



The future of fashion

Sustainable Investing Expertise by
ROBECOSAM

White paper

For professional investors
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Executive summary

As long-term investors, we think carefully about the impact of secular changes in consumer behavior on industries and individual companies. The purpose of this white paper is to identify and analyze the secular trends that look set to have the biggest impact on the fashion industry over the coming decade to help us make well-informed investment decisions on behalf of our clients.

We begin the paper by acknowledging that the fashion industry differs from most others in its insatiable desire for change and variety. The term 'fashion' stands for something rather abstract: a way of being, an identity, an affiliation, a style. The notion of garments only fulfilling a need is replaced by the desire to dress according to, or indeed in protest against, what is in vogue at a particular point in time. But while fashion in its holistic sense undeniably brings joy and a way for self-expression to millions of consumers around the world, the industry is also grappling with grave societal and environmental impacts. Population growth and increasing disposable incomes will continue to drive growth in demand for fashion items, which is why we see a growing need for the industry to become more sustainable, digital and inclusive.

The first chapter of this report is dedicated to the topic of sustainability. We admit at the outset that the term 'sustainable fashion' is to some extent an oxymoron. Indeed, the most effective way to limit the industry's environmental impact would be absolute reduction in consumption volumes. However, this seems unrealistic, so throughout this chapter we focus on five emerging trends that could unlock the transition towards a significantly more sustainable, circular fashion industry. We discuss the emergence of digital product passports and their role in bringing about transparency, authenticity and circularity. We consider the importance of recycling infrastructure for the world's most common fibers – polyester and cotton – and the opportunities presented by next-generation, animal-free and compostable materials. From a business model perspective, we highlight the substantial growth opportunities for internet platforms that are helping companies move away from linear towards circular business models, and we also consider the super-fast versus slow fashion movements.

The second chapter explores how digitalization is giving rise to entirely new product categories, business models and manufacturing methods. We first focus on the opportunities emerging in increasingly sophisticated wearable technologies and the rise of digital fashion goods such as non-fungible tokens in virtual worlds. We also explore the meteoric rise of team buying, livestreaming, influencer and direct-to-consumer brands, which are being enabled by rapid digitalization and blurring boundaries between physical and digital retail. Last, we consider the case for greater factory automation, which has been made possible by technological improvements in robotics, automation and additive manufacturing over the past decade.

In the final chapter, we look at casualization and personalization, two secular growth areas that accelerated during the pandemic. Reflecting consumers' evolving lifestyles, we expect continued blurring of the boundaries between sport, work and leisurewear. We also consider how increasing personalization and a greater focus on inclusivity are challenging the 'cookie cutter' approach to manufacturing, presenting opportunities for companies willing to return to fashion's original roots: individualism and craftsmanship.

Our conclusion is that over the decade to come, the fashion industry will continue to become more sustainable, digital and personalized, presenting opportunities for companies facilitating and driving these transformations.

“Fashion is not something that exists in dresses only. Fashion is in the sky, in the street, fashion has to do with ideas, the way we live, what is happening.”

Coco Chanel



1. SUSTAINABILITY

Key messages

- **Is sustainable fashion an oxymoron?** The most effective way to reduce fashion's environmental impact would be an immediate reduction in consumption volumes. Such a scenario appears unrealistic over the coming decade, however, so instead we focus on the ways in which the industry can, and is, becoming more sustainable.
- **Digital product passports:** We believe the adoption of internationally accepted digital product passports will be key to improving transparency and enabling circularity in the fashion industry over the coming years.
- **Closing the loop with recycling infrastructure:** While there is no silver bullet to reduce fashion's considerable environmental footprint, replacing virgin polyester and virgin cotton with recycled alternatives would be a major step in the right direction.
- **Next-gen materials:** We do not think the use of animal-derived products in the fashion industry can be eliminated, but we expect increased use of alternatives over the coming years, leading to opportunities for producers of next-gen materials such as mycelium and plant-based leather, and bio-based faux fur.
- **Circular business models:** The increased momentum in the adoption of digitally enabled repair, rental and resale services in recent years represents a significant opportunity for new and better growth in the fashion industry. Such circular business models hold the promise of decoupling revenues from production and resources, a move towards a more circular fashion industry.
- **Fast versus slow fashion:** We consider more sustainable supply-chain management as a prerequisite for fast fashion businesses. At the same time, the growth of the slow fashion movement, which is putting pressure on the entire industry to source and produce more sustainably, is an encouraging step in the right direction

1.1 Is sustainable fashion an oxymoron?

The most effective way to reduce fashion's impact on the environment would be an absolute reduction in consumption volumes. This seems unrealistic over the coming decade, so instead we focus on the ways in which the industry can, and is, becoming more sustainable.

Setting the scene: how bad is it, really?

Every year, about 100 billion articles of clothing are produced – 14 for every person on the planet¹. Around 20% go unsold. Less than 1% is recycled into new clothing, and the industry is responsible for around 2-8% of global greenhouse emissions, depending on the accounting methodology. Strictly speaking, much less actually needs to be produced for people to still be able to dress themselves. So while there is no doubt that fashion brings joy and a way of self-expression to millions of people around the world, the industry also has major societal and environmental impacts. In short, the situation is pretty bad, and change is long overdue.

1. [The High Price of Fast Fashion - WSJ](#)

Figure 1.1 | The clothing and textile industry: facts and figures

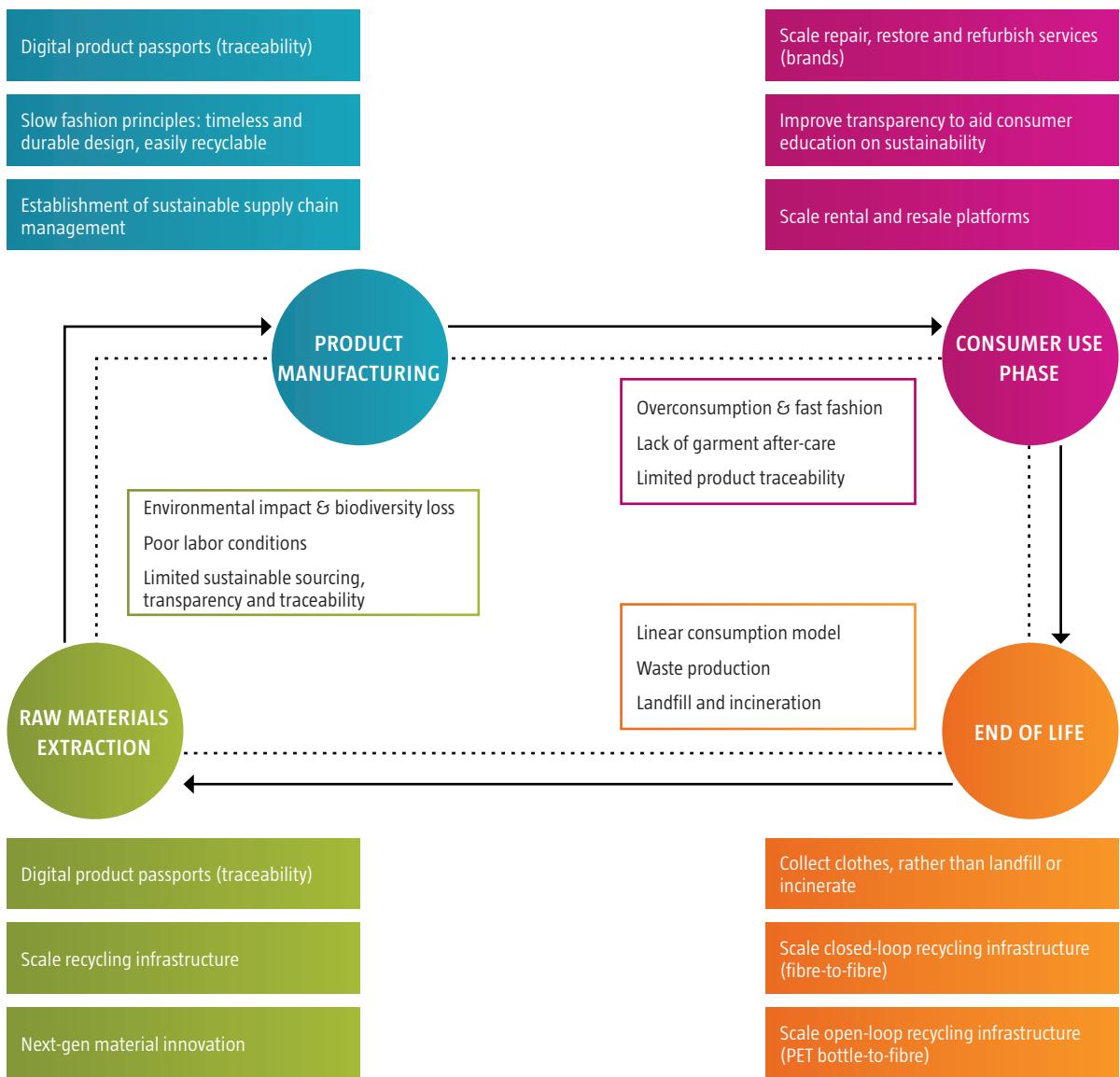
Contributes USD2.4 trillion to global manufacturing	Employs 300 million people worldwide across the value chain (many of them women)	Is responsible for an estimated 2-8% of the world's greenhouse gas emissions
Around 215 trillion liters of water per year are consumed by the industry	Annual material loss of USD 100 billion due to underutilisation	Textiles account for approximately 9% of annual microplastic losses to the oceans

Source: [UN Alliance for Sustainable Fashion, 2022](#)

Our approach

Throughout this chapter we focus on some of the opportunities resulting from more conscious consumption habits in fashion. In considering how fashion can be consistent with the principles of sustainability, we introduce a high-level framework (Figure 1.2) that helps us assess where individual companies are with respect to the industry's transition towards climate, social and circular economy-related commitments by 2030 and 2050.

Figure 1.2 | Framework for assessing fashion companies' adoption of sustainable and circular models



Source: Robeco

We believe that moving towards more sustainable, circular business models, requires companies to rethink the ways in which clothes are made and used. The fashion industry creates a lot of waste for many reasons, not least its use of low-quality materials and consumers' continuously changing preferences. With this in mind, our framework considers the following factors.

- 1. From a raw materials perspective**, we consider a company's impacts on biodiversity, the environment and society by assessing the extent to which it has invested in or adopted digital product passports, sustainable agriculture practices and certified / recycled / next-generation materials to limit the need to produce virgin fibers and reduce the prevalence of unfair working conditions.
- 2. From a manufacturing perspective**, we consider environmental and working condition challenges while assessing to what extent the company has adopted slow fashion principles such as timeless, durable design and recyclability.
- 3. From a consumer / retail perspective**, we consider overconsumption and the lack of readily available product care solutions as key issues in prolonging garments' lifespans, leading to opportunities for repair, rental and resale services.
- 4. From an end-of-life perspective**, we are concerned about the impact of linear business models on the environment, and see opportunities for large-scale collection and sorting, as well as the build-out of recycling infrastructure.

In conclusion, while there is no silver bullet to drastically reduce the fashion industry's impact on the environment, we are encouraged by the increasing preference for circular fashion among consumers, regulators and companies. There is a long way to go, but we are optimistic about the general direction that many historically environmentally unfriendly businesses are taking in their quest to shift away from linear to circular business models.

1.2 Digital product passports

The adoption of internationally accepted digital product passports will be key in improving transparency and increasing circularity in the fashion industry over the coming years.

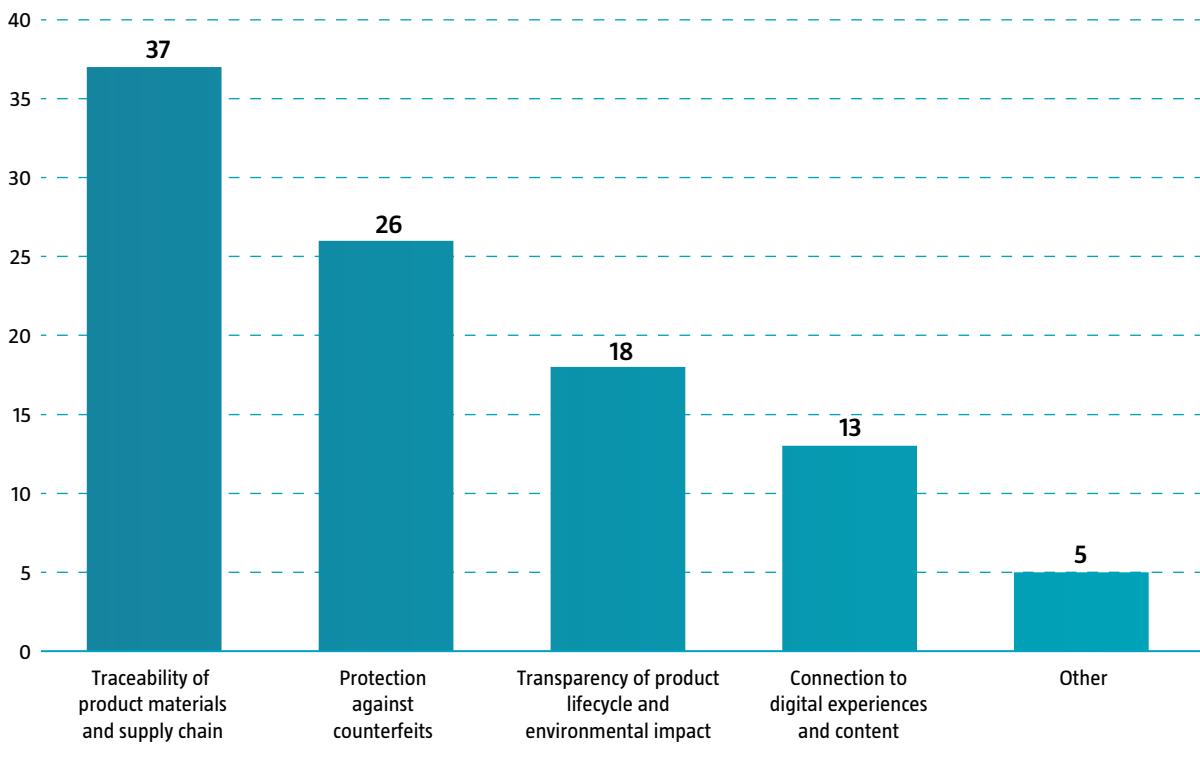
The aim of digital product passports is to electronically register, process and share product-related information among supply chain businesses, authorities and consumers. The expected benefits of large-scale adoption of digital product passports are two-fold: increasing transparency for supply chain businesses and consumers, and increased efficiency in terms of information transfer.

We think that the adoption of internationally accepted digital product passports will be key in improving transparency and increasing circularity in the fashion industry over the coming years. Some progress has already been made on this front, with brands and retailers adopting various sensors, scanners and cloud-based software to monitor and maintain their inventories. However, as it stands there is still no internationally accepted standard way to store and access information about a product's material content, where and how it was made, or the working conditions at the people who made it. We expect that as the underlying technologies mature, physical and digital elements will converge into a single digital product passport for individual items. This will probably include a combination of radio-frequency identification (RFID) tagging, QR codes, near-field communication (NFC) features and unique digital IDs stored on a decentralized, distributed ledger (blockchain).

Enabling traceability, authenticity and transparency

The increasing vertical integration among top global brands is driving demand for the digitalization of corporate functions and product information. The State of Fashion 2022 report by McKinsey found four effective use cases emerging for digital product passporting: traceability of product materials and supply chains; protection against counterfeits; transparency of product lifecycle and environmental impact; and connection to digital experiences and content. In addition, initiatives such as the European Commission's European Data Space for Smart Circular Applications, the American Apparel and Footwear Association's call for digitalization of apparel and The China Certification and Inspection Group's battle against counterfeiting are increasing the pressure on the fashion industry to adopt certain widely accepted digital product passport protocols.

Figure 1.3 | Effective use cases for product passports relating to sustainability and protection against counterfeits



Source: BOP-McKinsey State of Fashion 2022

Regulatory intervention example: The Green Claims Initiative (GCI)

The GCI is an EU initiative to crack down on greenwashing by introducing a digital product passport, requiring companies to substantiate the claims about sustainability that they make. Over the coming decade, it is expected to demand mandatory requirements about the circularity and environmental sustainability of textiles, incorporating key data into generic product labels.

Existing physical solution example: RFID tagging

One technology that has already been widely adopted is radio frequency identification (RFID) tagging. With their prices having fallen by 80% over the past decade, RFID tags are widely used by luxury and mass-market brands alike to help in the fight against counterfeiting and to enable item sales, stock and availability to be tracked. Companies such as Rent The Runway have sewn RFID tags into over 1.5 million items of clothing to help robotic arms and X-ray machines sort them automatically.

Future digital technology solution example: Blockchain

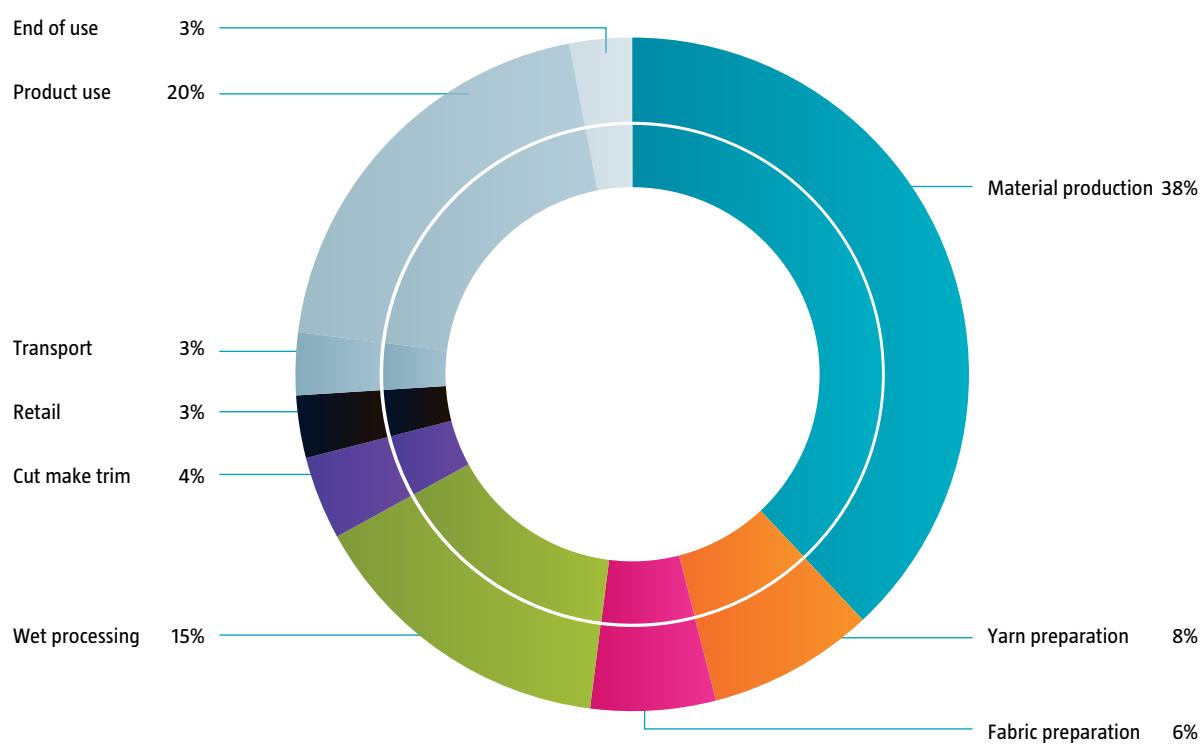
Apart from the obvious benefits of transparency, we see blockchain-enabled digital product passports as key enablers of circularity as they will help reduce some of the biggest obstacles to resale scaling. These are principally the lack of authentication mechanisms, and the lack of collection, sorting and recycling infrastructure for worn items. Of course, brands still need to make sure the data their suppliers provide is accurate, and that the brand authentication process is standardized across complex global supply chains. In this context, producers of high-quality products are in a better position than fast fashion brands to adopt digital product passports. A handful of solution providers are emerging, including the Aura Blockchain Consortium, which was launched by several luxury companies including LVMH and Prada to increase transparency in the luxury fashion market, the open-source Arianee tokenization service launched in collaboration with IBM, the blockchain-based Textile Genesis traceability platform and EON, whose mission is to connect every item to a Digital ID to make it interactive, intelligent and circular.

1.3 Sustainable and recycled fibres

Closing the loop: while there is no easy way to reduce fashion's considerable environmental footprint, replacing virgin polyester and cotton with recycled alternatives would represent a major step in the right direction.

Since 2018, 130 signatories of The Fashion Industry UN Charter for Climate Action have committed to achieving net-zero greenhouse gas emissions by no later than 2050. This will require large-scale adoption of responsibly sourced and recycled materials. Currently, material production and the preparation and processing of yarn and fabric are responsible for around two-thirds of all greenhouse gas emissions across the apparel and footwear lifecycle (Figure 1.4). Over the coming decade, we expect the combination of mandatory minimum recycled content requirements and increased sourcing transparency to lead to investment opportunities in large-scale textile recycling infrastructure.

Figure 1.4 | Greenhouse gas emissions from apparel and footwear by lifecycle stage (2018)

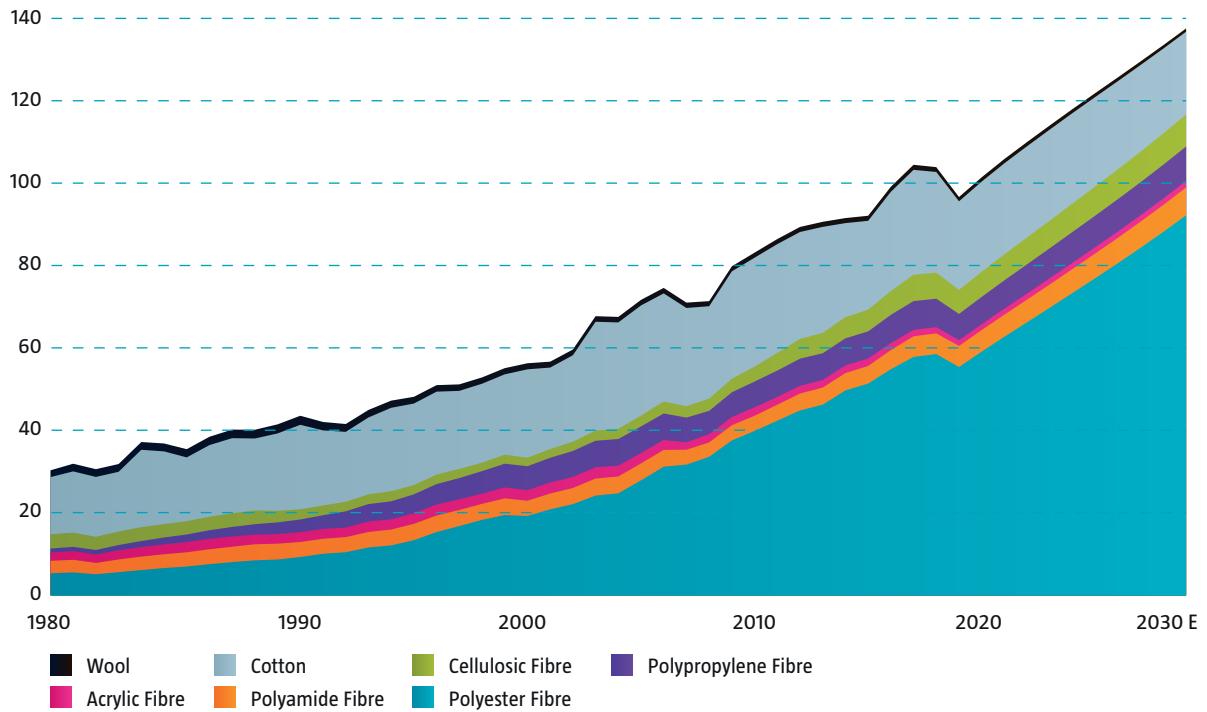


Source: Global Fashion Agenda and McKinsey, Robeco

The problems with virgin polyester and cotton

The two most widely used materials in the fashion industry – polyester and cotton – involve a number of problems from a sustainability perspective.

Figure 1.5 | Global Fibre Production (1980-2030)



Source: Tenon Orbichem, Business of Fashion, 2022

Polyester is cheap, versatile and reliable, characteristics that have resulted in it becoming by far the most widely used fiber in the world – it accounted for around 58% of global fiber production in 2021². Made from fossil fuels and often mixed with other fibers, virgin polyester is both resource-intensive and difficult to recycle. It also accounts for up to 35% of all plastic microfiber pollution in the world’s oceans. But due to its many attractive features, polyester is also the most difficult fiber to eliminate from the fashion industry.

Cotton, the second most commonly used fiber in fashion, accounting for about 24% of the global fiber market in 2020, is also mired in controversy. It is among the ‘thirstiest’ of all crops, requiring around 2,700 liters of water (enough drinking water for one person for 900 days) to produce enough cotton to make just one t-shirt³. What’s more, manufacturing garments from cotton requires high amounts of energy and water and results in water pollution. Less than 1% of the cotton on the market in 2020 came from recycled sources. Perhaps most importantly, there are also serious concerns about conditions for the workers involved in producing cotton, with accusations of modern slavery in some cases.

The roles of consumers and regulators

Many consumer surveys make it clear that the general public want to see improvements in how and from where materials are sourced. Nearly 90% of apparel shoppers questioned by McKinsey in 2020 believed that pollution needs to be reduced, while over 60% wanted to move beyond the ‘fast fashion cycle’. We believe that not only are some consumers beginning to vote with their wallets, investors too are compelling brands to improve disclosure on ESG metrics, which in turn further incentivizes the adoption of more responsibly sourced and recycled materials. Lastly, but perhaps most importantly, the regulatory landscape is beginning to change. For example, the EU Circular Economy Action Plan is pushing for digital product passports that contain information about items’ sustainability credentials, as well as mandatory minimums for recycled content, forcing brands to become more transparent and adopt recycled materials at greater scale.

2. Tecnon Orbichem: [Textiles & Fibres, leather & Footwear | Tecnon Orbichem](#)

3. [Handle with Care | Magazine Articles | WWF \(worldwildlife.org\)](#)

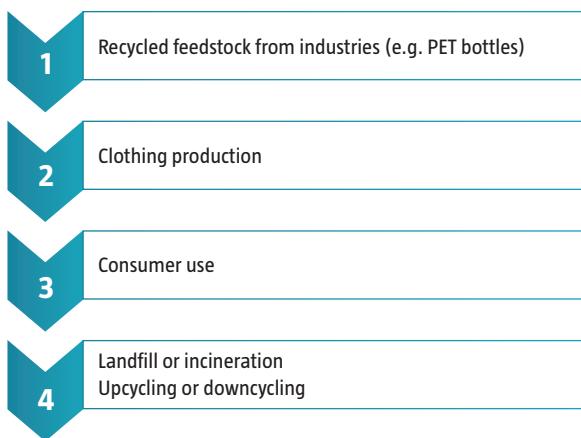
Investment opportunities in recycling infrastructure

According to research by industry body Global Fashion Agenda, if barriers to scale are overcome, recycling of textiles could create a USD 100 billion opportunity by 2030⁴. We see the most attractive long-term growth opportunities for companies involved in textile-to-textile (closed-loop) recycling, in which textile waste is recycled into new clothing so that materials remain in constant circulation. We prefer this approach from a sustainability point of view to open-loop recycling, in which one product, such as PET bottles, is downcycled into different products, including fibers for clothing, before eventually reaching landfill. However, closed-loop recycling remains sub-scale and expensive today. In the case of polyester, for example, 7.6 percentage points of the 8.1% fiber production that came from recycled sources in 2020 came from plastic bottles rather than recycled textiles.

Figure 1.6 | Open-loop recycling versus closed loop recycling

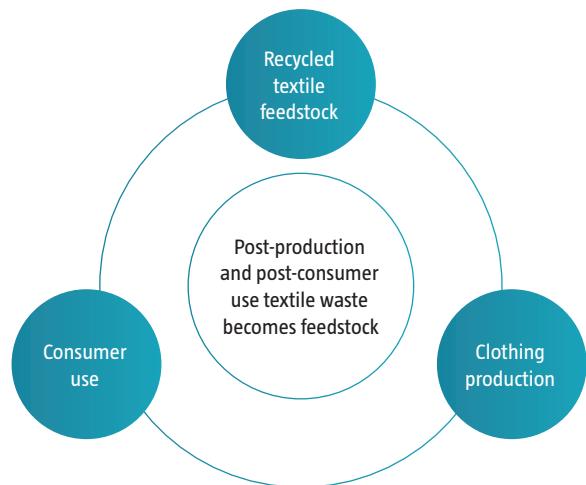
Open-Loop Recycling

One product (e.g. PET bottles) is recycled into a different product (e.g. clothing) but is not recycled into clothing again.



Closed-Loop Recycling

Textile waste from production and consumer use is recycled into new clothing so that materials remain in constant circulation



Source: Business of Fashion and Ellen MacArthur Foundation

Over the coming years, we expect further investments in the infrastructure needed to recycle materials, resulting in increased uptake of several closed- and open-loop recycling technologies, including mechanical fiber-to-fiber, regenerative cellulosic, regenerative synthetic, thermomechanical synthetic and regenerative blended recycling. While the development of these technologies represents a step in the right direction, the overall environmental impact of recycling is complex, and sometimes more energy and resources are needed to recycle a product than to produce it from scratch. What's more, greater use of recycled content could lead to reduced consumer guilt, resulting in even higher consumption, which is why it will be crucial to examine each recycling technology in its own right.

4. Scaling Circularity, 2021, Global Fashion Agenda

Figure 1.7 | Five major textile recycling technologies

Recycling Type	Input / Feedstock	Output	Examples	Readiness to Scale
Mechanical-to-fibre	100% cotton (textile waste), solid colours and denim	Lower quality cotton – needs to be mixed with virgin cotton	Recover	4/4
Regenerative cellulosic	Man-made cellulosic fibers and cotton fabric (>80%)	Man-made cellulosic – has the same quality as virgin feedstock	Hilaturas Ferre Cyclo Re:NewCell Infinitred Fibre Spinnova Ioncell	At commercial scale today but focused on pre-consumer fabric 3/4
Regenerative synthetic	>80% Polyester textile waste), solid colours, knits and woven	Polyester with the same quality as virgin polyester	Loop Ineos Carbios Eastman	1/4 Promising technologies at pilot scale
Thermo mechanical synthetic	PET bottles	Polyester with same quality as virgin polyester	Polyana	4/4 Recycling of PET bottles at scale today already
Regenerative blended recycling	Blended fabrics (printed, multi-coloured, textiles)	Cellulose powder, pulp or PET pellets, fiber, monomers	Worn Again BlockTexx	1/4 Several technologies at pilot scale, need better purity

Source: Scaling Circularit, Global Fashion Agenda, 2021

In conclusion, we believe the industry needs to pull as many levers as possible to meet its ambitious targets to hit net-zero emissions by 2050. We are seeing encouraging signs of progress as virtually all brands, from fast fashion incumbents to sustainability leaders, are drawing up roadmaps to increase their use of recycled materials over the next decade. Examples include Zalando, H&M, Adidas, Patagonia and Bestseller collaborating with the Infinitred Fiber Company; Ralph Lauren, Allbirds, Richemont and Patagonia working with Natural Fiber Welding; and H&M, Levi's and Bestseller partnering with Renewcell.

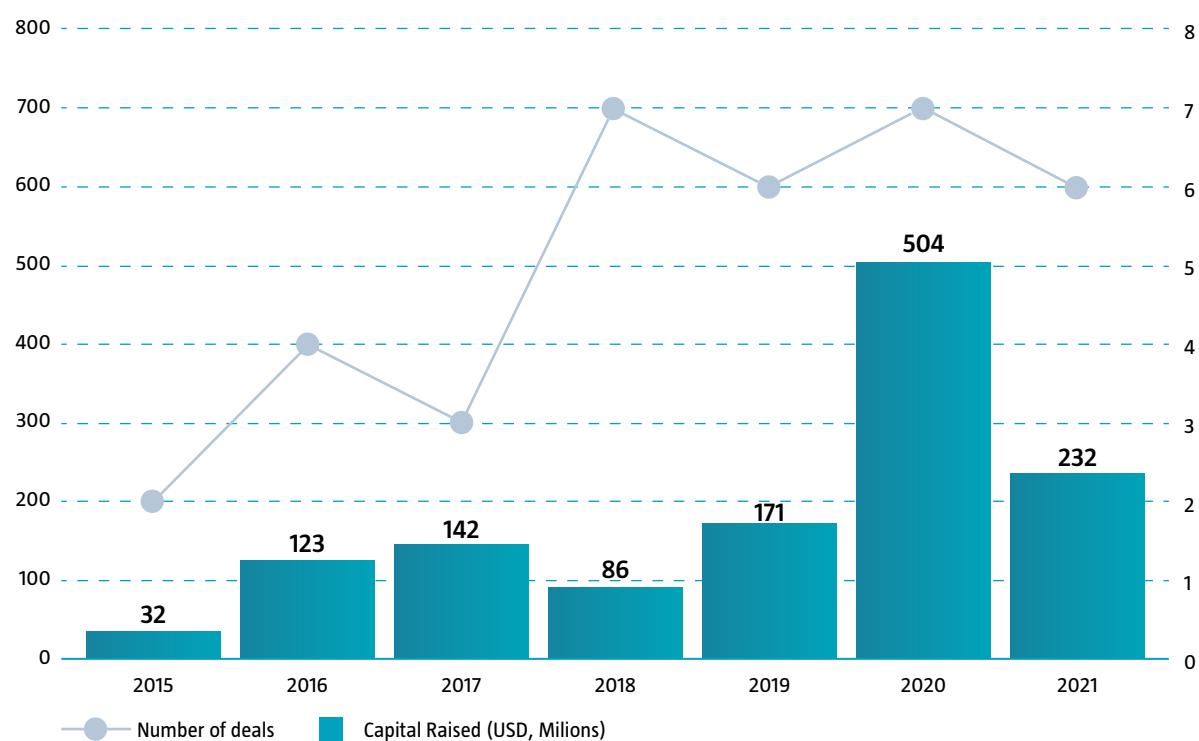
5. Example from the Business of Fashion's white paper, Fashion's Race for New Materials.

1.4 Next-generation materials

Trendy and sustainable: while we do not think products derived from animals can ever be completely eliminated from the fashion industry, we expect increased use of alternatives over the coming years, leading to opportunities for producers of next-gen materials such as mycelium leather and bio-based faux fur.

Until recently, companies wanting to replace products made from real leather or fur faced a quandary. A faux leather handbag may be more environmentally and animal-friendly than a real leather one, but it is also quite likely that its look and feel would be inferior. What's more, it would probably be made from a blend of virgin petroleum-derived raw materials that is difficult to recycle⁵. However, all this may be changing. Today, there is an enormous amount of hype about next-gen materials in the fashion industry. Investors have been increasingly backing start-ups involved in producing compostable leather substitutes made from plant, fungi and animal cells. Around USD 1 billion of capital was raised to fund innovations in materials to replace animal fibers in clothing between 2018 and 2021, with several collaborations involving high-profile brands. We expect this momentum to lead to the development and scaling-up of a range of next-gen materials over the coming years.

Figure 1.8 | Capital raised by next-gen materials startups



Source: Material Innovation Initiative, Business of Fashion

Trendy, sustainable, or both?

In addition to satisfying fashionistas' craving for novelty and innovation, alternatives to materials derived from animals and plastics could reduce animal suffering, impacts on biodiversity, carbon footprints and waste, and improve recyclability, durability and performance. However, while progress has been made on many of these fronts, the alternative materials that have been developed to date are still far from perfect. The key challenges so far have revolved around scaling quality, performance, price and environmental credentials. In the words of Matt Scullin, CEO of mycelium start-up MycoWorks, "nobody is willing to sacrifice quality and performance for sustainability".⁶

6. [This Mushroom Leather Is Being Made into Hermès Handbags - Scientific American](#)

That said, we expect the influx of capital into this field to lead to a wave of innovations. As can be seen in the table below, The Material Innovation Initiative, a nonprofit that accelerates the development of next-gen materials, has identified 36 companies replacing leather, down, silk, wool and fur via partnerships with global fashion brands which could eventually lead to large-scale commercial adoption.

Figure 1.9 | Companies developing next-gen materials

Material	Company examples				
Next-Gen Leather	Ananas Anam	Bolt Threads	Mycoworks	Ecovative	Hemp Black
	VEGEA	Frumat	Malai	Newlight	Natural Fiber Welding
Next-Gen Down	PANGAIA	Save The Duck	3M	PrimaLoft	Thermore
Next-Gen Silk	Orange Fiber	Bolt Threads	PoSpiber	AMSilk	
Next-Gen Wool	Spinnova	Faborg	EcoSimple	Osom Brand	
Next-Gen Fur	Ecopel	Lenzing			

Source: The Material Innovation Initiative, 2022

While we do not believe the use of animal-derived products in the fashion industry will be completely eliminated for the foreseeable future, we expect the market for alternatives to mature over the coming years, leading to major opportunities for producers of next-gen materials.

Focus on leather

One of the oldest materials used in clothing in the world, leather offers a unique combination of hand feel, warmth, breathability, aesthetics and durability. But it is also mired in controversy. Animals need to be slaughtered to produce it, rearing them can result in biodiversity losses, and supply chains are long and complex. These issues, combined with volatile prices and availability, mean leather is high on the list of materials that alternatives need to be found for.

Several prominent fashion houses, including Gucci, Prada, Coach and Versace, have already eliminated animal fur from their collections. We think for many brands, leather could become the next material to avoid. And with some mycelium-based materials, such as Mylo, which is made by Bolt Threads, and Sylvania, made by MycoWorks, increasingly hitting the shelves in products from well-known brands including Adidas, Lululemon, Everlane, Stella McCartney, Ganni and Hermès, the fashion industry is taking notice. After all, about half of the USD 100 billion of sales made by Europe's five largest luxury companies in 2020 came from leather-based products like handbags and footwear. A 2021 poll found that 37% of people in the US think leather is an inappropriate material to use in clothing⁷, while several companies have committed to phase out or significantly reduce their use of virgin leather over the coming decade.

Figure 1.10 | Animals and fashion



Source: The Material Innovation Initiative

According to a 2022 publication by Scientific American, there are three main ways of producing bio-based synthetic leather alternatives:

1. Cultivating mammalian cells to form leather-like sheets. In a similar process to the cultured meat industry, cell lines are grown in a nutrient-rich environment. With the help of scaffolds, the cells form tissue with the complexity of real leather without the need to slaughter an animal.
2. Genetically engineering microbes, that are grown to produce collagens subsequently turned into textile fibers.
3. Isolating and growing proteins that are subsequently linked to form biomaterials with properties similar to leather instead of using complex cell cultures.

Provided that increased scale leads to lower prices and high sustainability and quality credentials, such leather alternatives could take share away from the global leather goods market, which was worth USD 394 billion in 2020.



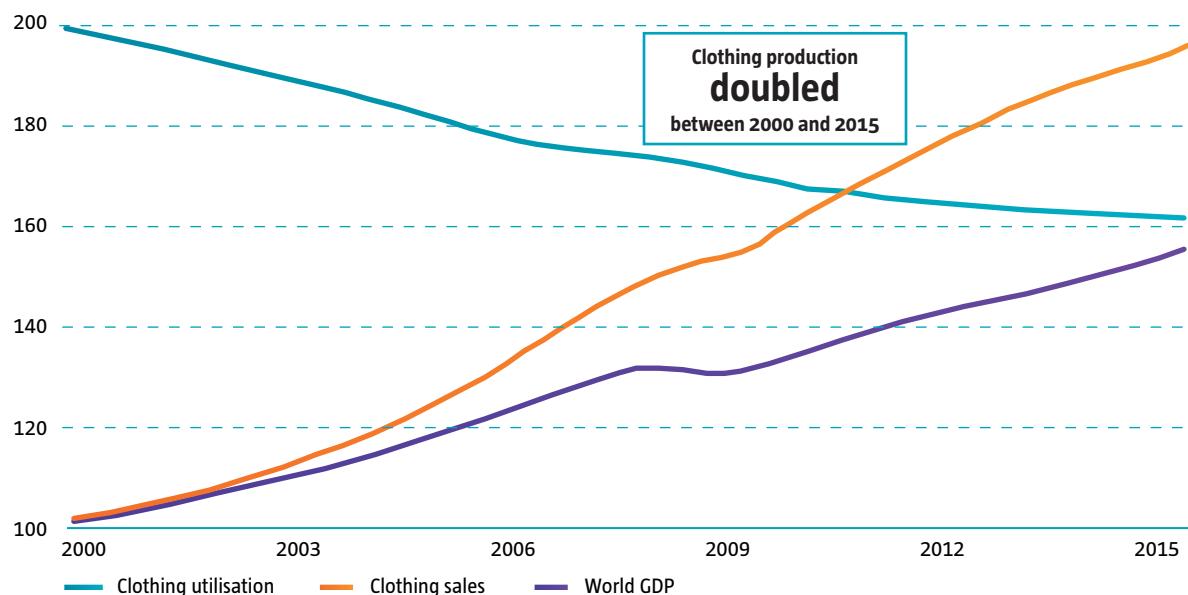
7. [Brands are phasing out fur. Could leather be next? | Vogue Business](#)

1.5 Circular business models: repair, rental and resale

Business models that decouple revenues from the use of virgin resources are contributing to the transition towards a more circular fashion industry.

The fashion industry currently primarily operates according to a linear model consisting of three stages: take (the harvesting of raw materials), make (the production of garments) and waste (the subsequent disposal of garments)⁸. With the advent of the fast fashion business model, an item of clothing has evolved from a durable good made to last for years to an impulsive purchase. Between 2000 and 2015, clothing production doubled, while the number of times an item of clothing is worn fell by 36%⁹.

Figure 1.11 | Clothing production and utilisation trends between 2000 and 2015



Source: Ellen MacArthur Foundation

While Millennial and Gen Z shoppers have a penchant for fast fashion, they are also the consumers most likely to buy second-hand clothing or rent clothes. According to the 2021 Refinery29 Survey, 91% millennial women have bought or are open to buying second-hand clothing, while ThredUP's 2021 Resale report found that two in five buyers of secondhand clothing are replacing fast-fashion purchase. This shift is being driven not just by the growing importance of sustainability in people's decision-making, but also by the increasing ease of use and influence of social media. According to another industry survey, younger customer cohorts post nine selfies a week on social media, increasing the demand for variety in the wardrobe¹⁰. We believe repair, rental and resale models could provide a more sustainable alternative to meet growing demand for variety than buying new clothes.

8. Ellen MacArthur Foundation, 2017

9. [Rethinking business models for a thriving fashion industry \(ellenmacarthurfoundation.org\)](http://ellenmacarthurfoundation.org)

10. Rent the Runway prospectus.

What makes a business model more circular

We think of circular business models as those that increase utilisation either by increasing uses per user or users per product. Circular approaches include the adoption of repair, rental and resale solutions:

1. Repair (more uses per user)

Resale and rental models have been on the rise in recent years as the fashion industry becomes increasingly aware of the need to become more sustainable. But repair services have been somewhat left behind, even though they are one of the most effective ways of increasing product utilisation. That said, local, online platforms operating in this field are beginning to emerge. By creating a network of local seamstresses, companies like Sojo – ‘the Deliveroo of fashion repairs’ – promise to make clothing repairs and alterations accessible and affordable to more consumers in London, while offering brand partners a shortcut to circular business models.

Meanwhile, companies like The Clothes Doctor (which has more than 7,500 drop-off points throughout the UK) and The Restory (which works with department store Selfridges and online luxury marketplace Farfetch) are finding ways to scale repairs in more densely populated areas.

Finally, we also see educating and enabling consumers to take better care of their garments as a form of repair: companies such as Steamery and The Laundress offer laundry products, fabric shavers and other fabric care products that ultimately help extend product life. Over time, more convenient, widely available repair solutions could persuade mid-range brands to make their items more durable, leading to less wasteful behavior from consumers. Finally, indie brands such as Nudie Jeans offering free repairs are also helpful in terms of raising the bar for expectations about repairs in mid- to high-end fashion.

Figure 1.12 | Nudie Jeans offering free repairs forever



Source: Nudie Jeans website

2. Rental (more users per product)

Renting clothes is far from a new phenomenon. Until recently, however, it was a niche activity reserved for clothes for special occasions, and far from an everyday occurrence. The idea of renting rather than buying one’s day-to-day clothes was popularized by Rent the Runway, a company founded in 2008. Today, the concept is moving into the mainstream and several business models are emerging:

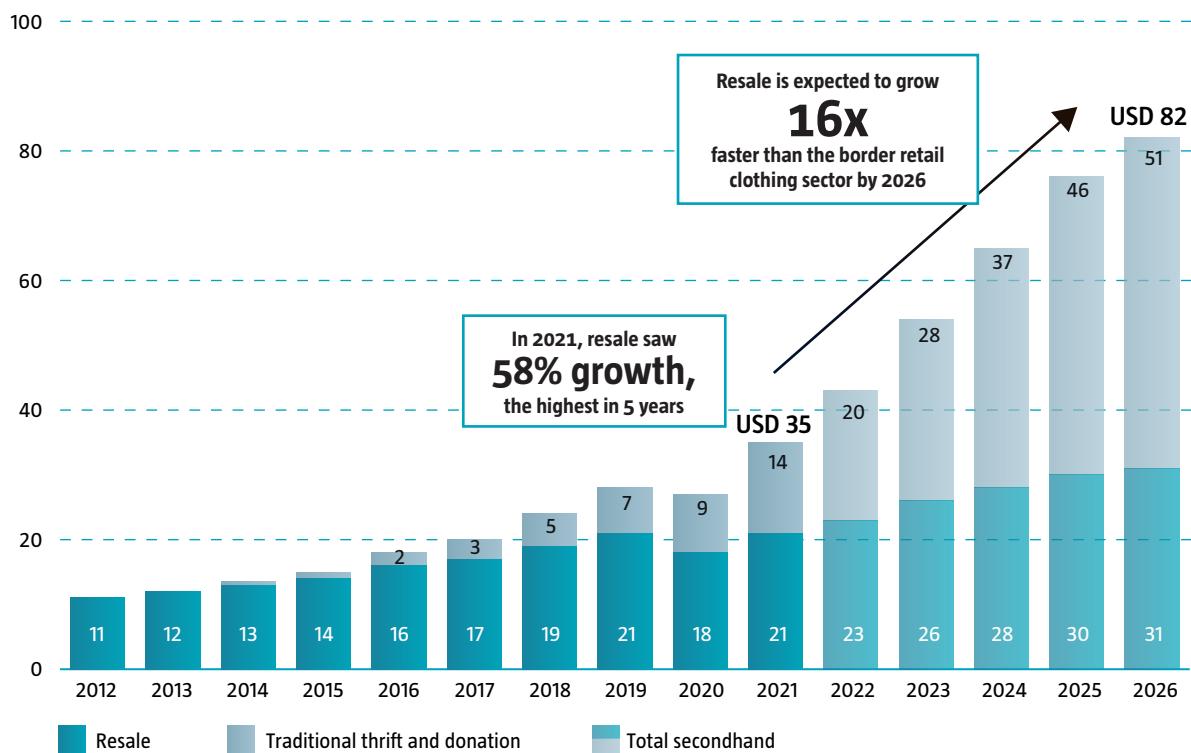
- Multi-brand ‘closet in the cloud’ platforms such as Rent The Runway and Cocoon, which work in partnership with multiple brands and benefit from greater scale and more choice than with single-brand rentals. In 2022 Rent The Runway for example, reported that 89% of its subscribers buy fewer clothes than they did prior to joining the service¹¹.
- Peer-to-peer clothing rental platforms such as By Rotation.
- Brands offering rental services via their own website, such as Patagonia, Decathlon and Adidas.

11 Prioritizing Access Over Excess: Rent the Runway Unveils Impact Strategy | Rent The Runway, Inc

3. Resale (more users per product)

Resale is another term for buying clothes secondhand, or thrift shopping. Online resale is a relatively new category in the fashion world, pioneered by eBay and made popular in recent years by specialist fashion resale marketplaces such as ThredUP and Vinted. It is a rapidly evolving market, having grown by 58% in the US in 2021, and expected to grow 16x faster than the broader retail sector over the next five years.

Figure 1.13 | US resale market



Source: ThredUP 2022 Resale report

In resale, we see three business models emerging:

- **Two-sided marketplaces** based on the principle of individuals selling to individuals. They are scalable companies with capital-light business models, operating in fiercely competitive markets with low barriers to entry.
- **Independent marketplaces** which enable customers to dispose of unwanted items and offer a wide assortment of products. They offer an element of discovery to consumers, but also tend to be relatively more capital-intensive.
- **Resale-as-a-services (Raas)** providers offer a seamless resale process for brands, doing away with the logistical complexities of online resale while unlocking a new revenue stream and improving sustainability credentials. Brands such as Lululemon, Levi's, Patagonia and Gucci are exploring Raas, and we expect more to follow suit. However, recent studies suggest the resale of low-ticket items does not actually lead to an overall decline in consumption. Instead, it often promotes even faster fashion cycles, more purchases and therefore a high CO₂ footprint from shipping. As such, we believe the development of a high-end resale market will have a greater impact in driving sustainable circular consumption than the resale of low-quality, fast-fashion products.

1.6 Fast versus slow fashion

Over the past two decades, shopping has become easier, faster and more digital. Many people are no longer shopping for clothes – they are shopping for content to share with the world. We consider more sustainable supply-chain management as a prerequisite for fast fashion businesses. At the same time, the growth of the slow fashion movement, which is putting pressure on the entire industry to source and produce more sustainably, is an encouraging step in the right direction.

While the impact of the fashion industry on the climate is widely acknowledged, its substantial contribution to biodiversity losses has only started to hit the headlines recently. The crux of the problem lies in fashion's reliance on virgin synthetic, plant- and animal-based materials such as polyester, cotton, cellulose, silk, leather and cashmere, and the use of water- and chemical-heavy processes at almost all stages of supply chains. All this has a direct impact on species and habitats around the world. Another major concern from a sustainability point of view, is the large volumes of clothing being produced, especially by fast fashion companies, and the associated change of land use, soil degradation, freshwater availability, chemical pollution and production of waste.

"I love new clothes. If everyone could just wear new clothes every day, I reckon depression wouldn't exist anymore."

Sophie Kinsella, Confessions of a Shopaholic

Fast and getting even faster

Fast fashion can be defined as creating cheap, trendy clothing by sampling ideas from runways and magazines, and turning them into garments that reach the market as fast as possible. With the rapid rise of companies such as H&M, Zara and Forever 21 in the early 2000s, fast fashion companies made it possible for shopping to become a hobby. The fast fashion movement has grown rapidly since then, valued at USD 36 billion in 2019 and expected to reach USD 43 billion by 2029¹². With the boom in e-commerce and the growing trend towards casualization, new players such as Shein, Fashion Nova, and Boohoo have entered the fast fashion space. By adopting digital business models, this new generation of companies has been able to further reduce prices and production times, making fast fashion even faster. They use aggressive marketing practices, subsidies and advanced data analytics to identify new 'microtrends', which are marketed to consumers – mainly Gen Z – via influencers on social media platforms. By producing small batches of clothes (just 50-100 of each item) and often cutting corners to manufacture affordable items quickly, fast fashion companies have adopted the 'test and repeat' model made famous by Inditex and H&M, offering thousands of new designs each week at ever-lower prices.

As an example of how important social media has become as a marketing tool, videos tagged with the hashtag #haul on Tiktok, showing young influencers unpacking dozens of items, have been viewed more than 18 billion times. The race for content is feeding the core business of these ultra-fast fashion companies, which are built on the concept of overconsumption.

12. Source: Wren, B (2022). Sustainable supply chain management in the fast fashion industry: a comparative study of current efforts and best practices to address the climate crisis.

Consumers, investors and regulators alike increasingly see a need to move away from fast fashion:

1. Consumers: events such as the collapse of Bangladeshi garment factory Rana Plaza in 2013 and concerns about workers' rights in China's cotton industry in 2020 have sparked a consumer backlash, with growing demand for change from the public¹³.
2. Investors: within ESG investing, some fast fashion companies such as H&M and Inditex are considered to be best-in-class in the way they incorporate sustainability considerations in their processes and are improving transparency in their supply-chain management. However, stricter monitoring requirements from investors are necessary to ensure that brands meet their commitments.
3. Regulators: regulations against fast fashion are on the rise. Recent examples include the anti-waste and carbon label laws passed in 2020 in France, the Green Button Label Law passed in 2020 in Germany, and the California Garment Worker Protection Act signed in September 2021. The EU has also proposed new rules to tackle fast fashion in its impending EU Strategy for Sustainable Textiles¹⁴.

Incremental, long-term improvement is needed

Fast fashion companies face a trade-off between offering ever-lower prices and becoming more sustainable. One of the more effective ways to achieve sustainability is through more sustainable supply-chain management. Specifically, companies should focus on reducing the indirect impacts of their upstream¹⁵ and downstream¹⁶ activities and re-evaluate their design processes to integrate circular considerations across their product portfolios. From this point of view, the key sustainability practices that investors will increasingly look for in a fast-fashion company include:

- collaboration with industry leaders and participation in external sustainability standards (such as the International Labor Organization);
- outreach to local communities through corporate social responsibility projects;
- ensuring there is a sustainable approach to relationships with suppliers. This includes strict sourcing criteria (raw material sourcing, product design, efficient production processes, labor conditions) and the establishment of rigorous monitoring systems to ensure compliance and measure improvements.

Focusing on ensuring long-term sustainability rather than short-term gains and supplier incentives is vital if fast-fashion companies are to establish a sustainable supply chain and reduce the negative impacts linked to the industry. While we are pleased to see a few companies moving in that direction, most fast fashion companies are still dragging their feet when it comes to providing transparent information about their sourcing and production processes, approach to labor rights, or criteria for sourcing raw materials, including organic and recycled inputs. From a sustainable investment perspective, we encourage investors to focus on companies that are at the forefront of sustainability integration, but stress that unless sustainability considerations are heavily embedded into companies' business models, fast fashion does not yet have a place in the Future of Fashion.

“Fashions fade, style is eternal.”

Yves Saint Laurent

13. [forbes.com/sites/jonquilhackenberg/2021/04/29/brands-you-need-to-listen-to-the-conscious-consumer-of-the-future/](https://www.forbes.com/sites/jonquilhackenberg/2021/04/29/brands-you-need-to-listen-to-the-conscious-consumer-of-the-future/)

14. ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12822-EU-strategy-for-sustainable-textiles

15. Some examples: decarbonizing material production and processing (for example the use of new technologies or targeted farming techniques such as pesticide and fertilizer reduction), improved energy efficiency and adoption of renewable energy at production facilities, incentivizing decarbonization of supply chains, working closely together with suppliers.

16. Examples include incorporating recycling, repair and resale business models, increasing transparency towards and education of consumers.

The slow fashion movement

The slow fashion movement advocates for manufacturing products with respect for the environment, people and animals. It involves local, ethical production and the use of relatively eco-friendly materials. Slow fashion offers the possibility of moving away from overconsumption, limiting the industry's negative social and environmental impacts, aligning with upcoming regulatory requirements on circularity and meeting the requirements of sustainability-minded consumers. Characterized by a focus on timeless designs, locally or organically sourced materials, low production volumes, longer production times, higher garment quality and longevity, and prices reflecting the true cost of a garment (including above-living-wage salaries for workers), slow fashion assigns value to functionality and material quality while applying sustainable and ethical considerations across the entire value chain of a product.

As it stands, it is mainly small, local, independent brands and designers that are focusing solely on slow, ethical fashion. Only a few global brands have so far been tapping into this market. However, collaborations between slow fashion brands and larger, household names (including fast fashion firms) are also on the rise, such as the collaboration in 2021 between H&M and Lemlem¹⁷. But while such collaborations boost visibility for the designer and help slow fashion to move into the mainstream, we still stress the importance of focusing on sustainable supply chain management and ensuring companies adopt transparent practices to avoid negative impacts hidden within the production process.

Robeco's engagement: living wage in the garment industry

Between 2018 and 2021, Robeco engaged with nine companies involved in the fashion industry, ranging from fast-fashion retailers to luxury brands, to promote the payment of living wages in the apparel industry's global supply chain. We carried out these engagements through the Platform Living Wage Financials, a coalition of 18 financial institutions that use their influence to engage with the companies they invest in on the topic of living wages in supply chains.

Our engagements focused on how companies uphold the payment of living wages across their strategy, how this is supported by responsible purchasing practices and industry collaborations, and whether the companies act to remedy any incidents that are identified.

We successfully closed engagements with five out of the nine companies. We ended the remaining four as they made unsatisfactory progress, primarily due to a lack of appropriate commitments by the companies in question on the payment of living wages, poor transparency about supply chain management and limited evidence of how the companies engaged on multi-stakeholder initiatives to create a level-playing field to advance the payment of living wages.

Fashion companies are setting out more comprehensive strategies governing labor practices across their supply chains. However, despite growing internal oversight and increased collection of data about wages that suppliers are paying, there is still limited evidence of living wages being paid in most countries in which suppliers are based. Over time, most of the companies that we have engaged with have included references to living wages in their policies, but few have a strategy on how to accelerate the payment of living wages in their supply chain.

While these engagements have come to an end, we continue to engage with apparel companies on the topic of 'Enhanced Human Rights Due Diligence in Conflict-Affected and High-Risk Areas', focusing on companies' sourcing strategies and efforts to prevent human rights violations in their supply chains.

Case study

US clothing company PVH has signed up to multi-stakeholder initiative ACT's Global Purchasing Practices Commitments. These commitments include accounting for wages as itemized costs, fair terms of payments, and better planning and forecasting. Providing internal training on responsible purchasing practices is crucial to ensure all relevant functions in the organization are aware of the topic's importance. PVH provided training on purchasing practices to 250 of its employees in 2021. The firm also gathers feedback from participants to understand how they put these topics into practice in their day-to-day work.

17. businessoffashion.com/articles/news-analysis/business-logic-balmain-hm-olivier-rousteing-designer-collaboration/



2. DIGITALIZATION

Key messages

- **Wearables:** Increasingly sophisticated health and physical performance monitoring functionalities will blur the boundaries between smart consumer devices and medical-grade wearables.
- **Digital goods for virtual worlds:** Consumers' desire to express themselves online using digital goods such as in-game outfits and tradable digital sneakers represents an opportunity for brands to strengthen their connections with consumers and make additional sales.
- **Direct-to-consumer brands:** Shifting to a direct-to-consumer business model results in more sales, higher profits and stronger relationships between customers and brands.
- **Team buying and livestream shopping:** Enabling consumers to form an online buying teams incentivizes consumers to become sales agents themselves. For brands and consumers, livestream shopping could lead to higher conversion rates and a more exciting shopping experience. Both concepts are already popular in China and we expect them to gain traction elsewhere.
- **Building influencer brands using social networks:** Celebrities and previously unknown individuals alike are building large international brands with little to no staff or upfront investment using their large followings on social networks and modern e-commerce software.
- **3D Printing and AI:** Technological improvements in additive manufacturing, predictive algorithms and robotics will lead to greater adoption of automation on the manufacturing floor, as well as higher uptake of AR/VR technologies both in-store and online.

2.1 Wearables

Increasingly sophisticated health and physical performance monitoring functionalities will blur the boundaries between smart consumer devices and medical-grade wearables.

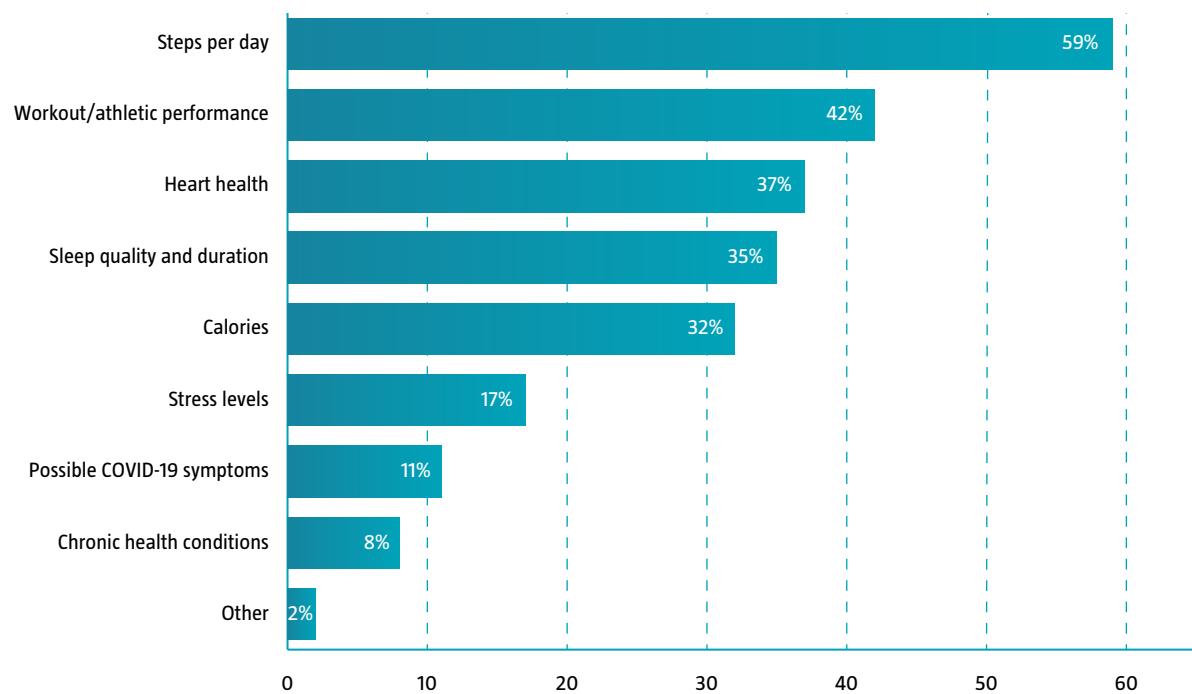
Wearables include electronic devices such as smartwatches, rings, glasses and / or sensors embedded in shoes and clothes. The first wearable – the Seiko TV watch – was launched in Japan in the 1980s. It incorporated a television that could operate for five hours powered by two AA batteries (while being connected to a small TV receiver). James Bond wore it in Octopussy. Over the years, a series of other smartwatches were launched. Casio was particularly prolific, developing the Game and Calculator watches (1980) and its Wrist Camera watch (2002), while Timex launched the Datalink watch (1994), which was co-developed with Microsoft and was the first watch able to download information wirelessly from a computer (it could store up to 150 phone numbers)¹⁸. What most of these wearables have in common are their mundane functionalities. Other than secret agents, who wants to watch TV or take pictures from their wristwatch?

18. <https://prowatches.com/seiko-tv-watch-everything-you-need-to-know-and-more/>

More recent innovation in smartwatches has focused on transforming them into mini-computers, with the promise of freeing consumers from their smartphones¹⁹ and enabling them to use apps, for example for shopping. However, such developments did not generate much enthusiasm among consumers, with some media outlets proclaiming the 'death of smartwatches' in 2017²⁰. While Apple helped smartwatches to go mainstream by producing a 'desirable' wearable (unlike other clunky connected watches), the only way for a smartwatch (or any other wearable) to become truly indispensable is for it to create a unique use case²¹, something that is difficult or impossible to achieve with a smartphone. Fitness and health tracking represents such a unique use case, and has revolutionized the world of wearables.

Use cases

Figure 2.1 | Smartwatch use cases



Source: Deloitte 2021 Connectivity and mobile trends survey

In 2021, 39% of Americans reported owning a smartwatch or health and fitness tracker²². 59% of consumers use them to track the number of steps they take per day and about 40% monitor their athletic performance and heart health. The Apple Watch can detect an irregular cardiac rhythm, providing real-time notifications to the user. Other wearables monitor the health, wellness and physical status of their users in greater depth by measuring blood oxygen levels and respiratory rates or even helping track female fertility through changes in body temperature – further differentiating themselves from smartphones. As wearables become more sophisticated, consumers and health care professionals are likely to start using them to monitor chronic conditions, for example by providing continuous data outside medical consultations. With 1.8 billion adults around the world suffering from either diabetes or hypertension, the ability to accurately measure blood pressure or glucose levels could significantly expand the addressable market for smartwatches²³. For example in 2021, Garmin announced that users with diabetes will be able to pair their Dexcom continuous glucose monitor to their smartwatch to view their glucose levels and trends²⁴.

19. [businessinsider.com/google-android-wear-2-2017-2?r=US&IR=T](https://www.businessinsider.com/google-android-wear-2-2017-2?r=US&IR=T)

20. [businessinsider.com/what-happened-to-smartwatches-2017-8?r=US&IR=T](https://www.businessinsider.com/what-happened-to-smartwatches-2017-8?r=US&IR=T)

21. [networkworld.com/article/2604687/how-the-apple-watch-could-create-a-new-mainstream-market.html](https://www.networkworld.com/article/2604687/how-the-apple-watch-could-create-a-new-mainstream-market.html)

22. Deloitte's 2021 Connectivity and Mobile Trends Survey

23. www2.deloitte.com/xe/en/insights/industry/technology/technology-media-and-telecom-predictions/2022/wearable-technology-healthcare.html#text=In%202019%2C%20low%20and%20middle%20income%20countries

24. [mobihealthnews.com/news/garmin-becomes-first-integrate-real-time-dexcom-diabetes-data-](https://www.mobihealthnews.com/news/garmin-becomes-first-integrate-real-time-dexcom-diabetes-data-)

Business opportunities

Figure 2.2 | All about the wrist: the global wearables market (x million units)



Source: IDC

Smartwatches dominate the global wearables market as it stands, but they have also paved the way for other wearable devices such as smart rings, glasses and fabrics, which now need to find their own relevance in consumers' lives. Smart rings are becoming increasingly popular, and have similar tracking capabilities to watches, but are less bulky and enable sleeker design²⁵. Smart clothing, which encompasses both connected clothing and smart fabrics, remains a largely untapped opportunity. Connected apparel can track indicators of health and performance using strategically placed sensors; for example, connected socks can monitor a baby's heart rate, or training clothes with sensors can detect which muscles are working. However, smart fabrics are the most promising segment within non-watch wearables, especially performance-enhancing smart fabrics, as they have a wider range of applications, from body temperature regulation to reducing water and wind resistance.

Smart fabrics are fabrics with an embedded digital component such as a sensor, electronic chip or battery. They can interact with the wearer's body and its environment and have three main uses.

Aesthetics: smart fabrics that use technology for fashion. They light up, change color or respond to their environment.

Performance: some smart fabrics can help enhance performance by regulating body temperature, reducing wind resistance or protecting against radiation.

Interactivity: smart fabrics that can interact with external devices. They enable the wearer to take calls, play music or take photographs with a single motion.

Source: thetechfashionista.com/what-are-smart-textiles-and-examples/

Recent history has shown that the success of individual wearables is largely dependent on the strength of their use cases. We think that the strongest growth potential lies with devices providing increasingly sophisticated health and performance monitoring functionalities. We believe the boundaries between smartwatches (or rings and fabrics) and medical-grade wearables will become increasingly blurred, notwithstanding concerns about data privacy and security. Conversely, smart glasses, such as the Ray-Ban Stories, which enable their wearer to capture and instantly share videos on social media, or cumbersome²⁶ connected jackets, which enable their user to take calls by pressing on sensors on their sleeves, serve as a reminder that not every innovative gadget is destined for success.

25. mashable.com/article/smart-ring-movano-oura

26. The 'single motion' argument assumes the user already carries a smartphone and readily plugged headphones

2.2 Digital goods for virtual worlds

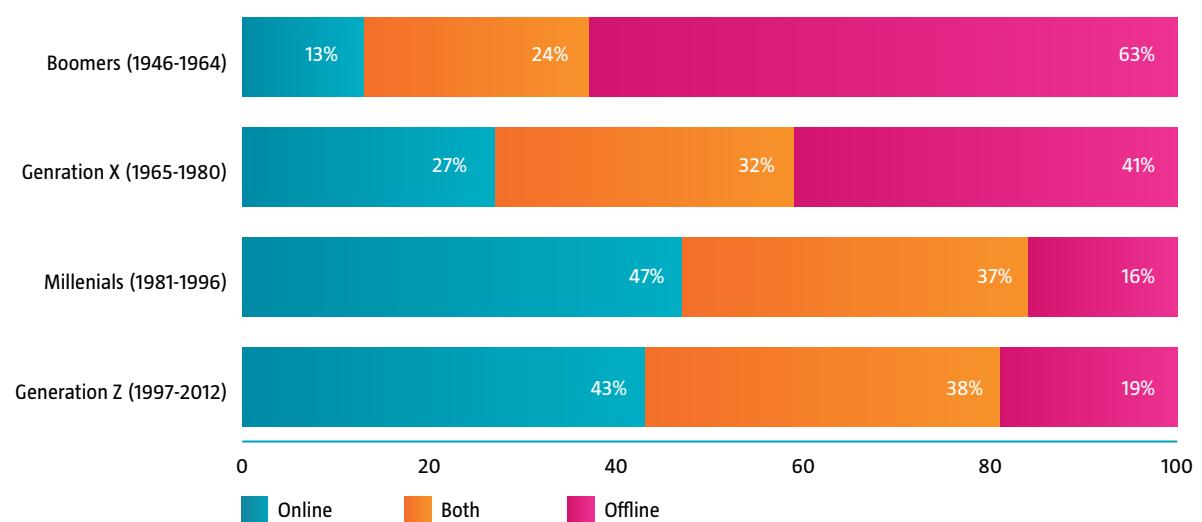
Consumers' desire to express themselves online with digital goods such as in-game outfits and tradable digital sneakers represents an opportunity for brands to strengthen their connections with consumers and make additional sales.

Digital goods are a developing concept, ranging from a simple jacket that can be worn in a game such as Fortnite to more complex non-fungible tokens (NFTs), which are non-interchangeable units of data on a blockchain that can be sold or traded. One way in which digital goods could take off is through brands selling 'digital twins' alongside physical products. For example, a consumer buying a pair of sneakers might also receive a digital version that can be worn in a virtual world such as Decentraland or in the game Roblox. We expect some consumers, especially younger ones, to adopt digital goods as part of their online identity. Brands could follow them and have an opportunity to differentiate themselves.

We think younger demographics are more likely to adopt digital goods, as they tend to be frequent users of social media and active members of online communities. About half of US consumers say they are active members of a community. According to Pew Research and Toluna, 47% of Millennials and 43% of Generation Z say the communities they are active members of are online. Although Pew Research and Toluna do not provide the data, we expect these communities to be made up of friends that met online, offline friends that predominantly communicate online, people with similar interests and gamers. In the future, they might want to wear digital goods in their online communities to express themselves and stand out.

As technologies like virtual reality, 3D simulation and cloud gaming develop further we expect digital environments providing better user experience and more interaction to emerge. This in turn is likely to lead to larger, more active online communities in which people socialize and also want to look good. Fashion, luxury and sports brands are already playing into people's desire to look good online by selling NFTs and virtual clothing, footwear and accessories.

Figure 2.3 | Where communities are based

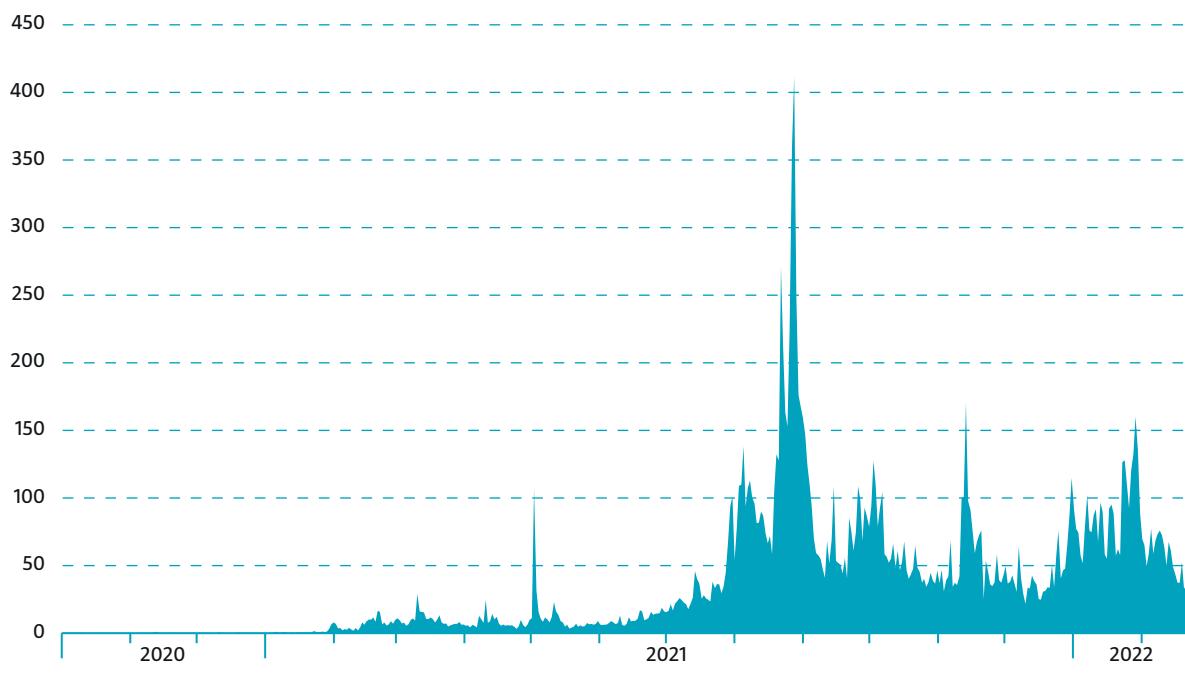


Source: Toluna, 2021

Probably the best example of people's willingness to spend money on their online appearance is the USD 5.1 billion in revenues Fortnite reported in 2020. The game is free to play, but to acquire different outfits (skins) for their characters and dances that they can perform, players must spend 'V-Bucks', which can be bought with standard currencies. These games are predominantly played by children, whose parents are willing to fund the purchase of such digital goods without apparent functionality.

This represents both a problem and an opportunity for brands. They have a problem if consumers shift their spending from physical items to virtual goods, resulting in lower sales. Such a shift is not happening at a large scale today, but spending on digital games, NFTs and virtual-reality headsets is growing faster than it is for apparel, footwear and most other physical fashion items. Brands founded on selling physical goods can address this potential problem by making exciting digital goods and distributing them through digital channels such as Decentraland and Roblox. In fact, this is arguably already happening. In 2021, a digital version of Gucci's Dionysus bag sold for more inside Roblox's virtual world than the retail price of the physical version. A user paid the equivalent of USD 4,115 for the bag, which sells for USD 3,400 in-store. Gucci was probably surprised by the sums some users were willing to pay for its digital bags given they initially sold for a mere USD 6. Despite the low amount of sales in absolute terms, the profit margins are presumably very high given brands don't need to pay for materials, craftsmen and rents in high-street shopping areas. This means digital goods could represent a sizable opportunity for brands to increase their profits as more people spend their time and money in digital environments.

Figure 2.4 | Daily spending on non-fungible tokens



Source: nonfungible.com, 2022

Reddit founder Alexis Ohanian tweeted about the USD 4,000 Gucci bag in Roblox, reminding us that the in-game luxury item holds no monetary value outside Roblox's virtual world. "Remember: this Roblox purse is not an NFT and thus has no value / use / transferability outside the Roblox world – yet it's worth more than the physical one. Watch this space", he wrote. Mr. Ohanian may be correct in stating that the Roblox purse has no value in the real world, but inside the game it gives the wearer status, and it can also be used as a means of speculation.

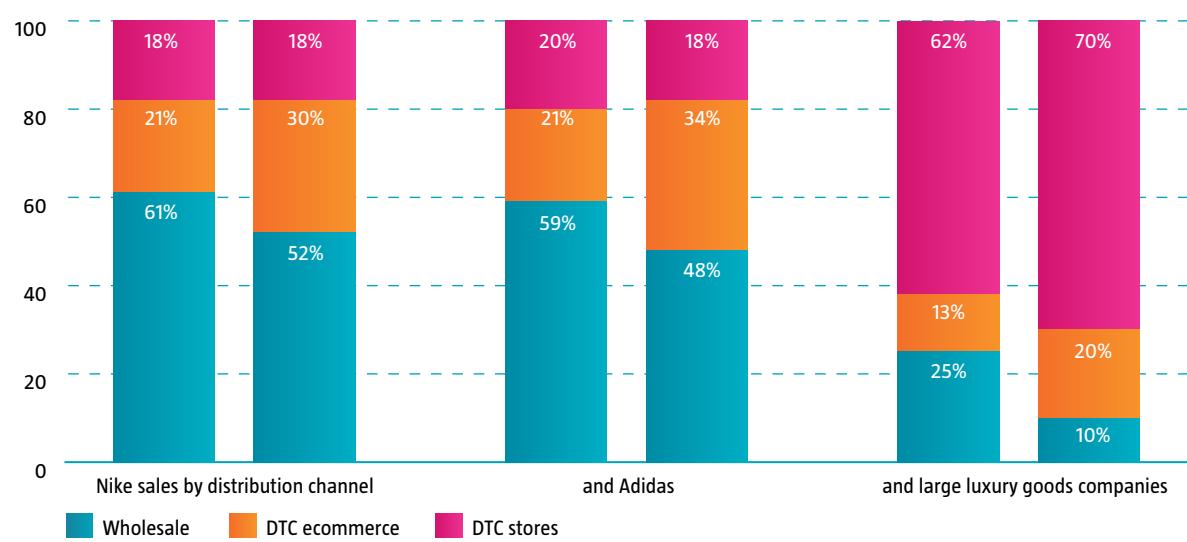
In December 2021, Nike bought a virtual shoe company that makes NFTs and sneakers for the metaverse. Meanwhile, Adidas has already sold about EUR 35 million worth of NFTs. Contrary to the Gucci bag in Roblox, NFTs are more technologically advanced and can provide more and longer-lasting value to their owners. In the coming years, we expect brands to hire more programmers, digital goods specialists and virtual reality experts to sell digital versions of their products. We may even see the launch of digital native brands that start out in a virtual world and decide to expand into selling physical products.

2.3 Direct-to-consumer brands

Shifting to a direct-to-consumer business model results in more sales, higher profits and stronger customer relationships.

Over the next five to ten years, we expect brands to continue to shift their product distribution from wholesale to online and offline retail. In other words, we expect fewer products to be sold in department stores, category retailers and boutiques, and more in the companies' own stores, websites and apps. This is a shift to what is called direct-to-consumer (DTC) distribution. In addition to incumbents shifting to a DTC business model, we expect more firms to be founded as DTC brands than in the past.

Figure 2.5 | DTC as share of brand sales is expected to increase over the next 5 years



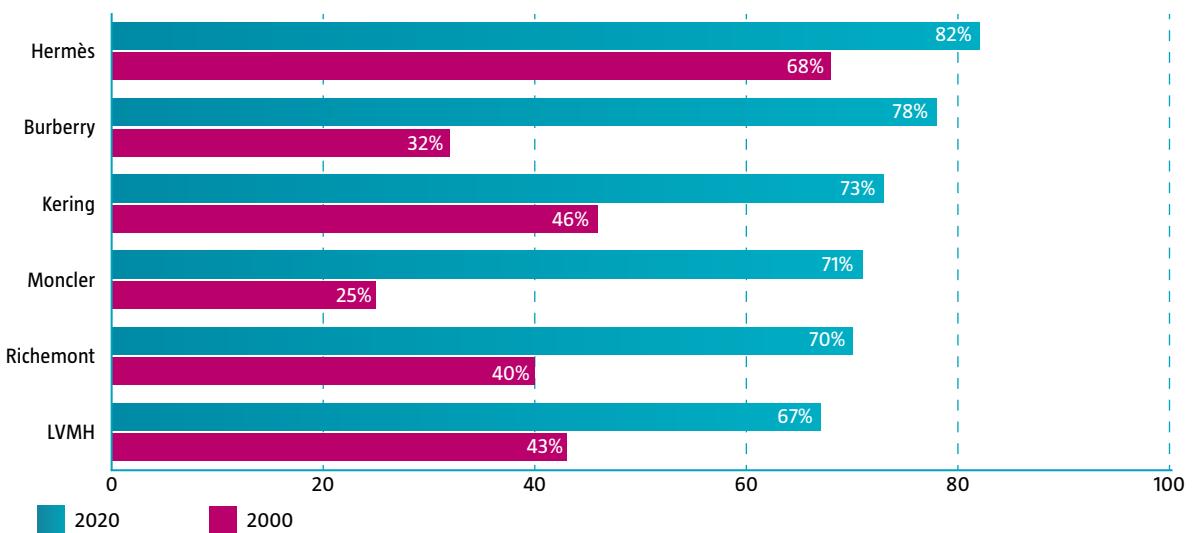
Source: Company filings, Robeco estimates, 2021

Fashion, luxury and sporting goods companies have benefitted from broad and convenient distribution via wholesale. But brands have found out that wholesale distribution also involves some drawbacks: they have no control over inventory, which leads to discounting; their products have to share the attention of consumers and salespeople with other brands; and they have no access to data about consumers and retail performance. In addition, wholesale selling means brands have to forego the retailer mark-up. Selling products directly to consumers is the brands' answer to those problems.

How can brands sell direct to consumers? They have two options. First, they can sell from owned and operated physical retail stores. This involves more responsibilities and costs, such as training store salespeople, designing retail spaces, picking locations, paying rent, curating product assortments and attracting consumers to their stores. Second, brands can sell via their own website or app. But this is easier said than done because they need fulfilment centers, software developers and personalization in terms of merchandising and marketing at scale.

Luxury goods brands are leading the shift from wholesale to DTC distribution as they suffer the most from wholesale distribution's drawbacks. The discounts of over 30% on high end luxury handbags offered by some US department stores in the early 2000s were what made many luxury brands pull the plug on wholesale distribution. Nowadays, Louis Vuitton and Chanel, for example, distribute all their products apart from beauty via DTC offline and online retail. Other brands such as Gucci, Hermès and Prada are following in their footsteps.

Figure 2.6 | Luxury goods have been increasing their direct sales since the 2000s

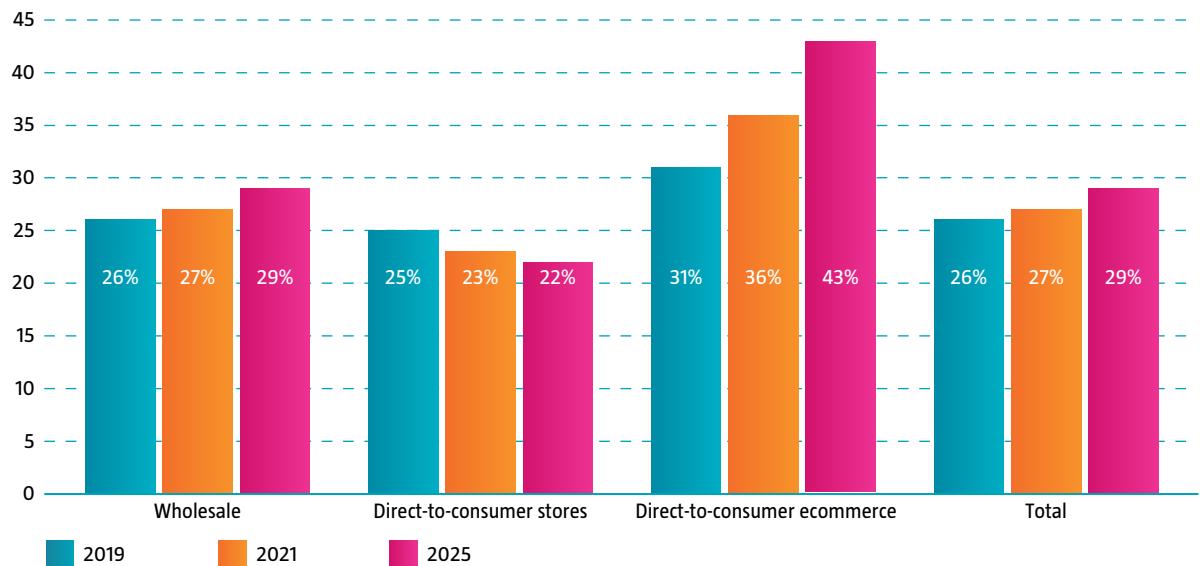


Source: Bernstein, 2021

Sporting goods brands with considerable scale, like Nike and Adidas, are also ending wholesale contracts. Nike has terminated hundreds over the past few years, including with long-time partners such as Macy's and Urban Outfitters. By doing so, such brands have more control over customer shopping experiences, can communicate with consumers more closely and manage inventories more efficiently. The shift to DTC distribution is also a way to increase their revenues because retailers' mark-ups are now for the brand to take.

However, DTC distribution is more expensive and capital-intensive. Without sufficient scale, it is hard to make it profitable. Until recently, investors doubted whether the returns on investment for DTC projects were adequate. However, luxury goods and sporting goods brands have proven that higher absolute sales and gross margins can compensate for the additional logistics, staff and store costs that are involved. Lululemon, for instance, has always sold direct to consumers and its 58% gross margin and 21% operating margin prove it can be highly rewarding. A distinction must be made between DTC sales made through physical stores and e-commerce. The latter has greater potential for economies of scale to lead to higher operating margins. In the case of sporting goods, DTC e-commerce can achieve 30-45% operating margins compared with 20-25% for physical stores.

Figure 2.7 | Nike operating margins by distribution channel



Source: Nike results, Robeco forecast, 2022

2.4 Team buying and livestream shopping

Team buying (digitally teaming up with others to purchase goods simultaneously) incentivizes consumers to become sales agents themselves, ultimately leading to higher volumes, lower prices and a more enjoyable shopping experience. Livestream shopping could lead to higher conversion rates and a more exciting shopping experience. Both concepts are already popular in China and we expect them to gain traction elsewhere.

Team buying and livestream shopping are innovations that are already reaching meaningful scale in China. It is not unlikely that e-commerce and social network companies will offer opportunities for team buying and livestream shopping in other parts of the world. If they do, we expect fashion companies to adopt both. Amazon has recently piloted livestream selling, while brands such as Nike, L'Oréal and Coach are already selling via livestream in China and their products are available on Chinese team buying marketplaces such as Pinduoduo.

Team buying

Team buying is a form of social commerce in which friends, family, and more distant contacts – even strangers – collectively buy a good to obtain a lower price. For example, someone scrolling on Pinduoduo sees a pair of jeans they like for CNY 400. The merchant selling the jeans may offer a price of CNY 350 if ten pairs of jeans are bought by a team. The initially interested person forms a team by reaching out to people they think might be interested in the jeans and tries to persuade them to buy a pair as well. If they succeed, they'll buy the jeans for CNY 350 instead of CNY 400, and the merchant sells more jeans. For consumers, team buying involves the offline shopping element of socializing and interacting with friends that often gets lost in online shopping.

Pinduoduo is a Chinese social e-commerce company that pioneered team buying in 2015. It sold products to almost 900 million Chinese consumers in 2021, up from 540 million in 2020. Figure 2.8 illustrates how group buying works in practice.

Figure 2.8 | How group buying works



Source: Ycombinator blog, 2020.

Interactions between team buyers could create two positive feedback loops. First, they could give the company running the marketplace more information about buyers' preferences and behavior, which could in turn be used to

make better recommendations and improve advertising results. This would be beneficial for both buyers and sellers. Second, higher sales and volumes lead to economies of scale for sellers, resulting in higher profits for them and potentially leading to lower prices for buyers. Smaller sellers would benefit the most, but one can imagine larger sellers such as Li Ning and Nike offering discounts when hundreds of buyers team up.

The primary motivation for consumers to engage in team buying is the chance of obtaining a lower price. We expect some companies offering team buying to shift their focus from price to deeper social interactions and gamification. This will probably lead companies to make more products available for team buying as most see discounting as bad for their reputation.

Pinduoduo's popularity in China is a signal that online shopping is becoming more of a social experience than it has been up to now. There have also been experiments with team buying outside China in the past. Microsoft co-founder Paul Allen started Mercata, which offered high-end electronics deals to online shoppers, but it could not compete with Amazon. Groupon is a form of team buying, while Pinterest also has characteristics of social e-commerce. However, there are as yet no large-scale team-buying marketplaces outside China. Incumbent e-commerce companies such as Amazon may be reluctant to offer team buying because it gives individual buyers more bargaining power, impacting their sellers. Social network companies Meta, TikTok and Snapchat could possibly venture into e-commerce and offer team buying, but this seems unlikely for now. The concept also tends to promote over-consumption and heavy discounting, practices increasingly discouraged by sustainability-focused regulators in markets such as the EU.

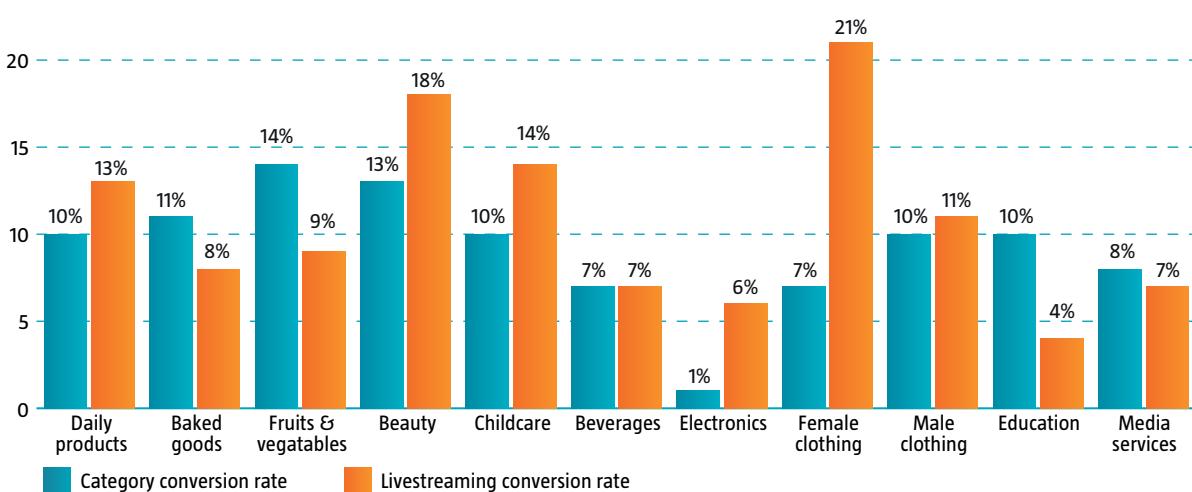
Livestream shopping

Livestream selling is decades old, with TV shopping channels selling things like Snuggie blankets, George Foreman grills and Shake Weight fitness apparatus. Chinese e-commerce companies JD.com and Alibaba and video sharing apps Duoyin and Kuaishou have modernized selling via livestream, making effective use of their large user bases and improvements in mobile internet connectivity and digital payments.

How does this livestream shopping in China work in practice? Let's consider a beauty brand selling lip gloss. The brand contracts a merchant services company that chooses suitable influencers who match the company's identity and target customers. These influencers present the lip gloss to users via livestream on e-commerce and video sharing apps such as Alibaba's Taobao and Douyin. If all goes well, consumers like the livestreamed product and buy it directly in the app they are using.

How effective is livestreaming? Livestream selling conversion rates for daily necessities, beauty, childcare, electronics and clothing are 10 percentage points or more higher than for non-livestream selling, according to a 2019 by Chinese merchant services company Youzan.

Figure 2.9 | Merchant conversion rates Youzan's WeChat stores



Source: Youzan female fashion industry report, 2019.

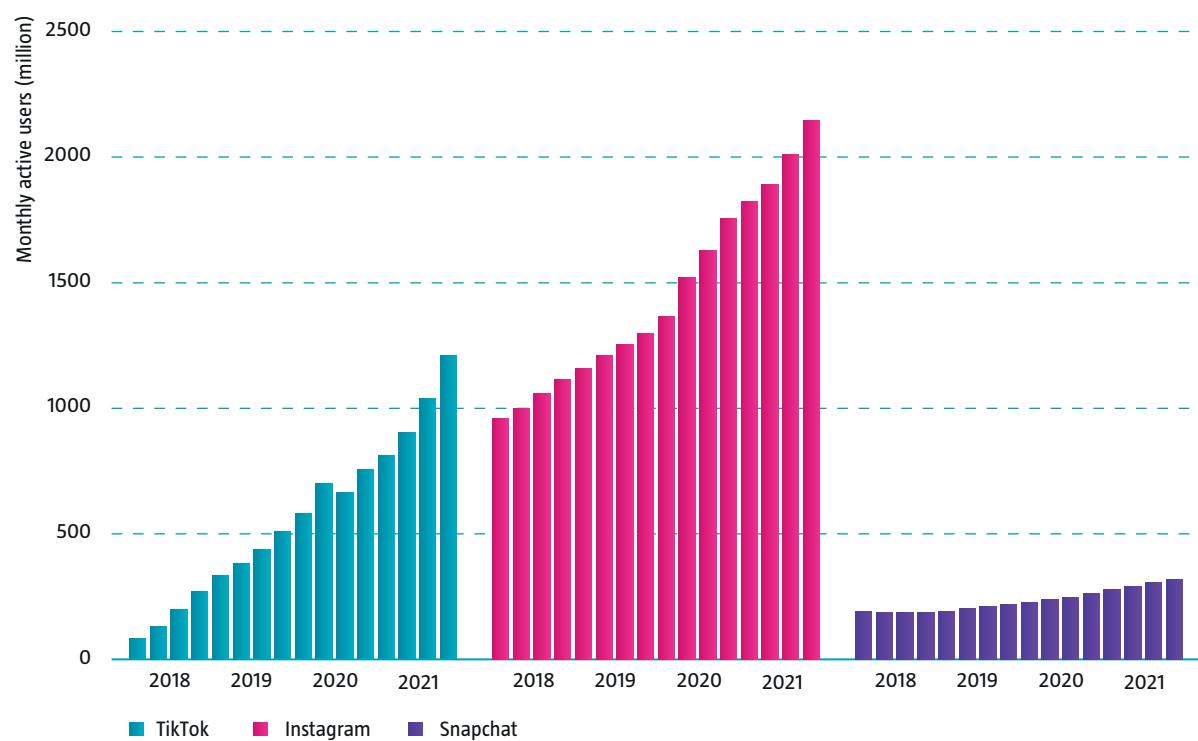
What does the future hold for livestream shopping? We think fashion brands will increasingly use influencers with strong social connections with a niche following. This makes coordinating marketing efforts more complex, possibly favoring larger brands. We watched Amazon's livestream shopping channel Amazon Live and a replay of a livestream selling jewelry on e-commerce website AliExpress; both seemed to be of poor quality and received low numbers of viewers. But we expect the quality of livestream shopping outside China to improve over the coming years, and think social networks like Facebook, Instagram, TikTok and Snapchat could expand their livestream features to incorporate shopping over the coming years.

2.5 Building influencer brands using social networks

Celebrities and previously unknown individuals alike are building large international brands with little to no staff or upfront investment using their large followings on social networks and modern e-commerce software.

Consumers are increasingly using social networks such as TikTok, Instagram, Facebook and WhatsApp when shopping. From 2018 to 2021, TikTok, a short-form video sharing app, went from 85 million to 1.2 billion monthly active users outside China. Its Chinese version, Douyin is immensely popular within the country, with about 750 million users. The increasing adoption and time spent on such social apps has enabled influencers, a new form of celebrity, and unknown individuals alike to sell to almost anyone, anywhere. At the same time, e-commerce software like Shopify and customer support software like Zendesk are making it much easier to sell online.

Figure 2.10 | Number of active users on social media



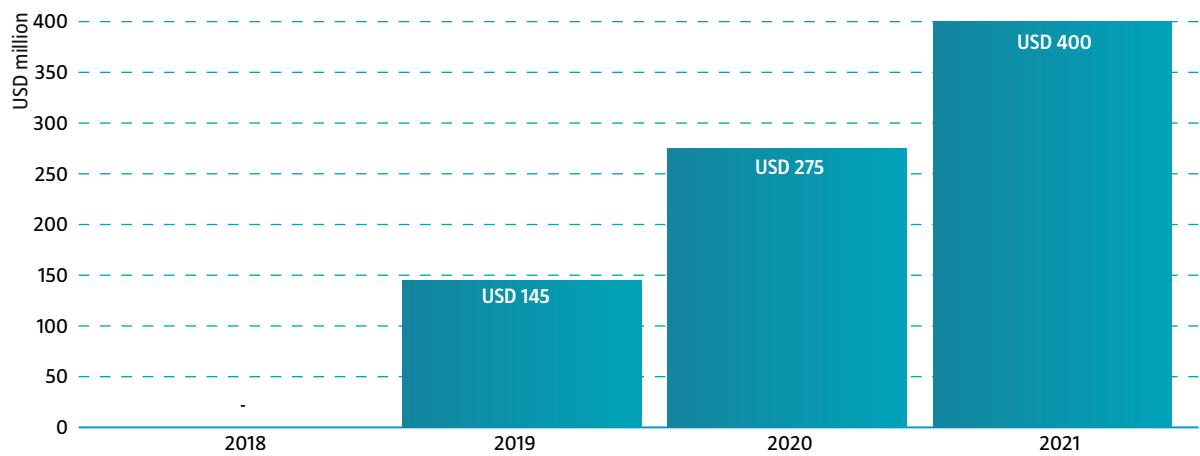
Source: App Annie, CNBC, Business of Apps, companies' data, 2022

In 1985, Michael Jordan partnered with Nike to monetize his celebrity status by selling Air Jordan footwear and clothing. Nowadays, celebrities can use their large followings on social networks to market their brands while using software like Shopify to manage their operations. Successful examples of such initiatives include Kim Kardashian's loungewear and shapewear brands SKIMS and Kylie Jenner's beauty brand Kylie Cosmetics. In January 2022, SKIMS raised USD 240 million²⁶ in funding from investors. In its debut year, 2019, SKIMS made estimated sales of USD 145 million and probably reached USD 400 million in 2021. While Kim was building SKIMS, Kylie sold 51%²⁷ of Kylie Cosmetics to beauty brand owner Coty for USD 600 million in 2020. This shows celebrities can extract substantial value from their fame using social networks, and we expect more to do so in the future.

26. wwd.com/fashion-news/intimates/kim-kardashian-skims-240-million-investments-1235055574/

27. theguardian.com/lifeandstyle/2019/nov/19/kylie-jenner-makes-600m-from-selling-majority-share-in-her-beauty-company

Figure 2.11 | Estimated sales of SKIMS, a celebrity brand



Source: Business of Fashion, 2022.

Both Kim Kardashian and Kylie Jenner were known from their reality TV show, Keeping Up With The Kardashians. But many fashion brands are being built up by otherwise unknown influencers with large followings on Instagram and other social networks. Danielle Bernstein, for example, has 2.8 million followers on Instagram and sells clothes and footwear under her brand We Wore What²⁸. Another example is Chiara Ferragni, who has 26.8 million followers on Instagram and sells apparel, cosmetics and jewellery from her website²⁹. There are many other successful fashion brands run by formerly unknown individuals. From seemingly nothing they have quickly built fashion brands with an international client base.

Selling fashion items or building a brand does not necessarily require a large following on social networks. For example, Poshmark is a marketplace in which both unknown individuals and celebrities can buy and sell items online, with social elements such as receiving personal recommendations from other users, asking for feedback from others and choosing whose 'closets' to follow. Meanwhile, brand incubators like the New Guards Group have helped companies such as Off-White and Palm Angels grow into popular international brands. In many countries individual sellers and companies use viral Whatsapp and Facebook³⁰ groups to reach potential customers. Digitalization and social networks are enabling individuals to build brands without the need for a lot of staff (sometimes none) or large upfront investments. Although most brands are likely to remain relatively small or fail, we expect a handful to reach a size at which they could consider listing publicly or be acquired by a listed company.

28. weworewhat.com/

29. eu1.chiaraferragnibrand.com/

30. [linkedin.com/pulse/race-digitize-commerce-sub-saharan-africa-bryan-pon/](https://www.linkedin.com/pulse/race-digitize-commerce-sub-saharan-africa-bryan-pon/)

2.6 3D Printing and AI in fashion

Technological improvements in additive manufacturing, predictive algorithms and robotics will lead to greater adoption of automation on the manufacturing floor, as well as higher uptake of augmented and virtual reality technologies in-store and online.

It is probably fair to say that 3D Printing and AI designers have, as yet, failed to deliver on their promise to revolutionize the way the fashion industry operates. 3D-printed clothes remain too expensive for mass-market adoption, so are still mostly confined to art pieces and haute couture. And while an 'AI designer' called DeepVogue won an award at China's International Fashion Design Innovation competition in 2019, outfits designed by machines aren't always runway-ready³¹.

But despite their shortcomings today, technological improvements in additive manufacturing, predictive algorithms and robotics are likely to lead to greater adoption of automation on the manufacturing floor. Driven by ongoing digitalization of the garment industry, digital tools can help businesses align supply and demand, design better products and create further avenues for personalization. The following examples illustrate how fashion companies could benefit from greater adoption of such technologies:

1. **Performing mundane tasks:** Whether it is sewing or sorting dresses, 3D printing and smart robots could outperform humans both in terms of accuracy and speed, leading to cost savings, greater ability to detect product faults and improved quality maintenance.
2. **Reducing waste:** Printing garments can reduce fabric waste in production by as much as 35%³² – a meaningful amount for low- and high-volume garment producers alike. Meanwhile, increasing adoption of predictive algorithms to gauge what will and will not sell well can reduce the need for retailers to discount.
3. **Producing goods on demand and creating avenues for personalization:** With demand for personalization growing, especially in the athleisure segment, brands are exploring how 3D Printing can help them produce goods on demand. For example a 2021 partnership between adidas and 3D Printing design company Carbon resulted in the release of a perfectly fitted performance running shoe that would be nearly impossible to produce without such technology.
4. **Automation potential:** The ability to reduce forecasting errors by detecting new trends, projecting demand, automating logistics and supply chain processes and monitoring customer activities has become important for fashion companies. We expect to see greater adoption of machine vision for product discovery and styling by companies and consumers alike, as well as adoption of smart mirrors in offline locations by retailers.

Figure 2.12 | Adidas Ultra 4D shoes



Source: Adidas website, 30-05-2022

31. An AI 'Designer' Just Won Runner-Up in a Major Fashion Design Competition (radiichina.com)

32. Estimate by the performance clothing company Ministry of Supply.



3. CASUALIZATION AND PERSONALIZATION

Key messages

- **Casualization:** Reflecting consumers' evolving lifestyles, casualwear looks set to take a growing share of our wardrobes, breaking down the barriers between sportswear, workwear and leisurewear.
- **Brand collaborations:** Brands will continue to surprise and excite consumers through their collaborations. The strongest brands will go even further and turn their collaborations into multi-year recurring collections.
- **Personalization and inclusivity:** Fashion brands' ability to deliver individualized customer experiences and inclusive designs will act as a key differentiator in the post-pandemic online and offline retail worlds.

3.1 Casualization

Reflecting consumers' evolving lifestyles, casualwear looks set to make up a growing share of our wardrobes, breaking down the barriers between sportswear, workwear and leisurewear.

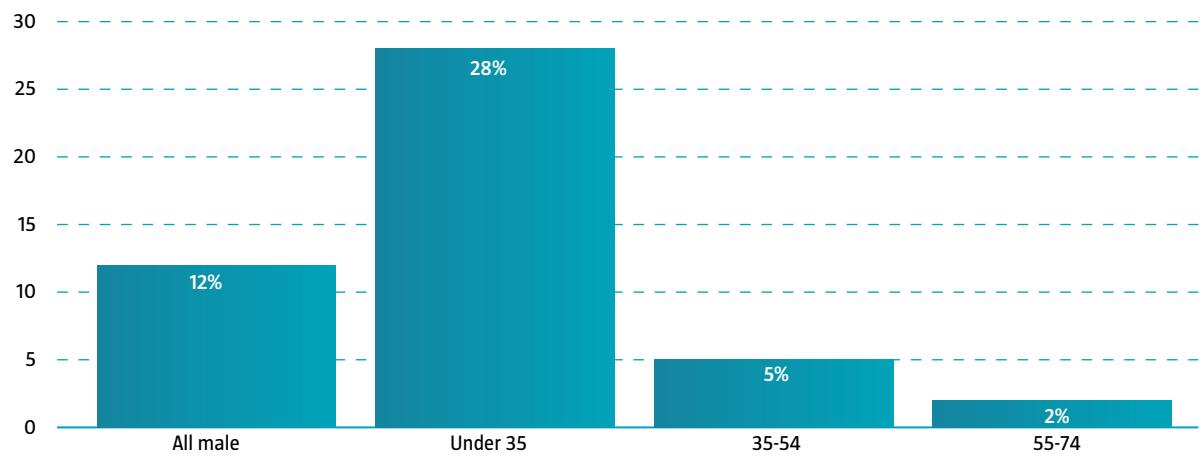
While the pandemic saw many transition from suits to sweatpants, the trend towards casualization started over a century ago with the advent of sportswear in the 1910s³³. This was shortly followed by the introduction of shorts in the 1920s, first as knee-length cotton culottes for women to wear when performing activities such as cycling, exercising or gardening, and then later in the 1940s as fashion items made from a range of materials and with different lengths. However, shorts – for men and women – did not immediately gain widespread acceptance and were actually banned from many American towns and universities until the end of the 1950s³⁴. The transition towards a unisex wardrobe in the 1960s marked a further breakthrough, with women starting to wear jeans, t-shirts and pullovers. In 1979, the March issue of Nation's Business magazine coined the term athleisure to describe the clothing worn by people who want to look athletic without necessarily participating in sports³⁵.

33. time.com/3984690/american-casual-dressing/

34. npr.org/sections/npr-history-dept/2015/04/07/397804245/when-wearing-shorts-was-taboo

35. merriam-webster.com/words-at-play/athleisure-words-were-watching

Figure 3.1 | Exane BNP Paribas, Survey of Shoppers March 2019



Source: Robeco

In the 1960s, jeans were popularized by icons such as Marilyn Monroe and Brigitte Bardot, and became a fashion item rather than a functional workwear outfit³⁶. Similarly, over the past decade, the rise of health- and wellness-focused lifestyles, as promoted by celebrities and influencers on social media and reinforced by the pandemic, has normalized athleisure's presence in the streets and at fashion shows. Only 13% of US consumers wear athletic shoes and apparel exclusively for playing sports or working out³⁷. Sportswear now accounts for 36% of the US apparel market, up from just 23% in 2007, benefitting not only pure-play sports brands, but also mainstream retailers such as H&M and Asos, which have launched their own sportswear collections.

Far from leading to athleisure fatigue, the boom in casual clothing sales as a result of lockdowns has accelerated the shift towards athletic wear. Since the beginning of the pandemic, activewear brands such as Lululemon have reported continued consumer appetite across different categories, while workwear and denim brands are rapidly expanding into active and casual categories to cater to new preferences.

Before the pandemic, the office arguably remained the last unconquered territory for athleisure. But even in 2019, Vogue predicted that the future of athleisure lay in the workplace³⁸, a prediction that was supported by a survey by recruitment company Randstad in the same year suggesting that 33% of employees would prefer an informal dress code to an extra USD 5,000 in salary. Today, with workers around the world returning to the office, many are adopting a so-called workleisure style, defined by The New York Times as 'the basics of the off-duty wardrobe (T-shirts, pullovers, track pants) translated in the materials and details of the office'³⁹.

Comfort and quality were the top considerations when buying athletic apparel in 2021, and people's preferences when choosing workwear do not differ. Workleisure must strike the right balance between comfortable and presentable, for example by combining Lululemon's flagship ABC pants with a more traditional blazer. Formalwear retailers have been forced to adapt to remain relevant, with suit maker Brooks Brothers launching a sportswear and casualwear collection and Banana Republic releasing an athleisure line. Hugo Boss actually began a similar transformation several years ago, and now aims to be able to dress its customers for any occasion, offering business clothing, casualwear and sportswear. However, when shopping for casual clothing, sportswear brands remain most consumers' top choices.

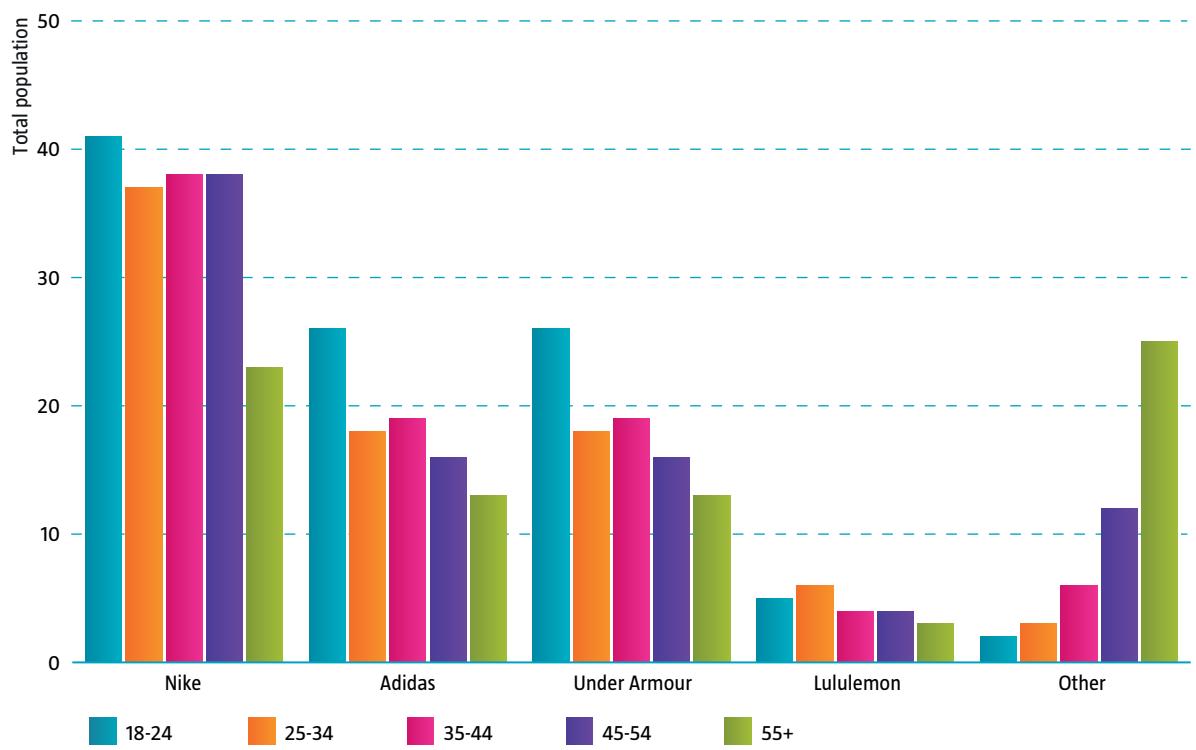
36. revellenation.com/blog/history-of-womens-jeans/#:~:text=Although%20the%20oldest%20women's%20jean,jeans%20made%20exclusively%20for%20women.

37. Source: AlphaWise, Morgan Stanley

38. voguebusiness.com/consumers/the-future-of-athleisure

39. nytimes.com/2020/08/20/style/work-from-home-clothes.html

Figure 3.2 | Shopping for Casual Lifestyle Apparel



Source: Cowen Millennials Survey June 2020

Luxury brands understand this, and while they have launched their own premium athleisure and footwear collections – for example, Chanel showcased sneakers as a luxury item for the first time in 2014 – they have focused more on partnerships and capsule collections. Examples include Prada and Adidas, Dior and Technogym, and Gucci and the North Face.

All in all, casualwear appears to be here to stay and looks set to make up a growing share of people's wardrobes. Going forward, athleisure will evolve in line with consumer taste and innovations – for example, it may incorporate more sustainable materials and high-performance fabrics, and use ethical sourcing. Lifestyle and sports preferences across generations will also influence the future design of athleisure clothing. Older generations have been heavily influenced by team sports such as soccer and basketball, while Millennials and Gen Z's sports culture is more distinctively rooted in fitness and outdoor activities. Similarly to jeans, whose casual look became the symbol of a carefree generation in the 1960s and 1970s, athleisure represents much more than stretchy yoga pants. It embodies consumers' desire for freedom and self-expression, and reflects their evolving lifestyles.

3.2 Brand collaboration

Companies will continue to surprise and excite consumers through their collaborations. The strongest brands might go even further and turn their collaborations into multi-year recurring collections.

In 1972, American tennis player Stan Smith won Wimbledon, but that's probably not the reason most consumers recognize his name nowadays. Six years after his win, Adidas collaborated with him to create a white sneaker with an appealing silhouette. More than 70 million⁴⁰ pairs have been sold since. This shows collaborations can be hugely successful for brands. In this example it was an individual collaborating with a brand, but brand-with-brand collaborations can also be highly profitable. In 2017, the collaboration between skateboarding lifestyle brand Supreme and Louis Vuitton went viral, and pieces from that year's Supreme x Louis Vuitton collection are still being sold for thousands of euros. A pre-owned Supreme x Louis Vuitton Keepall travel bag is currently listed on Farfetch for EUR 17,823⁴¹. It's rumored that a sequel collaboration is on the cards.

Figure 3.3 | Examples of brand collaborations



Source: Adidas, Farfetch, Apple

Collaborations have been around for a while and come in many different forms. US retailer Target collaborated with luxury fashion house Missoni, enabling consumers for whom luxury is normally out of reach to buy high-end products. Apple worked with Nike to bring together fitness and music with the Nike+iPod in-shoe sensor, and the two firms continue their collaboration to this day with the Apple Watch Nike Series. Collaborations don't just have to be between two brands – Kanye West, Gap and Balenciaga⁴² created a clothing collection together. Combined, they have around 30 million followers on Instagram they can use to market their collection. We expect brands to continue to find creative ways to benefit from each other's identities and target customers.

Not all collaborations are successful, however. Companies licensing their brand name to low-end producers can damage their reputation. Thoughtless use of logos and too much collaboration can confuse consumers and dilute a brand's identity. Adidas has been criticized for collaborating with too many luxury brands but they probably didn't do as badly as shoes brand Cole Haan, which put the logo of collaboration software company Slack logo on its shoes. Who wants to be reminded of the daily grind of going to work when going out and about?

40. [vogue.fr/fashion/article/stan-smith-adidas-history-best-selling-sneakers](https://www.vogue.fr/fashion/article/stan-smith-adidas-history-best-selling-sneakers)

41. [farfetch.com/nl/shopping/women/louis-vuitton-x-supreme-2017-pre-owned-keepall-45-reistas-item-17217022.aspx?size=17&storeid=10031&utm_source=google&utm_medium=cpc&utm_keywordid=27655851&utm_shoppingproductid=17217022-6963110321099797116&pid=google_search&af_channel=Search&c=798445663&af_c_id=798445663&af_siteid=&af_keywords=pla-65112101911&af_adset_id=41152258973&af_ad_id=190053067343&af_sub1=27655851&af_sub5=17217022-6963110321099797116&is_retargeting=true&shopping=yes&gclid=EA1aIQobChMI9oTXhcqz9wIvI-FRCh3h7gQ8EAYYBjABEqLdsyD_Bw](https://www.farfetch.com/nl/shopping/women/louis-vuitton-x-supreme-2017-pre-owned-keepall-45-reistas-item-17217022.aspx?size=17&storeid=10031&utm_source=google&utm_medium=cpc&utm_keywordid=27655851&utm_shoppingproductid=17217022-6963110321099797116&pid=google_search&af_channel=Search&c=798445663&af_c_id=798445663&af_siteid=&af_keywords=pla-65112101911&af_adset_id=41152258973&af_ad_id=190053067343&af_sub1=27655851&af_sub5=17217022-6963110321099797116&is_retargeting=true&shopping=yes&gclid=EA1aIQobChMI9oTXhcqz9wIvI-FRCh3h7gQ8EAYYBjABEqLdsyD_Bw)

42. [yeezygap.com/collections/all](https://www.yeezygap.com/collections/all)

Tapping into a diverse customer base

Collaborations provide companies with a number of opportunities that might not otherwise be available:

Expansion into new product categories: collaborations enable brands to venture into product categories they have no technical knowledge of. For example, in 2019 Hello Kitty collaborated with Swarovski to create a jewelry collection, with individual items ranging in price from USD 149 to USD 10,600. Meanwhile, the Hermès x Apple Watch collaboration has enabled one of the world's most prestigious luxury brands to venture into the fast-growing smartwatch category.

Customer acquisition: buying a EUR 150,000 sportscar is not possible for most consumers. But for some, financial success will eventually enable them to afford Porsches and Ferraris. To familiarize consumers with brands selling high-ticket items such as sportscars, they can collaborate with a brand selling lower-ticket products. The Rimowa x Porsche suitcase (retailing at USD 2,890 for a hand-carry Pepita case) is one example, giving consumers a somewhat more affordable entry into the world of Porsche.

Association with a good cause: association with a good cause through philanthropy has also become commonplace. For example, (RED) has raised more than USD 700 million⁴³ to help end AIDS, tuberculosis and malaria causes through collaborations with Apple, Starbucks, Durex, Canon, Converse and many others. Supporting a good cause through collaboration could also be a good way to appeal to consumers who are becoming more politically engaged, especially Millennials and Gen Z.

Figure 3.4 | Philanthropic (RED) collaborations examples



Source: (RED)

43. red.org/faq-contact

3.3 Personalization and inclusivity

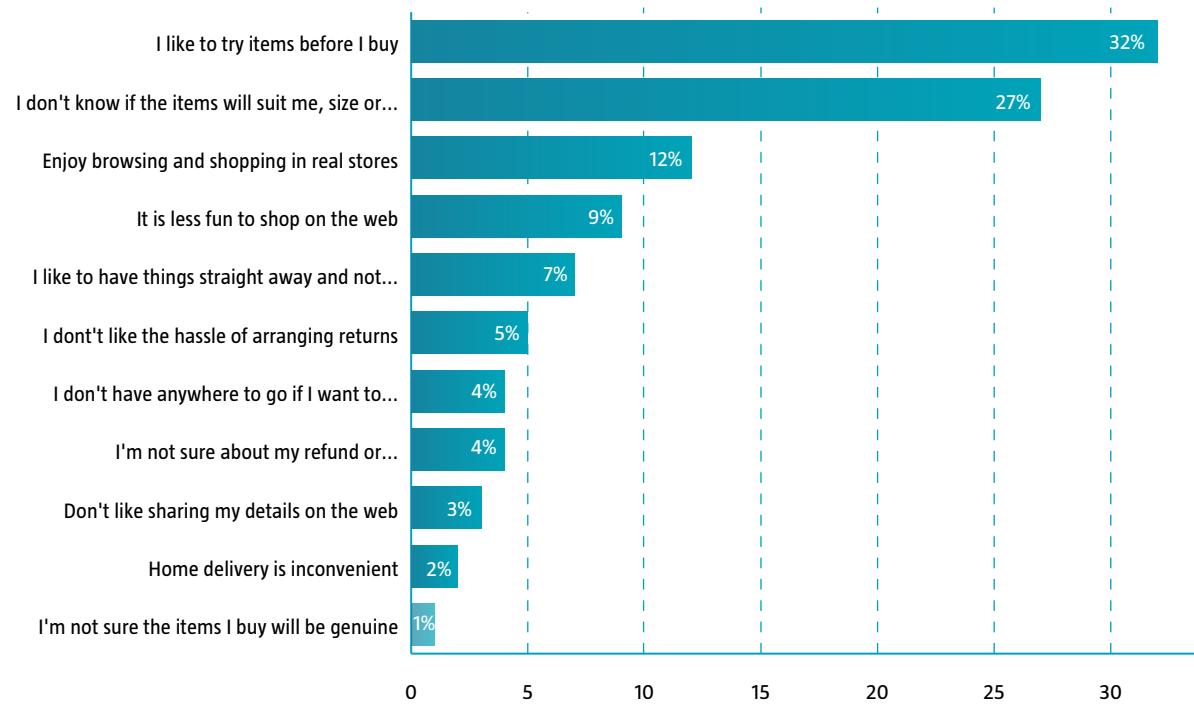
Fashion brands' ability to deliver individualized customer experiences and inclusive designs will act as a key differentiator in the post-pandemic online and offline retail worlds.

In 2018, McKinsey predicted that personalization would be the prime driver of marketing success over the next five years. A 2018 survey from the same year showed that 80% of US adults expect a personalized experience from a retailer, supporting McKinsey's perception of personalization as a 'hygiene factor' in today's retail environment. The race to solve the long-standing challenge of matching shoppers to their preferred items and correct sizes intensified during the pandemic, and online retailers have been heavily investing in data collection and AI to help customers choose the right items and reduce the need for returns and exchanges.

Personalizing products has proven to be trickier. Studies suggest that 84% of consumers would be interested in having their favorite item of clothing personalized, a figure reaching 94% for luxury shoppers. But customization takes time, and involves financial and logistical costs. As discussed in our chapter on sustainability, the increasingly lower prices, shorter production lead times and the meteoric rise of super-fast fashion have made it difficult for brands to stick to the principles of sustainable fashion design. We see the growing popularity of the slow fashion movement, which is rooted in traditional craftsmanship and customization, as a potential catalyst for increased personalization going forward.

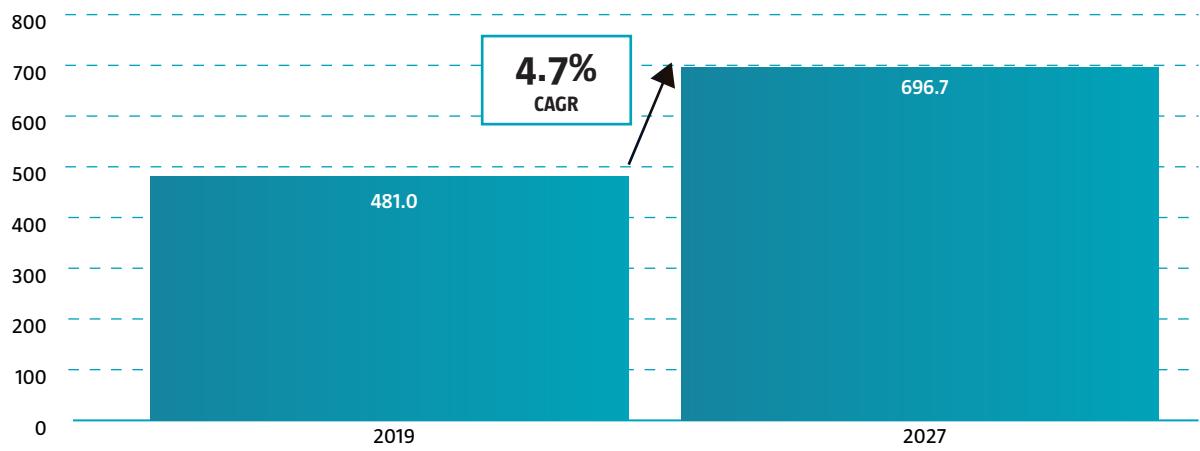
Finally, the topic of inclusive design has been gaining traction among brands and retailers alike. But despite there being a substantial addressable market, inclusive clothing remains a largely untapped opportunity. Research suggests most brands only sell clothes up to size 14, despite the average clothes size of women in the US being between 16 and 19. Only 0.6% of luxury apparel, for example, is available online in what is considered plus-size. Meanwhile, a 2021 survey revealed that most performance shoes are designed for men and only later adopted for women, and only a very limited number of brands have designed clothing that is comfortable for wheelchair users. The apparel industry is ripe for disruption in this respect.

Figure 3.5 | Top barriers for online shopping



Source: Robeco

Figure 3.6 | Global plus size clothing market growth projection



Source: Robeco

Opportunities abound in more personalized and inclusive fashion

When it comes to personalization, we believe technologies providing a smoother and more individualized shopping experience, such as virtual fitting rooms or AI-generated recommendations along the lines of 'if you like this, you might like that', are key to enabling a personalized, multi-channel shopping experience. The delay from product discovery to conversion shortens and customers are less likely to suffer from analysis paralysis, which is thought to lead to up to 40% of online shoppers leaving empty-handed. On Zalando's platform, for example, AI-powered outfit recommendations have resulted in 40% larger basket sizes and twice as high conversion rates compared with single items⁴⁴. For product personalization, we see digital design tools, flexible manufacturing and additive manufacturing as enabling technologies of mass customization of products at a lower cost.

Examples of forms of online personalization

- Visual similarity: AI highlights products with similar visual characteristics.
- Complete the look: AI recommends how to complete an outfit.
- Personalized recommendations: AI suggests products to customers based on factors such as their gender, age, region, and browsing and purchase history.
- Visual search: Customers can search for a product using an image instead of keywords.
- AI styling advice: an AI chatbot delivers personalized advice based on body type, skin, hair, eye color or occasion.
- Sizing technology: analysis of large datasets can help customers find the right size for specific products – for example, what size of Asics Gel Nimbus is equivalent to a size 36 Adidas Ultra Boost?
- Virtual fitting: customers can use their phone camera to see how an individual item would look on them.
- Digital avatars: a more advanced form of virtual fitting in which customers can create an avatar using their phone camera and an app and dress in digitized clothes to see how they would look in a full outfit.

When it comes to inclusive design, we believe many more mainstream brands are going to introduce products designed for specific body types. Examples to date include Lululemon releasing female sneakers designed based on scans of women's feet and adidas launching a new sports bra collection available in 72 sizes. One of the most meaningful demonstrations of inclusivity in fashion has come from an unlikely hero: singer Rihanna. Through her Savage X Fenty brand, Rihanna created gender-neutral products in a wide range of sizes and bras in sizes from 30A to 44DDD. The brand was early to feature models who are plus-sized, pregnant, disabled or simply older, to great commercial success. It generated USD 150 million in sales in 2020, and recent IPO rumours have set the value of the business at USD 3 billion⁴⁵, testament to its disruption potential and the demand for inclusivity in the fashion industry.

44. [globenewswire.com/news-release/2017/10/25/1300518/0/en/Segment-Survey-Finds-Consumers-Will-Spend-More-When-Their-Shopping-Experience-is-Personalized-but-Most-Retailers-are-Missing-the-Mark.html#:~:text=Personalization%20Drives%20Impulse%20Purchases&text=49%20percent%20of%20shoppers%20have,based%20on%20a%20personalized%20recommendation.](https://www.globenewswire.com/news-release/2017/10/25/1300518/0/en/Segment-Survey-Finds-Consumers-Will-Spend-More-When-Their-Shopping-Experience-is-Personalized-but-Most-Retailers-are-Missing-the-Mark.html#:~:text=Personalization%20Drives%20Impulse%20Purchases&text=49%20percent%20of%20shoppers%20have,based%20on%20a%20personalized%20recommendation.)

45. [bloomberg.com/news/articles/2022-03-11/rihanna-s-lingerie-company-said-to-weigh-ipo-at-3-billion-value](https://www.bloomberg.com/news/articles/2022-03-11/rihanna-s-lingerie-company-said-to-weigh-ipo-at-3-billion-value)

Conclusion and potential investment implications

We believe that the fashion industry moving towards a future that is more sustainable, digital, personalized and inclusive provides big opportunities for innovative companies with future-proof business models. In this final section, we identify business models that we expect either to play an instrumental role in shaping the future of fashion or to directly benefit from it. We also highlight some that we think should be approached with caution from an investment standpoint.

Sustainability

As the fashion industry becomes more sustainable, we think luxury goods companies selling high-quality, timeless pieces with high resale values and long lifespans are generally well positioned. We also see a bright future for medium-sized brands with strong sustainability credentials, that are investing in improving their supply chains and are experimenting with different fabrics and circular business models. Rental- and resale-as-a-service companies stand to benefit from higher clothing utilization rates instead of ending up in a landfill. However, these businesses require substantial upfront capital investments to achieve sufficient scale and could, somewhat counterintuitively, contribute to continued overconsumption. Although investing directly in these companies can be difficult, firms involved in textile recycling, peer-to-peer resale marketplaces, next-generation-material technology firms and hardware and software manufacturers for digital product passports are also likely to benefit from the move towards more sustainable fashion. We would caution against fast-fashion companies whose business models promote overconsumption and are therefore at fundamental odds with sustainable fashion principles.

Digitalization

Digitalization is a powerful driver of change in the fashion industry. For example, consumer electronics companies selling wearable devices have considerable growth potential as many consumers want to monitor their health and fitness more closely. Elsewhere, fashion, sporting goods and luxury goods companies are building capabilities to sell digital goods so that they can have a presence in virtual worlds. Although this remains a nascent area, it could represent a highly profitable opportunity to monetize their brands further. Meanwhile, technology companies are developing what might one day be popular virtual worlds and brands that people like to spend their time in. Perhaps one of the most tangible and investible opportunities are brands with, or that are moving towards, full direct-to-consumer distribution, which is enabled by digitalization. DTC is a different way of distributing, but we also see opportunities for companies changing the way we shop. These include team buying and e-commerce companies embracing livestreaming. Social media firms are also experimenting with selling fashion items to their vast social networks, although their efforts are still at an early stage. Finally, advanced technologies such as 3D printing, robotics and AI are being more widely adopted by fashion companies, providing opportunities for greater personalization, automation and digitalization of the industry as a whole.

Casualization and personalization

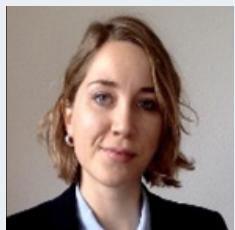
Moving from how we shop to what we wear, we are seeing continued casualization of people's wardrobes. We expect well-established sportswear brands to continue to benefit from this secular change. Gen Z takes casualization a step further and is willing to spend substantial sums on casual statement pieces from luxury brands. Fashion companies' ability to deliver individualized customer experiences will be an important differentiator in the coming years, which is why we expect retailers with a strong online presence and personalization capabilities to grow faster than the competition. Bricks-and-mortar retailers with a limited online presence and poor access to consumer data will find the coming years challenging, in our view, although we are by no means suggesting it is the end for bricks-and-mortar retail. Finally, many fashion brands have not historically designed products for a wide range of body types and skin colors. Companies prioritizing inclusive design are consequently likely to attract more custom, in our view.

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No securities commission or similar authority in Canada has reviewed or in any way passed upon this document or the merits of the securities described herein, and any representation to the contrary is an offence. Robeco Institutional Asset Management B.V. relies on the international dealer and international adviser exemption in Quebec and has appointed McCarthy Tétrault LLP as its agent for service in Quebec.

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Robeco Institutional Asset Management B.V. is registered and regulated by the Financial Sector Conduct Authority in South Africa.

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Additional Information relating to RobecoSAM-branded funds/services

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The sale of the Fund qualifies as a private placement pursuant to section 2 of Uruguayan law 18,627. The Fund must not be offered or sold to the public in Uruguay, except under circumstances which do not constitute a public offering or distribution under Uruguayan laws and regulations. The Fund is not and will not be registered with the Financial Services Superintendency of the Central Bank of Uruguay. The Fund corresponds to investment funds that are not investment funds regulated by Uruguayan law 16,774 dated September 27, 1996, as amended.