

Finance

Introduction

- How can the mobile devices which the majority of us are carrying with us every day, help us make decisions about the businesses we engage with? In terms of user experience, can personalized AI advisors empower our financial actions from shopping to saving and investing?
- As an interaction design student who cares about the environment, I ask myself how can interaction design contribute to increase sustainability? I make the assumption that investing is inherently “good” for one’s life, in the same way, that doing sports is good, or eating healthy is good. It’s one of the human activities that is required for an improved quality of life as we age - and started investing sooner, rather than later, is best because of the compound interest. Nonetheless, investment also includes higher risk than sports or food. How to communicate the risk effectively while educating the users?
- In 2022, the world population emitted 37.5 gigatonnes of CO₂, the highest emissions in world history, following a steady annual increase, according to Statista (2023).
- *World Economic Outlook (April 2023) - Real GDP Growth (2023)*
- In 2022 the Global Gross Domestic Product (GDP) was estimated at around 100 Trillion USD Aaron O’Neill (n.d.).
- Lack of leadership. Capgemini (2022): “Many business leaders see sustainability as costly obligation rather than investment in the future”.
- Is it possible to make financial decisions that follow our guidelines and preferences but without moment-to-moment involvement needed so as to save up our precious time?
- The key improvement of personalizing financial advice is understanding the user’s dynamic risk profile.
- Capponi et al. (2019) argues “The client has a risk profile that varies with time and to which the robo-advisor’s investment performance criterion dynamically adapts”.

- The combination of consumption and investment is an access point to get the consumer thinking about investing. Even if the amount are small, they are a starting point for a thought process.

Shopping

Shopping Footprint

- Shop CO2e emissions for each company who i buy from? “get rid of brands”!! cause they hide and lie
- “Decreasing the Carbon Footprint of Supermarket Shopping” (2019)
- Sally Parker (2022)
- “The sustainable market for Fast Moving Consumer Goods is \$2.5T, that includes an untapped market opportunity worth \$1T. Nearly 40% of customers say they would switch from their current preferred brand to one that offers more transparency”
- *EU* (n.d.) **Ban polluting products campaign success story, EU shops can’t sell deforestation products**
- *From Burning Bridges to Allbridges* (n.d.)
- Current shopping is like having a one-night stand. you barely know the name of your company. You don’t know much about their background. Building consumer feeling of ownership, create meaningful connections between producers and consumers.
- **AI alert:** “The company you’ve purchased from 3x in the past month is owned by Unilevel, which is under investigation for poor labor practices and deforestation”.
- Sustainable Consumerism via Self-Regulation. 2M EUR project for the shopping app
- Klinglmayr et al. (2016)
- EMILY WATERFIELD (2019)
- Igini (2022) Online Shopping impact. Single’s day, etc. Impossible to turn the tide?
- “Asia is set to account for 50% of the world’s total online retail sal”
- What is the consumer CO2 contribution? What is the target?
- Konrad (n.d.) “an internet-wide directory of purchasable products, reminiscent of how the much of the world’s music is made available on streaming platform Spotify.”
- All the world’s product directory
- “How to Become an Investor Instead of a Consumer” (2020) Define your habits: are you consumer or investor?

- “Learn to notice so we can preserve”, “Õpetame märkama, et oskaksime hoida”
- Franklin Templeton Distributors, Inc (2021)
- Consume pressure to advance ESG regulatory standards to add a baseline ESG dynamic pricing of risk like climate, mandatory climate disclosures, carbon pricing knowing your supply chain, analyze supply chain risk
- **Live more sustainably with 10 minutes per day.**
- From Shopping to Investing Next Generation Customer Experience (n.d.) suggests “Targeted at millennials, Acorns is the investing app that rounds up purchases to the nearest dollar and invests the difference.”
- McKinsey (2022b) Inclusive consumer
- “Consumers have increasing power. Where we put our money reinforces certain types of businesses, as conscious consumers we can vote with our dollars. How can we do it Sustainable brands, ESG, etc, etc. Pushing higher Standards and choose companies that adopt circular design”
- “TDRI on Instagram” (2021) and (n.d.) Cradle to Cradle Nordic circular design in Taiwan
- McKinsey (2022a)

Indexes and Certifications

- Rating Systems: Companies assess customer’s credit score, however how can customers rate companies.
- ESG Shopping: “Changing our relationship with money”

Rating System	Link
B Corporation	
ESG	
Fair Trade	
Responsible Business Index	

There are many different certifications

- “Ethical Consumer” (n.d.)
- B Impact Assessment
- sustainable brands
- Fair Trade

- “The Green Web Foundation” (2023) For example, the Green Web Foundation certifies how sustainable is the web hosting used by websites.
- *Estonian Responsible Business Index* (n.d.) Responsible business index

Existing rankings

- Earth.Org (2022)
- Staff (2021)

B Corporations in Taiwan

B Corporations undergo strict assessment and adhere to stringent sustainability practices.

- *Find a B Corp* (n.d.) BCorporation listings by country
- “Etsy Made Mistakes, but Its Commitment to Social Responsibility Wasn’t One of Them” (2017)
- Citywealth (2021)
- “Social Enterprises, B Corps, Benefit Companies, ESG” (n.d.)
- RavenPack (2021)

Ratings and Scoring

References	What it does
LeafScore (2023)	Leafscore for product
“Ethical Consumer” (n.d.)	Ethical consumer ratings

- Frances Schwartzkopff (2022b) “Companies in industries with the biggest carbon footprints aren’t reporting how their emissions feed into financial risk, according to an analysis of corporate reports by the Carbon Tracker Initiative.”
- Fashion brand ratings
- B Impact Assessment
- Ethical Shopping
- “Top 100 Consumer Goods Companies of 2021” (n.d.) Largest consumer goods companies

Consumer Activism

- Hyman & Tohill (2017)
- Brantley (2021)
- Contact Kalle Lasn, Culture Jam
- “ESG Accessibility”, Large-scale accessibility to ESG,
- Lilleväli (2022) and *Estwatch - Estwatchi Värskest Uuringust Selgub, Et Eesti Toidupoed...* / Facebook (n.d.) Shop sustainability in Estonia
- Helen Saarmets (2021) Tarbimise jalajälg poes
- Credit Suisse (2022) Young consumers drive speed of eco change?
- Hester M. Peirce (2022): “The piece of the settlement aimed at getting important information to customers is more understandable from a retail protection standpoint. Customers who lend crypto assets to a company in exchange for a promised return should get the information they need to assess the risks against the rewards.”

Sustainable Shopping

- Weber (2021) proposes a sustainable shopping guide.
- Fuentes et al. (2019) discusses package free shopping.
- van der Wal et al. (2016) discusses “status motives make people publicly display sustainable behavior”.

Conscious Consumerism

- Building customer loyalty is a key part of repeat business and financial predictability. Large consumer brands like Starbucks have for long ran successful rewards programs that encourage customers to come back.
- McKeough (2018) business consultancies have begun to recognize the importance of design to business. They advise their corporate clients to bring user experience design to the core of their business operations.
- Green Finance Platform (2020) report predicts the rise of personalizing sustainable finance, because of its potential to grow customer loyalty, through improving the user experience. Similarly to good design, interacting with sustainable finance for the ‘green-minded’ demographics, providing a reliable green product is a way to build customer loyalty.

- Hoikkala (2019): meanwhile the CEO of the Swedish clothing producer H&M, one of the largest fast-fashion in the world, recognizes the potential impact of conscious consumers as a threat.
- Success stories integrating previously distinct experiences with sustainability have shown positive results, for example, Alibaba's Ant Forest simultaneously raising money for planting forests and building loyalty, leading the company to consider further avenues for gamification and eco-friendliness.
- From building loyalty to building ownership, the first step is to start saving money to invest. How to encourage savings in daily life and make it a part of the everyday payments experience? Even starting with a small step, gathering a small target amount per month for savings, has the potential to shift the user's way of thinking about money. The second step, choosing where to invest these savings, will help us begin thinking like an investor. To start noticing trends and looking into how finance shapes the world.
- Fotheringham (2017): In the words of a Canadian investment blogger, "every dollar you spend or invest is a vote for the companies and their ethical and sustainability practices".
- Could investing as a pathway from a loyalty scheme strengthen the feeling of connection with the business even further? After all, I'm now a minority owner! What are the standard conversations about money and savings that I would traditionally have with a financial advisor, that could be converted into a portable, mobile form, in my pocket every day?

Programmable Money

- People like Turkey losing 75% of the value of their assets when currency collapses, why people buy crypto.
- "Cryptocurrencies - Worldwide | Statista Market Forecast" (n.d.) estimates over 600 million cryptocurrency users worldwide
- Raido Tõnisson (2022a) Estonian bank selling Metaverse cryptocurrency Sandbox
- Marten Põllumees (2022) retirement funds invested in crypto
- Raido Tõnisson (2022b) due to a law change Estonian could take out their pensions and invest or spend them however they wanted.

Digital Currency

- Emele Onu & Anthony Osa-Brown (2022) reports how in order to promote eNaira use, the Nigerian government limited the amount of cash that can be withdrawn from ATMs. "In Nigeria's largely informal economy, cash outside banks represents 85% of currency in circulation and almost 40 million adults are without a bank account."

Payments

- *Grenpay - Heasta Oma CO₂ Jalajälg* (n.d.)
- hetkel hinna info liigub aga toidu kvaliteedi info ei liigu roheline filter finding good wuality products stock are disconnected from the products companies make
- What if we gave consumers the tools to keep companies accountable?
- “Contactless Payments Prevalent in Macau - City’s de Facto Central Bank” (2023) in Macau Contactless Payments:

Digital Payments

“First Paper Money” (n.d.) China was a money innovator introducing paper money in the Tang Dynasty (618–907 AD).

- “Central Bank Digital Currency (CBDC) Tracker” (2023) Digital currencies make tracking easier
- E-Naira find papers
- Yahoo Finance (2022): WeChat, Alipay, vs digital yuan by Eswar Prasad
- MARISA ADÁN GIL (2022)
- Caio Jobim (2022)
- Digitalisation of payments creates lots of Point of Sale (PoS) data that would be valuable to understand what people buy.
- *The European Fintechs to Watch in 2022* (2022)

People are concerned with digital payments

- Jeff Benson (2022) “use the e-CNY network to increase financial surveillance.”
- democratize financial surveillance!
- Crypto tools allow you to look at any wallet already
- green transparency

Saving

- Savings and Investing are conflated into the same chapter because the large majority of savings that people have are invested by their banks. Thus the question of *sustainable savings* comes one of where exactly are they invested and what is the impact of that investment of sustainability.
- There are two ways to look at sustainable savings and this chapter is going to look at both of them. 1) Savings in CO2e emissions 2) Savings in the financial sense of the word.
- Assumptions: — where to put money makes a difference to sustainability. i.e. it matters what we buy, what we save, and where we invest
- Investing is a stronger signal to business than interactions on social media. Design Stakeholder capitalism. In future company every company should get a sustainability plan. this can be a push in that direction if companies with a sustainability plan become more competitive because of higher consumer demand.
- Hypothesis?
- Savings are the money one has in a pension fund or managed by themselves. For the majority of people, savings are invested by the bank and make up the largest proportion on investments for the people who are not active investors themselves.
- “M1 Finance Review” (2023)
- “Environmental savings”, “means the credit incurred by a community that invests in environmental protection now instead of paying more for corrective action in the future. If there is no way to estimate environmental savings for a particular project, then the amount of” (see Yale Center for Environmental Law & Policy (2018) and *Yale, Princeton, Stanford, MIT and Vanderbilt Students Take Legal Action to Try to Force Fossil Fuel Divestment - The Washington Post* (n.d., p. 33))
- “ENVIRONMENTAL SAVINGS Definition” (n.d.)
- Ethical Savings
- *Ethical Savings* (2023)
- *Ethical Shopping* (2019)
- “The Good Shopping Guide” (n.d.)

Fintech User Experience (UX)

Given the large number of fraud cases in finance, *trust* is the number one concern for users (CITE). Good design is crucial for creating transparency, and transparency leads to trust.

- *Why Design Is Key to Building Trust in FinTech* / Star (2021)
- Sean McGowan (2018)
- ROBIN DHANWANI (2021)
- “Designing a Fintech App - The UX Design Process” (2021)
- Cordeiro & Weevers (2016)
- Ungrammary (2020)

- Like a Robinhood stock symbol page for brands including live ESG metrics and ability to register divestment - Same for crypto can be automated? - People will start to discuss ESG vs price discrepancy?

Banks, Fintech, and Payments

- While the financial industry is highly digitized, plenty of banks are still paper-oriented, running digital and offline processes simultaneously, making them slower and less competitive, than startups. Indeed, the new baseline for customer-facing finance is set by fintech, taking cues from the successful mobile apps in a variety of sectors, foregoing physical offices, and focusing on offering the best possible online experience for a specific financial service, such as payments. The European Central Bank describes fintech as improving the user experience across the board, making interactions more convenient, user-friendly, cheaper, and faster.
- “Fintech has had a more pronounced impact in the payments market [...] where the incumbents have accumulated the most glaring shortcomings, often resulting in inefficient and overpriced products,” Yves Mersch, Member of the Executive Board of the ECB says in European Central Bank (2019).
- Using digital payments instead of cash enables a new class of experiences, in terms of personalization, and potentially, for sustainability. According to McKinsey (2020), Asia has shown the fastest growth in payments in the world.
- Meanwhile, in Europe, point of sales (PoS) lending is a common practice in Sweden, and one of the reasons for the success of Klarna, the Swedish banking startup, which has managed to lend money to more consumers than ever, through this improved user experience. Taking out loans for consumption is a questionable personal financial strategy at best. If people can loan money at the point of sales, why couldn't there be 180 degrees opposite service - pointof sales investing?
- Bunq (2020): A Dutch fintech company Bunq (fig. 5) offers payment cards for sustainability, provided by MasterCard, which connects everyday payments to green projects, such as planting trees and donations to charities within the same user interface.
- Sharing a similar goal to Alibaba's Ant Forest, Bunq's approach creates a new interaction dynamic in a familiar context (card payments), enabling customers to effortlessly contribute to sustainability. However, it lacks the level of gamification which makes Alibaba's offering so addictive, while also not differentiating between the types of purchases the consumer makes, in terms of the level of eco-friendliness.
- If corporate social responsibility (CSR) loyalty programs, driven by points systems are useful, can we go a step further, and create a pathway to enable the consumer to become an investor in the company they like to buy from? Could this strategy provide more meaning for the consumer, leading to higher customer retention, as well as financial

returns? The following popular (totaling millions of users) robo-advisory apps combine sustainability, personalization, ethics, and investing (fig. 6) - however, they are mostly only available on the US market:

- Financial AI companion apps have not yet grown to mainstream scale in Asia, Africa, Latin America, and Europe, being for the moment a largely US-based retail investor trend. The apps outside of the US are niche products in a nascent stage, however, they still provide relevant design directions or stories of what to avoid.
- Bhatia et al. (2020) For example, in India, research is being conducted on how AI advisors could assist with investors' erratic behavior in stock market volatility situations, albeit without much success.
- Cowan (2018) In Europe, Germany and the United Kingdom show the way with the most robo-advisory usage.
- AltFi (2017) ETFmatic (fig. 7) gaining the largest number of downloads by 2017, focusing exclusively on exchange-traded funds (ETFs), tracking stock-market indexes automatically, with much less sophistication, than their US counterparts.
- Bankinghub (2019): While Germany has 30+ robot-advisors on the market, with a total of 3.9 billion EUR under robotic management, it's far less than individual apps like Betterment manage in the US.
- AltFi (2017): In the UK, several robo-advisors have shut down recently.
- While the financial AI companion apps in the US market are ahead globally, they are not yet using many of the user experience innovations that are prevalent on social media platforms targeted at Generation Z and/or Millennials, possibly presenting an opportunity for cross-industry knowledge transfer, from businesses that are traditionally closer to the consumer - such as retailers.

Robo-Advisors and Financial AI

- John Ssenkezi (2022): Small stock investments
- Financial empowerment
- Small cash apps like African market Investment Clubs Invest in sustainability with people smarter than myself
- *Phase Two* (n.d.)
- Qayyum Rajan (2021) ESG pulse
- Tyce (2020) and Parlasca et al. (2022) M-Pesa in Kenya since 2007 for mobile payments, used by more than 80% of farmers.
- "NGFS" (n.d.) Network for Greening the Financial System
- "How to Become an Investor Instead of a Consumer" (2021): How do consumer become investors?

- Outlaw (2015)
- SmartWealth (n.d.) marketing materials say: “One of the greatest hurdles to financial independence is a consumer mindset.” One of the greatest hurdles to sustainability is a consumer mindset?
- Sustainable investing, kids watch TikTok lizlivingblue (n.d.)
- Malliaris & Salchenberger (1996) **(Need to pay for paper!)**
- “CMB | New Future of Financial AI” (n.d.) Huawei
- Consumption is ruining the world the world thinking as an investor the investor mindset
- *Vise* (2023) Personalised portfolios
- *K+ Wallet - Apps on Google Play* (n.d.) Thai finance app
- “Thai Fintech Association (TFA)” (n.d.)
- Renato Capelj (February 16, 2021 6:47 PM)

Investing

Retail Investors

Rise of Novice Investors

Several banks have started offering a service to automatically save and invest tiny amounts of money collected from shopping expenses. Every purchase one makes contributes a small percentage - usually rounded up to the nearest whole number - to one’s investment accounts. For example, Swedbank (2022), the leading bank in the Estonian market, offers a savings service where everyday payments made with one’s debit card are rounded up to the next Euro, and this amount is transferred to a separate savings account. Similarly, the Estonian bank LHV (2020) offers micro-investing and micro-savings services, with an interesting user experience innovation showing how for an average Estonian means additional savings of about 400€ per year.

- Investing is a fundamentally hopeful act. It means I think there’s a future. Specifically, ‘green investing’ is investing in the future of our planet - but can we trust the sustainability practices the ‘green’ investment vehicles aggregate, promising to have a positive impact? For example, the European Union for many years counted biomass as ‘green’ energy, even while forestry companies were cutting down trees to produce the biomass - the regulation was not specific enough to curb this practice. So, in effect, a ‘green investor’ might be supporting deforestation. How can an easy-to-use investment app address such complexities without alienating the users?
- The world will be very different in 30 years - it’s time to invest in services that make our societies resilient, able to robustly respond to rapid change. Research and product development go hand-in-hand; the outcome of this study can provide insights for new financial product and service development. Related to SDG 9: “Build resilient infrastructure, promote sustainable industrialization and foster innovation”. The complexity of the situation offers an opportunity for design to make it understandable for humans

- Recently, the Estonian government decided to free up mandatory retirement savings so people can exercise their own judgment on how to invest (or spend it). Financial analysts are worried the Estonian population will spend their retirement savings right away - instead of investing.
- **Feature:** Help me write me investment thesis first.
- Gov launching ESG funds. Why is this important to research now? People in their twenties should invest in their future. Millennials and younger generations like services with a green, eco-conscious focus.
- Which investment vehicles are the most suitable for green investments? When a person wants to make a sustainable investment, where to put your money if you want to make the world greener? If young people are worried about climate, why are they not investing in green assets? To what extent can interaction design increase market participants' engagement with sustainability? What are some suitable user interfaces for millennial green investors? Is design relevant to investing decisions? Direct investment AI assistant vs marketplace of existing investment products? But how to measure?
- Where to invest for green impact?
- Airbnb for Investments platform for projects linked to your consumption habits. Can provide better products for you as well as invest in these companies. The consumer can feel closer connection to the businesses they interact with through shared values, leads to participatory design and stakeholder capitalism. Platform to understand investment products. Green crowdfunding already allows people to invest into projects to make new green products, for example from recycled materials. but what about getting involved on a deeper level. Bigger than projects, scalable solutions. Kickstarter has green projects section. Startups vs large businesses. The design of the user interface helps the adoption of a new technology. What is the suitable user interface for millennial green investors?
- Currently, there is no easy way to do it, and the UX of traditional banks is too cumbersome and old-fashioned.
- Sest ei saa ESG ja teisi mõõdikuid usaldada, crowdsourced mõõdikud
- Information evavõrdsus between pro and novice investors
- Q: Reflection on the ESG wave: Does a company that performs well in carbon reduction but whose products are harmful to health conform to the spirit of ESG?
- “ESG ESG ” (2022)
- Implication for design: ESG can't be trusted.
- Gary Gensler (2022) Investor protection, making investing accessible, climate risk disclosure
- “Let's Do DeFi - DeFi Guides Grandma Can Follow ” (n.d.) Crypto DeFi education
- Trading ESG futures?? because climate is slow it makes sense to trade de climate future
- While ESG is riddled with problems, it has started a common language and there are many ways how to improve it
- “Meet the Fintechs Leading Sweden's Green Revolution” (2021) *Swedish green fintech (important article)*
- “Doconomy announces largest ever Climate Fintech investment round in Europe; adds \$17million to further accelerate expansion” (2021) Doconomy Business footprint

- Margaryta Kirakosian & Angus Foote (2022) suggests “Disparity between ESG methodologies was one of the key hurdles to finding the right sustainable strategy.”

References	What it does
“Ziglu The Fast, Simple Way to Buy and Sell Crypto, with No Hidden Fees.” (n.d.)	UK simple investing app
“Lightyear” (n.d.)	Estonian investing app
<i>Selma – Your Finances Done Right</i> (n.d.)	Finnish investing app

Personalized Investing

- 2022 saw a wave of new platforms aiming to make investing easier for retail investors
- “Revolut Launches ETF Trading Platform in Europe” (2023) and “Kickstart Your Investment Journey” (2023) One example is Revolut, which expanded from a simple payments app to support varied saving and investment types.

Influencers

- Influencers are terrible for investing... but?
- Influencer - crypto twitter connections
- Irene Zhao (2022)

Green Investment Platforms

There are many ‘green investment platforms’ who to trust?

Name	Description	Link
Trine		https://trine.com/
The Many		https://the-many.com
Sugi		https://sugi.earth/
ClimateInvest		https://clim8invest.com/
Circa5000		https://circa5000.com/
FairOwn		https://www.fairown.com/

- Hankewitz (2021)
- Investing - Your investment fund’s ESG thesis investing thesis investing expert investing thesis research
- Investing thesis

- Open Banking: “Open Banking offers massive potential for improving online customer experience. That potential starts with the payment experience, which then generates a positive ripple effect through the entire customer journey. ” investing into good companies

Financial Inclusion

- Tan (2020) proposes “*financial ecologies*” to understand the dynamic relationships between various actors: investors, advisors, government, where the government plays an active role in growing financial inclusion and responsible financial management. However, the paper further suggests that current robo-advisors (available in Singapore) make the investor captive to the agency of AI, making the person lose agency over their financial decisions.
- Li et al. (2022) suggests retail “investor attention can significantly improve enterprises’ green innovation level”
- Celo and Impact Market
- MicroLending
- Retail Investor Helpers: A wide number of banks are offering services marketed as sustainable. It’s hard to decide.
- *Design implication: As a user, I can use the app to compare banks available in my country*
- Ant Group’s Eric Jing in Turrin (2021): “*The financial system of the past 200 years was designed for the industrial era and served only 20% of the population and organizations. As we enter the digital age, we must better serve the remaining 80%.*”
- Rupert Jones (Mon 7 Feb 2022 07.00 GMT)
- Jackson (2020)
- Stef (2019)
- “Make My Money Matter - Green Your Money” (2023)
- Seeking Alpha (2020)
- Marko (2022)
- Consumer debt in the USA
- Nubanks, also known as challenger banks.

Company	Link
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Company	Link
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SPARQAN	
Robinhood	

Neobanks and ESG

- There are far too many neo-banks, or challenger banks to list. The table only includes a small sample of banks and the landscape is even larger if one includes the wider array of fintechs.
- Neo-banks often use sustainability marketing.
- Migozzi et al. (2023): India has more than 2000 fin-techs since 2015.

Name		Reference	Country
Monzo		Monzo (2023)	UK
Nubank		<i>Nubank - Finalmente Você No Controle Do Seu Dinheiro</i> (n.d.)	Brazil
EToro			
Revolut	From payments to investing		UK, EU
Mos	Banking for students	“Mos - The Money App for Students” (n.d.)	
Robinhood			

- Andrés Engler (2022)
- **Feature:** Sustainable investing product for young people everyday use Crypto, NFT provide everyday excitement trend of young ppl in crypto retail investors without needing to pay bank fees
- Raha maraton etv investeerimissaade.. raadios on ka mingi saade
- Gamestop for climate massively collaborative investing by gen-z?
- But there’s so much capital in large funds retails investor money doesn’t matter at all. does retail money make any difference?

- “Empowering Digital Asset Banking” (n.d.): digital assets bank
- *The Bank for the New Economy* (n.d.): Crypto bank
- FINMA (2021) First crypto fund
- *Myclimate – Your Partner for Climate Protection* (2023) calculate climate cost
- Anand Chandrasekhar & Andreas Gefe (2021): **Trading commodities “Switzerland has a hand in over 50% of the global trade in coffee and vegetable oils like palm oil as well as 35% of the global volume of cocoa, according to government estimates.”**
- “Green Central Banking” (n.d.)
- swissinfo.ch/urs (2022) “More than half of the Swiss banks apparently plan to offer digital assets services over the next few years.”
- Improving ESG Accessibility
- Hyde (2006) Money as a gift

Community

- You don’t know how to invest? Build an investing community? Can follow others and raise capital together.

Sustainable Investing

The Trend

There’s literature suggesting it’s possible to make investments that both make an attractive financial return and adhere to sustainability goals. In housing development, there’s evidence of ‘green’ buildings achieving a ‘higher financial return than conventional buildings, both in terms of rent and sale price’ (Oyedokun (2017)). There’s also a trend of investors looking for sustainability in addition to profits in a few countries.

- For example - In Sweden “Preferences for sustainable and responsible equity funds
- Lagerkvist et al. (2020) undertook a choice experiment with Swedish private investors.
- T. Smith (2019) suggests 74% of Chinese youth are looking for “positive impact”.
- Lingeswaran (2019) suggest philanthropy is on the rise in Asia however Ho (2019) counters investors are not sure how to separate sustainable assets from less sustainable ones.

ESG

- Environmental, Social, and Corporate Governance (ESG)
- Since the 1970s, international bodies, governments, and private corporations have developed sustainability measurement metrics, the prominent one being ESG (Environmental, Social, and Corporate Governance) developed by the UN in 2005. This rating system has already been implemented or is in the process of being adopted on stock markets all over the world and has implications beyond the stock markets, allowing analysts to measure companies' performance on the triple bottom line: the financial, social, and environmental metrics.
- The Taipei stock market in Taiwan has listed ESG stocks since 2017 and was hailed by Bloomberg as a regional leader in ESG reporting (Grauer (2017)), while Nasdaq Nordic introduced an ESG index in 2018, and Euronext, the largest stock market in Europe, introduced an ESG index and a series of derivative instruments in the summer of 2020 (Euronext (2020)).
- Doorn (2020): Many ecologically focused funds with different approaches have been launched in recent years, with variations in asset mix and style of management. Thematic asset management is expected to grow, with investors packaging opportunities based on consumer trends.
- Kirakosian (November 16, 2020) Digital payments and circular bio-economy, even using tactics such as co-branding with famous individuals.
- Jersey Evening Post (2020) A recent example is one of the largest private banks in Switzerland, Lombard Odier & Co, when they launched a thematic bio-economy fund inspired by the words of The Prince of Wales, 'Building a sustainable future is, in fact, the growth story of our time'.
- Reid (2020) ESG gives banks a new tool to market and sell environmentally conscious opportunities to institutional investors, for example, universities - a case in point being the recent partnership between HSBC and the University of Edinburgh.
- PWC (2020) PWC suggests "asset managers educate their staff and client base. 'It will be critical to build stronger ESG expertise among their employees by up-skilling existing staff on ESG principles and strategically scout for and integrate more diverse and ESG-trained talent'".
- The advice consultancies are providing to banks establishes a common language and helps banks to sell strategic alignment for long-term institutional sustainability in terms of finance, social, and governance.
- For AI-powered assistants to be able to provide guidance, metrics are needed to evaluate sustainable assets, and ESG provides the current state-of-the-art for this. The largest obstacle to eco-friendly investing is greenwashing where companies and governments try

to portray an asset as green when in reality it's not. A personal investing assistant can provide an interface to focus on transparency, highlighting data sources and limitations, to help users feel in control of their investment decisions, and potentially even provide large-scale consumer feedback on negative practices back to the business through infringement discovery.

ESG Hedge Funds

- BlackRock (n.d.) notes some ESG-oriented hedge funds can be “highly engaged with management teams” in order to influence management towards ESG practices in said companies .
- *ESG Hedge Funds* / *Barclays Corporate & Investment Bank* (2021)
- **Feature:** Make a climate hedge fund with friends
- Hedge (2023): Make a hedge fund with your friends
- Most successful investor invest together
- Angelist
- What does investing look like at the scale of billions of people? like IG

ESG Investing

- My research aims to find ways to enable a wider audience to access sustainable investment opportunities. This chapter gives an overview of the current (as of late 2020) sustainable investing landscape as well as future trends related to interaction design and user experience innovations (fig. 4).
- This research is concerned with how billions of people might exclude polluting companies from their lives and elect to support companies that put sustainability in the core of their business instead. Why does it matter? Individual sacrifice is too small to have a meaningful impact. For societal change, we need to pool our resources.
- **How can ESG (environment, social, and governance) become accessible to our everyday experience, while avoiding greenwashing?**
- Given our combined power (I'm a Millennial) with Generation Z, we are willing to pay more for sustainable products [^8].
- In institutional finance, the Norwegian \$1.3T USD sovereign wealth fund (the world's largest, followed by China)[^5] started a divestment trend in 2016 by divesting from coal. Their plan to reach net zero CO2e nonetheless only targets 2050. Furthermore, who would be the counterpart for such large transactions? The fund also announced divesting from Russia after its invasion of Ukraine, however has yet to sell any shares citing lack of buyers on the Moscow stock market. University of California also followed suit with divestment of its \$126B USD portfolio from oil and gas.

- Other large university endowments, such as managed by Yale, Stanford and MIT are in decision gridlock^[6]. Blackrock, the largest private investment fund in the world with \$10T USD under management, released guidance reflecting their plans to shift their investments to vehicles that are measured on Environmental, Social, and Governance (ESG) performance ^[7]. However they later backtracked from their decision.
- Banks are required by law to apply the principle of Know Your Customer (KYC).
- How could people apply the same principle (Know Your Company) when buying a product or investing? Would building an ESG community help push polluting companies towards greener practices? - or starving them from cheap access to capital.
- It can be as mundane as choosing the next eco-friendly product instead of the polluting one we purchase in the supermarket make a difference? How to invest in the growth of companies that put ESG at the center of their activities instead of using it for greenwashing? Creating direct ties will improve ESG. A journey from consumption to investing, in line with users' personal values, by providing relevant sustainable finance guidance.

ESG Crisis

- James Phillipps (2022) and “Financial Materiality Marks Next Big ESG Investing Battle” (2023) ESG Not delivering on it's hopes
- Margaryta Kirakosian (2022)
- Daily (2021) best ESG list
- ESG UAE FutureESGInvesting
- Sanjai Bhagat (2022): Not better environmental performance, ESG poor performance
- Simões-Coelho et al. (2023) Coca Cola ESG
- ESG is a Marketing Tool
 - Gemma Woodward (2022) 8 problems with ESG
 - Agnew (2022) RIP ESG
 - Luo (2022) found firms with a lower ESG score are more profitable.
- Analysis: Messari: investor education, information asymmetry

Regenerative Investing and Finance

- “What Is ReFi | Regenerative Finance Explained” (2023): What is Regenerative Finance (ReFi).
- Regen Network (2022 C.E.) and Regen Network (2023) regen network
- B. Smith (2021)
- “KlimaDAO” (2023) KlimaDAO
- “Planet of the Klimates - Luis Adaime - Founder & CEO of MOSS.Earth” (n.d.) Moss.earth
- “Socially Responsible Investing Advisors” (n.d.)
- naturalinvest (2020)
- Marquis (2021)

Asset Classes

- The main categories of investment products are, based on the *Investment Products / Investor.gov* (n.d.)

Investment Product	Col2
Stocks	
Bonds	
Mutual Funds	
ETFs	
Insurance Products such as Variable Annuities	

Thematic Capital

- Build a thematic portfolio
- There’s a wide range of investment products marketed as *sustainable*, however many of them are fake (CITATION).

Green Bonds

- Sustainability Linked Bonds: What this?
- City of Malmö (2017): In 2017 the Malmö city in Sweden released green bonds to finance a sustainable transition of the city
- Anthropocene Fixed Income Institute (AFII) (2022): Aramco, Saudi Arabian public petroleum and natural gas company ‘Fake green bonds’ under scrutiny.

- Shashwat Mohanty (2022): “sustainable funds don’t buy Zomato’s ESG narrative”
- Priscila Azevedo Rocha et al. (2022): “Sustainability-linked bonds let companies borrow cheaply if they meet environmental, social, and governance targets. A Bloomberg News analysis found those goals are weak”
- Priscila Azevedo Rocha et al. (2022) suggests “So far, most ESG investing is in the stock market. But the the \$22 trillion corporate bond market, where mature global companies such as Chanel go to borrow money from investors, has a particularly powerful role to play. Companies rely on debt much more than they do on stocks.”
- Green Bonds ESG data needs to be visualized Passive Investing Why focus on PI instead of daily investing like Robinhood?

Hedge Funds and DAOs

- While hedge funds used to be available for professional investors, *smart contracts* make it possible to create decentralized organizations which pool member resources for investing.
- Nathan Reiff (2023)
- Savings in CO2 Equivalent Emissions: CO2 savings are the amount of CO2e reduction one manages to achieve by changing one’s behavior and influencing others (people, companies). While the individual footprint is so small, the largest reduction will come from influencing large groups of people, either by leadership, eeskuj, or other means.
- “Trees for the Future” (2023) DAOs to enable concerted action towards climate goals
- *Investment Clubs and Collectives / Deprecation FAQ* (n.d.): Crypto investment clubs canceled
- *IBISA Network – Enabling the Next Generation of Insurance for Agriculture* (n.d.): Crypto crop insurance
- Social + NFTs - What would investing look like at the scale of 1 billion people
- Ian Bezek (2021)
- Lucas Matney (2022)
- BlockChannel (2017)
- Carra Wu & Chris Dixon (2021) DAO consumer to investor
- Koreans investing into media personalities: Yuqing Zhao (2021)

Greenwashing

- Greenwashing is a large detractor from environmental action as it's difficult to know what is sustainable and what is not.
- ~~Reading EU Commission's proposals, one might think the politicians have everything under control, we can relax and continue the same lifestyles as before. Unfortunately, this is not true. As with ESG, while the good intentions may be there, the reality is emissions keep rising, while they should be falling. It's possible to curb greenwashing!~~
- Sahota (2021): "thanks to other emerging technology like IoT sensors (to collect ESG data) and blockchain (to track transactions), we have the infrastructure to collect more data, particularly for machine consumption. By measuring real-time energy usage, transportation routes, manufacturing waste, and so forth, we have more quantifiable ways to track corporations' environmental performance without relying purely on what they say."
- Bingler et al. (2021) and Sahota (2021) ClimateBert AI finds rampant greenwashing
- Yu (2021) ESG is filled with greenwashing.
- US Securities and Exchange Commission (2022): In the USA: *"If it's easy to tell if milk is fat-free by just looking at the nutrition label, it might be time to make it easier to tell if 'green' or 'sustainable' funds are really what they say they are."* says Gary Gensler, head of U.S. Securities and Exchange Commission.
- Frances Schwartzkopff (2022a) suggests the ESMA and EU has strengthened legislation to counter ESG greenwashing.
- Sustainability is fragmented. How can billions of people find greener alternatives and build closer relationships with sustainability-focused companies? Greenwashing is widespread, how can we feel trust, honesty, and transparency? A research project for designing a sustainable shopping, savings, and investing companion.
- Laws against greenwashing
- US Securities and Exchange Commission (2022) Both the European Commission and the Chair of U.S. Securities and Exchange Commission (SEC) Gary Gensler have called for more legislation to curb business greenwashing practices.
- André & Valenciano-Salazar (2022): Until new legislation is in place (2030 in the EU), consumer awareness is crucial as currently most emission-reduction programs are voluntary and thus affected by consumer demand. Geoffrey Supran (2022) Greenwashing is widespread in company social media communications.
- Purkiss et al. (2022) highlights the confusion between compostable and biodegradable plastics and public misunderstanding what happens to these plastics when they reach the landfill. For example, "Most plastics marketed as "home compostable" don't actually work, with as much as 60% failing to disintegrate after six months".

- Napper & Thompson (2019): Shopping bags marketed as *biodegradable* don't show deterioration after 3 years in salt-water sea environment ..
- Frédéric Simon (2020) and Kira Taylor (2021): While the EU has proposed legislation to curb greenwashing, EU climate policy itself has been criticized for greenwashing. Sometimes greenwashing comes under legislative protection.
- Booth (2022) describe how “A recent investigation shows illegal logging of protected areas in eastern European countries that supplies residential wood pellets in Italy. Belgium, Denmark, and the Netherlands are importing pellets from Estonia, where protected areas are logged for pellets and the country has lost its forest carbon sink, despite large-scale wood pellet plants being certified ‘sustainable’ by the Sustainable Biomass Program”. A number of new AI-based tools aim to find instances of greenwashing.
- “Climate Bonds Initiative Calls for Greening of \$55trn Short-Term Debt Market” (2022): Climate Bonds Initiative greening the \$55 trillion short-term debt market
- **Design Implications:** *As a consumer, I can get notified by the app about highlights of poor legislation refuted by science.*

Governments and Legislation

- PWC (2020) Changes to laws and regulations aimed at achieving climate change mitigation is a key driver behind the wave of ESG adoption. The goal of these laws, first adopted in the European Union, a self-proclaimed leader in eco-friendliness, is to pressure unsustainable companies to change towards greener practices, in fear of losing their access to future capital, and to create a mechanism forcing entire environmentally non-compliant business sectors to innovate towards sustainability unless they want to suffer from financial penalties. On the flip side of this stick and carrot fiscal strategy, ESG-compliant companies will have incentives to access to cheaper capital and larger investor demand from ESG-friendly investors.
- House of Commons (2002): Already in 2001, the UK government was discussing ways to promote sustainable investment “fundamental changes in VAT or corporation taxes could be used to promote greener consumption and investment”.
- European Parliament (2014) Directive 14 2014/65/EU, 2014: The European Union fully recognizes the changing financial landscape trending towards the democratization of investments: “more investors have become active in the financial markets and are offered an even more complex wide-ranging set of services and instruments”.
- Kenton (2020): Some key legislation for investors has been put in place recently, for example “MiFID II is a legislative framework instituted by the European Union (EU) to regulate financial markets in the bloc and improve protections for investors”. European

Securities and Markets Authority (2017): “MiFID II and MiFIR will ensure fairer, safer and more efficient markets and facilitate greater transparency for all participants”.

- Quinson (2020-08-31T17:00:13.652Z, 2020-08-31T17:00:13.652Z, 2020-08-31T17:00:13.652Z) While the larger trend is for governments to adapt to and work towards their environmental climate commitments and public demand, the sovereign risk remains an issue. For example, the policies supported by U.S. President Trump during his presidency ran counter to many sustainability recommendations, including those directed at the financial markets. Helping legacy industries stay competitive for longer through subsidies, and lack of regulation, or even regulation supporting legacy technologies.

Countering Greenwashing

- Upcoming EU greenwashing legislation hopes to curb misleading communications by companies.
- “Anti-ESG Crusade in US Sweeps 15 States With More Laws in Works” (2023) several US states are introducing regulation for ESGs to curb greenwashing.
- Green investing only makes sense if it’s possible to distinguish sustainable investments from not sustainable ones.

Individual Climate Action

- Kristian Steensen Nielsen (2022) **Individual climate action!!!**
- **Give Gen-Z the tools to turn climate anger into positive change to transform companies**
- Cherry & Sneirson (2010) in Lavers et al. (2022) suggests “Like climate change, the focus on individual actions as a solution is often misplaced, though it remains a focus of media and industry. For decades, the petrochemical industry has offloaded responsibility onto individuals through promoting concepts such as the “carbon footprint”, championed in a 2004 advertising campaign by British Petroleum”
- Echeverría et al. (2022) suggests greener modes of mobility.

Product Databases

- Most sustainable companies. Make a database?
- *StandardsMap* (n.d.): “The world’s largest database for sustainability standards”, “We provide free, accessible, comprehensive, verified and transparent information on over 300 standards for environmental protection, worker and labor rights, economic development, quality and food safety, as well as business ethics.”
- “Sustainability Intelligence for Food Companies” (n.d.)

- *Open Food Facts - World* (n.d.) app for nutrition and sustainability data
- “Open Product Data” (n.d.): Open Knowledge Foundation’s Open Product Data website shut down
- Håkon Bogen (2016): “Is there a global database of all products with EAN 13 barcodes?”
- GS1 (n.d.) EAN/UPC barcodes on most consumer products
- Semantics3 (2017)
- World product database
 - *Datakick* (n.d.): “open product database”
 - *WIPO GREEN* (n.d.) green tech database
 - “Packaging World” (n.d.) packaging database

Sustainability Marketing

- Ames (2022)
- The Muse Editors (2020)
- Shradha Bhatta (2021)
- Earth.Org (2022)
- Todd-Ryan (n.d.)

Sustainable Finance

- Money connects all industries. People want to shop, save, invest sustainably - how to do it?
- “Chancellor Sets Out Ambition for Future of UK Financial Services” (n.d.) Taxonomy of sustainable activities in the UK
- UNEP (2022): **UNEP has identified that if the world is to meet its climate change, biodiversity, and land degradation targets, it needs to close a \$4.1 trillion financing gap in nature by 2050. The stakes are higher than ever, biodiversity and nature must be at the forefront of the COP27 climate agenda.**
- *Green Finance Institute* (2023): “We can and must channel private capital into nature-based solutions. This will require policy and regulatory support, catalytic capital and financial innovation. Ahead of COP27 in Egypt, Financing Nature: COP27 Special will showcase examples of where this is already happening, and discuss what we collectively must do to mobilize capital at scale” said Dr Rhian-Mari Thomas, Chief Executive Officer, GFI.
- Nerdwallet’s Tommy Tindall (2023) suggests making financial commitments instead of resolutions.

Transparency

- *Simply Wall St - Stock & Sector Analysis Made Simple* (n.d.): Sites like Simply Wallstreet provide in-depth analysis: Simply Wallstreet also same for crypto
- Snowflake analysis like Simply Wallstreet
- Defi Donut (2021) Savings Lottery

Realtime ESG

There's a growing number of companies helping businesses to measure CO2e emissions in their product lifecycle.

- Kyle Wiggers (2022) proposes makersite, instant sustainability impact from supply chain.
- Makersite (n.d.) proposes *product sustainability modeling*.
- Tim Nicolle (n.d.) "Real-time ESG data is more difficult to greenwash", "supply chain is a significant source of ESG content"
- Automate CO2 calculations realtime:
- Indrek Kald (2022): FlowIT automate CO2 counting
- "Factory social score".
- People working at the factories can report conditions
- *ESG Analytics / Real-time ESG Scores and Ratings for Companies Globally / GHG Emission Data* (n.d.): "But the real breakthrough is how we can surface that real-time ESG data directly to individuals in the shops and online, linked to the products that they are browsing and potentially buying. This means that ESG change will finally be driven by the ultimate judge of business success – the customer."

Summary

- "10 Years of Green Bonds" (2019): "Investors want to know where their money is going", says Heike Reichelt, Head of Investor Relations at World Bank.
- This applies to both institutional and increasingly retail investors. Sustainable investing is possible due to consumer demand for greener products and services, and new tools such as ESG for measuring sustainable businesses and assets, as well as advancements in large-scale computational technologies to analyze large amounts of tracking data, comparing performance between different assets. Given these developments, might it be possible to create a practical sustainable investing AI advisor for consumers?

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