combines financial value FV , social value SV and environmental value EV :¹

$$IV = FV + b \cdot SV + c \cdot EV \quad (2)$$

whereby b and c are non-negative parameters setting the company's priority for social and environmental value. This integrated value measure allows managers to balance several types of value (financial, social and environmental) at the same time. In this model, the shareholder value paradigm represents an extreme case in which financial value is maximised, effectively putting the parameters for social and environmental value at zero: $b=c=0$. By contrast, the integrated model allows managers to deal with all stakeholder interests $b,c>0$. From an aggregate welfare point of view, integrated value is achieved when the marginal contribution of the value components is equalised, which puts the parameters for social and environmental value at one: $b=c=1$ (Schoenmaker and Schramade, 2023). For students, seeing that shareholder value is just a special (and extreme) case of viewing value, is a

¹ Paziienza et al. (2022) perform a necessary condition analysis for the concept of corporate sustainability. They find that the concept of corporate sustainability can be defined around its economic, social and environmental constitutive pillars.

crucial insight. Hence, widening this view on value should be a major goal of management education.

To make the new objective function operational, an interdisciplinary approach is needed to measure and value the social and environmental value components in equation (2). Impact accounting, based on the accounting, social and environmental disciplines, enables companies to measure social and environmental effects and to express these in monetised form via cost-based pricing techniques (Jansen et al., 2024; Schoenmaker and Schramade, 2023; Serafeim, Zochowski and Downing, 2019). A key barrier for finance academics to conduct an integrated valuation is knowledge of social science to measure, for example, human right breaches and employment wellbeing. On the environmental side, knowledge of sciences to measure carbon emissions, air, water and land pollution, and biodiversity loss is needed. As highlighted in the introduction, the standalone disciplinary approach of finance has hindered valuation of social and environmental externalities (Gasparini and Tufano, 2023). By contrast, we don't observe this restraint at the company level. Peters, Romi and Sanchez (2019) find that companies that hire professionals with sustainability expertise experience improvements in sustainability performance.

Calculating integrated value

Chapter 11 of Corporate for Long-Term Value (Schoenmaker and Schramade, 2023) contains a company case-study of the integrated valuation of Inditex, the international fast-fashion company. It is the largest fast fashion company in the world, and operates over 7,000 stores in almost 100 countries. The fast fashion industry faces major social (S) and environmental (E) challenges, such as heavy pollution and the exploitation of workers. Since the industry is characterised by high levels of outsourcing, those challenges tend to be hidden down the supply chain.

This case-study shows how the social and environmental value can be calculated. In three steps, the value flows are estimated: 1) identification of material E and S issues; 2) quantifying the E and S issues in their own units and estimating them for future years; and 3) putting a shadow price on those units. These steps require students to take an interdisciplinary approach and to go beyond the company's reported financials. Students tend to find especially the second step difficult, both to find suitable units and to estimate their volumes going forward. Once the value flows have been calculated, they can be discounted to arrive at value estimates – see Table 1 for Inditex.

Table 1. Components of integrated value for Inditex (Euro billions, 2021)

Integrated value calculation (equal weights)	Value (Euro billions)
Financial value (enterprise value)	79
Positive social value	283
Negative social value	-137
Negative environmental value	-183
Integrated value	42

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

Source: Schoenmaker and Schramade (2023), Table 11.18, page 316. The calculations are based on

discounted value flows that can be found in Tables 11.6 to 11.17 on the preceding pages.

In brief sessions we simply show students the results after an explanation of the process. This empowers students to make these calculations in groups for other companies in deep dive classes. In both settings, it is typically an eye-opener for students that these value components can be very large relative to the company's financial value, both positively and negatively (as in Table 1).

Managing for integrated value creation

Responsible companies manage for integrated value creation (profit and impact) rather than merely shareholder value (profit) (see, for example, Kurznack et al., 2021; Mayer, 2018 and 2023). Managing for integrated value creation involves managing and balancing all value components in equation (2), FV, SV and EV, at the same time, often involving trade-offs. Ideally, the value components are aligned. Companies that create more social and environmental value are also financially more successful since they deliver what customers value. While such alignment is possible, it is often absent due to distortions such as market power (where companies can extract too much value from consumers, suppliers, etc.) or external impacts. Fossil fuels, tobacco, and the garment industry are classic examples of industries with large negative impacts.

However, such misalignment is not static. It is important to adopt a dynamic and systemic perspective in corporate strategy. We distinguish four driving forces behind the internalisation of SV and EV into FV:

1. Licence to operate;
2. Regulation and taxation;
3. Technological advancement; and
4. Customer preferences.

Society expects leading companies to contribute to the major transitions, as discussed above. By contrast, companies that create FV at the expense of SV or EV are likely to lose their license to operate at some stage (Kurznack et al., 2021). An example is the tobacco industry in Figure 1. In the realm of regulation and taxation, carbon taxes are accelerating the adoption of low-carbon production technologies and the phasing-out of carbon-intensive ones. Technological advances in combination with economies of scale make wind and solar energy competitive with fossil energy for electricity generation. Another example is the rise of electric cars (see Figure 1). Finally, changing customer preferences for sustainable products and services are also relevant. An emerging trend is the sharing or peer-to-peer economy (Weber, 2016), whereby participants mutualise access to products or services, rather than having individual ownership. This reduces materials use, since consumers do not need to buy the products or services individually. Such analyses clearly transcend the boundaries of the finance discipline and require an interdisciplinary perspective. Ideally, teachers explicitly ask their students for the links with fields such as strategy, marketing, sustainability, and transition theory (see Section 3.2 on transitions).

Figure 1: Long-term alignment between profit and impact

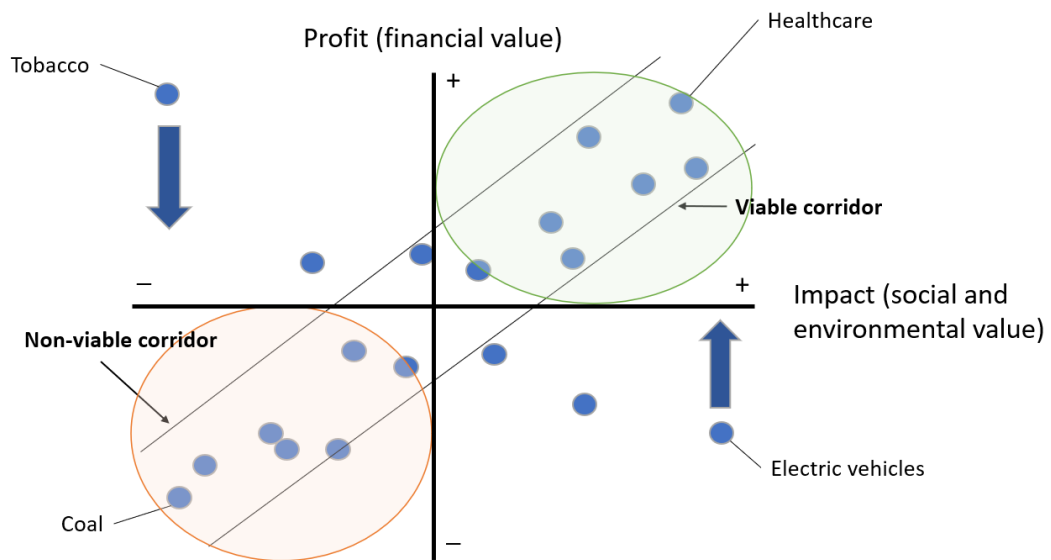
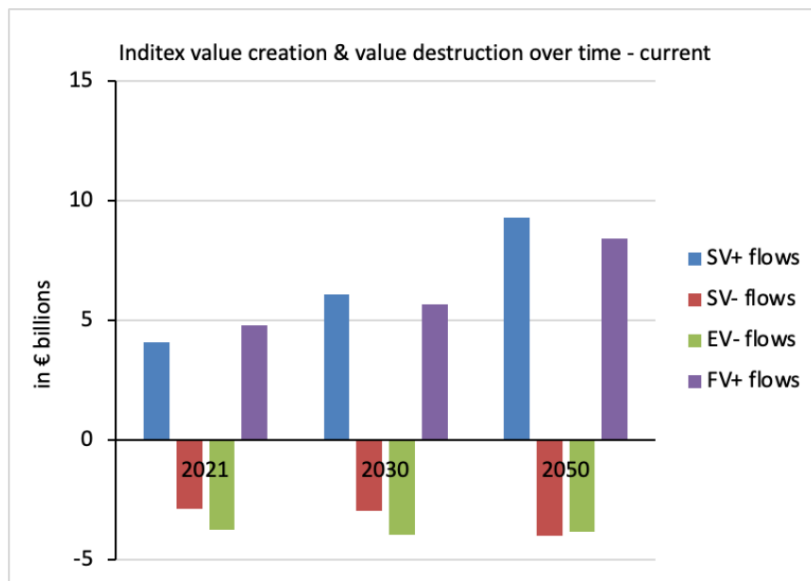


Figure 1 illustrates the long-term alignment between profit (FV) and impact (SV and EV). The diagonal provides the long-term corridor, where FV and SV and EV become aligned through internalisation of external impacts. The alignment can be on the positive side (the viable part of the corridor) or on the negative side (the nonviable part of the corridor, with products that are to become obsolete). Healthcare is in the positive quadrant where companies can combine profit and impact. Example of healthcare companies include medtech companies that produce medical equipment and pharmaceutical companies that develop and produce medicines.

Applying this thinking to the Inditex case, we find that Inditex is currently in the top left quadrant, which suggests significant risk of internalisation. We thus ask students to assess the nature of the internalisation risks at the company (that is, of Inditex or of the company that they study). To what extent are the four abovementioned forces at work yet? And how can the company change (elements of) its business model to make it move to the right, i.e. towards the viable corridor? Of course, one could ask those questions without a financial model as well, but the financial model helps to make the case more urgently and to show the pathways more explicitly.

Figure 2 shows our estimates of Inditex' value flows at the company's current trajectory. This is unsustainable: the company's improvement efforts are nullified by its volume growth, and its EV- and SV- flows continue to be very large in 2030 and 2050. This is at odds with a company and an economy within social and planetary boundaries. This is unlikely to be tolerated by society, and hence the company's license to operate will be at risk. Responsible management means that this should be fixed. But how? We now ask the students not only to come up with alternative business models, but also to show alternative, more favourable value flow projections.

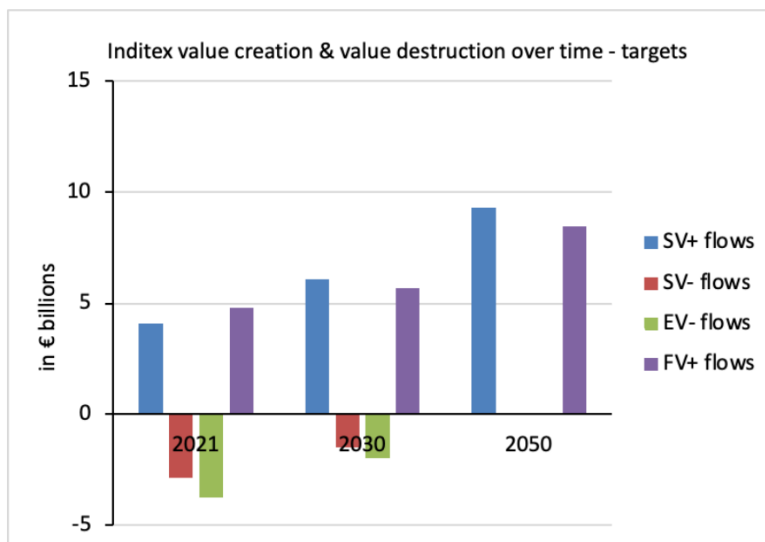
Figure 2: Inditex’s composition of annual value flows over time – current trajectory



Source: Schoenmaker and Schramade (2023), Figure 11.9, page 318.

For Inditex, we model an alternative pathway that does eliminate the negative externalities (see Figure 3), but it requires significant business model change. That business model change would include, for example, lower frequency of new collections; responsible supply chain management with decent pay for suppliers and suppliers’ employees; experiments -and subsequent scaling- of rental clothing and circular production (Chapter 11 in Schoenmaker and Schramade, 2023).

Figure 3: Inditex’s composition of annual value flows over time – ambitious trajectory



Source: Schoenmaker and Schramade (2023), Figure 11.10, page 318.

Students make these projections for their companies too, forcing them to put high demands on the business model change that is needed. This is the opposite of the typical reaction: staying in business as usual because change seems too risky in a competitive market. These analyses typically

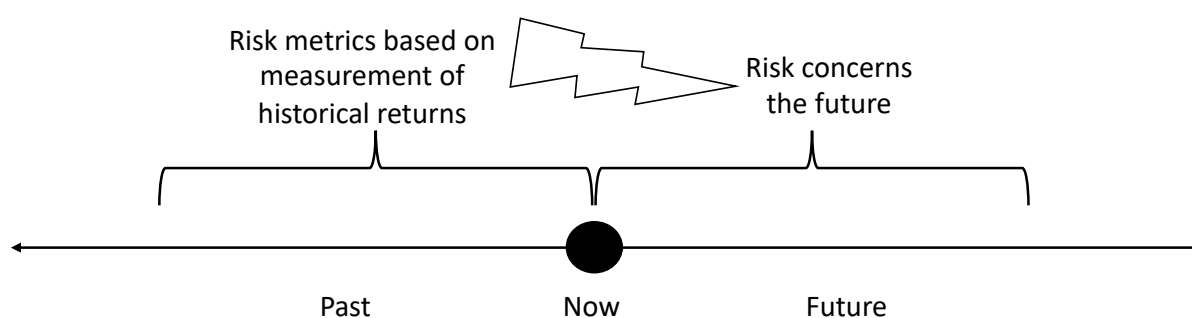
teach students that the opportunity cost of not changing now is more costly than change later or going out of business altogether.

3.2 Forward-looking risk measures

This dynamic view can and should be applied to risk as well, which includes accounting for transitions. Finance students are often not well versed in transition thinking, let alone how to include transitions in their financial analysis. To guide the transition towards a sustainable and inclusive economy, the United Nations has developed the Sustainable Development Goals (SDGs), as a strategic agenda for 2030 (UN, 2015). Several transitions can be identified. Examples are the energy transition for climate mitigations, the circular transition to reduce the use of raw materials, the agricultural transition to reduced biodiversity loss and the social transition towards decent labour practices across the value chain of production. Transitions are about transformational change rather than incremental change and may involve massive value destruction. It is seen as an iterative process of building up a new regime and breaking down an old regime over a period of time, with disruptions along the way (Loorbach, Frantzeskaki and Avelino, 2017). Regime refers to the dominant cultures, structures and practices in a societal system. Regimes are our shared 'comfort zone' that develop historically and give structure, stability and continuity to how we organise societal functions like energy, mobility, or finance. Transition involves parts of the regime being phased out while other parts grow; with pockets of extreme value destruction; and risks that are not well captured by backward-looking risk measures. Transitions are, of course, not only constrained to moving to a sustainable economy. Other examples of major transitions in society are digitalisation and ageing population.

Given the limitations of historical or backward-looking risk measures as discussed in Section 2.2, it makes sense to develop forward-looking risk measures that are able to take transitions into account. Figure 4 illustrates the time connection between backward- and forward-looking risk. Forward-looking risk measures tend to be of a more qualitative nature. But there are ways to quantify them, such as scenario analysis and real options analysis.

Figure 4: Backward and forward-looking risk



Scenario analysis is a process of analysing possible future events by considering alternative possible outcomes, sometimes called 'alternative worlds'. Scenario analysis can be used to analyse the effects of possible future events on the value of a company (TCFD, 2020). An important parameter is

the time horizon. The time horizon should be short enough to be plausible, and long enough for important changes with an impact on future business to take place. For climate transition scenarios, typical horizons are 2030 and 2050.

In the Inditex case-study, we apply transition valuation scenarios, i.e. we estimate the company's financial value (single materiality) under various transition scenarios. Such valuation scenarios need to be simple to allow for quantification that makes intuitive sense. Table 2 describes such simple scenarios, along two dimensions: whether effective global climate mitigation occurs by 2030; and whether the company is well prepared for it.

Table 2. Transition valuation scenarios for Inditex

	Effective global climate mitigation by 2030 (successful transition)	Mere climate adaptation, no serious mitigation by 2030 (unsuccessful transition)
Company is well prepared for climate mitigation	Scenario 1a: serious investment in recycling and in rental models; cutback on new collections; more ownership in the value chain	Scenario 2a: strategy as in 1a, but with less payoff
Company is ill prepared	Scenario 1b: continued to operate in business-as-usual mode, missed trends, and paid high price	Scenario 2b: strategy as in 1b, but at no penalty

Source: Schoenmaker and Schramade (2023), Table 11.7, page 305.

To get to a scenario weighted valuation, we need to make models for each scenario and assign probabilities to them. We assign a 40% probability to effective global climate mitigation by 2030, and a 60% probability that Inditex is well prepared for it. Note however that this is not necessarily a good thing for financial value, since in scenario 2a the company prepares for a transition that does not happen. Hence, the probability of scenario 1a is then $40\% \times 60\% = 24\%$. The probabilities of the other scenarios can be calculated through the same method. Table 3 shows how the valuation model differs per scenario, and what (probability-weighted) fair value results from all four scenarios together.

This kind of analysis gives students an alternative view on risk. Ideally, such scenario analysis is done not just for financial value, but also for integrated value. In addition, other feedback loops might be considered. For example, the analysis of E and S liabilities could highlight off-balance sheet risks, and students might adjust the cost of capital accordingly. Scenario analysis also gives agency, in that it helps to better prepare for the future or even partially shape it. In the technique of back casting (Loorbach, Frantzeskaki and Avelino, 2017), students are encouraged to envisage the future and then analyse what steps are needed now and in the near future to get to a desired outcome.

Table 3. Transition scenarios weighted valuation for Inditex

Scenario	DCF fair value per share	Probability	Main value driver assumptions (baseline from the basic scenario: 4.5% growth; 16.5% EBIT margin; 4% capex/sales)
1a (Well prepared; successful transition)	€28.4	24% (60%*40%)	3 years of 3% growth rate, then back to 4.5% 3 years of 13% margins, then 20% 3 years of 6% capex/sales, then back to 4%
1b (Ill prepared; successful transition)	€10.4	16% (40%*40%)	-20% growth in 2023 and -15% growth in 2024, then 0% onwards* 3 years of 8% margins, then 11%
2a (Well prepared; unsuccessful transition)	€22.5	36% (60%*60%)	10 years of 3% growth rate 3 years of 13% margins, then back to 16.5% 3 years of 6% capex/sales, then back to 4%
2b (Ill prepared; unsuccessful transition)	€31.9	24% (40%*60%)	6% sales growth 18% margins
Overall	€24.2		

Note: Authors' assumptions. *Of course, we could also model the drop to come later, much closer to 2030, with the same valuation impact. And yes, much worse scenarios are possible, in which the company fully misses the trend and fails.

Source: Schoenmaker and Schramade (2023), Table 11.8, page 306.

Good scenario planning involves designing diverse scenarios that capture the main sources of risk. And you should be able to assign probabilities to the scenarios. Students can learn to do this in case-studies. The challenge is also to account for real uncertainty in scenarios. Can you, for example, account for tail risks (Taleb, 2007)? In terms of probability distribution, tail risk involves an abrupt move of more than three standard deviations, while most risks are within one or two standard deviations from the mean. Real option analysis can be used to deal with uncertainty when the probability distribution is unknown (Triantis and Borison, 2001). A real option is an economically valuable right to make or else abandon some choice that is available to the managers of a company, exemplifying the value of flexibility. Real options come in various types, such as the option to delay, the option to expand and the option to abandon. They can be applied in valuation and in investment decisions, including M&A. So, finance already has good tools that help teach the integration of transition thinking in financial analysis. The next step is for teachers and students to start using that toolbox in the context of transitions.

There are also new risk concepts beyond transitions. Axelsson et al. (2024), for example, introduce the concept of risk of reversal of carbon emissions in carbon removal projects. While adopting low-carbon technologies is first best to reach net zero, there has been growing interest in carbon offsetting strategies. The risk of reversal measures the quality of carbon removal and storage projects. While nature-based solutions have the lowest risk of removal, there are still variations among

such solutions. Carbon removal to the biosphere (e.g. afforestation with non-native single species plantations) has a higher risk of reversal than carbon removal to the geosphere (e.g. direct air carbon capture and storage (DACCS)). Carbon removal projects with a high risk of reversal may give rise to greenwashing.

3.3 Stakeholder-based corporate governance

When companies manage for integrated value, control should also be expanded beyond shareholders to the relevant stakeholders. These include employees, customers, local communities in which companies operate, and future generations, who are indirectly affected by the company's conduct, for example through ecological damage and climate change. Stoelhorst and Vishwanathan (2024) build a stakeholder theory of corporate governance. They show that giving primacy to shareholders, or any group of stakeholders, is a comparatively inefficient solution to governing modern companies. Given that regulation is not always capable in dealing with externalities (see Section 2.1), companies need a corporate governance mechanism to balance the interests of the different stakeholders. A coalition of stakeholders is a possible solution to deal effectively with externalities (Stoelhorst and Vishwanathan, 2024). Integrated value creation is then governed by the company's relevant stakeholders.

The main argument against stakeholder-based governance is that the board is supposedly accountable to none in the case of multiple goals or masters (Bebchuk and Tallarita, 2021). However, the integrated value measure does allow for accountability. In corporate governance terms, the executive directors set the parameters b and c of equation (2) as part of company strategy (Schoenmaker, Schramade and Winter, 2023). This parameter setting is subsequently challenged in a strategy dialogue with the non-executive directors (in a one-tier board) or the supervisory board (in a two-tier board). In addition, stakeholder driven companies often have a stakeholder council with the relevant stakeholders, where the company's priorities are discussed. Stakeholders can thus indirectly influence the setting of the parameters. By setting the parameters (b "and" c) in advance executive management can be held accountable by non-executive directors or the supervisory board on delivery of integrated value IV . The annual general meeting of shareholders and, if applicable, the stakeholder council can also use the reporting on realised integrated value to hold the board accountable. This is not just a theoretically nice idea. In practice, stakeholder-oriented governance practices are found in many countries. For example, quite a few companies in the Nordic and German speaking countries are owned by foundations that were set up by their founders in the 19th and 20th centuries, with the explicit goal to avoid mission drift (e.g., Thomsen et al., 2018). Examples include Carlsberg, Maersk and Novo Nordisk in Denmark, and Bosch in Germany. Such models fall under the umbrella term of steward ownership, which is slowly being popularised (e.g., Mayer, 2023). But unfortunately, most finance students are unaware of these models.

In the Inditex case, we stress that the founding family still has a strong say in the company, both with its stock ownership and in management, where the founder was recently succeeded by his daughter as CEO (Schoenmaker and Schramade, 2023). As the family still holds the majority of voting rights, there is less pressure from external shareholders to purely maximise shareholder value. Hence, the potential for change is there, but it is dependent on the new leadership. Current family values seem to prioritise the customer's experience by bringing fast and attractive fashion, with frequent renewal of collections (Schoenmaker and Schramade, 2023). This priority to the supposed needs of customers

hinders the improvement of worker rights; the reduction of pollution in the supply chain; and the company's efforts to educate customers to become more conscious consumers. In the assignment, we ask students to investigate the corporate governance context and take that into account in their company study.

3.4 Academic advances beyond shareholder value

These advances in analysing integrated value, forward looking risk measures, and stakeholder governance are slowly being made, but they are not very well diffused yet. Unfortunately, they seem to be taught to just a tiny proportion of the business school student population. Changing this is a long and challenging road. A major hurdle is that alternative approaches, like the integrated value paradigm, require an interdisciplinary approach. Impact valuation, for example, draws on accounting, social science and environmental science. The dynamics of integrated value are studied in strategic management and entrepreneurship. To stimulate research on sustainable finance, new journals have been established. Leading examples are the *Journal of Sustainable Finance & Investment* (which started in 2011) and the *Journal of Sustainable Finance & Accounting* (which started in 2024). This process mirrors the evolution of behavioural finance, which also started as a niche with its first publications in the 1970s and its own journal – the *Journal of Behavioral Finance* – in 2000². Over the last twenty years, behavioural finance has become mainstream and is now an integral part of finance textbooks. Then again, behavioural finance does not challenge shareholder primacy, which makes it more palpable to finance academics.

Academic frontrunners have adapted key finance theories to deal with sustainability. We list some examples. Lukomnik and Hawley (2021) move beyond MPT by integrating sustainability as systemic risk factor. Blitz et al. (2024) expand the two-dimensional mean-variance CAPM to a three-dimensional risk-return-impact framework.³ Schoemaker and Schramade (2023) extend the NPV rule to the IPV (Integrated Present Value) rule for investment decisions.

Another interesting example is Andrew Lo (2017), who updates the EMH to the AMH (Adaptive Markets Hypothesis). The EMH states that share prices reflect all available information instantaneously. The EMH thus incorporates new information in market prices with the speed of 'light'. By contrast, the AMH incorporates new information with the speed of 'thinking' (Lo, 2017). The incorporation of sustainability-related information in stock prices depends on the number and quality of analysts studying sustainability trends. In this context, new articles are emerging on investor attention. Carbon risk, for example, has started to be priced since the 2015 Paris Climate Agreement (e.g. Bolton and Kacperczyk, 2023), as has biodiversity risk since the 2022 Kunming-Montreal Global Biodiversity Framework.

The evolution from EMH to AMH reflects the move from mechanistic 'Newtonian' economics to more philosophy- and organic-based approaches (Bronk, 2009). For example, the integrated value paradigm fits in the rights approach of Rawls (1971). Applying the rights approach to the company

² The publication history is interesting moving from 'psychology' to 'behaviour'. The journal was formerly known as *Journal of Psychology and Financial Markets* (2000 - 2002) and currently known as *Journal of Behavioral Finance* (2003 - current).

³ See also Busch et al. (2021) on impact investing.

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 amount of benefits).

(Dis)equilibrium

Another extension is complexity economics (Arthur, 2021), which captures the interactions and feedback loops between the value components, FV, SV and EV. Neoclassical economics assumes perfectly rational agents (firms, consumers, investors) who face well-defined problems and arrive at optimal behaviour consistent with — in equilibrium with — the overall outcome caused by this behaviour. This rational, equilibrium system produces an elegant economics, but is restrictive and often unrealistic. Complexity economics (Arthur, 2021) relaxes these assumptions. It assumes that agents differ, that they have imperfect information about other agents and must, therefore, try to make sense of the situation they face. Agents explore, react and constantly change their actions and strategies in response to the outcome they mutually create. The resulting outcome may not be in equilibrium and may display patterns and emergent phenomena not visible to equilibrium analysis. The economy becomes something not given and existing but constantly forming from a developing set of actions, strategies and beliefs — something not mechanistic, static, timeless and perfect but organic, always creating itself, alive and full of messy vitality (Arthur, 2021). Ecological economics also stresses such adaptive processes, but goes even further by addressing the relationships between ecosystems and economic systems (e.g., Wilson and Snower, 2024).

The transition to sustainable business models, if successful at a large scale, can accelerate the transition to a new sustainable equilibrium in the economy (Kurznack et al., 2021). This would be an endogenously driven change in the economy. By contrast, existing investing theories, like the CAPM, do not allow for the possibility of endogenous sustainability transitions bringing the economy to a new equilibrium. Investors have a purely passive role: they hold the market portfolio in equilibrium, and they bear no responsibility for real-world outcomes. The reason is simple: those real-world outcomes are not in the model or the objective function. At best, those real-world outcomes show up as shocks to companies' financial, social or environmental value and they are assumed to be exogenous. Any deviations from the CAPM equilibrium are called investor preferences, leading to ESG investors bidding up the stock price of high ESG-rated companies today. The higher stock price leads in turn to lower expected returns tomorrow as the stock price is ultimately expected to move back to its original price in equilibrium (Pástor, Stambaugh, and Taylor, 2021).

Our recommendation is that the teaching of investing theories (asset pricing) should go beyond existing equilibrium models, like the CAPM, and include more flexible models that accommodate transition (Kurznack et al., 2021) and climate tipping points (Armstrong McKay et al., 2022).

Marginal versus aggregate impact

A touchstone of modern economics is the consideration of marginal impacts. As discussed in Section 2.2, ESG ratings may be useful to analyse the (marginal) impact of sustainability on risk. However, because of the scale of climate-related investments required, Gasparini and Tufano (2023) argue that we need to consider aggregate impacts as well as incremental impacts. These investments may require

reductions in other spending and will have macro-economic and macro-social impacts. In effect, micro- and macro- analyses will blend together uneasily. Considering only marginal impacts of non-marginal investments might lead to biased appraisals of projects with qualitative and quantitative errors. For example, the clean energy transition might significantly change relative prices of certain commodities such as copper, cobalt, lithium, and nickel. These effects are not generally considered in marginal cost-benefit analysis.

3.5 Implications for responsible management education

The advances in sustainable finance research look promising, but they have hardly resulted in changes in finance teaching. There has been an increase in separate sustainable finance courses, but these are typically taught as electives, with little to no impact on the rest of the curriculum. And such courses typically stay within the shareholder value paradigm, often merely analysing the effects of sustainability on shareholder value (see Section 2.2). An interesting initiative is the Impact & Sustainable Finance Faculty Consortium⁴, a community of educators in the Impact Investing and Sustainable Finance realms who try to share and learn with one another, by means of conferences and the sharing of syllabuses.

4 Taking finance education forward

4.1 Challenges to teaching responsible management

Heartle et al. (2017) describe the long road to teaching responsible management, which started in the mid-2000s, as the UN Global Compact and its academic community recognised that the business leaders of tomorrow would need to play a critical role in tackling sustainability challenges. In 2007 former UN Secretary-General Ban Ki-moon launched the Principles for Responsible Management Education (PRME) initiative, with a mission to inspire and champion responsible management education, research and thought leadership globally. PRME now has over 800 signatory members, which develop and share approaches to integrating the SDGs in their teaching.

Still, teaching responsible management at business schools remains challenging, not just in finance. In 'The Engaged Scholar', Hoffman (2021) describes how over the past century the societal role of academia has declined, with 'increasingly siloed research communities', and 'internal departmental divisions that hinder the ability to focus on social problems that are multidisciplinary in nature'. In addition, Vos and Page (2020) signal a marketisation of universities, involving 'performative management practices that require universities to report on an expanding range of metrics designed to demonstrate value to students and the general public'. And they argue that this applies even more to business schools, which have increasingly become universities' cash cows. These developments are detrimental to ideal teaching conditions. Vos and Page (2020) identify the following ideal conditions for teaching practices development in business schools: autonomy over what to teach; engaged students and institutional support for skills development; more time to carry out the teaching role;

⁴[Impact & Sustainable Finance Faculty Consortium \(impactandsustainablefinance.org\)](https://www.impactandsustainablefinance.org)

regular interactions and sharing of ideas with colleagues; fewer metrics and data requests; and resources to ensure the teaching practice is up to date.

For responsible leadership, Muff, Liechti, and Dyllick (2020) show the importance of attitude, in particular related to ethics and values, and skills. Indeed, responsible leaders are needed in higher education, financial institutions and corporates to make the shift from the shareholder value to the integrated value paradigm happen. But that is a challenge in an 'econ' dominated environment. In a survey on the morality of a broad range of corporate actions, Iliewa, Kempf and Spalt (2024) find that participants with an econ degree are more likely than those without an econ degree to consider these actions as financial issues rather than moral issues.

Part of that attitude problem is a greenwashing tendency at both corporations and business schools in that they tend to cheer marginal improvements, unaware of the large steps that still need to be taken before operating within social and planetary boundaries. They might point out that they offer courses with the label 'SDG' or 'sustainable' in the name, while leaving the core curriculum unaffected. As corporations are increasingly finding out, referring to the SDGs is not the same as actually contributing to them, and staying within planetary boundaries is even harder, requiring analyses of thresholds and allocations, and subsequently changing business models – and business schools should be able to help companies in doing that.

Fortunately, progress is being made, at least in accounting education, with case-based learning. Teaching with cases is an effective method to help students achieve learning outcomes towards sustainable development (Prado et al., 2020; Perusso and Baaken, 2020). And the case-based learning immerses students in realistic business situations, including incomplete information and time constraints (Anderson and Schiano, 2014). Tran and Herzig (2023) find that the effectiveness of blended case-based learning is driven by student characteristics, educator roles, and design features. This is likely to apply to finance education as well. However, it should be noted that the fields of accounting and finance differ in terms of their goals, methods, beliefs and identity. Hence, there are tensions between both fields, which limit the transmission of ideas and practices between them. In Section 4.2, we provide a critical discussion of several practical learning tools (Perusso and Baaken, 2020).

4.2 Methodology for responsible finance education

To derive the key elements of responsible finance education, we apply a methodology developed for responsible management education. De Paula Arruda Filho (2017) distinguishes three phases for responsible management education. The first phase is building knowledge of sustainability. The second phase is to incorporate sustainability comprehensively into responsible management education. The third phase is practical application.

After an extensive review of sustainable finance teaching practices, Belinga and Morsing (2020) recommend new learning goals for designing sustainable finance courses. In line with de Paula Arruda Filho (2017), they identify three main elements. The first is to introduce sustainable finance definitions, issues and strategies to raise awareness. The second is more technical introducing sustainability metrics (applying measurement techniques for sustainability) and financial techniques (adapting financial analysis and calculus to sustainability). The third, and more holistic, learning goal is an interdisciplinary approach to sustainable finance to learn different skillsets and stir critical thinking.

This article suggests going one step further. We should not only introduce sustainable finance concepts, but also incorporate these in the goal function.

Following de Paula Arruda Filho (2017), we propose the following elements to be included in teaching finance for responsible leaders:

1. Goal setting: start with sustainable development as the goal;
2. Integrated value: offer an alternative perspective to shareholder value (financial value) that incorporates sustainability;
3. Practical application: use problem-based assignments and cases to enhance the interdisciplinary learning experience of students.

Ad 1. Goal setting: start with sustainable development as the goal

It is important that courses start with knowledge of sustainable development (Sachs, 2015). Moreover, sustainable development could be set as the goal. Responsible management and finance then follow as the means to achieve that goal. This may sound obvious, but this point is often missed. Finance courses and textbooks tend to start with financial goals, which put students and faculty in a tunnel vision. Instead, what's needed is to zoom out: what are the big societal challenges (Sachs, 2015)? How do they affect business? How can businesses navigate these challenges and even provide the solutions that society needs? How can finance help meet those challenges?

Seen in isolation, finance can become a goal in and of itself, with sometimes detrimental effects on societal outcomes. Rather, finance can and should be a tool for building better business models for better real-world outcomes. As a management accounting colleague puts it: "We should train controllers to help them use numbers to tell a company's value creation story." Belinga and Morsing (2020) also stress the importance of training finance teachers in sustainable finance.

Ad 2. Integrated value: incorporate sustainability

Next, it is essential to move beyond shareholder value (financial value). Once the abovementioned goals are set, it should also be acknowledged that the current paradigm of shareholder value is doing a poor job at realising those sustainability goals. Unfortunately, this step is often not taken. Sustainable finance courses tend to be taught within the conventional frameworks of shareholder value and Modern Portfolio Theory, where the label 'sustainable' refers to the addition of ESG factors or the use of instruments such as green bonds. This is a missed opportunity, and a typical example of what transition researchers (e.g., Loorbach, Schoenmaker and Schramade, 2020) would call optimisation within the existing regime. Instead, what is needed is that teachers embrace paradigm change or at least acknowledge that shareholder value is not the only way of analysing value; and that shareholder value is not a natural law but based on a certain worldview that can be challenged. Uncovering the assumptions behind it can be an eye-opener for students.

Another step is to start using a form of the integrated value model, which integrates financial value and sustainability, in core finance courses instead of the standard shareholder value model. Not many have taken this step yet, unfortunately, as most teachers are reluctant to let go of their standard textbook. Using a standard finance textbook means applying the shareholder value model. The calculations in such books tend to be static and are geared to maximising shareholder value. In a new

corporate finance textbook *Corporate Finance for Long-Term Value* (Schoenmaker and Schramade, 2023), we take a different approach. We tackle the typical corporate finance topics, such as investment decisions, capital structure, M&A, and options, but we discuss them in four stages:

1. Financial value without regard for sustainability considerations (i.e., as is done in the standard finance textbooks);
2. Financial value with regard for sustainability considerations (i.e., the ESG view);
3. Social value and environmental value as separate types of value, next to financial value (i.e., the impact view);
4. Integrated value: financial, social, and environmental value; and their interrelations.

The last stage, integrated value, provides a holistic learning goal (Belinga and Morsing, 2020). A holistic approach builds on the interaction of the sustainability, strategy, accounting and finance dimensions of integrated value. Admittedly, it is a challenge to teach the new integrated value paradigm based on an interdisciplinary curriculum, as current teaching materials and finance textbooks are focused on financial valuations. Next, most teachers are not aware of integrated methods and/or trained in them.

Ad 3. Practical application: use problem-based assignments and cases

Perusso and Baaken (2020) indicate that management education has a long history of using practical learning tools. The most common practical learning tools include cases, problem-based assignments and internships. The authors identify four building blocks of management learning: (1) ill-defined problems, where students (2) execute solutions in real-life (3) in close collaboration with a real company, with learning (4) supported by a process of reflection. While none of the reviewed learning tools adequately incorporate all four blocks, Perusso and Baaken (2020) find that problem-based learning is the approach most suited to adaptation.

In line with this recommendation, we make extensive use of problem-based assignments in the courses we teach at Rotterdam School of Management, Erasmus University, and Nyenrode Business University. In those assignments, we not only ask the students to make calculations, but we also challenge them to analyse companies in the context of their specific sustainability, transition, and strategy challenges – and to reflect on how those in turn affect their calculations. After all, companies differ a lot in these respects, which in turn affects their stakeholders, externalities, and value drivers. Such assignments make students see these connections and enhance the interdisciplinary learning experience of students. Ideally, student groups should be interdisciplinary, drawing students from finance, accounting, strategy and sustainability. In this interdisciplinary setting, students can learn from each other, as all disciplines are needed to complete such assignments successfully. By reviewing companies with different degrees of sustainability integration, students also learn that more sustainable companies incorporate sustainability in their strategy and report about their integrated performance. By contrast, less sustainable companies typically ‘talk’ about sustainability without showing concrete results and have a (small) sustainability department separate from the business lines. Doing these problem-based assignments students develop the necessary skills and they experience first-hand how difficult it is to perform an integrated valuation, as some social and environmental datapoints are still missing.

Students need help to develop judgment to carefully model social and environmental costs (Gasparini and Tufano, 2023). Often to their surprise, students observe wide divergence in outcomes. While the integrated valuation of some companies may be higher (e.g. in the health sector) than their financial value, the reverse is true for many other companies (e.g. in oil and gas, (heavy) manufacturing, fast-fashion, food or tobacco). Moreover, we challenge students to envisage new business models for companies. At current trajectories most companies do not even get close to eliminating their negative externalities (see Figure 2 from our Inditex case-study), so what would an alternative trajectory look like?

As students study different companies, they face similar challenges in different conditions. We ask them to propose alternative business models that would fit such ambitious trajectories. Typically, students are initially hesitant to do this, and they struggle with the analysis of social and environmental value, especially in terms of missing data and making estimates. But once they have done this, they tend to become more confident and creative. For example, a group of MBA students saw a role for a supermarket chain to help tackle obesity in a joint venture with health insurers to promote healthier food and exercise. Another group even went so far as to turn an alcoholic beverage company into a non-alcoholic beverage company, which sparked intense discussions between the groups. The students really did what we hoped them to do: to use finance as a tool for building a better business model.

As suggested in step 2 above, an interdisciplinary curriculum is needed to understand sustainable finance principles and solve problem-based assignments. Such a curriculum would provide an overview of the basics of sustainability, strategy, accounting and finance in relation to sustainable finance. While most students are familiar with one or two of these disciplines, they learn the basics of the other disciplines and the integrated application. In the recently launched iMBA (impact MBA) at Nyenrode, we offer such an interdisciplinary curriculum. However, this was a lot of work since it required faculty to develop a large amount of new material. After all, most advanced textbooks specialise (i.e. advance) within a discipline rather than across disciplines.

4.3 Student perspective

Teachers tend to be the bottleneck, as discussed in Section 2.4, not students. In our experience, most bachelor and master students are intrinsically motivated to study more sustainable forms of business and finance. They enjoy it and challenge us to offer more. They often complain that integration of sustainability issues is lacking in most courses (the 2nd element of responsible teaching in Section 4.2), and they would prefer to have sustainable finance as a core course instead of an elective. Quite a few millennials / z-gen want to contribute to addressing the SDGs, which we also see in the demand for SDG focused courses at our schools. Moreover, they notice that employers ask for the skills to deal with sustainability challenges (see Section 4.4).

In executive education we see a lot of student enthusiasm for sustainable finance as well, backed up with more experience and agency, but there is also more resistance than in bachelor and master programmes: from experience these students know that sustainability integration is challenging; and many of them work at companies that are reluctant to change their business model. However, it also means they bring very relevant questions that help us identify bottlenecks. In class, these students tend to be quite open in sharing the real-life dilemmas that they run into, which often sparks great

debate.

Also in terms of attitude, we have the impression that a responsible mindset comes easier to students than to teachers. The bachelor and master students are still young and open, with less conditioning to a specific paradigm or setting than teachers and older students. But the corporate executive students also tend to be more pragmatic than finance teachers or financial industry professionals: operating in real companies, they are confronted with interdisciplinary challenges on a daily basis, and they can imagine solutions that deviate from current practices.

Regulation is one of the drivers of sustainability transitions. But it can also hold people back. We often encounter executive students who are overly focused on regulatory needs – especially the European regulations such as the Corporate Sustainability Reporting Directive (CSRD) for corporates and Sustainable Finance Disclosure Regulation (SFDR) for financial institutions. For them it can be hard to think beyond the regulation and to recognise regulation as part of a bigger movement that they can anticipate. Here too, the group assignments on integrated value are a great tool to help them see the multilevel perspective (Wilson and Snower, 2024).

Much of the regulation requires the creation of new data. The positive side of that is that we are witnessing the emergence of much better corporate disclosure and third-party sustainability data. The flipside is that companies are still scrambling to build the required information infrastructure, with less time for thoroughly thinking about the use of those data as management information for decision-making.

Data are challenging for students too: as they conduct an integrated valuation, students find that the availability and reliability of sustainability-related information is limited. Company annual reports typically contain not (yet) much sustainability-related information. This will improve with new reporting requirements, such as the IFRS Sustainability Disclosure Standards at the international level and the CSRD at the European level. This lack of data forces students to make assumptions, and many of them clearly struggle with this.

Students must learn to look beyond annual reports and explore other data sources on sustainability, such as NGO reports (e.g. Amnesty International on human rights and Climate Action 100+ on carbon emissions). It is also important for students to develop a critical attitude, as students often take company information on sustainability at face value. Experienced analysts know that companies have a bias towards reporting positive information (“the good news show”). As they progress with their group assignments, many students accept that data are not as hard as they had thought (even a lot of financial data are based on estimates) and they grow more confident in making estimates based on their own judgment.

Another aspect is the organisational form. The public (stock-listed) company is an important corporate vehicle and the default option in finance textbooks, but there are alternative solutions for the organisational form of companies, consistent with alternative business models and broader stakeholder involvement in strategy setting. These alternative organisational forms give more substance to responsible management, providing a broader perspective to students. Alternatives to the publicly listed company include among others the private company (financed by private equity, families or foundations) and the cooperative (created by customers, suppliers or employees). Thomsen et al. (2018) show that foundations are patient and committed shareholders (also called ‘stewards’),

enhancing the longevity of companies. While the tension between shareholders and other stakeholders is still present in privately owned companies, some families or foundations are adopting integrated (or long-term) value creation as company objective (see also Section 3.3). A recent organisational form is the B corporation (see Section 4.4).

4.4 Employee perspective

Employers are also looking for new skills. This applies both to established companies that are trying to adapt and to the vanguard of sustainable investors and sustainable companies (e.g., B corps and social enterprises, see below) that build their business models on enabling the transition to a more sustainable economy. Both groups are looking for the skills to integrate sustainability into corporate decision making, including investment decisions.

In practice, the increased emphasis on integrated value has given rise to a new organisational form, the so-called benefit corporation with B Corporation certification (Kim, 2021). Certified B Corporations, abbreviated as B Corporations or B Corps, aim for profit and impact. The number of certified B corps has exponentially risen from 43 in 2008 to 4,413 in 2021, spanning 77 countries. Another emerging organisational form is the social enterprise, which puts impact before profit (WEF, 2024). These companies exist in various industries and sectors (from agriculture to information technology and health care to financial services) and deliver against all SDGs. In 2023, the number of social enterprises is approximately 10 million, which is 3% of global companies.

The rise of alternative organisational forms is reflective of a wider trend among established corporates as well. More companies and corporate professionals are becoming aware that shareholder value alone is too limited, and they are looking for ways to balance their various goals. And they are looking for people who can help them do this – with both the technical skills to build models and the people skills to build bridges. Again, the interdisciplinary group assignments are a great way to train people in building those skills.

5 Conclusions

The dominant shareholder value paradigm in finance is a major obstacle to responsible management. To move forward and educate the next generation of business leaders, we propose several shifts in education. Courses should start with sustainable development as the goal, i.e. finance as a means instead of finance for the sake of shareholder value maximisation. Courses should also offer an alternative perspective to shareholder value, not just slight modifications. Next, we suggest using the integrated value model, which estimates not just financial value, but also social and environmental value, as well as the interaction between those types of value. Finally, we encourage the use of (group) assignments on integrated value to enhance the interdisciplinary learning experience of students.

To realise this agenda, we need to educate not only the students, but also the teachers. To stimulate this, business schools need to show leadership with the right tone from the top, and incentives that are aligned with them (Belinga and Morsing, 2020). That means they have to get serious about changing attitudes; invest in training the trainers; stimulate and reward interdisciplinary research; and select faculty accordingly, i.e. more on their efforts to make business schools transition-prepared and less on single discipline publications.

Finally, a research agenda on teaching finance for responsible management could be formulated, so as to develop a better understanding of both bottlenecks and best practices (e.g., Belinga, Gond and Morsing, 2025). Interviews and surveys among students, employers, and faculty could enrich our understanding. But most importantly, let's develop and teach more courses that teach finance for responsible management.

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