# CAPCO JOURNAL

The Capco Institute Journal of Financial Transformation

# Value dynamics

Disruptive forces reshaping financial services

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# JOURNAL

The Capco Institute Journal of Financial Transformation

## Recipient of the Apex Award for Publication Excellence

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# Value dynamics

Welcome to the 61st edition of the Journal of Financial Transformation.

I am delighted to announce our new partnership with King's College London, a world-renowned leader in education and research, marking a new chapter in the Journal's long and distinguished history.

In this edition focusing on Value Dynamics, we explore a critical – and ever more pressing – challenge: how institutions across financial services create, distribute and sustain value.

As Professor Crawford Spence, our editor from King's College highlights in his own introduction, the forces shaping value dynamics across financial services are myriad, encompassing technological transformations, secular shifts, political and social structures.

As a firm that has been at the cutting edge of innovation for over 25 years, these value drivers intersect directly with the work Capco does every day, helping our clients around the globe transform their businesses for sustained growth.

The integration of innovative new technologies including generative and agentic AI models, the digitalization of currencies and payments infrastructures, the reimagining of customer experiences, the relentless evolution of market ecosystems, the vital role of culture as a value driver: these imperatives are where we see – first-hand – clear opportunities for our clients' future growth, competitive differentiation and success.

We are excited to share the perspectives and insights of many distinguished contributors drawn from across academia and the financial services industry, in addition to showcasing the practical experiences from Capco's industry, consulting, and technology SMEs.

It is an immense source of pride that Capco continues to champion a creative and entrepreneurial culture, one that draws on the deep domain and capability expertise of thousands of talented individuals around the world.

We do not take our hard-earned status as a trusted advisor lightly, nor our responsibility to make a genuine difference for our clients and customers every single day – placing excellence and integrity at the forefront of everything we do.

I hope the articles in this edition help guide your own organization's journey as you navigate the many complexities and opportunities ahead.

As ever, my greatest thanks and appreciation to our contributors, readers, clients, and teams.

**Annie Rowland,** Capco CEO

2025, Edition 61

# Editor's note

KING'S College LONDON

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This 61st edition of the Journal of Financial Transformation is the first with a new editorial team in place, and is the product of a formalized collaboration between Capco and King's College London. This collaboration – a leading financial services consultancy and a prestigious academic institution – embodies the Journal's ethos: a balance between academic rigor and practical accessibility.

Traditional academic journals often deal with more prosaic conceptual matters. Even when they focus on more practical concerns, the timelines and mechanics of double-blind peer review processes can mean that the insights that they offer risk being out of date by the time they are published. Conversely, traditional op-ed articles in the financial press are all too often heavy on opinion and pre-conceived ideas and can lack the heft that comes with thoroughly researched pieces of work.

The Journal we've published strikes a vital balance between these two approaches.

This edition has an overarching focus of Value Dynamics. Specifically, the various articles look at how value is created, distributed and sustained across financial services. In turn, the submissions are grouped into three broad themes.

Technological transformations are explored in terms of how these can bolster or hinder value dynamics if not managed effectively. A number of secular shifts are also discussed – these being long-term changes that are impacting value dynamics in the sector. Finally, structural challenges are highlighted that emphasize the importance of sticky, tricky social and behavioral issues that surround the execution of financial services.

Overall, these themes highlight challenges and opportunities in the sector and encourage us to think differently.

It has been a pleasure working on this issue with such a fantastic and diverse array of different contributors.

**Professor Crawford Spence**
King's College London

# Technological transformations

# Riding the digital tides:

## Analyzing the digital yuan's present and possible future*

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## Abstract

Central bank digital currencies (CBDCs) are being considered in many countries – as a novel form of digital public money issued and backed by the state. One of the most extensive and advanced of these schemes is China's e-CNY or "digital yuan" pilot. It is also one of the most discussed. And yet it is perhaps one of the most mysterious, owing to the reticence of Chinese officials, the complexity of the pilot, and the wide variety of options available to Chinese authorities for future development of the e-CNY and the broader digital asset ecosystem within China. This note takes stock of the current status of the e-CNY, emphasizing its core infrastructure, existing use cases, and the "managed anonymity" model. Looking forward, how the e-CNY may fit into a digital financial system, how it may underpin non-financial and government activities, and how it may promote the internationalization of the renminibi are also discussed. We argue that external observers may be somewhat exaggerating the individual importance of the e-CNY scheme to the Chinese government. Ultimately, the e-CNY should be regarded as only one piece of a broader, coordinated drive to modernize the Chinese economy and how the government interacts with it.

## 1. Introduction

Conceived 2014, and active since 2020, the "digital yuan" or "e-CNY" is arguably the most ambitious central bank digital currency (CBDC) scheme in existence. While still nominally in pilot stage, the scale of the e-CNY project is such that it dwarfs all other active CBDC schemes. Even allowing for extensive schemes currently under development or exploration (notably the digital euro, digital rupee, and digital ruble) it seems likely that the e-CNY will remain a key benchmark for CBDCs in the future. Given China's rapid growth, modernization and global diplomatic goals, it is vital to understand such a large scale policy. And yet, despite the importance of the project, there remains enormous ambiguity surrounding the e-CNY. To some extent this ambiguity is reflected in other countries also, where the pace of change in the digital money domain can be bewildering and confusing. But the goals of the PBOC, and its Digital Currency Research Institute, are also less frequently stated and discussed, relative to the information (arguably an overload of information)

* The views expressed in this document and all errors and omissions should be regarded as those of the authors and not necessarily those of the the Bank of England, the Central Bank of Ireland, Qatar Central Bank, or Chainlink Labs.
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provided by other central banks. As such, taking stock of the e-CNY's current status is relatively difficult, and predicting its future path is even more so. This article attempts to address this, providing insight into features of the digital yuan, explaining the apparent logic behind its design, how it relates to broader Chinese policy, and what one might expect in the future. A key point is that the commonly expressed view that the e-CNY will be pushed to become a domestically and globally dominant money is perhaps questionable. The breadth of the Chinese government's approach to digital money, payments and financial reforms is such that e-CNY is perhaps better regarded as one piece of a broader strategy, and one that may never become the dominant payment medium within the economy. This is not to deny the significant importance of the project, but simply to note that the picture is more nuanced than some depictions of the project.

The development of a CBDC represents an important change in the payment rails of a given country. In China, given the high degree of government or government-backed institutions' interaction with private corporations, it is especially important to be informed about the progress and future of CBDC. Whereas digital money debates have been driven mainly by financial system issues in most countries, China's e-CNY pilot has emphasized non-financial usage, from the disbursement of public funds to contractors, to the use of the e-CNY in transport payments, and in supply chain administration. Foreign banks have begun to offer corporate e-CNY accounts and services and foreign citizens are able to set up e-CNY wallets. Broader projects, such as the belt and road initiative, and wider blockchain/digital asset schemes, show that China could rapidly scale up the e-CNY, not least because it can draw on experimentation currently underway in Hong Kong. The connection of the e-CNY to the wider desire to internationalize the Renminbi, and the possibility that it could (eventually) unlock a more relaxed foreign exchange policy also demands attention from any firm interested in doing business in China.

The structure of the paper is as follows. After a brief discussion of the underling infrastructure of the e-CNY in Section 2, we discuss the privacy challenges surrounding the e-CNY in Section 3 and its relationship to anti-money laundering in Section 4. We then discuss more forward looking topics – asking how the e-CNY might evolve in the future, as one component of the broader strategy of the Chinese government. Section 5 considers the e-CNY in the context of the internationalization of the yuan, while Sections 6 and 7 consider the role the e-CNY may eventually play in a broader digital asset ecosystem and how it may coexist with other forms of digital money and payments reform.

## 2. Infrastructure

The infrastructure of the e-CNY system seems still to be evolving, in line with the experimental (if advanced) nature of the pilot. As such, it can be difficult to divine what the ultimate approach taken will be. Some high-level characteristics, however, seem to have been finalized. The system will be highly centralized in terms of issuance and distribution of e-CNY, coordination of interbank transactions, and monitoring of the system. With issuance being purely the preserve of the central bank and a set of authorized operators, the system conforms to what presumably will be the approach taken by many – if not all – central banks. Since 2022, the PBOC has been reporting outstanding e-CNY in its monetary accounts [PBOC (2023) and PBOC (2025) for example] and regards the e-CNY as an element of M0, the narrowest form of money. As such, it is akin to cash, but digital and available to the public and businesses.

Currently, the set of authorized operators is small and focused on banks and key payments providers, though one could imagine the set being further expanded in the future. These agents represent "tier 2" institutions, intermediating between the "tier 1" PBOC in a so-called "two tier" structure. This structure was identified early on in the e-CNY development as being most appropriate for the PBOC's aims. First, it allows private sector expertise in on-boarding (wallet creation and management), user interface, and AML/KYC to be exploited. As noted in DCRI (2021), the PBOC sets rules and expectations around what privately provided wallets must offer, in terms of e-CNY functionality. They then defer to private companies for how exactly this is implemented and how their services would function in other dimensions. Arguably, the PBOC has thus implemented a system conforming to the "Model 2" CBDC ecosystem discussed in Liu et al. (2024)'s analysis of possible CBDC ecosystems, described as follows:

"The central bank is responsible for providing the network infrastructure and a basic wallet for end users. Intermediaries provide all other end-user services which would allow central banks to establish a downstream quality standard, foster competition through a central bank digital wallet, enable intervention for market failures and ensure inclusivity for overlooked segments of the population."

This collaborative approach (between PBOC and private sector) is partly in acknowledgment of the greater experience of existing e-money and payment providers in these areas, but also reflects a desire for the e-CNY not to disintermediate the banking system. While even a zero interest-bearing e-CNY might imply some competition with existing payment rails, the inclusion of e-CNY functionality could conceivably crowd in users into a payment provider's app. While this is perhaps unlikely for Alipay and WeChat, who have already almost saturated the mobile payments market, there are suggestions that the inclusion of e-CNY functionality could aid banks in enhancing their mobile payments market share by making their wallets and, indirectly their other services, more attractive.

As discussed in Deutsche Bank (2021) there is, in a sense, a "tier 2.5" set of institutions, comprising other banks and payment service providers who cannot directly exchange deposits and cash for e-CNY with PBOC, but who can interact with the authorized operators to layer services upon their underlying rails. This provision of a unified underlying rail is one of the main benefits cited by other central banks in their communications on CBDC (notably the digital euro and digital pound) in that it should allow innovative services to be created by those with the comparative advantage for doing so, the banking and payments sector.[1]

While there is an official e-CNY wallet app, the PBOC, in collaboration with commercial partners, has ensured that the e-CNY is increasingly available as an option in existing widely-used apps, and can be used in much the same manner as existing payment methods and digital moneys. This was an explicitly stated aim of the PBOC in minimizing switching costs. It was thought important for adoption that merchants and citizens should not have to learn new methods and habits. Similarly, the avoidance of fees for merchants and other users was a priority. The ability to use existing approaches (touch to pay, QR code scanning, and so forth) and existing apps (AliPay, WeChat, and commercial banking apps) ensures that in technical terms, the e-CNY scheme could be rolled out with minimal disruption.

[1] For a useful comparison of some of the main characteristics of the digital yuan and digital euro, see Hogan Lovells (2025)

The e-CNY scheme features a rich variety of wallet options, which has been termed the "wallet matrix" [Mu (2023)]. A set of important wallet characteristics defines the dimensions of this matrix: software or physical, offline or online, and individual or corporate. An interesting further distinction is whether the wallet is the primary wallet, or one of possibly multiple "sub-wallets" that are connected to an overarching primary wallet, but which can be used for particular interactions with external services and counterparties. Users can tune characteristics of their sub-wallet according to use case, such as setting payment limits or limiting the sharing of personal information for a particular type of transaction.

Software-based wallets, be that in the official e-CNY app or via intermediaries' apps, will likely be the dominant method of using the e-CNY, reflecting familiarity with, and the success of, mobile payments (often implemented via QR and barcode scanning) within China. However, as noted in Mu (2024) the expectation is that the variety of wallets will grow. An important theme is that of "loose coupling" with banking rails, such that the e-CNY can be used independently of the rails, thus not requiring bank accounts. Enhanced physical and SIM-based wallets are emerging, and e-CNY functionality is even being embedded in the operating system of new Huawei smart devices [Ledger Insights (2024c)].

Great emphasis is put on the scope for official payments (be they fiscal or to contractors working on government projects) to be executed using e-CNY rails, so as to reduce corruption and fund diversion. In other countries, the ability to make direct fiscal payments has also been cited as a possible benefit of e-CNY [see World Bank (2021)] and in a country so vast and with such different degrees of terrain and development – in some cases subject to natural disasters – the ability to directly credit citizens and firms with government funds is extremely important. The aforementioned physical/visual wallets and off-chain functionality also relate to these issues, such that distant or damaged regions and less technologically savvy citizens are capable of participation.

## 3. Privacy

In many countries considering the introduction of CBDC, privacy concerns are prominent. Bidder et al. (2023) show a significant relationship between trust in the ECB and projected adoption of the digital euro, and that experience of authoritarian rule in East Germany prior to reunification also is associated with lower demand for the CBDC. In Korea, Choi et al. (2023) find similar results and in the United States, one of the often mentioned reasons for opposition to CBDC has been concern over government oversight (see Ted Cruz's CBDC Anti-Surveillance State Act, for example). Similar concerns have been expressed both within and outside China in relation to the e-CNY. Indeed, PBOC officials have acknowledged the importance of the issue and repeatedly emphasize the various steps that have been taken to ensure data security and to promote user privacy [Gang (2022)].

At the same time, a key aim of e-CNY is to help reduce fraud and money laundering. As in other countries, the ability to use digital cash at a scale that is impractical for physical cash has raised difficult trade-offs between privacy and oversight. Given the additional salience of capital controls and forex restrictions in China, and the greater role of the government within the economy, these trade-offs have especial force. An additional trade-off perhaps applies in China, arising from the more managed nature of its economy, where

the government is more involved in directing activity. In this context, the scope to use the "big data" arising from transactions with e-CNY in enhancing the efficiency of a given amount of government activity is enormous.

Balancing these trade-offs has led the PBOC to a policy commonly translated as "controlled anonymity" or, perhaps more naturally translated, "managed anonymity" [Mu (2022)]. As aforementioned, e-CNY wallets are available in various forms. Wallets with higher spending limits are associated with more rigorous identity checking. A mantra often referred to is that of "anonymity for small amounts, traceability for large amounts." To an extent this is also reflected in mooted designs for the digital euro, where it has been suggested that offline and small value transactions might be allowed to be effectively anonymous outside the counterparties involved [Daman (2024)]. However, it should be noted that the e-CNY, even in the lowest tier of hard wallet, does apparently require a phone number. While this per se is not equivalent to supplying identifying information, it is typically the case that to obtain a SIM card, one must provide identity documents such that the proxy (phone number) can presumably be traced back to an individual if necessary. However, there may be other safeguards in place to prevent this, or at least prevent it from happening without formal oversight and guardrails.

A subtlety to the privacy debate is that in some respects the e-CNY could enhance privacy, at least relative to existing digital payment methods. The ability to deploy sub-wallets for interaction with online services and the "loose coupling" of wallets with bank accounts [see PBOC (2022)] can promote privacy for users in relation to their counterparties and traditional payment intermediaries.[2] As in many other countries, Chinese consumers are growing increasingly wary of the use of their private information by payment firms. Indeed, the Bank of England emphasizes that one benefit of an hypothetical digital pound might be that transactions data and personal metadata cannot, or would not, be mined for profit in the way that private companies now do – a point reiterated by officials allaying privacy concerns around the digital euro [MIT DCI and BoE (2024); Daman (2024)].

Combined with sub-wallet features, the offline functionality of physical wallets, such as the visual hard wallets discussed in Zhang (2024) or SIM-based hard wallets associated with smartphones discussed in Ledger Insights (2023), does appear to provide privacy advantages for Chinese users, relative to some private sector payment options (along with other benefits unrelated to privacy, such as functioning in extreme conditions, internet outages and so forth). However, the concern most often raised is in relation to citizen's privacy from the PBOC and the broader government, and the security and use of their transactions data. One of the clearer statements on the approach to privacy is provided in Mu (2022), quoted here:

"The authorised operators collect the personal information necessary for the services and operations. The personal information generated by the wallet is collected and stored by the authorised operators. The PBC only processes inter-institutional transaction information and does not hold personal information. ID anonymisation technology is used between e-CNY wallets and

[2] The loose coupling of e-CNY to the banking system relates to the ability to use the e-CNY separately from traditional banking rails, even though one can (optionally) also use the e-CNY through bank-provided wallets, or exploit e-CNY functionality that relies on a bank account for automated top-ups. The "looseness" reflects functionality such as offline payments and the presence of hard wallets unrelated to banks. It also reflects the fact that the e-CNY allows a bearer instrument or "value-based" settlement model (settlement occurs at the point of the transaction), rather than solely an account-based model (ultimate settlement required interbank settlement). The advantages of loose coupling are not limited to privacy, in that it extends the e-CNY user-base to include the unbanked and those who find modern banking technologies too complex.

the personal information exchanged between all wallets is anonymous to counterparties and other commercial institutions. For legitimate transactions, none of the above entities can obtain complete transaction and consumption behavior information to protect consumers' privacy. Under normal conditions, no other party has the right to obtain the transaction information.

Only when suspicious transactions arise can the authorised operators apply to obtain relevant data for further analysis to ensure the fulfillment of their legal obligations, such as with respect to AML/CFT. In addition, when relevant authorities obtain consumers' personal information with legal warrants, they will strictly confine the scope of knowledge obtained and its use to the authorisation of laws and regulations. Moreover, they will take security protection measures.

The PBC strictly abides by the 'Network Security Law', the 'Personal Information Protection Law' and other laws and regulations. It ensures the security of personal information through advanced technical means and strict management mechanisms. The PBC adopts industry-leading technology, such as access control security and multi-factor authentication to protect data security and prevent data from unauthorised access, public disclosure, use, modification, damage or loss. The PBC has set up a 'firewall' internally and strictly implements information security and privacy protection through institutional arrangements such as specially-assigned responsible persons for maintenance, business isolation, hierarchical authorisation, post checks and balances and internal audit. Information relating to the e-CNY will be sealed and stored and all customer information will be de-identified. Without legal authorisation, neither the PBC's internal personnel nor any external business unit or individual may inquire or use it at will. Unauthorised inquiry or use of personal information will be investigated according to law and those responsible would be held accountable."

> **"It could be that the PBOC and Chinese government decide that a functioning but not dominant e-CNY system is adequate for their needs.**

Notwithstanding this, Lee et al. (2021b) [cited also in Subrahmanyam (2023)] refer to an architecture of "one CBDC, two databases and three centres" where the two databases are the "issuance database" supposedly held by the PBOC and the "digital currency commercial bank database" held (apparently) by authorized operators. The three centers are, apparently the "authentication centre, registration centre and big data analysis centre." Lee et al. (2021a) also state that "the PBOC could still track all trading information in China's efforts to combat corruption, money laundering, tax evasion, and terrorist financing." It is somewhat unclear what (if any) official documentation underpins these claims, but they are perhaps consistent with the above quote from Mu (2022). It is certainly the case that the PBOC and other authorities reserve the right to obtain detailed user data in the case of suspected crimes, as indeed would likely be the case in other countries. Naturally, one must then ask how any government might define and interpret criminal activity, and what evidence and process would need to be provided and followed to demonstrate a justification for obtaining private data. How different countries approach these difficult questions remains to be seen.

The presence of an "issuance database" seems intrinsic to any CBDC, all of which appear likely to be fully centralized for issuance. Similarly,

registration of operators and users would also naturally give rise to an associated "registration database." As Mu (2022) notes, authorized operators are expected to collect personal information and frequently provide wallet services so, it is natural that there should be some form of "commercial bank database."

Where there is perhaps greater ambiguity, though not necessarily contradiction, in how Mu (2022) relates to Lee et al. (2021b), is in the presence (if indeed Lee et al. (2021b) is correct) of a "big data centre." It is possible that the PBOC runs a big data center that operates not on e-CNY transactions data (unless, as discussed above they have been flagged as fraudulent and criminal in some way), but on some other data relevant to the e-CNY – perhaps some form of e-CNY metadata or aggregated and anonymized transaction data. If this sort of analysis is undertaken – preserving privacy at individual user or transaction levels, but tracking and analyzing properties of the whole set of transactions data – then it should be no surprise to find such operations coordinated within a "big data analysis" center. One can envisage many dimensions in which big data analysis of payments flows could enhance policy effectiveness in managing payments and monitoring system performance.

As discussed in BoE (2023) there are various methods that complement big data analysis in a way that protects privacy, which could be used by the "big data centre." To the extent that such analysis is being carried out, it would perhaps serve the PBOC's own interests to provide more detail. Since PBOC officials have acknowledged the delicacy of the privacy-security trade-offs in this area, it could promote greater trust and, ultimately, adoption. Specifically, it might be useful to clarify somewhat the nature of the privacy protections and analytical techniques used in the e-CNY big data analysis (if indeed they are analyzing e-CNY data in this way).

## 4. Privacy and AML trade-offs

An especially important trade-off with privacy is concern over anti-money laundering (AML), as noted in Lu and Zhang (2022) and Huang and Li (2023). In 2021, China introduced its first comprehensive legislation on personal information and data privacy – the Personal Information Protection Law (PIPL) – which is akin to the E.U.'s General Data Protection Regulation (GDPR). PIPL has imposed more stringent regulatory requirements on businesses and authorities dealing with citizens' data [Olcott (2021)]. However, the effective enforcement of AML regulations tends to require financial authorities and institutions to collect, share, and even in some cases disclose sensitive information relating to citizens' daily transactions. This could be hard to achieve under a strict set of data protection laws like PIPL or GDPR, especially when central banks plan to promote the usage of their CBDCs on the international stage.

When piloting the e-CNY, the PBOC is obliged to proactively incorporate the compulsory requirements of AML frameworks into the e-CNY payment and settlement process. Of course, "identity" is a key factor in triggering any AML enforcement cases and – from an international perspective – features prominently in data-gathering standards, such as the FATF "travel rule" [FATF (2024)]. Failures to conduct customer due diligence (CDD) or verify account ownership have been common reasons for substantial fines imposed on financial institutions and other corporations. This indicates that AML investigations initially prioritize verifying clients' identities and accounts as a primitive for transactions processing, thus allowing law enforcement officials to examine the origin and movement of funds, business connections, and potentially suspicious transactions. With the e-CNY intended to mimic cash-like properties (notably, a high degree of anonymity), it is clear

that some of the traditional approaches to AML used in the past may need some adaptation. Again, this points to the utility of techniques such as the combination of big data analytics with privacy enhancing transformations or aggregation of underlying transaction data.

Ultimately, of course, the idiosyncrasies of each country will determine where the line is drawn in trading off privacy against oversight and AML – as part of a the broader boundaries and restrictions placed on governments in relation to personal data. For example, in the European Union, a "proportionality test" requires member states to ensure that the regulatory powers granted to governments under a particular law do not unduly restrict fundamental rights protected by the E.U. Charter. Additionally, the AML transaction monitoring process may be reviewed and evaluated by the Court of Justice of the European Union (CJEU) to determine whether requiring financial institutions and banks to detect and report suspicious activities complies with the GDPR, as interpreted in light of the Charter.

Within Europe, arguably the protection of consumer data is the overriding concern. In mainland China and Hong Kong, regulators seem to prioritize the task of detecting potential money-laundering activities, though with safeguards to prevent inappropriate access to personal information. These differences reflect a major distinction between the Chinese and E.U. approaches in that the financial judicial system in China does not lead or shape regulatory policy as it does in Europe. Instead, court decisions relating to financial disputes usually follow the policies and decisions implemented by regulators. The PBOC and other Chinese regulators have a specific focus on financial stability and AML, and it is thus perhaps unsurprising that the balance between privacy and oversight shades somewhat more to the latter in China.

## 5. Renminbi internationalization and the e-CNY

The promotion of CBDCs beyond its borders aligns with China's long-term national strategy of Renminbi (RMB) internationalization and the building of a financial superpower. A key strategy of the Chinese government has been to promote the use of the RMB in international payments, competing with major currencies. Despite China having been the world's second largest economy for many years, RMB has been significantly underrepresented in international payments and financial transactions. As of August 2024, the U.S. dollar accounted for 49.1% of SWIFT international payments based on transaction value, the euro for 21.6%, and sterling for 6.5%, while the yuan only accounted for 4.7%. While the yuan has in recent years become the majority denomination in trade involving China, its position clearly lags well behind the dollar in terms of general global trade, where non-U.S. counterparties will typically rely on the dollar, even when trading among themselves [Reuters (2023)].

The e-CNY pilot is only part (and at the moment, a small part) of China's push towards internationalizing the RMB. Many of the trade-offs discussed above apply with greater force in the international arena. For example, U.S. and European norms and habits regarding privacy-oversight trade-offs are likely to differ from those of the Chinese. Additionally, foreign exchange restrictions and exchange rate policies constrain how independently influential the RMB can be, relative to the USD. On the other hand, some have suggested that future programmability (via smart contracts) of a digital yuan, along with government oversight, could allow more flexible and sophisticated forex controls than the relatively blunt tools currently used to control capital flows. As such, it could be that the Chinese

government can relax some elements of its capital controls because the e-CNY could allow more targeted restrictions.

As ever, when dealing with China one must take a (very) long-term perspective in assessing the e-CNY. China's role in international trade will continue to grow over time, not least boosted by the so-called "belt and road initiative" (BRI). Launched in 2013, the BRI is designed to enhance connectivity and strengthen economic cooperation across continents. While traditionally focused on infrastructure and trade, the BRI is now being complemented by schemes focusing on digital assets – including the international BSN Spartan network (discussed further below), and many trade credit pilots using the e-CNY have obvious connections to the broader BRI initiative. The PBOC was a prominent participant in the successful BIS mBridge wholesale CBDC pilot, along with the Hong Kong Monetary Authority and the central banks of Thailand and the United Arab Emirates.

## 6. Blockchain and digital assets in China

While much of the impetus for CBDCs around the world has come from the rapid emergence of cryptocurrencies deployed on blockchain, there is no requirement that a CBDC should itself run entirely, or even mainly, on a blockchain. There is ongoing ambiguity over the role of blockchain in the e-CNY system. There is suggestive evidence that the PBOC is considering it – though whether it would be part of the core implementation, as opposed to making e-CNY somehow interoperable with on-chain applications, is somewhat unclear. Notably, blockchain has been referred to in recent communications from the DCRI [see Mu (2024) for example]. Some e-CNY experiments have explicitly explored blockchain technology, such as "on-chain" payment of wages in Xiongan New Area – a hub for digital innovation [Xiongan (2021)]. In this case, wages were paid via a "blockchain fund payment platform" from a public wallet to subcontractors' private wallets. Furthermore, various official documentation make repeated references to smart contracts [again, see Mu (2024)]. And finally, patent activity linked to the DCRI suggests that expertise in core blockchain and cryptographic primitives has been developed, and that interoperability and automation featured in their research [CDC (2020)]. In many jurisdictions, providing an official "fiat on chain" has been one of the main justifications for introducing a CBDC, especially as stablecoins seem to be growing in popularity, despite continued concerns about their safety. As such, one might wonder if e-CNY issuance "on chain" may occur in the future.

Here we must acknowledge the idiosyncratic nature of China's relationship with blockchain. Crypto is tightly controlled within China. Cryptocurrencies, including stablecoins, have been especially restricted, to the extent that almost any cryptocurrency activity is prohibited, unauthorized stablecoin usage has been punished, and any trading (as opposed to primary market issuance and buying to hold/own) of digital assets is typically banned. And yet, the situation is nuanced – befitting a country that has previously seen widespread activity in this area (before exchange and mining crackdowns in 2017 and 2021) and which even now is home to enormous technical expertise in blockchain. Indeed, the legality of some forms of digital asset ownership has been affirmed [Kaaru (2024)].

On the mainland, blockchain is embraced by the government as a tool for non-speculative, non-financial applications (see Sergeenkov (2024) and Team Exponential (2024) for recent summaries of several projects). Indeed, while commonly associated in other jurisdictions with highly decentralized activities, the Chinese government is exploiting blockchain technology to enhance

the efficiency with which the government, and its various representatives across the vast country, coordinate activity. This is emphasized most obviously in the region of Xiongan [see Lei (2023) and SCMP (2024)], where various blockchain-based projects are explored as part of a broader push towards digital modernity.[3]

There is also an advanced government-controlled blockchain network, BSN, running in China.[4] Designed by Red Date, BSN provides a platform for a rich array of applications. Notably non-fungible tokens (NFTs or "digital collectibles") are extremely popular within China, though secondary trading is essentially prohibited [Shen (2022) and Quin (2022)].

## 7. Digital moneys in China – possible future paths

The Chinese approach to blockchain has been described as "blockchain without cryptocurrencies" [Hung (2024)], which is in stark contrast to many permissionless blockchains running globally, where the native currencies, such as Bitcoin and Ether, play a core role in the operation of the chains, and where stablecoins are blockchain's first "killer app" in the eyes of many. To the extent that the PBOC regards e-CNY as distinct from cryptocurrencies, an interesting question is how it could be incorporated into a broader blockchain system. One option is to issue a CBDC natively on a blockchain platform, while another is to permit an approved bridging protocol (or standards for such protocols) that allow a synthetic form of the CBDC to circulate on blockchains, while always connected 1:1 with off-chain CBDC. Similar issues have been discussed in the context of (wholesale) CBDC pilots run by the ECB and BoJ (2018) and in Switzerland [SNB et al. (2022)], as discussed in Bidder (2023).

It is purely speculative as to whether the e-CNY may play an on-chain role in this way. Rumors abound as to a possible relaxing of the government's stance on digital assets within the mainland – though this may be wishful thinking among blockchain supporters. If this were to occur, then the demand for a reliable on-chain fiat currency would increase dramatically, and it is difficult to envisage the PBOC (indeed this could be said of many central banks) being comfortable with privately provided cryptocurrencies and digital moneys being the only option on chain for a cash leg of settlement or for P2P payments. BSN already entails permissioned access – in contrast to the permissionless (and pseudonymous) access to global blockchains such as Ethereum mainnet and Bitcoin. As such, there is already a sense in which it is consistent with some of the tiers of e-CNY wallets (those with more demanding KYC elements).

The PBOC may also be swayed by the possibility that CBDC could crowd out destabilizing excess private liquidity, akin to the theories discussed in Krishnamurthy and Vissing-Jorgensen (2015), Greenwood et al. (2018) and Bidder et al. (2023). Whether in practice this is a quantitatively important justification for e-CNY expansion is unclear. Relatedly, proponents of CBDC sometimes point to the risk of "walled gardens" [see Cipollone (2023) and Panetta (2023)] from powerful synergies between money issuance and online platforms selling goods and services. These issues hold especial force in China and, indeed, across Asia where digital moneys are often issued by companies with dominant retail platforms and are embedded in super apps. However, in China at least, other tools – more direct than issuing a CBDC – for avoiding walled gardens have been explored. Alibaba and Tencent have been at the heart of this debate and some key platforms have

[3] Fortis (2023) discusses other initiatives in Shanghai.
[4] BSN Spartan is the international version of this network [Shen (2023)].

recently made it easier to use their competitors' moneys within their systems [see Wang (2021) and Hall (2024)].

Together with GFT and other participants, Red Date has been heavily involved in developing the Universal Digital Payments Network (UDPN), which is an interoperability platform for digital moneys – both CBDCs and privately issued (stablecoins and tokenized deposits). In a sense, UDPN is an alternative to SWIFT, though connecting blockchain payment platforms rather than traditional rails. It is a private sector solution somewhat akin to some of the bridging and cross-border protocols developed under various BIS pilots of recent years, such as Projects mBridge and Agora – with PBOC being involved in the former [BIS (2022) and BIS (2024b)]. UDPN is already seeing activity in the domain of stablecoins and tokenized deposits (see experiments discussed in Ledger Insights (2024a) and Ledger Insights (2024b)) and while the e-CNY is not a supported currency on UDPN, there are connections (client-customer and in initial setup) between Red Date and UDPN and Chinese government-connected organizations. It is unclear if the PBOC would ever choose to be involved in UDPN, but it would presumably be a simple avenue to explore, if it so wished.

A picture is thus emerging of various options for the PBOC to consider. It seems well within their technical and policy capability to extend e-CNY, at scale, into various blockchain-related platforms and use cases, both internationally and domestically. But will they choose to do so?

It is commonly assumed that the PBOC will keep pushing e-CNY, ultimately to the maximal scale. One reason why this may not happen – at least in the near term – is that China may wish to observe how other countries proceed and, indeed, how Hong Kong fares as it expands its activities in tokenization, digital money and CBDC. Given the apparent demand for digital money and crypto assets within China, and the PBOC's concern over speculative activity, it is understandable that in the mainland, the PBOC may be especially cautious. While other countries, notably in the Middle East, have created specific "free economic zones" from scratch to provide a "safe" and contained experimental environment [see de Ramos (2023) and Heaver (2024) for example], China effectively possesses one already in Hong Kong, and in the vibrant Greater Bay Area more broadly. The presence of such an "experimental" region somewhat reduces the pressure for the PBOC to experiment on the mainland.

It is also important to note the advanced capability of instant payments within China and the breadth of money and payments options available to the PBOC and government. In the presence of such options, it is far from clear that the e-CNY will be pushed to expand, particularly if organic retail adoption and usage continue to be modest. Indeed, important recent research on CBDCs makes clear that even zero to low adoption of CBDC is consistent with it nevertheless having welfare enhancing effects, through its impact on private sector moneys. The presence of a CBDC – and the option to use it – can be a disciplining effect that induces better service among incumbent payment and money providers [Chiu et al. (2022)]. That is, low take up of a CBDC is not necessarily a sign of failure, if it is accompanied by improvements in private sector solutions that it has helped stimulate.[5]

[5] Of course, low take up, if it is concentrated among previously marginalized or excluded groups could also be regarded as a success, on the basis of equality and access reasons.

While a stated aim of the PBOC was to be minimally disruptive to the existing financial system, there is a sense in which it could provide a disciplining effect on AliPay and WeChat and promote additional competition within the payments ecosystem. Antitrust concerns have been raised in relation to these two dominant providers before [see Ye et al. (2021) for example], and, even setting aside any competitive concerns, there is a worry that such concentration could make the payments system fragile to failure or attack. In this respect, there are interesting parallels to be drawn between motivations for the digital euro and e-CNY. The ECB has been even more explicit in its singling out of specific private companies – Mastercard and Visa – in their justification for the digital euro, citing competitive and "strategic autonomy" concerns [Cipollone (2025)]. There are also significant restrictions put on (non-euro backed) stablecoins under MiCA, which is a softer form of restriction than the outright bans currently in place on mainland China, but far stricter than what is being permitted in Hong Kong. The Bank of England's current stance on systemic stablecoins also appears incompatible with any of the most prominent and globally successful stablecoins. Restrictions on private digital moneys are also observed in Qatar, where there are parallels with the Chinese openness to blockchain and digital assets, yet restrictiveness on cryptocurrencies. In Qatar, as in China, emphasis is put on blockchain applications that relate to "real activity" or tangible underlying assets [see Wyden (2024) and Hofverberg (2025) for example]. Frequently, and understandably, countries with foreign exchange restrictions and concerns over digital dollarization or strategic autonomy are observed to be cautious on permitting the scaling of private digital moneys on global blockchains (see Ledger Insights (2024d) and Tepedino (2025) for related debates in Brazil and Turkey).

A further reason why the PBOC may choose not to push the e-CNY to mass adoption is the general cooling of interest, globally, in launching retail CBDCs. Apart from President Trump's executive order that effectively bans a U.S. CBDC for the foreseeable future, Canada and Australia have also scaled back their schemes, pivoting perhaps more towards wholesale CBDC. Indeed, in Asia, there are interesting experiments, such as Project Nexus, that focus on connecting instant payment rails across countries, rather than relying on CBDC [BIS (2024a)]. Furthermore, unlike in Europe, the U.S. or the U.K., instant payments schemes in Asia are exceptionally efficient and rich in functionality/synergies, reducing the need for a CBDC rail – at least at a retail level. In Europe, one of the most compelling economic arguments (as opposed to geopoliticial "strategic autonomy" arguments) for a CBDC is the fragmentation of payment systems between the Eurosystem countries. AliPay and WeChat dominate payments in China and provide instant settlement thanks to their "closed-loop" paradigm, where transactions can settle within their own balance sheets. While this is perhaps not so suitable for corporate use, there is also the functionality provided by the Internet Banking Payment System (IBPS) that already provides 24/7 real time payment rails. Furthermore, work to integrate Hong Kong FPS with IBPS was completed in June 2025 [FNHK (2025)]. There is also ongoing work to connect the e-CNY to FPS [HKMA (2024)].

It could be that the PBOC and Chinese government decide that a functioning but not dominant e-CNY system is adequate for their needs. In this case, the e-CNY could play an important role in filling the "gaps" in the existing payments system (regional disparities, access for excluded demographics) and/or provide a more efficient way for the government to disburse funds and interact with private sector contractors. It could

also complement other blockchain applications promoted by the government (trade finance and belt and road initiatives), while leaving an innovative private sector to deal with the majority of digital payments.

The PBOC and Chinese government have gradually constructed a broad and deep set of options for China's future monetary and payments system. The e-CNY could, and likely will, be an important component and could ultimately become the main component. But that is not a foregone conclusion, not simply because of reluctant adoption by the citizenry (which many people believe will afflict all CBDCs) but also because the PBOC and government regard it as only part of a broader approach to achieving their policy goals.

## 8. Conclusions

The e-CNY pilot shares much in common with other CBDC pilots. Anyone who follows CBDC debates globally will recognize many of the issues raised in relation to the digital yuan. Discussions over privacy, oversight, technology and infrastructure challenges are strikingly similar, even if the eventual choices will differ across jurisdictions. The broader and long-running goal of yuan internationalization and the rather idiosyncratic approach to blockchain and digital assets leads to some distinctive elements of the debate in China. These, together with the reticence of the PBOC and DCRI in describing their investigations and goals, leave many in the West (and perhaps also in China) unsure of where the project is heading. But given its sophistication, scale and innovative nature, the e-CNY is sure to become a key element in the Chinese economy and, thus, the global policy debate for many years to come. And yet, attention must be paid to many of the other reforms and digital money developments within China. It is far from obvious that the e-CNY will be promoted to the exclusion of alternative moneys and payment rails, given that many of the government and PBOC's goals can be achieved via other means.

Any firms interested in trading with, and operating in, China should be aware of the program and of broader advances, which could occur quickly, if the government is so minded, in blockchain and digital assets. We have emphasized how the e-CNY has been focused on non-financial use cases so far – in the sense of supporting real activity and modernizing "cash" for citizens. However, for advances in tokenization (where Hong Kong is a current leader) to be sustainable, a cash leg digital asset is likely to be required. It seems implausible that the PBOC will tolerate dominance by private digital moneys that are backed by foreign denominated assets, such as global stablecoins. At the same time, if the rest of the world pushes ahead with tokenized assets and on chain finance, it is also implausible that China will allow itself to be left behind (especially given its digital asset expertize). In addition to the existing use cases emphasized by the PBOC, a big question is how e-CNY usage might expand in the dimensions of wholesale finance and tokenization in the future. Will it become the dominant money in circulation, or will it focus on a subset of use cases, and/or indirectly complement (e.g., as a backing asset for stablecoins) or discipline (as an "outside option" for users) private moneys? The world will be looking on with great interest as the e-CNY develops.

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# Rebuilding capital markets on-chain:
## Tokenization, treasuries and the next financial layer

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## Abstract

Tokenization is more than a technical breakthrough – it represents a foundational shift in how capital markets are structured, accessed, and composed. By transforming traditional assets such as U.S. Treasuries, private credit, and money market funds into programmable, interoperable tokens, tokenization is redefining the architecture of global finance. This article explores the rise of tokenized real-world assets (RWAs), with a focus on tokenized U.S. Treasuries – the most advanced and strategically relevant use case to date. Drawing from product data, legal structures, and emerging integrations, the paper examines how these instruments are powering yield-bearing stablecoins, and reshaping liquidity management across decentralized and traditional finance. For financial services firms, this shift challenges established models of custody, fund management, and market access – demanding new infrastructure strategies, compliance frameworks, and rethinking client engagement and operation at scale. Firms that adapt early may unlock faster settlement, greater liquidity, and new institutional flows. This shift won't be defined solely in code or regulation, it will be shaped at the intersection of the two. As tokenization matures, its most transformative effect may not be what it replaces, but what new value creation models it enables.

## 1. Introduction

Tokenization – the process of representing real-world or off-chain assets as digital tokens on a blockchain – has emerged as one of the most promising innovations in modern finance. At its core, tokenization enables fractional ownership, global accessibility, programmability, and near-instant settlement of traditionally illiquid or inefficient financial instruments. These tokenized assets can integrate directly into decentralized finance (DeFi) platforms, digital wallets, and smart contracts, streamlining how assets are transferred, collateralized, or used in payments.

Tokenized assets span a wide spectrum of categories, many of which fall, sometimes loosely, under the term "real-world assets" (RWAs). While the definition varies depending on the context, RWAs generally refer to assets with value derived from off-chain, real-world economic activity. This includes both institutional-grade financial instruments and more retail- or consumer-facing assets. Examples include:

- **Short-duration U.S. Treasuries and money market funds**, offering compliant, yield-bearing exposure to government debt

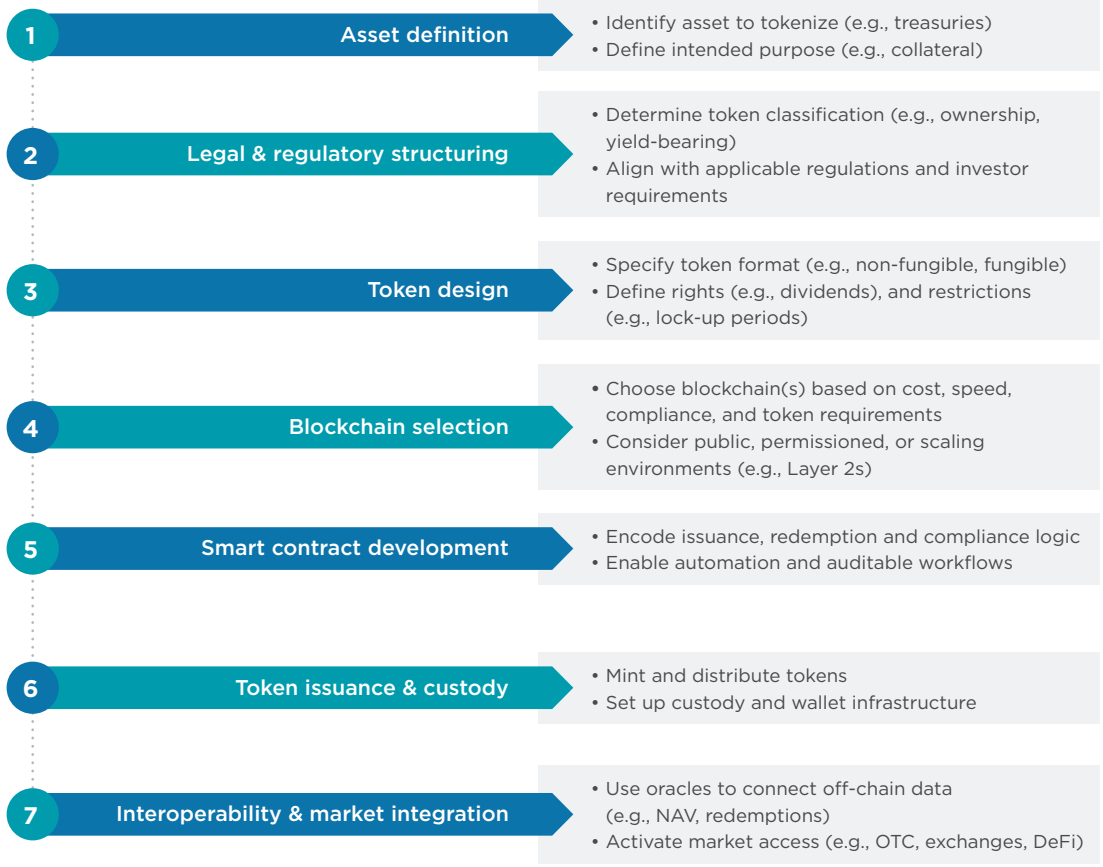
- **Stablecoins**, which are often seen as tokenized fiat, backed 1:1 by dollars held in reserve and critical for on-chain liquidity and cross-border transfers
- **Private credit**, where tokenized structures enhance liquidity and transparency across private lending markets
- **Real estate and commodities**, which benefit from fractional ownership and streamlined settlement
- **Art, collectibles, and intellectual property**, which tap into new models for provenance, monetization, and digital ownership.

In this article, when we refer to RWAs, we focus on institutional-grade financial assets – particularly U.S. Treasuries, private credit, and related yield-bearing instruments, given their current momentum and relevance to institutional adoption. These represent the segment where tokenization has moved furthest from theory to market reality.

## 1.1 Tokenized RWAs: Adoption and process

As of early 2025, the total value of tokenized RWAs exceeded $18 billion, up from less than $5 billion in 2023, and is expected to exceed $2 trillion (excluding cryptocurrencies and stablecoins) by 2030 [Banerjee et al. (2024)]. This surge reflects not only technical maturity, but also a shift in institutional sentiment: tokenization is increasingly viewed as a strategic solution for increasing capital efficiency, enhancing

**Figure 1:** Tokenization process



transparency, and building programmable infrastructure that bridges traditional finance (TradFi) with decentralized systems.

As institutional engagement grows, understanding how tokenization works under the hood becomes increasingly important – not just for developers, but for asset managers, legal teams, and infrastructure providers navigating this new financial architecture. While each asset class brings its own regulatory, technological, and market-specific challenges, the tokenization process tends to follow a common framework.

As shown in Figure 1, tokenization involves a multi-step process that spans legal structuring token design, blockchain selection, and market integration. Among these steps, the initial definition of the asset and its intended purpose is foundational. Whether the token is meant to represent ownership, provide access or deliver yield will directly influence how it must be legally structured, what rights it embeds, and how it will be treated by regulators. For example, a tokenized product designed solely to signal ownership may avoid a securities classification, while one intended to be yield-bearing can trigger additional compliance requirements. These early decisions ripple through the entire design and deployment process, shaping the path forward for both technical implementation and investor access.

Blockchain enables the tokenization process through its decentralized, tamper-resistant ledger, which ensures secure, transparent tracking of ownership and transactions. Smart contracts automate issuance, settlement, compliance, and redemptions – eliminating manual processes and reducing reliance on intermediaries. Collectively, these features address persistent pain points in traditional finance, offering practical solutions to challenges like limited liquidity, high barriers of entry, and operational inefficiencies. The table below maps common frictions in legacy systems to the blockchain-enabled capabilities that help drive tokenization adoption.

To ground these adoption drivers in a real-world example, this case study examines the rise of tokenized U.S. Treasuries, arguably the most

**Table 1:** Comparison of traditional finance challenges and blockchain solutions

| Traditional Finance Challenge | Blockchain Solution (Adoption Driver) |
|---|---|
| Limited liquidity in private/alternative assets | **Fractional ownership** enables smaller denominations and broader market participation |
| High barriers to entry for retail investors | **Greater accessibility** through tokenized assets reduces minimum investment sizes and expands reach |
| Manual, paper-based processes and intermediaries | **Smart contract automation** streamlines issuance, settlement, and redemption |
| Opaque ownership records and poor auditability | **Blockchain transparency and immutability** enhances auditability and reduces fraud |
| High operational costs and delayed time-to-market | **Cost efficiency** from reduced reliance on intermediaries and faster processing |
| Lack of interoperability between financial applications | **Interoperability** through shared ledger infrastructure and token standards enhances connectivity across siloed systems and streamlines integration |

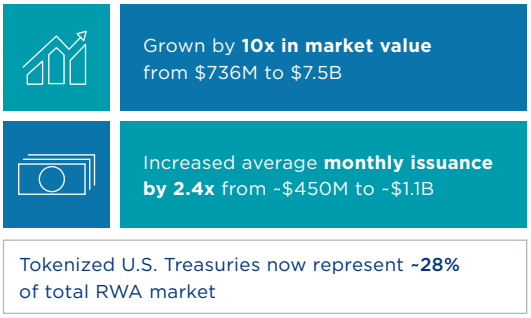
mature and institutionally embraced tokenized asset to date. It illustrates how blockchain is being leveraged to address core TradFi frictions such as inefficient settlement, opaque ownership structures, limited auditability, and constrained composability, while also unlocking new yield-bearing opportunities across both traditional and decentralized ecosystems.

## 2. Case study: Tokenized treasuries as yield bearing infrastructure

Tokenized U.S. Treasuries are on-chain representations of short-term government debt, designed to mirror the structure and performance of traditional treasury instruments while leveraging blockchain-based infrastructure. Their low credit risk, regulatory familiarity, and deep liquidity make them uniquely well-suited for blockchain adoption. Just as importantly, treasuries align with growing on-chain demand for programmable, yield-bearing instruments that can serve as financial primitives in both TradFi and DeFi ecosystems.

**Figure 2:** Tokenized treasury metrics snapshot

**Since Q1 2024, tokenized U.S. Treasuries have:**




**Source:** app.rwa.xyz
Data as of 09/02/2025

This convergence of technological readiness and macroeconomic tailwinds has triggered a surge in adoption. Since Q1 2024, the value of tokenized U.S. Treasuries has grown from $736 million to $6.89 billion – a nearly 836% increase. Much of this momentum has been driven by the Federal Reserve's quantitative tightening (QT) cycle, which pushed short-term interest rates to multi-decade highs, making U.S. government debt newly attractive to crypto platforms and cash-rich institutions seeking low-risk yield.

At the same time, stablecoin issuers, many of which hold U.S. Treasuries as reserves, began earning substantial returns on those holdings, often without passing that yield on to users. This gap created a new incentive: protocols recognized the opportunity to evolve beyond static, stable-value tokens and introduce yield-bearing stablecoins, digital assets designed to maintain price stability (typically one U.S. dollar) while distributing embedded yield. By embedding Treasury yield directly into user-facing products, they could drive adoption, differentiate their offerings, and gain more control over value flow within digital ecosystems.

The result has been a wave of innovation. To meet this growing demand, blockchain-native issuers, asset managers, and fintechs have introduced tokenized Treasury products that go beyond passive exposure – serving as the yield-bearing backbone for a new generation of programmable stablecoins and financial infrastructure.

### 2.1 The three structural models of tokenized treasuries

Tokenized U.S. Treasuries vary in structure, these products come in a variety of legal wrappers, reflecting different regulatory strategies and investor access models. While the end asset

**Figure 3:** Tokenized treasury wrappers

| Registered tokenized MMFs | Tokenized T-bill notes | Aggregator structures |
|---|---|---|
| **Legal structure:** U.S. registered investment company (1940 Act)<br>**Regulatory status:** SEC-regulated mutual fund<br>**Product mechanism:** Tokenized shares of a government money market fund<br>**Examples:** BENJI (FOBXX), WTGXX | **Legal structure:** Often Delaware LLCs or offshore SPVs<br>**Regulatory status:** Unregistered; sold under Reg D or to non-U.S. investors<br>**Product mechanism:** Tokenized claims on short-term U.S. debt instruments, typically structured as T-bill portfolios or notes<br>**Examples:** USYC, USDY, USTB, BUIDL | **Legal structure:** Delaware LPs or other pooled investment vehicles<br>**Regulatory status:** Varies; typically structured as exempt offerings under Reg D or offshore<br>**Product mechanism:** Tokenized interest in a fund that allocates capital across multiple tokenized treasury products<br>**Examples:** OUSG |
| **These are fully regulated U.S. mutual funds that tokenize shares in a government money market fund** | **These are tokenized debt instruments offering T-bill exposure, typically issued through private or offshore structures** | **These are meta-structures that pool capital and allocate into other tokenized Treasury products for diversification** |

exposure is often similar (T-bills or government money market funds), the structure of the product determines who can use it, how it integrates with financial infrastructure, and what roles it can play in broader DeFi and TradFi ecosystems.

This paper groups these products into three primary wrappers based on observed patterns in legal structure, investor access, and product mechanism. While these are not formal designations used by issuers, they offer a useful lens for understanding how tokenized treasuries differ in function and accessibility.

To illustrate how these structural models play out in practice, the table below compares leading tokenized Treasury products across key dimensions: legal wrapper, investor access, use case, custodianship, and fees. By mapping these variables, we can see how design choices align with each product's strategic role in the digital asset ecosystem, whether it's enabling yield-bearing stablecoins, powering collateral markets, or supporting institutional payment infrastructure.

## 2.2 Strategic alignment: Use case, legal design, and investor access

The data on Table 2 reveals a consistent pattern: issuers leveraging offshore or exempt legal wrappers typically do so to build products designed for foundational digital asset infrastructure, such as on-chain collateral and yield integrations for stablecoins. These products tend to carry more restrictive investor qualifications and higher monetary barriers to entry due to their legal structure. As a result, institutional users dominate this segment. Notable examples include:

- **BlackRock's BUIDL is used by Ethena**, a DeFi-native stablecoin issuer, to back its USDtb stablecoin [Sandor (2024)].
- **Circle is positioning USYC as preferred yield-bearing** collateral across exchanges [Circle (2025)], custodians, and prime brokers. USYC has also integrated into the Intercontinental Exchange (ICE), suggesting further product development and solutions for users across TradFi and DeFi.

**Table 2:** Comparison of tokenized treasury and money market products by issuer

| Issuer & product | Use case | Wrapper | Legal structure[2] | Investor type[2] | Custodian(s[1] | Fees[1] |
|---|---|---|---|---|---|---|
| Blackrock/ Securitize<br><br>BUIDL | On-chain collateral & yieldcoin infrastructure | Tokenized T-bills | Exempt offering (Reg D); entity incorporated in the British Virgin Islands (BVI) | U.S Qualified Purchaser | Custodian(s): BNY Mellon/ Komainu/ Copper/ Anchorage/ BitGo/ Fireblocks | Management: 0.20%-0.50%<br><br>Performance: 0% |
| Franklin Templeton<br><br>BENJI | Retail and institutional cash management | Registered tokenized MMFs | U.S. registered mutual fund under the Investment Company Act of 1940 | U.S. global and retail | Custodian(s):<br><br>JPMorgan | Management: 0.15%<br><br>Performance: 0% |
| Circle/ Hashnote<br><br>USYC | On-chain collateral & yieldcoin infrastructure | Tokenized T-bills | CIMA-regulated mutual fund (Cayman Islands); Circle intends to bring product under existing DABA license | Non-U.S. investors & U.S. qualified purchaser | Custodian(s): BNY Mellon/ Komainu/ Copper | Management: 0%<br><br>Performance: 10% |
| Ondo USDY LLC<br><br>USDY | On-chain collateral & yieldcoin infrastructure | Tokenized T-bills | Limited liability company (LLC) incorporated in Delaware | Non-U.S. investor | Custodian: BitGo/Morgan Stanley | Management: 0%<br><br>Performance: 0% |
| Ondo I LP<br><br>OUSG | Liquidity & payment rail enablement | Aggregator | Limited partnership incorporated in Delaware | U.S. accredited investor & qualified purchaser | Custodian(s): Clear Street LLC/Bitgo | Management: 0.15%<br><br>Performance: 0% |
| Superstate<br><br>USTB | On-chain collateral & yieldcoin infrastructure | Tokenized T-bills | Series of a Delaware statutory trust | U.S. qualified purchaser and accredited investors | Custodian(s): UMB Bank, N.A. / Anchorage/ BitGo | Management: 0.15%<br><br>Performance: 0% |
| Wisdom Tree<br><br>WTGXX | Retail and institutional cash management | Registered tokenized MMFs | U.S. registered mutual fund under the Investment Company Act of 1940 | U.S. global and retail | Custodian(s): BNY Mellon | Management: 0.25%<br><br>Performance: 0% |

Data as of 04/06/2025

[1] Fee numbers were obtained from the product page of each fund in app.rwa.xyz and confirmed with additional sources. Additional sources for each fund are listed in the reference section. Note that fees can change since date of publication.

[2] Investor type and legal structure obtained from the product page of each fund in app.rwa.xyz

- Ondo recently deployed USDY on Noble, a Cosmos-based routing hub, with the goal of making **USDY the preferred yieldcoin** across decentralized exchanges and money market platforms within the Cosmos ecosystem [Ondo Finance (2024)].

In contrast, products that are more heavily regulated, such as SEC-registered mutual funds, are geared toward retail and institutional cash management. Their regulatory status enables them to focus on user experience, including features like peer-to-peer transfers and seamless wallet integration. These characteristics make them attractive to wealth managers and traditional investors seeking a compliant entry into digital assets. For example:

- WisdomTree launched WisdomTree Connect to simplify cash management across traditional and digital systems [WisdomTree (2024a)].
- It also introduced "earn-until-you-spend" functionality, enabling users to fund debit card spending with yield accrued on their WTGXX money market fund holdings [WisdomTree (2024b)].

Finally, OUSG stands out as the only product using an aggregator wrapper. Its use case is uniquely focused on enabling liquidity and payment rails by leveraging a fund-of-funds structure. This structure allows Ondo to build a broader platform ecosystem:

- Ondo Nexus enables instant minting/redemption for tokenized treasuries, using products like OUSG as underlying collateral.
- OUSG already supports redemptions against USDC, with PayPal USD (PYUSD) expected to be added.
- Through a partnership with Mastercard's Multi-Token Network (MTN), OUSG can be used for institutional payment settlement, offering 24/7 subscriptions and redemptions without relying on traditional stablecoin ramps.

## 2.3 Infrastructure advantage: Strategic partnerships, acquisitions, and custodial expansion

In the race to lead the market for tokenized U.S. Treasuries, firms aren't just focused on launching new products, they're also investing in the infrastructure that supports them. By forming partnerships and making acquisitions, these companies can move faster and position their products for broader use, including as building blocks for future stablecoin and yield-focused applications.

BlackRock's BUIDL offers a clear example. Rather than building blockchain infrastructure internally, BlackRock partnered with Securitize to issue and manage the token, enabling a faster path to market [PR Newswire (2025)]. As a result, BUIDL quickly became the leading tokenized treasury product by assets under management, outpacing early movers like Franklin Templeton. Beyond its scale, BUIDL is now integrated across the digital asset ecosystem, used as on-chain collateral for stablecoins like USDtb, and serving as a foundation for other tokenized treasury products, such as OUSG. Similar trends are emerging elsewhere: Circle acquired Hashnote to incorporate USYC into its stablecoin stack, bringing yield-bearing capabilities to its suite of stablecoin offerings [Circle (2025)].

A second vector of infrastructure advantage lies in custodial expansion. Tokenized treasury products are changing what custodians are expected to support. While traditional custody focused on

fiat and securities, today's ecosystem demands interoperability across both TradFi and DeFi rails. Custodians like BitGo, Fireblocks, Komainu, and Copper are increasingly collaborating with firms like BNY Mellon, JPMorgan, and UMB to enable dual custody models, straddling legacy and crypto-native requirements.

Custodians now play a more active role in adoption. Their infrastructure enables tokenized treasuries to be held and used across platforms that require secure, compliant exposure to short-duration U.S. debt. This includes exchanges, prime brokers, and protocols that rely on custodians to support collateral, settlement, or treasury operations. In this way, custodians are becoming critical to the distribution and utility stack for tokenized U.S. Treasuries.

## 2.4 Fees and operational efficiency

Tokenized treasury products are not only reshaping how assets are issued and traded, they're also redefining the economics of fund management. One of the most immediate benefits is cost. Tokenized treasury products often charge lower management fees for investors compared to traditional market funds which typically range from 0.20% to 0.50%. These efficiencies can also reduce operational overhead for issuers, due to the operational advantages provided by tokenization via blockchain infrastructure. Among the products analyzed, most tokenized offerings range between 0% and 0.15%, with the notable exception of BlackRock's BUIDL, which mirrors traditional pricing. BUIDL's higher fee structure likely reflects its hybrid model, leveraging Securitize's tokenization infrastructure while maintaining BlackRock's premium brand and institutional servicing standards. In contrast, products like Ondo's USDY and Superstate's USTB offer zero performance fees and flat management rates around 0.15%, creating cost efficiencies that compound across high-volume or high-frequency use cases. These lower fees can be particularly powerful when paired with blockchain infrastructure. For example:

- Ondo's USDY, positioned as a yieldcoin within DeFi applications, benefits from zero-fee economics to making it easier to integrate into trading platforms like Helix. This fee compression enhances the appeal of DeFi platforms and stablecoin issuers seeking embedded yield.
- WisdomTree's WTGXX, which charges 0.25%, is more aligned with traditional pricing but mitigates friction for retail use cases via wallet-based functionality like "earn-until-you-spend," enabling users to deploy yield-bearing funds directly into debit card transactions.

Beyond headline fees, blockchain-based operational efficiencies offer other advantages:

- **Settlement speed and redemption cycles:** Tokenized funds typically settle in near real-time, improving liquidity visibility and reducing "cash drag" compared to T+1 timelines in traditional funds.
- **Custody flexibility:** Many products support dual custody models, allowing investors to self-custody or rely on digital custodians like BitGo and Fireblocks. This flexibility improves integration across prime brokers, protocols, and on/off-ramps.
- **Smart contract automation:** By automating compliance checks, onboarding flows, and fund operations, smart contracts reduce manual errors and regulatory friction.
- **Cross-chain interoperability:** Products like OUSG and USDY are increasingly designed for modular integration across settlement rails and DeFi primitives, positioning them as programmable financial assets, not just passive yield vehicles.

In this context, low fees are not just a cost advantage, they're a design choice aligned with the product's intended use case. Institutions exploring these offerings should assess fee structures in tandem with operational architecture, especially when evaluating liquidity performance, automation readiness, and strategic interoperability across financial systems.

## 3. Reshaping capital markets: Strategic implications of tokenized treasuries

The rise of tokenized treasury products is not just a product trend – it signals a foundational shift in how capital markets are structured, accessed, and composed. As adoption accelerates, several key implications are emerging.

### 3.1 Broader market access and participation

Tokenized treasuries dramatically reduce barriers to entry for global investors. With just a wallet, retail users and smaller institutions can now access U.S. government debt – a market traditionally gated by custodial constraints, KYC onboarding, and high minimum investments. For example, Franklin Templeton's Benji Investments app enables qualified users to onboard and begin investing in tokenized money market funds like FOBXX in just a few minutes through a wallet-linked interface.

For emerging markets and underbanked regions, this shift could redefine participation in global capital markets, opening access to secure, yield-bearing assets that were previously out of reach.

### 3.2 Infrastructure composability and innovation

Tokenized treasuries are not static assets – they're programmable building blocks. On-chain, they enable:

- Collateralized lending backed by U.S. debt
- Algorithmic stablecoins with embedded treasury yield
- Cross-chain treasury management for protocols and institutions.

As explored earlier, products like BUIDL and USDY are already embedded into stablecoin architectures (e.g., USDtb) or positioned for use across DeFi apps and decentralized exchanges. This composability allows capital markets infrastructure to evolve modularly, layering new services atop a shared foundation of secure, yield-generating assets.

### 3.3 TradFi–DeFi convergence in action

Perhaps the clearest sign of structural change is the emergence of hybrid operating models. A notable example is the 2025 Collateral Mirroring Programme between Franklin Templeton, Standard Chartered, and OKX, which enables users to utilize cryptocurrencies and tokenized money market funds as off-exchange collateral for trading. This model builds on trends already visible in products like the OUSG and Mastercard partnership for institutional payment rails, and WTGXX, which supports wallet-based retail access. Together, these efforts demonstrate how off-chain capital can be activated on-chain, creating new liquidity channels, programmable functionality, and novel user experiences across the capital markets landscape.

**Tokenized treasuries are just one example of how tokenization is beginning to reshape global capital markets.** While they've gained early traction due to their alignment with yield-bearing infrastructure, the broader tokenization ecosystem, spanning private credit, real estate, stablecoins, and beyond, is evolving rapidly. As more assets become programmable and interoperable, the implications for market structure, regulation, and investor behavior will only grow. Yield-bearing tokenized instruments – like tokenized money market funds, for example, could incentivize capital to flow out traditional bank deposits. Over time, this may reduce deposit balances and weaken the role of banks in credit creation, with second-order effects on how monetary policy is transmitted. These risks aren't unique to tokenization, but they highlight how digitized financial infrastructure could reshape the underlying plumbing of the financial system. Understanding tokenized treasuries today offers a lens into how the next generation of financial infrastructure might emerge tomorrow. But with that promise comes a complex set of challenges – technical, regulatory, and operational – that will shape how far and how fast tokenization can scale.

## 4. Tokenization's growing pains: Challenges on the road to scale

As tokenization moves from concept to critical infrastructure, it faces meaningful challenges that must be addressed to scale securely and sustainably. While many of these obstacles are technical or legal in nature, progress is underway across jurisdictions and protocol layers. This section outlines five of the most pressing challenges and how industry actors are working to address them.

**Tokenized treasuries offer a lens into how the next generation of financial infrastructure might emerge.**

### 4.1 Regulatory uncertainty

Tokenized assets are subject to a fragmented and evolving regulatory landscape. The European Union (E.U.) has led with the Markets in Crypto-Assets (MiCA) framework, which provides a foundation for digital asset issuer registration, reserve disclosure, stablecoin supervision, and a regulatory framework for crypto-asset service providers (CASPs) [ESMA (2023)]. In contrast, the United States has relied on enforcement-driven approaches, leaving many tokenized financial instruments in legal limbo. However, legislative momentum in the U.S. is slowly building. Bills such as the GENIUS Act seek to establish a federal framework for stablecoin issuance and reserve requirements [Tierno (2025)], while the Stablecoin Transparency Act focuses on ensuring that fiat-backed stablecoins are fully collateralized with cash and high-quality liquid assets such as U.S. Treasuries, and subject to monthly public disclosures [U.S. Congress (2022a)]. The Responsible Financial Innovation Act (RFIA) introduces the concepts of "ancillary assets" – digital assets offered under investment contracts that lack traditional security characteristics – and delineates regulatory responsibilities between the SEC and CFTC, granting the CFTC jurisdiction over these ancillary assets [U.S. Congress (2022b)].

Though none of these acts explicitly address tokenization, they have important indirect implications for key use cases, particularly

stablecoins and tokenized treasuries, by clarifying how underlying assets and digital asset infrastructure may be treated. More broadly, their introduction reflects an increasing policy focus on digital assets within the U.S. regulatory landscape.

## 4.2 Technological barriers

Scalability and interoperability remain major friction points for tokenized assets. Public blockchains often suffer from limited throughput and fragmented ecosystems, making it difficult to achieve composability across protocols or chains. In response, cross-chain communication layers like Chainlink's Cross-Chain Interoperability Protocol (CCIP), LayerZero, and Axelar are enabling asset movement across blockchain networks. Meanwhile, Layer 2 rollups such as Arbitrum and Optimism, and enterprise-grade solutions like Polygon CDK and Avalanche Evergreen Subnets, are helping to address congestion and settlement latency.

## 4.3 Security risks

While blockchain networks themselves are highly secure, vulnerabilities in smart contract design remain a critical challenge, especially in permissionless environments. High-profile DeFi exploits have eroded trust in tokenized protocols, with losses in the hundreds of millions. To mitigate these risks, projects are adopting formal verification methods, partnering with audit firms like CertiK and Trail of Bits, and implementing real-time monitoring tools such as OpenZeppelin Defender. Tokenization platforms aimed at institutional users, such as Securitize and Centrifuge, are also emphasizing permissioned flows, KYC/AML compliance, and circuit breakers to reduce systemic exposure.

## 4.4 Legal recognition

In many jurisdictions, tokenized representations of ownership do not yet enjoy the same legal standing as traditional securities or property. This can complicate enforcement rights, investor protections, and cross-border transfers. Some countries, however, are advancing supportive frameworks. For example, Switzerland's DLT Law explicitly recognizes DLT-based securities, allowing tokenized assets such as shares or bonds to be issued and transferred entirely on-chain with the same legal enforceability as traditional instruments [Swiss State Secretariat for International Finance (2023)]. Similarly, Singapore's Guide to Digital Token Offerings [MAS (2018)], while not tokenization-specific, outlines how tokens representing underlying assets may be treated as capital market products under existing securities laws, depending on their structure and rights conferred.

At the international level, the UNIDROIT Principles on Digital Assets and Private Law aim to harmonize private law treatment of digital assets across jurisdictions by defining control-based ownership, legal transfer mechanisms, and custody standards [UNIDROIT (2025)]. While not binding, these principles are expected to guide national legislation and provide foundational legal clarity for tokenized financial instruments.

## 4.5 Market infrastructure gaps

Institutional adoption of tokenized assets is constrained by underdeveloped market infrastructure. Custody models are still maturing, and token standards vary widely, limiting integration, auditability, and risk controls. To address this, custodians like Fireblocks, Anchorage, Copper, and BitGo are collaborating with traditional financial institutions such as

BNY Mellon and JPMorgan to create hybrid custody frameworks. At the token level, standards like ERC-3643 are gaining traction. These standards embed compliance logic into the token architecture, enabling features like investor whitelisting and transfer restrictions that are essential for regulated financial instruments.

Together, these developments suggest a rapidly professionalizing ecosystem. While significant gaps remain, the convergence of regulatory innovation, technical tooling, and institutional collaboration is pushing tokenization closer to mainstream adoption.

## 5. Conclusion

Tokenization is not simply digitization – it is infrastructure transformation. It redefines what assets can do, where they move, who can access them, and how financial systems interoperate. Tokenized treasuries offer a glimpse into this future. They turn traditionally inert assets into programmable, interoperable instruments that bridge legacy markets and emerging digital ecosystems.

From stablecoins to payment rails, settlement to collateralization, treasuries are already shaping new forms of liquidity and control. But what makes this shift foundational is not just the assets, it's the architecture being built around them. Regulatory clarity, smart contract automation, and custodial evolution are converging to support financial products that are not only more efficient, but more composable and inclusive.

The next chapter of capital markets will not be written solely in code or regulation, it will be shaped at the intersection of the two. Tokenization sits at that intersection. And as the ecosystem matures, its most transformative effects may not be what it replaces, but what it makes possible.

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# Artificial intelligence
## in the equity research industry

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## Abstract

This article explores the impact of artificial intelligence (AI) on investment research professionals based on recent academic research. To help investment professionals navigate this potentially transformative technology, we discuss recent academic research, including survey, archival and interview data, examining how AI has begun to transform the sell-side equity research field.

We first discuss the current state of AI adoption within the equity research field, including discussing some common AI applications used by finance professionals. We summarize the benefits of utilizing AI identified by sell-side analysts and documented by academic research, including reduced cost of preparing analysis, more in-depth analysis, broader coverage, and improved forecast accuracy.

Despite the powerful new capabilities and benefits that AI may provide, it is not without limitations. We discuss the factors that may accelerate or constrain the broader adoption of AI within organizations, including concerns about accuracy and inter- and intra-organizational factors influencing its adoption in practice.

Finally, we conclude the article by discussing the impacts of AI adoption on equity research professionals and provide several recommendations for practitioners when considering the adoption of AI by their firm as well as those outside them.

## 1. Introduction

Artificial intelligence (AI) tools are transforming a wide range of industries [U.S. Treasury (2025)]. In 2023 companies' investment in AI within the financial services industry exceeded $35 billion and is expected to grow to $97 billion by 2027 [WEF (2025)]. Compared to traditional data analytics tools, AI offers investors and financial analysts a new approach to collect, analyze, and process information for investment decision making. Moreover, recent research finds that many of the processes within investment research have the potential to be supported or completed by AI tools [WEF (2025)].

To help investment professionals navigate the wide range of AI applications and organizational challenges, we discuss recent academic research examining how AI has begun to transform the equity research field and the organizational factors affecting its adoption in practice. In

particular, we discuss the organizational and team accelerators and barriers to adoption and the specific AI applications utilized by sell-side equity research professionals.

We focus on the impact of AI on sell-side equity research professionals (i.e., sell-side analysts) because they are often among the most sophisticated users of financial information who may benefit from AI. These professionals are involved with a whole suite of different activities, including providing research on company and industry performance to investors and other capital providers [Millo et al. (2025)]. For example, they are typically involved with developing financial models on company performance that incorporate insights from firm and industry reports and proprietary data collected from customers, suppliers, competitors and other data sources. In addition, sell-side analysts often act as trusted advisors by building and maintaining social ties with key market participants, including company management and institutional investors [Spence et al. (2019)]. Given their workflows often incorporate a wide diversity of highly manual and complex tasks, this provides an interesting setting to understand where and how AI has impacted professionals working in a multifaceted environment.

In the following sections, we first discuss the current state of AI adoption within sell-side equity research, including a discussion of recent academic findings in this area (Section 1). Next, we discuss the benefits of adoption (Section 2), followed by the accelerators and challenges (Section 3) and the impact of AI on equity research (Section 4). We conclude with recommendations for practice (Section 5). We highlight key findings from a survey and interviews we recently conducted with sell-side analysts [Christ et al. (2025)] as well as other relevant academic studies.

## 2. Current state of AI adoption in equity research and potential AI applications

For many firms, the adoption of AI-based systems is still nascent. To better understand the current state of adoption, we recently conducted a survey among 190 sell-side equity analysts from 140 investment firms. Overall, we find that 58% of respondents use AI at least "a little" with an average rating of 1.77 on a scale of 1 (None at all) and 5 (A great deal) [Christ et al. (2025)]. Interestingly, despite the growing media attention on the impact of AI, we find the growth of AI within the equity research profession is highly varied with most respondents taking a conservative approach to adoption. Moreover, respondents in our survey indicated that they planned on only slightly increasing their use of AI in the future. We conducted follow-up interviews with over a dozen sell-side equity analysts to better understand the reasoning behind their relatively slow adoption of AI, as well as the particular applications they found most useful in their day-to-day workflows, which we briefly summarize below.

**Conduct preliminary research:** Several financial analysts we spoke to discussed using AI tools to conduct preliminary research, including learning more about new industries or topics before they engaged in more in-depth research. For example, one analyst mentioned using ChatGPT to better understand a new industry and identify major factors to consider when initiating coverage of a new company. Specifically, the analyst discussed using ChatGPT to learn more about big topics about the industry, relevant trade groups, and available datasets that could be used for more in-depth and tailored analysis.

**Collect and summarize text, image, and audio data from external sites:** According to a report by Citibank, analysts spend as much as 30% – 40% of their time manually collecting and analyzing company and industry research [Citibank (2024)]. Several analysts we spoke to discussed using AI to help collect data, such as non-standard key performance indicators or metrics from company filings, earnings transcripts, and other data sources. For example, FactSet developed a large language model (LLM) that helps listen to and summarize earnings conference calls, which is often a manually intensive task during earnings season [FactSet (2023)]. However, while these tools can help save time with collecting and summarizing information, some analysts also described instances where these tools incorrectly summarized information. Accordingly, analysts expressed the need to exert caution when utilizing AI applications, including thoroughly testing new applications before implementing them in practice.

**Analysis and classification:** Analysts also discussed using AI to help classify unstructured and raw data, including narratives within financial reports and earnings conference calls. In particular, AI can be used to help identify companies subject to a particular risk or analyze the sentiment of earnings conference calls and regulatory meetings. For example, Morgan Stanley has an AI-powered tool that helps analyze Federal Bank sentiment, including classifying the central bank's rate-setting meeting sentiment as dovish, hawkish, or neutral [Morgan Stanley (2023)].

**Drafting and editing research reports:** Before publishing research reports, one analyst describes the tedium associated with manually editing research reports multiple times to ensure compliance with company policies. Depending on the report length, the editorial process can take days or even weeks. One analyst described using AI to validate their reporting's writing style and formatting and has begun experimenting with using AI to clarify the report language. There is also some indirect evidence of financial analysts using AI to draft research reports. A recent academic study used an AI-generated text detection tool to analyze research reports prepared by Italian analysts. Interestingly, they found a drop-off in the use of AI-generated text within analyst reports when Italy temporarily banned the use of ChatGPT in March 2023 for a month [Bertomeu et al. (2025)].

**Answering questions for client requests:** The traditional process of answering client questions (e.g., how much a specific company spends on R&D or find other information contained within past analyst research reports) is a highly manual process often requiring chasing down an analyst, obtaining the relevant information, and then sending an email to the client a day or two later. One organization we spoke to discussed developing an AI tool to help answer these questions. In particular, some firms have begun feeding in all their historical research reports into their AI systems to help analysts more easily find information to answer client questions more efficiently.

**Generating independent forecasts**: Academic research has also begun to explore whether AI tools can develop independent financial forecasts. For example, in one recent study, the authors used GPT 4.0 to analyze standard and anonymous financial statements and found that it outperformed financial analysts in predicting earnings changes and generating excess investment returns [Kim et al. (2024)]. Specifically, the study found that GPT was able to accurately predict one-year ahead EPS in 60% of all the cases examined, while the analyst consensus accuracy was at 53%. However, less than 3% of our survey respondents indicated that AI is being used primarily to develop independent forecasts [Christ et al. (2025)]. Moreover, only one analyst

**Figure 1:** Common AI applications


from our interviews spoke about using current AI tools to forecast company earnings and was piloting an AI tool to help forecast product pricing. The rest of our interviewees indicated that AI was not yet in a state that could be used to help forecast company earnings.

## 3. Benefits of AI adoption

Next, we provide some of the specific insights from analysts on the benefits of utilizing AI within their day-to-day activities.

**Reduce workload or cost of preparing analysis:** In our survey, a top benefit of using AI cited by analysts was to reduce workload and the cost of preparing company analysis. For example, one analyst described an algorithm she developed that helped automate the preparation of research notes and financial models, which was previously a highly manual process. A recent report by Citibank (2024) estimates that AI could help save research teams as much as 25% of their time spent on company and industry data collection and analysis.

**Prepare more in-depth or customized analysis:** Recent academic research finds that adopting new technologies can help free up time for analysts to perform more in-depth analysis in complex areas where they have an inherent advantage over machines. In one study, the authors identified investment firms that automated the collection of earnings information and regulatory filings and found analysts working at these firms spent more time gathering and analyzing information in complex areas [Cao et al. (2024)]. They found on average these analysts spent more time gathering contextual information, such as attending earnings conference calls, viewing different types of filing forms and more historical filings per firm they covered. Moreover, these analysts also shifted their efforts to analyzing more complex organizations, such as firms with multiple operating segments and intangible assets.

**Cover a broader set of firms:** Within our survey, analysts discussed AI helping them cover a broader set of firms (i.e., approximately 12% of our survey respondents described this as a benefit of

AI). A recent academic study finds that analysts at firms that automated the collection of regulatory filings also tended to evaluate a broader range of firms, suggesting that AI may free up analysts' time to broaden their coverage of different firms [Cao et al. (2024)].

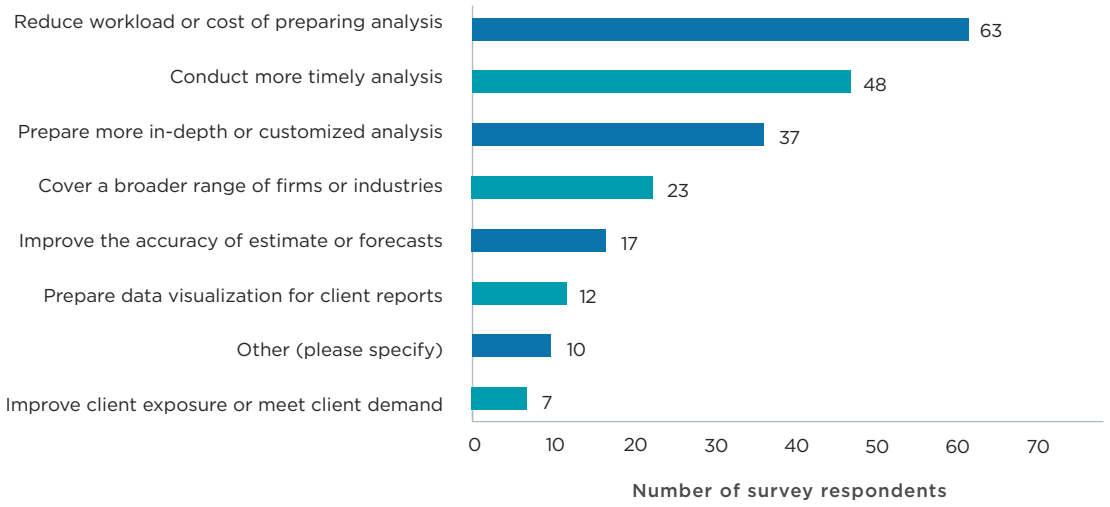
**Improved forecast accuracy and frequency:** A recent academic study finds that analysts at firms with greater AI investment issue forecasts more frequently and also make more accurate earnings forecasts [Shanthikumar and Yoo (2024)]. Specifically, the study identified AI investment by examining brokerages that have invested in AI human capital (i.e., hired talent with expertise in AI) and found that these brokerages produce more accurate earnings forecasts and in-depth analysis, including issuing more types of forecasts, such as sales and cash flow forecasts. Their results suggest that a one standard deviation increase in AI investment was associated with a stock price forecast accuracy improvement of 2.3%. The study further found the increase in accuracy and frequency were more pronounced when the analysts' forecasting task was more complex (i.e., when there was less consensus and greater variability among earnings forecasts among peer financial analysts at different firms). Moreover, another academic study examined whether there was a change in analyst forecast accuracy when ChatGPT was temporarily banned in Italy, and found earnings forecast accuracy of analysts that used ChatGPT before the ban dropped during this period [Bertomeu et al. (2025)].

## 4. Organizational accelerators and barriers

Despite the potential for AI to transform the equity research process, we find evidence from our interviews and survey that the rate of adoption of AI tools is highly varied among analysts and firms [Christ et al. (2025)]. Overall, we identify several accelerators and barriers to AI adoption ranging from technological to organizational cultural factors, which we describe below:

**Compliance and regulatory concerns:** Many new AI applications are being developed by external consumer-oriented organizations or third-party vendors. Several of the analysts we interviewed raised concerns about data leakage with uploading proprietary or yet-to-be published research to an external source. There may be risks that proprietary research is released more broadly without authorization or potential

**Figure 2:** AI benefits



copyright concerns when uploading information to external organizations. Before using external AI tools to evaluate sensitive data, we recommend that practitioners discuss with their company leadership to make sure appropriate safeguards are developed to avoid this concern (e.g., data remains on-premise or partnership agreement specifying data safeguards is developed).

**Accuracy and bias:** In our survey, a top concern cited by analysts (55% of our respondents) was related to concerns about accuracy or bias of AI recommendations [Christ et al. (2025)]. One inherent concern with AI systems, particularly LLMs, is their propensity to produce inaccurate information in a confident manner, referred to as "hallucinations." Unlike the technology industry that has a mantra of "move fast and break things," the reputational loss from providing inaccurate recommendations can have significant costs in terms of investment and reputation losses for analysts and investors.

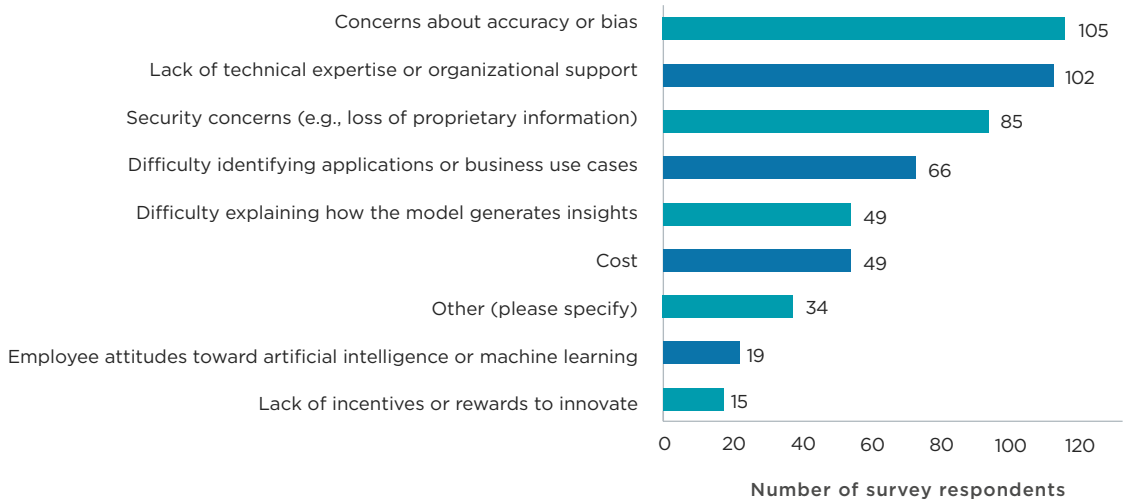
**Cost and resource constraints:** Investing in new technologies often requires balancing current demands with potential future productivity benefits. Despite the wide availability of general purpose AI tools, such as ChatGPT, many analysts we spoke to discussed simply not having the time to investigate, develop, or maintain new AI applications. Given analysts must often juggle many different roles, a common theme discussed was being under-resourced or simply lacking the time to investigate new tools. In addition, many analysts also discussed the lack of technical expertise to develop or maintain AI systems.

**Firm training and technical background:** Despite the ease of usability of many new AI tools, such as ChatGPT, many new technologies often require firms to train users on the potential applications. In our survey, 17% of respondents received some training on AI by their firm in the past two years [Christ et al. (2025)]. We find that analysts that received firm training as well as those with some computer programming knowledge were more likely to use AI to a greater extent.

**Team functional diversity and interconnectedness:** Among our survey respondents, 35% indicated identifying appropriate AI use cases as a barrier to adoption [Christ et al. (2025)]. Prior academic research finds that team communication and functional diversity can improve analyst outcomes, such as forecast accuracy [Fang and Hope (2020)]. In our survey, we asked participants about the quality of communication with other employees inside and outside their core analyst team. We found stronger communication with individuals outside their core analyst team, but not within their own core team, was linked with greater AI use. Overall, this may suggest that developing a wider network with individuals outside their core team is more effective at increasing AI adoption and the spread of new ideas.

**Decentralize or centralize AI decision making:** We also examined how firms structured their organization around the development of AI tools – whether they concentrated AI use and development among a centralized group within their organization or delegated this decision making among different individual analyst teams. Among our survey respondents, 27% indicated that their team has autonomy over AI use, 25% indicated that decision rights are determined by a centralized group, and 28% indicated that they used a hybrid between the two approaches. Overall, we find that more centralized organizations tended to adopt AI to a lower extent. One potential reason is that centralized groups often lack the requisite knowledge to identify appropriate AI/ML use cases that reside with analysts who are closer to operational challenges.

**Figure 3:** AI challenges




**Socio-organizational factors:** Many of the constraints inhibiting AI adoption that analysts described are similar to the socio-organizational factors that prior research has found impedes technology adoption in other commercial settings [Austin et al. (2021); Millo et al. (2025)]. For example, Austin et al. (2021) examine data analytics adoption by audit firms, finding that hesitancy to meaningfully integrate data analytics into audit practices stemmed from complex relationships between the auditors and their clients and regulators. Moreover, the lack of comprehensive regulations that lag behind technological innovations often deter institutions from adopting new technologies due to uncertainty of future regulation. In addition, interviews with financial analysts suggest that an analyst's role as a social intermediary, such as helping arrange meetings between institutional investors and company management, and reliance on information gained through social relationships may weaken the imperative to innovate or adopt new technologies, including big data, alternative data, and AI [Millo et al. (2025)]. Rather, financial analysts have been more willing to adopt tools that help develop client relations and assist with tracking client interactions [Millo et al. (2025)].

## 5. Impacts of AI adoption on equity research professionals

As individuals and companies begin to roll out new AI systems, it is unlikely to have a uniform impact on all investment professionals. In this section, we provide some of the initial impacts of AI adoption on analysts' careers.

**AI helps level the playing field for lower performing or less experienced analysts:** A recent study examined whether AI has augmented more or less experienced analysts [Shanthikumar and Yoo (2024)]. They found that analysts who had previously underperformed (i.e., if their forecast accuracy and the frequency of their forecasts in the past three years was below the median among their peers) had a greater improvement with the adoption of AI tools relative to more experienced analysts, suggesting that AI can help level the playing field. For example, one junior analyst we spoke to discussed being at an inherent disadvantage against more experienced analysts who covered a company for years. This analyst discussed using ChatGPT to obtain the historical trends and key company highlights from prior years to help narrow the gap.

**Consequences of AI on financial analyst careers:** There has been much discussion in the popular press on how the adoption of AI will impact analysts' careers in the financial industry [Perez (2025)]. A recent study by Grennan and Michaely (2020) examines the impact of AI on sell-side analysts' work activities. They found that there was greater labor market turmoil among financial analysts in industries that were more susceptible to AI adoption, suggesting that AI may be a substitute for financial analysts. They find departures of analysts disproportionately occur among highly accurate analysts, leaving for non-research jobs. Further, analysts who remained in the field reallocated their efforts toward tasks that rely on soft skills, such as helping arrange one-on-one meetings between company management and institutional investors.

## 6. Recommendations for practitioners

**Identifying relevant AI applications:** Unlike prior technological innovations introduced within the workplace that were often pushed by top management, many new AI applications are being introduced by employees incorporating consumer-facing technologies, such as ChatGPT and Meta AI, ahead of their company's formal AI strategy. Accordingly, employees may be an important source of identifying novel and effective AI applications and their application may be dispersed across the organization. As organizations develop more formal AI strategies, they should not overlook their employees as a source of potential ideas. Our interviews with analysts reveal that some organizations recognize their employees as having better information on potential AI applications and have begun using surveys as well as working with their IT departments to track heavy users of third-party AI systems. For example, one analyst we spoke to described how he received an email from his boss to explain how he used ChatGPT shortly after visiting the website. Moreover, our survey results also suggest that organizations focus on facilitating communication across different analyst teams to identify potential AI applications.

> **"While AI won't replace seasoned analysts in the near term, it will help them more efficiently collect and process information, freeing up time to engage with key stakeholders and perform more complex analysis.**

**Account for a growing AI audience:** Given a growing share of investment and trading is being initiated by AI and automated systems, recent research suggests that many firms are adapting their corporate disclosures to better resonate with both humans and AI audiences [Cao et al. (2023)]. For example, firms that have high AI readership are making their disclosures more machine readable, such as making it easier to process and parse key information by automated programs (e.g., extract numbers from text, separate tables from text, and minimize data included in external exhibits). Similarly, several analysts discussed the growing share of research reports being analyzed by AI systems as well. Accordingly, we recommend that analysts consider who and how their research reports are being consumed. For example, one analyst we spoke to discussed validating their research report's recommendations were accurately summarized by an AI system.

**Be wary of how firms discuss their own AI activities in company disclosures and marketing materials:** Like many prior innovations, there is a lot of hype surrounding AI's capabilities, including potential false or exaggerated claims on firms' AI investments and capabilities, a term referred to as "AI washing" [Gensler (2024)]. We caution

investors and other stakeholders that companies' claims on their AI investments may not always line up with their actions. For example, the SEC (2024) recently charged two investment advisors, Delphia and Global Predictions, for marketing their use of AI to clients and prospective clients when in fact they were not. While some companies may have motives to overstate their capabilities, other companies may have motives to hide their use of AI to avoid investor and public scrutiny. For example, a recent lawsuit was filed against UnitedHealthcare for using AI tools to deny patient coverage. In UnitedHealth's 2022 10-K regulatory filing, they had mentioned the term "AI" only once despite having over 400 job postings that had the term AI, suggesting they were investing heavily in this technology while remaining silent in financial disclosures.

## 7. Conclusion

AI has the potential to provide new approaches to collect, analyze, and process company and industry data for investment decision making. In this article, we summarized a recent survey we conducted with sell-side equity analysts and academic research examining AI's impact on equity research. While recent academic research finds that among sell-side analysts who have adopted AI experienced improved performance, our survey of sell-side analysts finds a more conservative pace of adoption. Our survey respondents typically indicate they are using AI tools streamline existing workflows, such as summarize earnings conference calls and edit research reports, rather than utilizing AI for more revolutionary applications, such as develop independent forecasts. In the near term, we expect this trend to continue due to organizational barriers that may stem the adoption of more advanced applications. For investment professionals to reap the potential benefits of AI applications, they need to ensure that they identify the appropriate AI use cases, AI talent, and organizational structures to support its implementation and development.

Looking further out, as the technology continues to advance, we expect AI to have an uneven impact on sell-side equity analysts. Many sell-side analysts act as trusted advisors with institutional investors and company management where they may glean context specific and soft information that is difficult to quantify or process with algorithms. We expect that sell-side analysts who have deeper industry expertise and relationships with key market participants, including company management, institutional investors, and other stakeholders to be more insulated from potential disruption from AI.

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# Sending out an SMS:
## How text alerts are transforming consumer finance

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## Abstract

Until recently, overdraft charges cost bank customers billions of pounds annually, disproportionately affecting a small share of heavy overdraft users. This paper summarizes Grubb et al.'s (2025) findings from large-scale field experiments at two major U.K. banks, showing that automatically enrolling customers into timely overdraft alerts significantly reduces charges. Just-in-time alerts cut unarranged overdraft charges by 17% to 19% and arranged overdraft charges by 4% to 8%. Required since 2019 for all customers at large U.K. banks, the alerts generate estimated annual consumer savings of £170 million to £240 million across the U.K. Most savings result from consumers transferring available funds rather than substantially changing their spending habits. While early-warning alerts also encouraged timely account checks and fund transfers, there were no statistically significantly savings beyond just-in-time alerts alone. While effective and broadly supported by consumers, automatic enrollment in alerts alone cannot entirely stop consumers from paying high overdraft charges unnecessarily. Consequently, regulators complemented automatic enrollment with reforms that simplified overdraft pricing starting in 2020, making borrowing costs clearer and comparable to credit card rates.

## 1. Introduction

Overdrafts are one of the most common forms of short-term borrowing, but they are also among the most expensive. Until recently, U.K. banks charged a mix of per-transaction, per-day, per-month, and interest-based fees, sometimes exceeding 10% in effective daily interest for unarranged overdrafts. In 2017, U.K. consumers paid an estimated £2.6 billion in overdraft and unpaid item fees, with more than half of these costs borne by just 5% of customers, many of whom were financially vulnerable [FCA (2018)].

For years, U.K. regulators have tried to reduce unnecessary overdraft fees, but most interventions had little to no effect. Research showed that many overdraft users had sufficient funds available in savings or lower-cost credit card accounts, yet still incurred fees [Stango and Zinman (2009), FCA

(2018)]. A major reason? Inattention – customers simply weren't aware they were overdrawing their accounts [CMA (2016)].

To address the problem, under the auspices of the FCA, we worked with two major U.K. banks to test a simple but powerful solution: automatic text alerts. This article summarizes our results and was adapted from our earlier publication [Grubb et al. (2025)]. Text alerts had been available on an opt-in basis at all major U.K. banks since 2012. But now, instead of requiring customers to opt-in, these banks automatically enrolled a random sample of customers in overdraft alerts. The experiments, run in 2017 and 2018, included a combined sample of 1.1 million banking customers. They automatically enrolled current (checking) account customers in a variety of "just-in-time" alerts, triggered by entry into overdraft or when a pending transaction is poised to be declined, and "early warning" alerts, triggered by low balances before the overdraft threshold.

Each alert was designed to warn of either a declined transaction called an unpaid item (UI) or one of the two types of overdraft facilities offered in the U.K.: arranged and unarranged. An **arranged overdraft (AOD) facility** is a line of credit with a borrowing limit pre-agreed between bank and consumer, equal to £1,000 on average for the two collaborating banks, which consumers automatically use when their current account balance drops below zero. An **unarranged overdraft (UOD)** facility is used when a bank approves a transaction that takes the consumer past their AOD limit or, if they do not have an AOD, below zero. These experiments were complemented by a follow-up survey in which we directly asked customers whether they found the alerts helpful.

The results are striking. After automatic enrollment in just-in-time alerts:

- Unarranged overdraft and unpaid item fees fell by 17-19%.
- Arranged overdraft fees fell by 4-8%.
- The estimated annual consumer savings across the U.K. market was £170-240 million.
- Alerts eliminated less than half of consumers' overdraft "mistakes."

Our findings encouraged two policy shifts: in 2019, based on the benefits of alerts, U.K. regulators expanded the requirement for automatic enrollment, and in 2020, based on the limitations of alerts, they restructured overdraft pricing, making fees more transparent and comparable to credit card rates. The following sections explain the history behind overdraft alerts, the automatic enrollment experiments, the effectiveness of alerts, why alerts work, how customers respond, and resulting implications for policy.

## 2. The search for an effective nudge

U.K. regulators have long struggled to keep overdraft charges in check without restricting consumer access to short-term borrowing. Overdraft charges are often far higher than those for other forms of credit, with markups three times those of credit cards after adjusting for the risk of default [FCA (2018)]. However, strict fee caps could make high-risk overdraft loans unprofitable and lead banks to restrict overdraft access, potentially harming customers who genuinely need it. Instead of strict price controls, U.K. regulators sought a behavioral "nudge" – a way to encourage consumers to manage overdrafts more effectively without disrupting credit availability. Unfortunately, their first two attempts failed:

1. Annual Fee Summaries (2008): Major U.K. banks agreed to send customers yearly account statements detailing overdraft fees. The result? Zero impact – likely because customers need real-time actionable information, not a once-a-year report [Hunt et al. (2015)].

2. Opt-In Overdraft Alerts (2012): Banks were required to offer text alerts for overdrafts and low balances. The problem? Fewer than 10% of customers enrolled, with some banks seeing sign-up rates as low as 1% [Caflisch et al. (2018)].

Hoping that increasing participation would make text alerts a success, the CMA tried again – this time, flipping the system from opt-in to opt-out. Instead of waiting for customers to sign up, banks were required to automatically enroll them in key alerts by early 2018.

Would this new approach work? The hope came from research by Hunt et al. (2015) showing that UOD charges fell by an average of 5% to 8% after consumers signed themselves up for alerts. However, the evidence was not conclusive that the alerts themselves drove the savings. Because consumers often enrolled in alerts after experiencing costly overdrafts, they might simultaneously adopt other strategies – like tighter budgeting or larger buffer savings – to prevent future charges. This made it impossible to tell whether alerts alone were responsible for the observed fee reductions. Getting to the bottom of this question motivated the large-scale randomized field experiments that followed.

## 3. The experiment: automatic enrollment in overdraft alerts

Would automatically enrolling customers in overdraft alerts actually help them avoid charges? And if so, which alerts would be most effective and who would benefit most? To find out, we conducted a series of randomized field experiments between 2017 and 2018 in collaboration with two of the U.K.'s six major banks. These banks serve a broad cross section of consumers, broadly representative of the overall market, and included a combined total of 1.1 million customers in the experiment.

The study was structured to test the effectiveness of two primary types of alerts:

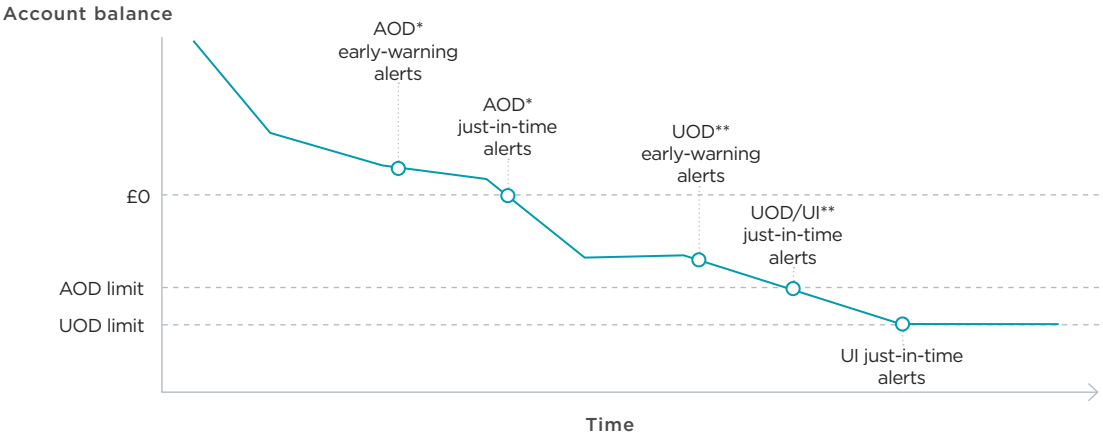
1. **Just-in-time alerts:** These alerts were sent immediately when a customer entered an overdraft or when a transaction was about to be declined. An existing same-day grace period let consumers avoid charges by restoring a positive balance by the end of the day (making these alerts "just-in-time" rather than "just-too-late").

2. **Early-warning alerts:** These alerts were sent before an overdraft, when a customer's balance fell below a threshold of £50 or £100, offering an opportunity to take preventive action, such as reducing spending or shifting spending to a credit card.

For a hypothetical consumer who has AOD and UOD facilities and is enrolled in all alerts, Figure 1 illustrates when just-in-time and early-warning alerts are sent as the consumer's account balance decreases. We say that the alert labeled "UOD/UI early warning" provides early warning for UI in addition to UOD because extension of credit through a UOD facility is at the bank's discretion and is typically limited – meaning that any account on the verge of incurring UOD charges is also on the verge of incurring UI charges.

In each trial, customers were randomly assigned to a control group, with no change in policy, or to a treatment group, in which customers were automatically enrolled in one or more alerts. Randomizing customers into alert groups allowed us to confidently determine the effectiveness of the alerts without confounding factors. Treatments were designed so that we could measure the effect of different alert timings (receiving alerts just-in-time, with early warning, or both), and measure the effect of alerts warning of different events (AOD, UOD, or UI). Finally, our last treatment did not automatically enroll customers in alerts, but rather emailed them encouraging them to self-enroll.

**Figure 1:** Illustration of balance thresholds at which alerts are sent




**Note:** Acronyms: arranged overdraft (AOD), unarranged overdraft (UOD), and unpaid item (UI). The AOD limit is pre-agreed between bank and consumer, whereas the UOD limit is unknown to the consumer. * = If the consumer does not have an AOD facility, this will be a UOD/UI alert. ** = If the consumer does not have a UOD facility, this will be a UI alert.

Alerts were sent with the same message text banks already incorporated in the alerts they offered on an opt-in basis, ensuring our results correspond to the actual messages banks send. Representative message text from each bank (which we refer to as banks A and B) are shown in Table 1.

Banks provided us with all current account transaction data for customers in the experiment over an eleven-month period, six months leading up to the intervention, and five months following automatic enrollment in the alerts. Key metrics include:

- Opt-out rates from the alert system
- Frequency and duration of overdrafts and resulting OD fees
- Frequency of declined transactions and resulting UI fees
- Frequency of logins, spending, and account transfers following alerts.

**Table 1:** Representative alert message text

| No. | Type | Target | Bank | Representative text |
|---|---|---|---|---|
| 1 | just-in-time | AOD | A | You are now using your overdraft and may incur charges |
| 2 | just-in-time | AOD | B | Your balance is now below £0 |
| 3 | just-in-time | UOD | B | You are now using your unarranged overdraft. Transfer funds before cut-off to avoid charges |
| 4 | just-in-time | UI | B | A scheduled payment will go unpaid. Transfer funds before cut-off to avoid charges |
| 5 | early warning | AOD/UOD/UI | A/B | Your balance is now below £X (For X= 100 or 50) |
| 6 | early warning | UOD/UI | B | You are approaching your arranged overdraft limit |

**Note:** This table reports representative text of alerts tested in our experiments. Exact text cannot be reproduced to protect bank anonymity. The bank's name appears as the sender of each text message, so recipients recognize alerts as coming from their bank. Acronyms: arranged overdraft (AOD), unarranged overdraft (UOD), and unpaid item (UI).

Finally, after the experiment, a survey directly asked a sample of customers in the study about their experiences with alerts.

## 4. Results

### 4.1. Opt-out enrollment dramatically boosts participation

Default settings strongly influence consumer decisions, and automatic enrollment in overdraft alerts is no exception. Previously, when consumers had to actively opt-in, enrollment rates across the six major banks were extremely low – at most 8% [Caflisch et al. (2018)].[1] By contrast, fewer than 10% of consumers opted out after being automatically enrolled during our experiment, increasing enrollment by over 90 percentage points at both banks. Even when opting out was made extremely easy (requiring only a reply to a notification text), most consumers remained enrolled. In stark contrast, a separate trial encouraging voluntary enrollment via email achieved less than one-tenth of this effect, raising enrollment rates by fewer than nine percentage points.

### 4.2. Just-in-time alerts substantially reduce overdraft fees

Our experiments clearly demonstrate that just-in-time alerts help consumers save money by reducing overdraft charges. We find that these alerts reduce AOD charges by 4% to 8% and reduce UOD and UI charges by 17% to 19%. (We provide ranges of estimates because results vary by bank and treatment group.) When scaled up to the entire U.K. market using total 2017 charges as a baseline, this implies potential consumer savings between £170 million and £240 million annually.

The impact of early-warning alerts is less clear. When used instead of just-in-time alerts, early-warning alerts appear somewhat less effective, but we cannot rule out comparable benefits. When used alongside just-in-time alerts, our results suggest a modest additional benefit, but this was statistically inconclusive – even with a large sample of 1.1 million customers.

Based on these findings, in 2019 the FCA expanded the CMA's existing policy mandate for automatic enrollment into just-in-time alerts to include all overdrafts (arranged as well as unarranged) and to cover more banks (by reducing the size threshold for which the policy applies). In addition, they decided against mandating automatic enrollment in early warning alerts [FCA (2018)].

### 4.3. Alerts prompt consumers to check accounts and transfer funds

Text alerts help consumers avoid overdraft charges primarily by prompting immediate action. Our analysis uses three data sources – login activity, survey responses, and detailed account transactions – to understand precisely how consumers respond.

Login data reveal that alerts prompt consumers to actively check their accounts. On average, every ten just-in-time alerts trigger about five additional customer logins.

What do consumers do after checking their accounts? Survey responses indicate that 61%–73% take additional action. Most consumers respond by transferring money from savings accounts (50%–64%), borrowing informally from family or friends (25%–43%), or reducing spending (31%–48%). Far fewer delay bill payments (8%–24%), used credit cards (2%–7%), or borrowed from other formal sources (0%–7%).

Detailed transaction data support these survey responses, but emphasize the importance of fund transfers over spending reductions. Each

[1] Personal experience of one coauthor at two of the major banks indicates opting-in was difficult, involving locating a hard-to-find setting online without an in-person or telephone option.

just-in-time alert prompted an average increase in transfers of £126 per event, with roughly one-quarter of alerts triggering a transfer averaging £465. In contrast, the average reduction in spending per alert was minimal – around £4. Thus, most savings resulted from consumers leveraging available liquidity rather than significantly altering their spending patterns.

We hoped early warning alerts would give consumers more time to cut spending (or shift it to a credit card), giving even those without available funds for transfer an alternative way to avoid overdraft charges. Early-warning alerts did conclusively prompt consumers to log into their accounts and make transfers earlier. Unfortunately, while some evidence is suggestive of additional reductions in spending or overdraft charges compared to just-in-time alerts alone, none is statistically conclusive.

One possible reason for the underwhelming impact of early warning alerts is that sending alerts £50 to £100 before an overdraft often translated into only one or two days of warning time. Unfortunately, while raising low balance thresholds would give more advanced warning, it would likely also dilute alert effectiveness by creating too many "false alarms." In the future, early warnings may be more effective if artificial intelligence can be used to forecast overdraft risk earlier and more precisely than a simple low balance threshold.

## 4.4. Consumer benefits are broadly shared

An essential question for policymakers is whether overdraft alerts benefit vulnerable groups, including heavy overdraft users and low-income customers. A concern is that alerts will benefit these groups little because they have limited available cash to transfer into an overdrawn account or are already aware of their balances. On the contrary, however, we found that alerts provided substantial benefits across all customer segments studied – including both frequent and infrequent overdraft users and those with high and low incomes. Benefits were notably larger for customers with a history of:

- frequent overdrafting
- low average balances
- near-overdraft experiences ("close calls")
- infrequent account logins (low account engagement).

These groups benefit most because they are at greater risk of overdrafting or because they find alerts particularly informative, given their lower initial account engagement.

## 4.5. Consumers appreciate automatic alerts

Following the field experiment, the FCA employed a market research firm to conduct a 10 to 15 minute telephone survey with 2,000 trial participants from each bank. We asked consumers about their attitude towards alerts. Of the small minority who opted out of alerts, roughly half (40% to 58%) did so primarily because the alerts were "not useful" or "not needed," with a smaller share (27% to 40%) opting out to avoid some psychological discomfort (such as irritation, anxiety, or embarrassment).

A possible downside of automatic enrollment is that it could unintentionally irritate consumers who do not like alerts but find it too much of a hassle to opt out. Fortunately, among customers who remained enrolled, the vast majority were positive about the alerts: 54%–64% liked receiving them, 84%–92% found them helpful, and only a small minority (3%–8%) disliked them. Most respondents (87%–91%) felt the frequency of alerts was "about right," while only 2% to

5% reported receiving alerts "too often." Finally, 69%–81% agreed that automatic enrollment was best, although 20%–28% would have preferred a choice to enroll voluntarily.

### 4.6. Alerts are not a panacea

The fact that just-in-time alerts could reduce overdraft borrowing charges by £170 million to £240 million shows that, in the absence of alerts, a substantial portion of overdraft borrowing is unintentional due to lack of awareness about account balances. Unfortunately, although highly effective at reducing this problem, alerts do not resolve all the problems with overdraft borrowing.

In 2016, prior to alert auto-enrollment policies, the FCA (2018, Technical Annex Chapter 5, Table 1) estimated that more than half of days in overdraft could have been avoided if consumers used their savings or shifted spending to their credit cards – which notably had much lower effective interest rates. Automatic enrollment in just-in-time alerts eliminated fewer than half of these avoidable overdrafts, shrinking days in arranged overdrafts by 4%-9% and days in unarranged overdrafts by 15%-21%. Thus, despite their large benefits, alerts cannot entirely eliminate consumers' financial management challenges leading to unnecessary overdrafts.

## 5. Policy implications and regulatory changes

Based on our headline prediction of £170–240 million in consumer savings from automatic enrollment in just-in-time alerts, in 2019 the FCA expanded the CMA's 2018 opt-out mandate for just-in-time UOD and UI alerts to cover more banks (by reducing the size threshold for which the regulation applies) and added a mandate for just-in-time AOD alerts. Based on our failure to find statistically detectable benefits from additional early warning alerts, the FCA let banks continue to offer early-warning alerts on an opt-in basis [FCA (2018)].

Moreover, our finding that alerts are not a panacea for all overdraft borrowing "mistakes" encouraged the FCA to enact additional regulations effective in 2020. Historically, overdraft charges in the U.K. were complex and difficult to compare. Banks used a mix of per-day, per-month, per-transaction, and interest-rate based charges, making it challenging for consumers to understand how much they were paying for overdraft borrowing. This may be why consumers rarely shifted their current account spending to their credit cards after receiving early warning alerts – they didn't realize credit card interest charges would be cheaper than the corresponding overdraft charges. The FCA responded by requiring banks to structure overdraft charges as a simple interest rate, and encouraged them to disclose the interest rate to consumers in the same format as credit card interest rates (as an effective annual rate or EAR) [FCA (2019)].

The FCA's new overdraft pricing reform reflects smart policy making. The reform avoids capping charges in a way that could inadvertently restrict credit. Instead, by making the overdraft borrowing costs easily comparable both across banks and with credit cards, it harnesses consumer comparison shopping and the forces of market competition to limit overdraft charges. Prior to the policy, effective daily interest rates on overdraft borrowing regularly exceeded 10% per day [FCA (2018)]. After implementation of the new rule, large banks began charging dramatically lower effective interest rates – in 2023 the largest six banks all offered overdraft ERAs below 40%. It is now easier for consumers to recognize that their credit cards offer lower-cost credit, and is less costly when they don't.

Since the FCA's 2019 opt-out mandates for alerts were implemented, consumer adoption of mobile banking apps has continued to grow – from 63% in 2019 to 73% in 2024.[2] Because the FCA allows banks to deliver mobile app push alerts instead of SMS text alerts if customers have the app installed [FCA (2025, Section 8.4.8])], this trend increasingly positions push notifications as an important channel for just-in-time alerts. This shift offers several potential benefits, including lower messaging costs for banks, improved consumer responsiveness to alerts, and a reduced risk of fraud, as push alerts may be harder to spoof compared to SMS messages.[3] Nevertheless, even as digital channels evolve, the ongoing necessity of the FCA's alert mandate remains clear. Santander's recent decision to cease sending five non-mandated text alerts (low balance, high balance, high deposit, high withdrawal, and weekly summary) starting May 12, 2025,[4] clearly demonstrates the limitations of relying solely on voluntary bank practices and consumer opt-in, underscoring the enduring importance of regulatory oversight.

Our experimental tests of alerts do not reveal if or how banks might try to recoup lower overdraft revenue by raising charges for other products or services. Nevertheless, we are optimistic that U.K. retail banks will respond similarly to U.S. retail banks, which did not adjust prices to offset 2009 CARD Act reductions in hidden credit card charges [Agarwal et al. (2015)]. Investigating whether our optimism is borne out in practice is left for future work.

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# Digital transformation in Brazilian companies:
## Recommendations to accelerate digital maturity

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## Abstract

This article aims to explore the maturity of the digital transformation of Brazilian companies, based on a survey carried out in 2024, analyzing different strategic dimensions and the barriers that hinder the transversal digitalization of the Brazilian territory. Furthermore, it discusses Brazil's technological trends in relation to the global digital competitiveness landscape, offering recommendations on how the country can overcome its internal challenges and close existing gaps so that organizations can strengthen their digital initiatives and push Brazil toward a more competitive position in the global digital transformation arena.

## 1. Introduction

Digital transformation has become a key factor in the competitiveness and sustainable growth of companies around the world. The advance of new digital solutions, such as artificial intelligence (AI), automation, big data and cloud computing, has reshaped business models, boosted operational efficiency and redefined the customer experience. In Brazil, despite the growing recognition of the importance of digitalization, many companies still face challenges in implementing effective strategies and achieving more advanced digital maturity.

According to Acemoglu (2021), AI and other emerging technologies will transform jobs and markets over the next two decades, but their impacts on society and the economy will depend on how they are developed and implemented. He argues that the current trajectory automates work excessively while failing to invest in human productivity, potentially leading to workers being displaced without new opportunities being created. This situation also highlights the shortage of specialized labor and the inability of the workforce to keep pace with technological

advances, an issue that is particularly evident in Brazil. While government support has declined, corporate funding now plays a major role in shaping the direction of research on AI, machine learning and big data with leading technology firms, such as Google, Facebook, Amazon and Microsoft, setting the agenda and establishing norms through their academic and political influence. Therefore, it is necessary to question the current focus on automation and instead target its development toward complementing human labor, increasing productivity and creating new tasks and activities for workers.

Susskind (2020) reinforces these concerns by arguing that advances in AI and automation may lead to a structural decline in the demand for human labor, particularly in routine and middle-skill occupations. Rather than simply replacing specific tasks, these technologies have the potential to reshape entire industries, challenging traditional notions of employment and economic participation. Without parallel investments in education, workforce training, and inclusive innovation strategies, digital transformation risks exacerbating existing social and economic inequalities. This perspective is particularly relevant for Brazil, where many companies are embracing digital tools while simultaneously facing a shortage of skilled professionals.

Firm-level research on automation provides important insights into the broader implications of digital transformation for the labor market. Acemoglu et al. (2022), using data from the 2019 Annual Business Survey in the United States, found that automation adoption is more common among larger firms, particularly in the manufacturing and information sectors. These companies tend to have higher productivity levels and a more educated workforce, indicating that human capital is essential for successful technological adoption. However, the study also revealed that automation is often associated with reduced employment rate, suggesting that while it can enhance efficiency, it may also contribute to job polarization. This trend has significant implications for labor market dynamics and may exacerbate wage inequality.

Moreover, the successful adoption of new technologies requires complementary innovations in organizational processes and business models in order to fully benefit from them, reshaping entire value chains. Firms must redesign internal workflows, invest in workforce training and realign their business strategies to truly benefit from technology integration, according to Agrawal et al. (2023). This perspective is highly relevant to the Brazilian context, where many companies still focus on digital tools without implementing the broader organizational reforms needed to generate meaningful impact.

These challenges are embedded in Brazil's current political and economic landscape. At present, there is a strong focus on investment projects in the country's physical infrastructure, such as logistics, energy, and housing, at the expense of prioritizing digital infrastructure. The absence of a structured digital agenda within the Growth Acceleration Program (PAC) highlights a governmental gap in prioritizing digitalization as a driver of development.

In addition, national inflation has exceeded the 3% target set by the National Monetary Council (CMN), reaching 4.9% in 2024. This scenario impacts the profitability of Brazilian companies as well as their capacity for internal investment. As a result, the development of structured plans for digital transformation, automation, AI, and new digital platforms faces the challenge of high capital costs, making accessible credit scarce

and further penalizing small- and medium-sized enterprises that, under different conditions, could innovate more rapidly.

With this in mind, this article aims to explore the maturity of the digital transformation of Brazilian companies, based on a survey carried out in 2024, analyzing different strategic dimensions and the barriers that hinder the transversal digitalization of the Brazilian territory. Furthermore, it discusses Brazil's technological trends in relation to the global digital competitiveness landscape, offering recommendations on how the country can overcome its internal challenges and close existing gaps so that organizations can strengthen their digital initiatives and push Brazil toward a more competitive position in the global digital transformation arena.

## 2. Methodology

To better understand the digital maturity of Brazilian companies, we conducted a survey among 144 companies from various sectors of the Brazilian economy. The sectors analyzed were consumer and retail, healthcare, financial services, energy, information technology, industrial manufacturing, agribusiness, and consulting and services. The selection criteria for these sectors were based on their strategic relevance to national economic growth, as well as their demand for innovation, technology, and the modernization of services across the entire value chain. Additionally, executives from the automotive, construction, and infrastructure sectors were interviewed, however, these segments did not reach the minimum number of respondents required to be considered separately.

The survey included closed questions, using a scale from 1 to 6, to measure ten dimensions of the organizations' level of digital transformation, such as:

- **Strategy:** mapping opportunities and a clear vision of the future for both the company and the digital business, including short-, medium- and long-term plans and strategies to define the essential technologies for the transformation.
- **Governance:** adoption of structured governance and management mechanisms, such as the creation of forums and committees, definition of metrics and initiatives aimed at people management, organizational changes and strategic partnerships.
- **Digital processes:** the ability to adopt new business models and generate value through digital services and products, both internally, through digitalization and improved efficiency, and externally, through attracting new customers and partners.
- **People and culture:** promoting a culture geared towards digital transformation and the development of employees in this area, creating an environment that fosters innovation and digitalization.
- **Infrastructure:** the organization's ability to sustain the use of new technologies and large volumes of data through its IT infrastructure, ensuring adaptability and efficient integration of digital assets.
- **Data-driven decisions:** decision-making approach based on data and analysis, involving the collection, processing and interpretation of information to generate insights to guide strategies, operations and performance evaluations.

- **Technology strategy:** alignment between investments in technology and the organization's strategic objectives, ensuring support for innovation and transformation
- **Artificial intelligence (AI):** adoption and integration of AI into processes, services and products to increase company efficiency.
- **Digital customers:** collecting and analyzing customer data from various channels to personalize and improve the customer journey.
- **Technological frontier:** adoption of new emerging technologies and exploitation of innovations in the sector.

In addition, open questions were included regarding the main digital transformations that took place in the organizations over the past five years. Therefore, we generated the Brazil Digital Transformation Index, on a scale from 1 to 6, based on a quantitative analysis of the responses of the closed questions and conducted a qualitative analysis of the open questions to gain a deeper understanding of the key digital transformations highlighted by the executives in their organizations.

To generate the Brazil Digital Transformation Index, we employed the following specifications:

After tabulating the data, we proceeded to obtain the loads according to the distribution of dimensions. The loads were obtained by principal component analysis (PCA) using the statistical software IBM SPSS Statistics. PCA was used to find underlying dimensions in the data. PCA attempts to generate linear combinations of variables that capture as much of the variance of these observed variables as possible, and in PCA all of the variance is used. PCA is only concerned with determining which linear components exist in the data and how a specific variable contributes to the component [Dancey and Reidy (2006)].

PCA is conceptually less complicated than factor analysis and has several similarities with discriminant analysis [Field (2009)]. PCA was chosen because it generates an empirical summary of the dataset [Tabachinick and Fidell (2007)]. In this way, the principal component technique can be used to reduce the original variables to a smaller number of uncorrelated component. The adjusted model considering the factor scores as explanatory variables will no longer present the problem of multicollinearity, and all results and interpretations will now be based on the factors [Farrar and Glauber (1967)].

It is understood that the greater the correlation, the greater the weight. It is weighted by the correlation. Thus, the "Weight" data was calculated using the formula:

$$Weight_i = \frac{Load_i}{\sum_j^n \text{Load of the respective dimension}} \quad (1)$$

Once all the weights for each question and dimension were obtained, the "Base" data was prepared. A weighted average was calculated for each dimension and company using the following formula:

$$\text{Dimension per company} = (weight_{Q1} * data_{Q1C1}) + (weight_{Q2} * data_{Q2C1}) + (weight_{Q3} * data_{Q3C1}) + (weight_{Q4} * data_{Q4C1}) + (weight_{Q5} * data_{Q5C1}) + (weight_{Qn} * data_{QnC1}) \quad (2)$$

Where:

$Q_1$ = Question 1;
$Q_2$ = Question 2;
$Q_3$ = Question 3;
$Q_4$ = Question 4;
$Q_5$ = Question 5
$Q_1C_1$ = Question 1, Company 1;
$Q_2C_1$ = Question 2, Company 1;
$Q_3C_1$ = Question 3, Company 1;
$Q_4C_1$ = Question 4, Company 1;
$Q_5C_1$ = Question 5, Company 1;

In this case, a dimension index was created for each company.

## 3. Results

The results revealed a level of maturity that is still low, but which has evolved in relation to previous years, demonstrating managers' growing interest and concern about the issue. The majority of organizations (45.1%) adopt a cautious stance when it comes to investing in digital initiatives, allocating small amounts. On the other hand, 41% recognize digital transformation as a determining factor in their investment decisions, acknowledging its importance. However, only 13.9% consider digital transformation to be a strategic priority for the future of organizations, indicating a long-term vision that is still limited. In this way, it can be seen that a large number of organizations are adjusting and recognizing technology as an important factor in their strategy. The gains from digital transformation depend on complementary intangible investments, such as organizational restructuring, training and data infrastructure, which take time to develop [Brynjolfsson et al. (2021)]. This may explain the current gap between intent and execution when it comes to capturing value from new technologies in Brazilian firms.

The Strategy dimension was the best rated, which suggests that Brazilian companies are increasingly recognizing the importance of aligning digital transformation with their business strategies. In this context, digital transformation is no longer just a trend and has become a fundamental component in guaranteeing companies' competitiveness and success in the short and long term. A clear digital strategy makes it possible to optimize operations, improve the customer experience and reach new markets, an important competitive differentiator to position companies as leaders in their respective sectors. Advanced AI could significantly boost global economic growth, but only when implemented through deliberate, well-aligned strategies [Davidson (2021)]. For Brazilian firms, this implies that the perceived strategic value of digital transformation must translate into clear and measurable roadmaps to unlock these broader benefits.

In this context, 76% of respondents indicated that strategic and future business vision is the term that best defines the understanding digital transformation in their organizations, followed by analytical model and process improvement (61%) and technological development with a customer focus (53%). This data shows that, in addition to strategic alignment, companies are also looking to optimize internal processes and improve the customer experience. However, although companies understand this importance, many still don't have clear and structured plans for the effective implementation of digital transformation. When it comes to developing digital strategies, the majority of respondents (34%) focus on drawing up a digital strategic plan, while others focus on improving processes and operational efficiency (19%).

On the other hand, the data-driven decisions dimension received the worst rating, indicating that companies face difficulties in transforming large volumes of data into valuable insights on which to base strategic decisions. Although data collection has advanced, the ability to generate value from this data is still a challenge, as Brazilian firms are still in early stages of developing the analytical and algorithmic capabilities. Advanced machine learning models, such as gradient boosting machines have proven effective in extracting predictive patterns from complex datasets and are widely adopted in digitally mature ecosystems [Friedman (2001)]. However, their application in Brazil remains limited. Therefore, adopting a data-driven culture requires significant changes in the organizational culture, involving everything from leadership to employees at various levels. This requires continuous training, ensuring that all members of the organization feel empowered to work with data efficiently.

In addition, companies reported difficulties in attracting and developing talent with the new digital skills required. Even so, they showed concern about complying with the General Data Protection Act (LGPD) and mitigating risks related to the digital transformation, with a view to guaranteeing the privacy and security of information, with 92% of respondents having the ethical and moral use of digital data and technologies as part of their strategy. In addition, 95% say that information security is aligned with governance and compliance, helping to avoid risks and security breaches.

## 3.1 Emerging trends

The adoption of emerging technologies in Brazil reveals a paradoxical reality: while companies seek to modernize processes and gain efficiency, structural obstacles still hinder the consolidation of a systemic digital transformation. Factors such as inflation and restrictive economic policies reduce companies' capacity to take steps toward deep digital transformation, causing digital projects to remain mostly in the background. Additionally, the country's complex tax system results in bureaucratic dysfunction, with a heavy administrative burden that compromises companies' operational time and resources.

These contradictions become particularly evident when comparing the national scenario with the global landscape. The study in question indicates a decline in technological infrastructure, with a drop from 3.7 to 3.6, signaling limitations in connectivity, legacy systems, and computational capacity. Although computational capacity continues to improve globally, the cost-benefit is still inaccessible for many organizations, especially in emerging economies with outdated infrastructure [Besiroglu and Hobbhahn (2022)].

According to the IMD, technologies such as artificial intelligence (AI), robotics, and the internet of things (IoT) have gained prominence in global business strategies. AI, for instance, was identified by 20% of respondents as the primary technology adopted, reflecting a growing trend of automation and productivity gains. Its applications range from internal process automation to customer service through chatbots and virtual assistants. Emerging forms of AI, such as large language models (LLMs) like GPT-3 and GPT-4, are already reshaping the nature of work by transforming tasks that involve information processing, writing, and programming. AI adoption is not only about access to tools, but also about the ability to redesign organizational processes and upskill the workforce to fully leverage these technologies. Even in advanced economies, the adoption faces organizational and infrastructural constraints [Eloundou et al. (2023)]. In Brazil, the implementation of AI faces recurring challenges, including a shortage of qualified professionals, low analytical culture, and inadequate technological infrastructure in many organizations. Although the index shows a significant improvement in the AI dimension (from 2.4 to 3.7 on a scale of 1 to 6), this progress falls short of indicating consolidation.

Robotics, mentioned by 11% of companies, has been instrumental in automating tasks and processes, reducing costs, and increasing efficiency. Additionally, robots can be integrated with human labor, making automation more flexible and adaptable to market needs. The growing demand for automation in Brazil reflects companies' pursuit of greater competitiveness, particularly in the industrial and logistics sectors, especially amid a shortage of specialized labor.

The internet of things (IoT), cited by 9%, enables the connection of devices and sensors for real-time data collection and transmission, facilitating the creation of intelligent and interconnected environments. However, the high implementation cost remains a barrier to widespread adoption, particularly for small- and medium-sized

enterprises. In this context, the expansion of 5G technology in the country is seen as a promising opportunity to broaden IoT usage in the coming years.

The application of 5G technology in Brazil represents not only a technical advancement but also a strategic political movement toward modernizing the country's digital infrastructure. Coordinated by Anatel (National Telecommunications Agency) and driven by public policies involving various government levels, the national plan envisions the phased installation of antennas by 2029. Since July 2022, when the first commercial antenna was activated, 5G coverage has reached all Brazilian municipalities, operating in the 3.5 GHz band and offering speeds up to five times faster than 4G. The schedule, defined within a regulatory environment supported by Congress and federal agencies, stipulates that by July 2025, municipalities with over 500,000 inhabitants will be served, extending to all cities with more than 30,000 inhabitants by 2029. The network expansion, in addition to facilitating the installation of fifth-generation stations by operators, also symbolizes a political agenda focused on innovation, economic digitalization, and global competitiveness. In this context, the EAF (Entity for Band Management) plays a crucial role in assisting the population's transition from traditional satellite dishes to digital ones.

Thus, 5G emerges as a political and economic transformation tool, essential for productivity, sustainability, and reducing connectivity access inequalities. Still, technological transitions at the national level require a blend of market forces and long-term policy to be successful [Korinek and Suh (2024)]. The 5G deployment in Brazil is a prime example of this coordination, but its long-term impact will depend on how well the ecosystem of public, private, and civil society actors work together to enable scalable adoption. This collaborative approach is essential not only for the integration of 5G but also for preparing the country for the future of more advanced technologies.

Beyond these technologies, 25% of companies mentioned the use of more specific solutions, such as financial tools, computer vision, and biotechnology, indicating a trend toward technological customization according to each productive sector's demands. Even when automation technologies become economically viable, their adoption depends on task-specific cost-effectiveness and the feasibility of labor substitution, due to high deployment costs, limited accuracy improvements and other factors that are highly sensitive to local economic and organization contexts [Svanberg et al. (2024)]. This behavior suggests that Brazil has the capacity to explore advanced technologies but still lacks structural conditions, such as training, governance, and well-defined strategies, to support this expansion in a continuous and widespread manner.

This is precisely where the contrast with the international scenario becomes more evident. In the IMD World Digital Competitiveness Ranking 2024, Brazil ranks 57th among 67 countries, behind Latin American neighbors like Chile (47th) and Colombia (55th), and far from leaders such as Singapore, Switzerland, and Denmark. While these economies heavily invest in foundational digital education, data infrastructure, applied research, and intelligent regulation, Brazil still struggles to align its technological strategy with its economic reality. This disconnect manifests in various areas: high capital costs (driven by the elevated interest rate), low regulatory predictability, fragmented innovation tax incentives, and educational inequality, which hinders the development of a critical mass of professionals capable of leading or sustaining large-scale digital transformations. Currently, Brazil still faces high levels of social

and educational inequality, with limited education outside major urban centers. The lack of qualified technology professionals is identified by executives as one of the main obstacles to digital transformation, making it challenging for companies to train digital leaders and disseminate knowledge internally, thereby compromising cultural change.

Nevertheless, there are positive signs. The digital governance dimension showed a significant improvement in the index, rising from 2.9 to 3.9, reflecting the creation of internal forums, innovation committees, and more structured digital strategies within companies. The "strategy" dimension, in turn, was the highest-rated (4.1), indicating that the discourse on digital transformation is already embedded in executive agendas.

From this perspective, the financial services sector stands out, exhibiting the highest level of digital maturity among the sectors analyzed. This performance can be explained by the need to offer fast and secure services while handling large volumes of data. Digitalization has enabled banking services to be carried out in an accessible manner, anytime and anywhere, with high efficiency. The regulatory environment has been a key factor in fostering digital transformation within the sector, with the Central Bank of Brazil implementing initiatives such as open banking, which allows for the secure sharing of data among financial institutions, and PIX, an instant payment system that promotes greater competitiveness and innovation in the financial market. Additionally, Brazil has a large fintech ecosystem that has been leading innovation in the financial sector. The growth of these startups has pressured traditional banks to adopt new technologies or even form partnerships with fintechs in order to remain competitive. This movement has further accelerated digital transformation in Brazil's financial sector. As a result, the financial services sector has become a benchmark for digital transformation, serving as a model for other sectors.

The challenge now is to turn discourse into practice. For that, it is not enough to adopt isolated technologies or follow market trends: it is necessary to train people, redesign processes, invest in governance, and connect the digital agenda to the country's broader economic and social development goals.

## 3.2 Barriers to digital transformation

The implementation of digital strategies faces structural and cultural challenges within companies, which compromise the progress of digitalization effectively. The integration of technologies into businesses strategies depends not only on adoption, but on the firm's ability to overcome organizational inertia, invest in intangible assets, and develop new work process [Bresnahan (2019)]. These aspects are particularly challenging in economies with lower digital maturity, such as Brazil, where the workforce lacks training and access to adequate infrastructure.

The biggest barrier identified is the organizational structure and culture that is resistant to change, pointed out by 49% of the businesses. This figure shows that almost half of the companies surveyed have a high degree of resistance to digital implementation. This resistance is associated with the difficulty of adapting traditional processes to new technological approaches, as well as a lack of incentives for innovation. Despite the growing availability of advanced analytical tools, most companies in Brazil are still far from fully leveraging unstructured data for strategic purposes. The extraction of value from data, such as text, logs, or customer feedback, requires not only robust modeling frameworks and computational power but also data literacy and the ability to apply the right models to extract meaningful insights. The lack of data literacy

and algorithmic understanding further reinforces the cultural resistance to digital transformation, making it difficult for companies to move beyond superficial digital initiatives [Blei et al. (2003)].

In addition, 22% of companies report a lack of strategic vision for digital business models as a significant obstacle, indicating that many organizations have not yet developed a structured plan for digitalization. Risk aversion (20%) and lack of experience in digital projects (17%) indicate that initially adopting digital processes can generate uncertainty about the transformation of historically traditional company practices. Risk-averse companies tend not to invest in digitalization and innovation projects, restricting their growth in this area and depriving employees and management of valuable learning from these experiences.

> **“The real challenge lies not in technology, but in governance mechanisms.**

However, the obstacles are not limited to companies' internal dynamics. They are strongly influenced by external structural factors, particularly those related to the economy, politics, and technological accessibility in the country. The diffusion of digital technologies is often uneven, with large firms and leading sectors benefiting the most, while smaller businesses struggle to access and implement these technologies. This dynamic increases economic inequality, as those unable to invest in digital transformation are left behind, further widening the gap between more and less competitive firms [Bresnahan (2019)]. The high cost of capital in Brazil, driven by a restrictive monetary policy aimed at controlling inflation, makes it difficult for companies to access funding for innovation projects, especially small- and medium-sized enterprises. In this context, more complex digital initiatives become risky and less viable, reinforcing a preference for safer and less transformative operational models.

On the political-institutional front, the absence of an integrated and long-term public policy focused on digitalization limits the systemic advancement of digital transformation. Although important federal initiatives exist, such as the National IoT Plan, the Brazilian Strategy for Digital Transformation (E-Digital), and the expansion of 5G, they still lack continuity, integration with state and municipal governments, and coordination with the productive sector. Moreover, regulatory uncertainty surrounding topics such as artificial intelligence, data governance, and cybersecurity contributes to companies' hesitation in investing in cutting-edge solutions.

Another critical issue is the disparity in access to basic digital infrastructure, which still persists across several regions of the country. The connectivity gap, especially outside major urban centers, hinders the full digitalization of production chains and reinforces digital exclusion for both businesses and workers. This barrier to technological accessibility directly impacts the level of digital maturity observed across sectors and regions, keeping the country at an intermediate position in international rankings. These structural limitations are not only technical but also socio-economic. Technological progress, when not accompanied by inclusive labor policies and investments in education, tends to reduce the labor share of income, disproportionately benefiting capital and exacerbating inequality [Elsby et al. (2013)]. In Brazil, this dynamic is already visible in the unequal access to digital training and in the concentration of digital capabilities within a few sectors and regions.

Internally, the lack of a structured and clear process for the stages of digitalization within organizations remains a significant barrier. More than half of the companies (56%) emphasize that it is necessary to carry out the digital transformation as a robust internal plan, so that it is possible to measure the performance of the proposed stages. Another relevant aspect is the difficulty in economically evaluating digital projects, identified by 32% of companies. Innovation and digitalization need to be able to boost companies' ability to convert capital. Standardized methodologies for measuring the effectiveness of technological initiatives are therefore essential. This reinforces the need for clearer guidelines for integrating new technologies into the core business, as well as within existing projects (31%).

The main gap for Brazilian companies today lies in the strategic planning and management of digitalization initiatives (27%). The role of leadership is essential for centralizing the digital transformation within the corporate culture, as well as defining the initial scope of the plan. Through this responsibility, it is possible to achieve other opportunities for improvement, such as operational efficiency by improving processes and using assertive technological tools.

## 3.3 Impacts

The impacts of digitalization are significant and cover various organizational dimensions. In the operational context, there has been a significant increase compared to previous analyses, and the impact of digitalization in this segment is expected to grow. 75% of companies say that digital transformation significantly improves the efficiency of internal processes. Digitalization makes it possible to automate repetitive tasks, optimize workflows and improve resource allocation, resulting in reduced operating costs and greater productivity. AI and related technologies can enhance the productivity of mid-skill works by embedding expert knowledge into the tools and systems they use. This allows a broader range of workers to perform complex tasks that were previously limited to highly skilled professionals. However, for organizations to fully realize this potential, it is essential that they actively support the transition [Autor (2024)].

Another impact to be analyzed is in terms of the company's internal culture, with 47% of organizations indicating that digitalization contributes to a significant cultural change, promoting a mindset with tendencies towards innovation and new practices, which consequently contributes to greater acceptance of digital habits.

In terms of consumers, 43% of companies identify greater customer orientation as a positive impact of digitalization, allowing for a more personalized response to consumer needs, as well as an in-depth understanding of their behavior in terms of how they relate to companies. This is fundamental to boosting the organization's ability to influence the market, offering solutions and products that are assertive in relation to customer demands. In addition, 38% of organizations point to an improvement in decision making, driven by the adoption of analytical technologies and business intelligence tools that help managers understand internal and external factors and guide the company's decision making. Overall, 85% see benefits generated by digital transformation practices.

Although the indicators are positive for procedural increases and gains in internal operational efficiency, the dimension of generating new types

of service and business offer is less prominent than the others. In other words, a closer look is needed to validate the real potential for creating digital transformation, based on an analysis of the challenges faced in the digitalization process.

In the area of sustainability, more than half of the companies assess the impact of digital transformation on their ESG strategy (55%). Although this is considered a significant figure, it indicates that there is still considerable room for improvement within organizations in this respect. This reflects the need for greater integration between technology and social and environmental responsibility. The lack of digital integration between companies and ESG may be due to factors such as internal culture, and there needs to be internal practices and initiatives that encourage contact with digital tools. Furthermore, there needs to be awareness of ESG issues within companies, so that structured and effective plans can be designed to achieve this. It is important to highlight the high percentage of companies that have not adopted technologies to mitigate ESG-related risks (48%) for stakeholders, with room for an increase in the percentage of companies with related processes in the development stages.

As far as compliance is concerned, with the implementation of emerging technologies of great value to organizations, ethical, moral and data security challenges must be taken into account. In this context, 92% of organizations consider the ethical use of data to be a strategic priority, while 95% say that information security is aligned with corporate governance, showing a growing commitment to regulatory compliance. These aspects are capable of strengthening investor security, although they require complex internal plans and structures at considerable cost, as well as an active role for management to implement them assertively.

# 4. Recommendations

Given the evidence gathered by the research and the contrast between Brazil's performance and that of more advanced economies in terms of digital transformation, it becomes essential to reflect on the possible paths the country can take to accelerate its digital maturity.

The comparative analysis with the IMD World Digital Competitiveness Ranking 2024, in which Brazil ranks 56th out of 67 countries, highlights a set of global best practices that can inspire structured and long-term actions. Countries such as Singapore, Switzerland, Denmark, and Sweden, which lead the digital competitiveness rankings, share characteristics that go far beyond technology: they treat digitalization as a state policy, rather than a government agenda.

## 4.1 Digital education starting at the basic school level

Building human capital with technological skills goes beyond training professionals for the IT market, it involves embedding digital thinking as a transversal competence. In Brazil, however, the responsibility for digital education still falls primarily on companies, often without systematic support from the public sector. It is essential that digital skills be integrated into basic and technical education curricula, and that partnerships between universities, the private sector, and government be encouraged to foster talent development. The absence of national programs for digital reskilling and inclusion deepens regional inequalities and limits the reach of digital transformation.

## 4.2 Strengthening digital governance

The first essential step is to strengthen digital governance by structuring digital transformation committees and creating clear metrics for monitoring the implementation

of new technologies. These committees should act in a multidisciplinary way, involving stakeholders from different hierarchical levels, ensuring that the digital strategy is aligned with long-term organizational objectives. In addition, the definition of information security and digital compliance policies is crucial to ensure compliance with legislation such as the LGPD and international data protection guidelines.

### 4.3 Developing a digital organizational culture

Resistance to change is one of the main obstacles to adopting new technologies. It is therefore essential to promote an organizational culture that values experimentation, continuous learning and collaboration between teams. Companies should invest in training their employees, providing training on new technologies, agile methodologies and analytical tools. Encouraging intrapreneurship can also be a differentiator, allowing employees themselves to develop innovative solutions in line with the corporate digital strategy.

### 4.4 Digital infrastructure

In leading countries, digital infrastructure is widely accessible, even in less developed regions. Brazil has made progress in this area with the expansion of 5G, but still faces challenges related to connectivity, data storage, and computing capacity. The country needs to increase investments in data infrastructure not only in major urban centers but also in rural areas and urban outskirts, ensuring that digital innovation is not a privilege for a few. Tax incentives for companies implementing technological solutions in low-coverage regions, as well as technical support programs for small- and medium-sized enterprises, can be effective ways to democratize access to digitalization.

### 4.5 Stable regulatory environment

In the top-ranking countries in the IMD, a stable, transparent, and up-to-date regulatory environment has been key to attracting investment and boosting innovation. Clear regulations on data protection, artificial intelligence, and cybersecurity provide legal certainty for companies to innovate responsibly. In Brazil, although important frameworks such as the LGPD exist, there are still significant gaps regarding topics like the ethical use of algorithms, open innovation, and generative artificial intelligence. Developing modern and responsive regulation is essential to build trust among economic actors and promote the adoption of emerging technologies in a safe and strategic way.

### 4.6 Strategies for evaluating and measuring digital impacts

The difficulty in economically evaluating digital projects can be mitigated by adopting digital return on investment (ROI) measurement frameworks, such as objectives and key results (OKRs) and key performance indicators (KPIs). These tools allow organizations to measure, quantitatively and qualitatively, the impacts of digitalization in different sectors of the company. Benchmarking and the use of predictive data can also provide relevant insights for decision making.

### 4.7 Integrating digital transformation into ESG practices

The implementation of digital solutions must be aligned with environmental, social and governance (ESG) guidelines, ensuring that innovations contribute to reducing the carbon footprint, optimizing resources and strengthening corporate transparency. Companies that adopt digital technologies to improve their environmental and

social practices tend to obtain greater perceived value from the market and consumers, as well as positioning themselves as leaders in social and environmental responsibility.

### 4.8 Adoption of emerging technologies and artificial intelligence

Investment in emerging technologies such as AI, the IoT and blockchain can significantly accelerate companies' digital maturity. However, its implementation requires strategic planning and a robust governance structure. Organizations must establish partnerships with universities, startups and research centers to foster innovation and ensure that they position themselves as leading players amid the scenario of technological transformations.

In summary, it is evident that the most digitally advanced countries in the world integrate digital transformation across their economic, industrial, and social development plans. It is not treated as a parallel agenda, but as a pillar of sustainable growth. In Brazil, there is still a fragmentation of initiatives across different levels of government and a lack of clear targets for digitalization within major national programs, such as the Growth Acceleration Program (PAC) or the Multi-Year Plan (PPA). To overcome this scenario, it is essential to include concrete digital maturity goals in Brazil's official planning strategies, promote sector-specific evaluation indicators, and strengthen the role of digital transformation as a strategic axis for national competitiveness.

## 5. Conclusion

The trajectory of digital transformation in Brazil is marked by significant progress, but also by structural challenges that continue to hinder its consolidation. The survey results show that although Brazilian companies recognize the importance of digital transformation, there is still a long way to go before digitalization is fully integrated into their strategies and operations. Most organizations operate reactively, with isolated initiatives that are not embedded in a long-term strategy, which limits their potential for innovation and sustainable growth.

Although digital discourse is increasingly present in corporate agendas, its effective consolidation still faces significant internal and external barriers. Structurally, these include deficient technological infrastructure, the absence of integrated public policies, and a shortage of qualified labor. Internally, factors such as cultural resistance, lack of a clear strategic vision, and difficulties in measuring the economic impacts of digital projects hinder progress in digital maturity within organizations.

On the other hand, there have been meaningful advances, particularly in the adoption of AI, the IoT, and data analytics solutions to enhance decision making and build a more innovative, resilient, and connected economy. Sectors like financial services already show that there are viable paths forward, which can be replicated, through proper regulation and innovation incentives, to accelerate digitalization and bring gains in efficiency, security, and competitiveness.

However, for digital transformation to be effective and produce lasting impacts, a coordinated effort between businesses, the state, and academia is essential. Above all, digitalization must no longer be treated as a sector-specific agenda but rather as a strategic pillar of national development. In this sense, companies must strengthen their digital governance, invest in workforce training, and align their technology strategies with market demands. At the same time, the public sector must promote long-term policies, invest in the development of digital skills, encourage research and innovation, and expand technological infrastructure equitably across the country.

The future of business competitiveness in Brazil will depend on organizations' ability to adapt and innovate. Digital transformation should not be seen merely as a trend, but as a critical strategic differentiator and a decisive factor in driving the country's productivity and competitiveness.

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# Beyond the hype:
## In what sense are algorithmic technologies transforming regulation?

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## Abstract

This article discusses the transformative claims surrounding the integration of algorithmic technologies, such as regulatory technology (regtech) or generative artificial intelligence (GenAI), into financial regulation. While industry and consultancy narratives celebrate these tools as disruptive innovations, their implementation often reproduces existing institutional structures and power asymmetries. Drawing on insights from the social studies of finance, the article argues that algorithmic systems are not neutral instruments but actively reshape regulatory logics and normative orders. By privileging automation and calculability over contextual and interpretive judgment, these technologies reconfigure regulatory practices. This article calls for a more reflexive and critical engagement with algorithmic technologies specifically and technology-led governance, highlighting the need to re-examine the political implications of regulatory transformation in the digital age.

## 1. Introduction

The integration of algorithmic technologies into financial practices has been heralded as a major transformative shift. From high-frequency trading to robo-advisors, to predictive analytics and real-time compliance monitoring, digital technologies are said to alter the operational and strategic dynamics of banks and financial intermediaries. Yet, amid the technological enthusiasm lies a crucial question: are these technologies reshaping the foundations of finance, or merely reinforcing and extending existing structures under the guise of innovation?

In this article, we consider the possibility that the dominant narrative of technological transformation in finance is exactly that – just a narrative. We argue, however, that this narrative of techno-transformation serves a two-fold purpose. First, glorifying the transformative thrust of new technologies in finance helps IT providers and data vendors market their products to a tech-savvy audience of professionals, while at the same time remaining far removed from realities that fall short of promises. Second, and more fundamentally, the adoption of financial technologies tends to reproduce rather than disrupt existing structures. Paradoxically, the narratives of transformation often reinforce established hierarchies and

logics instead of challenging or dismantling them. The rhetoric of digital disruption may be more about perception than substance; indeed, such narratives frequently repackage existing structures under the appearance of innovation.

Our scepticism toward transformative claims is grounded in a long tradition in the social studies of finance, which has shown that financial technologies do not simply reflect or implement pre-existing economic rationalities – they participate in constructing them. As sociologist Donald MacKenzie (2009) argues, technologies can be "performative," in the sense that they help bring into being the very market behaviors and structures they purport to describe or support. Building on this insight, we suggest that the dominant narratives around financial technologies (fintech) and regulatory technologies (regtech), position big data, blockchain, machine learning or GenAI techniques as not merely describing change, but actively reproducing what already exists, framed as transformation. In this context, the celebration of financial innovation goes beyond reflecting technological capabilities and advances the interests of dominant actors. Detailed ethnographies of American or European trading floors, for instance, have shown how technologies embed organizational values and control mechanisms, often reinforcing managerial authority and institutional path dependencies rather than disrupting them [see, for example, Beunza (2019)]. What is presented as democratization or decentralization may, in practice, reflect a reconfiguration of existing power rather than its dissolution. Recognizing this performativity is a first step. It opens the possibility of imagining and enacting more concrete counter-performances that can instigate the kinds of structural changes that finance and its governance urgently require – changes that are too often deferred by the hype surrounding yet another supposedly disruptive technology.

We proceed in three steps. First, we harness the notion of imaginaries from the Science and Technologies Studies (STS), a framework that has influenced much of the social studies of finance, to identify not only the narratives but also their concrete implementation into financial practices, particularly in the case of AI. Second, we show how these imaginaries function not merely as cameras but as engines, extending McKenzie's (2008) analysis of financial models to fintechs and regtechs. Third and finally, we summarize and conclude by pointing towards specific changes that regulators and firms might consider in order to avoid the recurring cycle of disappointment tied to narratives of technological transformation.

## 2. Imaginaries and the promises of AI for financial services

Technologies are never neutral. The adoption of new technologies in finance is not simply about improving efficiency or reducing costs, as it is often presented. Rather, such adoption is embedded in broader imaginaries, visions of desirable futures shaped by collective assumptions about what technology should do and for whom [Jasanoff and Kim (2009); Jasanoff (2015)]. These imaginaries carry normative weight: they structure expectations, inform policy choices, and guide investment priorities. Yet what is often left unexamined is that the purported gains, such as efficiency or savings, are not universally distributed. These benefits typically accrue to specific actors and processes while excluding others, reinforcing existing inequalities rather than resolving them. In the context of financial services, imaginaries frequently revolve around promises of automation, personalization, and rational decision making. These promises are both aspirational and strategic. To paraphrase the well-known observation attributed to North American science fiction writer William Gibson, the future is already here, but it is not evenly

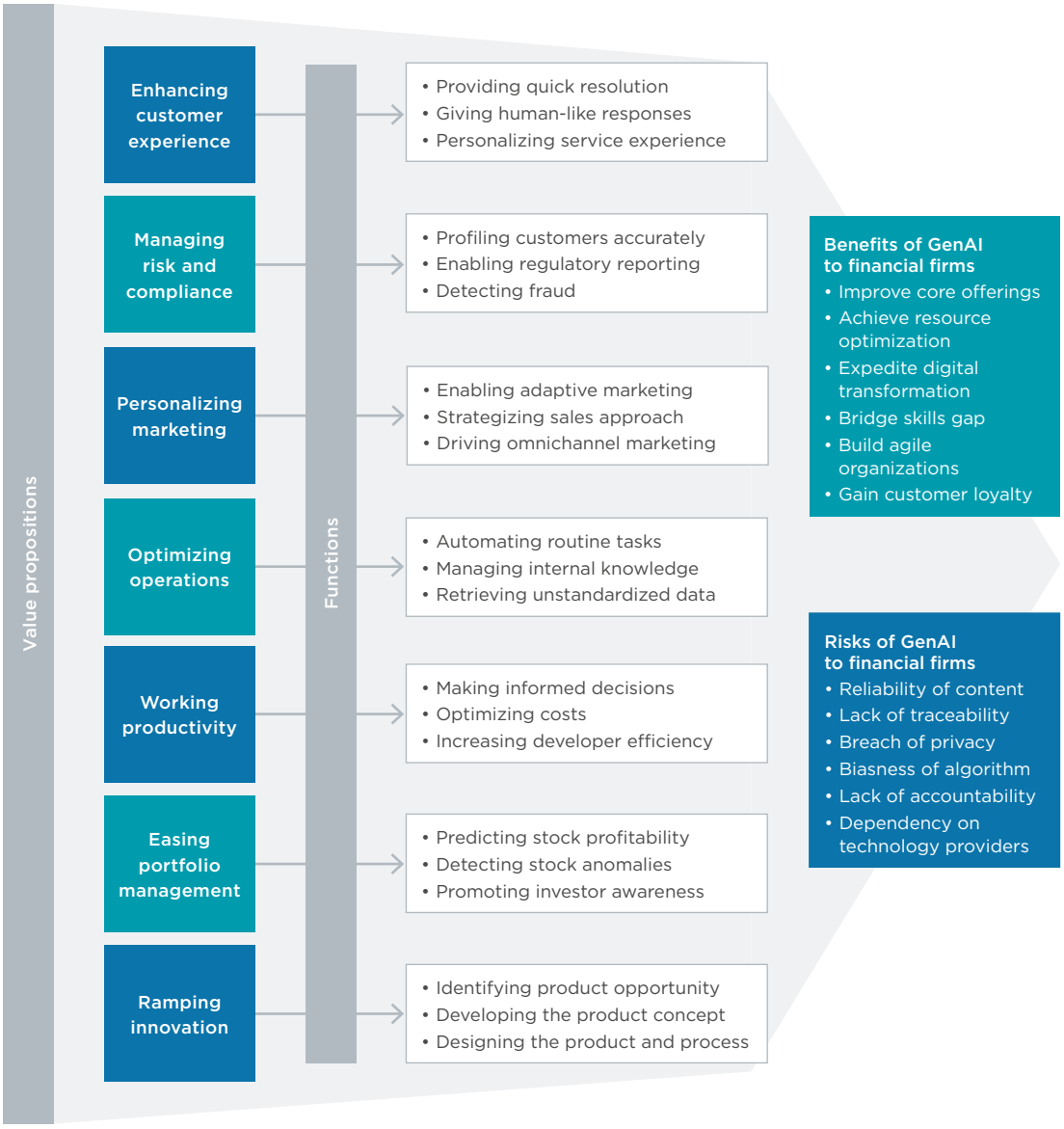
distributed. The same can be said of algorithmic innovation in finance: its benefits and impacts are asymmetrical, stratified across firms, markets, and jurisdictions.

Algorithmic systems are commonly cast as both the problem and the solution within governance contexts, creating a feedback loop in which technology justifies its own proliferation [Wijermars and Makhortykh (2022)]. GenAI, for instance, is widely framed within financial imaginaries as a tool for enhancing efficiency, transparency, and market integrity. However, such aspirations routinely overlook the institutional, social, and ethical complexities into which these technologies are deployed. For instance, consulting firms such as the Boston Consulting Group (2023) suggest that "AI is no longer a concept of the future—it's a game-changer today. And companies that move ahead decisively and strategically with AI will gain significant lasting advantages within their industries." Such statements illustrate how techno-optimistic imaginaries shape industry discourse, aligning with what has been described as utopian (and sometimes dystopian) narratives around AI – exaggerated accounts that seek to shape public perception and regulatory responses.

On the one hand, GenAI is championed as a democratizing force: unlocking productivity, expanding access to advanced analytics, and providing insights at scale to all market participants, including regulators. On the other hand, such narratives tend to obscure more fundamental issues, such as algorithmic bias, opacity, and systemic risk, which emerge when flawed tools are adopted at scale, for example by an increasingly wide array of market participants and their regulators. The deployment of GenAI, often perceived as neutral or self-correcting, overlooks the fact that these technologies are deeply embedded in socio-economic structures marked by regulatory asymmetries and power concentrations [Sartori and Theodorou (2022)]. As we argued at the outset, such assumptions of neutrality are misplaced.

Sociotechnical imaginaries, despite their abstraction, are not merely discursive; they are actionable frameworks. They guide material decisions: where to invest, how to assess risk, and how to design regulation. Crucially, they tend to privilege certain actors, notably large financial institutions and bigtech firms, while marginalizing others. As such, these imaginaries reinforce institutional hierarchies and path dependencies rather than fostering pluralism or innovation. Moreover, dominant financial imaginaries tend to promote a microprudential logic of regulation and risk management, one that is inherently path dependent. Because GenAI tools are trained on historical data, they often reproduce established norms and heuristics, thereby limiting the possibility of transformative change [Campbell-Verduyn and Lenglet (2023)]. A case in point is the EMPOWER framework proposed by Dubey et al. (2024), which highlights GenAI's potential to enhance customer experience and operational efficiency (see figure below). However, the framework pays little attention to broader macroprudential or systemic risks, thereby reinforcing a technocratic rather than reflexive engagement with AI. As a result, GenAI is increasingly deployed within existing institutional templates, rather than prompting a critical interrogation of those templates. The risk, then, is not the emergence of a new, more democratic or frictionless financial paradigm, but rather the entrenchment of old models in new technical guises. This highlights the need for regulatory innovation and a more nuanced engagement with the sociotechnical dynamics of AI.

**Figure 1:** Dubey et al's (2024) funnel framework for how GenAI empowers financial organizations




In sum, imaginaries surrounding GenAI and other algorithmic technologies in finance continue to emphasize efficiency gains and cost reduction. However, these narratives often obscure the uneven distribution of potential benefits and systematically downplay broader likely risks and externalities. While such technologies may yield improvements for certain actors or domains, they also introduce new layers of complexity, opacity, and vulnerability, particularly as they are scaled across sectors, regulatory regimes, and asset classes. To avoid recurrent cycles of disillusionment when technological promises fail to deliver, more grounded and critical assessments of both their benefits and limitations are required. This includes a clearer recognition of the structural

risks that arise not merely from malfunction or misuse, but from the uncritical embedding of these tools into existing institutional logics and power asymmetries.

## 3. Warnings from regulatory technology practices in finance

The case of regtech provides a cautionary example of how technological narratives often diverge from practical outcomes. The emergence and proliferation of regtech provide instructive warnings. Beginning in the mid-2010s, a wave of industry white papers and consultancy reports championed regtech as a transformative response to mounting regulatory demands. However, rather than delivering systemic innovation, regtech developments often reinforced prevailing hierarchies and entrenched modes of compliance. A relevant example can be found in the white paper published by Compliance.ai (2019), which emphasized the "imperative to automate regulatory change management" amid growing financial complexity. While framed as a disruptive move, the solutions it promoted largely served to streamline existing compliance routines. They did not question the legitimacy or proportionality of the regulatory demands they sought to address. Instead, regtech applications were crafted to fit within current operational roles and legal interpretations, ultimately preserving the status quo rather than prompting reflective change or critical dialogue.

At the heart of this trend lies what we call automated rationality: the process through which algorithmic tools begin to define what counts as appropriate or legal conduct. As Aldasoro et al. (2024) note, GenAI is already being adopted for back-end processing and regulatory compliance, suggesting an implicit assumption that these tools can deliver efficiency and clarity in an otherwise ambiguous regulatory landscape. Designed and promoted by consultancies and technology vendors, these systems often obscure the fact that legal reasoning, discretion, and judgment are not reducible to rule-based automation. Similarly, GenAI introduces new interpretive logics that subtly reshape what is accepted as regulatory "truth," thereby contributing to the increasingly well-documented unintended consequences associated with the implementation of regulation [Lenglet et al. (2024)]. Consequently, GenAI and LLM-based systems are likely ill-suited to provide the forms of interpretive work that regulatory practices require.

The case of regtech, once more, offers relevant insights. Organizations such as the London-based trade association TechUK have, for instance, articulated imaginaries that case regtech as a "game-changing" dual-purpose instrument, serving both as a shield against escalating compliance costs and as a sword in the battle against financial crime:

"With technologies such as artificial intelligence, machine learning, robotics, distributed ledger technology and biometrics, RegTech can enable regulatory compliance to become both the sword and shield against economic crime. Such a benefit not only reduces the burden of cost and complexity, but also improve capacities of financial services firms by automating compliance processes" [Challinor (2022)].

Such militarized metaphors subtly shift the framing of compliance from a normative endeavor rooted in morality or fairness, to a competitive contest over technology superiority. Under this narrative, financial firms are encouraged to adopt regtech not to strengthen the integrity of financial markets, but to shield themselves from reputational or legal exposure. The

emphasis shifts from reform or improvement to risk avoidance and reputational containment – a pattern still clearly visible a decade later.

This experience carries a broader warning: increasing reliance on automation and GenAI may amplify systemic risks rather than mitigate them. The opacity of these tools, combined with their tendency to disguise embedded assumptions, introduces new challenges. As the Institute of International Finance (2017) pointed out long ago now, machine learning and AI are now central to key processes such as anti-money laundering (AML) and know-your-customer (KYC) checks. Yet these technologies are frequently adopted without clear standards for data quality, model transparency, or accountability mechanisms. The result is that many firms are encouraged to trust so-called "black-boxed" systems, reducing their own capacity for critical oversight. In this way, automation takes on a life of its own and becomes a self-reinforcing imperative – less a means of improving governance and more an expression of procedural drift and risk avoidance.

These experiences demand a more fundamental rethinking of the role and direction of technology-assisted compliance and regulation. Indeed, what should be the goal of compliance? Can technologies like GenAI foster meaningful shifts in financial conduct, or do they risk reproducing existing norms under the guise of innovation? Might GenAI encourage market actors to approach regulatory texts through discussion and re-interpretation, thereby enabling more dynamic forms of understanding and dissemination? Or conversely, does the growing uptake of such systems reinforce a mode of oversight that is highly technical and opaque, effectively displacing public reasoning and democratic scrutiny?

## 4. What needs to change to enact real change?

If GenAI and other algorithmic technologies are to genuinely transform finance, rather than reproduce its existing configurations, they must enable the emergence of new normative orders. Such a transformation would require more than technical substitution; it demands a rethinking of the foundational principles upon which regulation operates.

Traditionally, financial regulation was grounded in legal hermeneutics: a practice in which compliance officers interpreted abstract legal texts and applied them to real-time, often ambiguous market circumstances. This was not a mechanistic task but a fundamentally creative and situated one: a form of practical jurisprudence, as Lenglet (2021) argues, that generated normative meaning in ongoing dialogue with specific contexts and unfolding events. In this interpretive model, regulation was less about enforcing static rules and more about crafting responsive, context-sensitive solutions in collaboration with market participants: "jurisprudence does not consist in an attempt to recognize rights and duties coded in advance [...] but rather seeks to solve specific problems by expressing the law" [Lenglet (2021), p. 815]. This captures how compliance work historically responded to uncertainty: not by retrieving fixed norms, but by generating them in real time through reflective judgment. It is precisely through direct engagement with the unfolding market event that the compliance officer develops a practical understanding of what is at stake and, in doing so, formulates a normative response that is attuned to the situation: "a normative proposal for acting (juris) prudently" (ibid).

However, this legal-hermeneutic mode of regulatory engagement is increasingly parasited by a regime of computation [Bailey et al. (2023)]. Algorithmic technologies bring with them a normative order based on calculability, not interpretation. Instead of accommodating ambiguity or engaging in normative deliberation, algorithms operate through executable scripts that transform regulation into a series of formalized outputs. In this model, the code itself becomes the norm: pre-structured, automatic, and unyielding. The space for discretion and reflexivity narrows considerably. As a result, regulation shifts from a dialogical and interpretive practice to one embedded in technological systems, where human regulators are sidelined or reduced to supervisory roles, and even then, often cannot fully grasp what they are observing.

This shift has significant implications. Yet regulation is still largely being drafted without adequate recognition of this epistemic transformation – one that cuts to the core of regulatory logic and the very meaning of rule-following. Current frameworks continue to presuppose human agency, while algorithmic systems increasingly generate their own internal logics and obfuscations. In this new regime, the normative order of finance is no longer centered on interpretive human subjects, but on technical artifacts that execute and enforce their own regimes of meaning.

To move beyond rhetorical invocations of disruption and toward genuinely transformative outcomes, regulatory actors therefore must reassert the interpretive and normative dimensions of compliance and regulation. This involves designing oversight frameworks that support human decision making, contextual evaluation, and ethical deliberation alongside technological tools. Regulators should introduce clear standards for algorithmic transparency and traceability, establish procedures for contesting automated decisions, and involve affected stakeholders in shaping regulatory responses. In short, moving beyond the hype means confronting not only what these technologies do, but how they reshape the normative foundations and power dynamics of regulation itself.

## Short summary:

- Algorithmic technologies are heralded as transformative, yet often serve to extend rather than reshape existing financial structures.
- Industry narratives frame AI as transformative while masking institutional continuity.
- Regulation is shifting from human judgment to rule-based automation.
- Tools meant to innovate compliance have largely entrenched existing routines.
- Meaningful change requires transparency, contestability, and normative engagement.

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# Secular shifts

# Private equity:
## Default source of capital for business and preferred asset class for investors?

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## Abstract

This article explores the increasing dominance of private equity as both a source of capital for businesses and a core asset class for institutional and, increasingly, private investors. In the context of ongoing challenges in public markets, including lower IPO volumes and diminished price discovery, PE is also the default financing model for many founders and management teams. Drawing on recent data and market trends, the article contrasts the "inside-out" operational engagement of PE with the "outside-in" constraints of public equity, highlighting the advantages PE offers in strategic alignment, performance measurement, and return potential.

The article also addresses emerging systemic risks associated with PE's expansion. It concludes that while PE offers powerful advantages, it still depends on public markets for exits, benchmarking, and capital recycling. As such, the future of global capital markets lies not in the dominance of one model over another, but in a rebalanced ecosystem where both private and public structures contribute to long-term economic dynamism and investor value.

## 1. Introduction

In Bain's (2025) latest review of private equity (PE), 2024 "can be considered the year of partial exhale" for the asset class.

This qualified comment on the state of PE activity reflects the ongoing challenges that the asset class has experienced in relation to:

- Delivering "exits" (from investments made) and, as a result, the level of distributions made by PE firms (general partners or GPs) to investors in their funds (limited partners or LPs); and
- Raising new funds (potentially from the same LPs deprived of expected distributions) that could then be recycled into new fund investments and transactions.

Despite the challenges of the last two years (in particular higher interest rates and lower leverage levels for buyouts), Bain (2025) highlights a 37% uplift in new buyout value in 2024 versus prior year and a 24% increase in exit value.

**Note:** In this article, "private equity" refers to venture capital, growth equity and buyouts. "Private markets" includes other alternative assets such as private credit, infrastructure, real assets.

More relevant are two longer-term trends:

1. The value of global buyout assets under management has grown at 11% per annum over the last 20 years to almost $5 trillion [Bain (2025)] which, added to a further $5 trillion of venture and growth equity, approximates to $10 trillion for PE as a whole.
2. LPs current 8.3% target allocation to PE is 2 percentage points higher than it was 10 years ago [Edlich et al. (2025)].

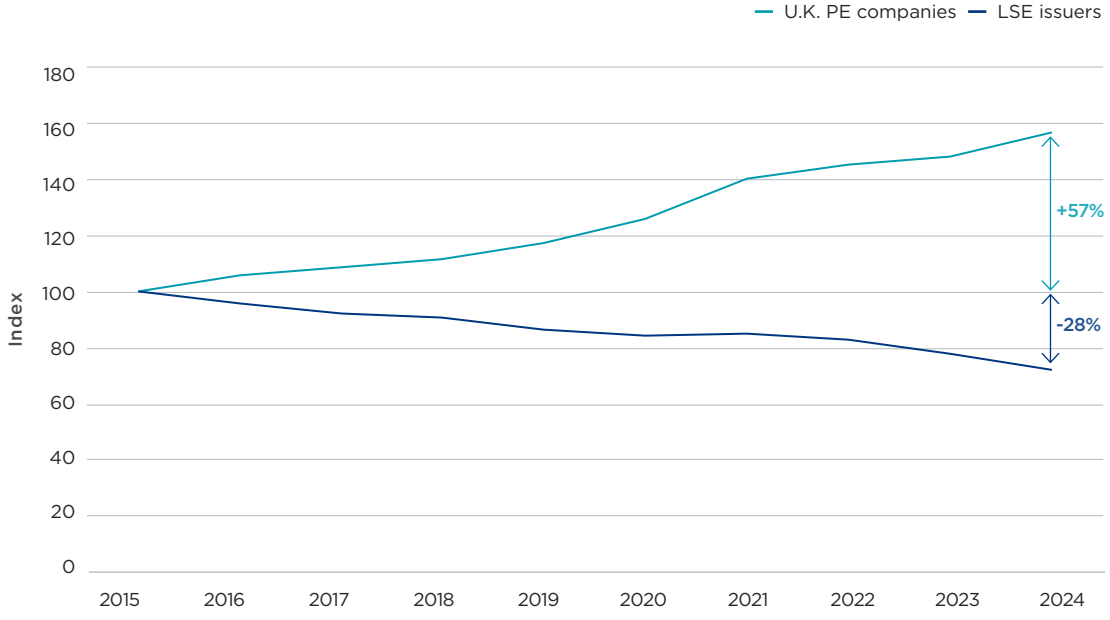
Public markets have also faced extended challenges in recent years – particularly in terms of IPO proceeds, which, on a global basis, were down 9% on 2023 [Newman et al. (2024)].

In London, the "Jurassic Park" tag applied to the London Stock Exchange in 2021 remains appropriate not because of the exchange's credibility or regulatory framework but rather the depth, composition and conviction of active investors. If this does not change, then the regular delistings (mostly from PE-sponsored bids but also venue changes and some companies simply choosing to cancel their public listings) will eventually kill the market for smaller and growth businesses.

Figure 1 shows the relative growth in numbers of U.K. companies under PE ownership versus the decline in public companies on all the London Stock Exchange's market segments over the last ten years. While specific to the U.K. (where PE is very evolved), the trends have relevance to all markets.

This article highlights the practical reality that, as a mechanism, PE is already the default choice of capital for founders and managers of businesses (where relevant to the business and the team). It also proposes that the breadth and depth of investors seeking to allocate to PE is growing beyond the traditional LP investor base, so all investors are considering this as a default portfolio choice.

**Figure 1:** U.K. PE portfolio companies versus London Stock Exchange issuers – year end net company count % change




**Source:** Wyvern Partners research

By way of roadmap, we consider reasons why:

1. For many companies and management teams, the PE model is a superior financing model to the public markets (accepting that not all PE firms are attractive)
2. Investors are compelled by the nature of the supposedly illiquid returns (accepting returns dispersion levels are high so not all PE funds deliver above market returns)
3. There are potential risks emerging in the PE model that could become systemic
4. The public markets should complement PE.

## 2. PE is the preferred source of equity capital

As is the case for all sources of investment, PE is a world of unrequited love, where "have nots" definitively outnumber the "haves."

However high the desire might be for PE backing, the many filters to complete an investment are challenging and subjective, which can lead to worthy businesses and management teams failing to convince PE investors.

Inter alia, the "have nots" may not pass the bar because:

- Management or their business is deemed unsuitable for investment or unlikely to be able to drive the growth in value that will satisfy the PE investor's return aspirations
- The investment does not fit with the GP's portfolio criteria
- The GP is busy with another deal
- The fund is reaching the end of its investment stage and there is a need for a final, very specific, transaction to round off the portfolio
- The right GP is not identified out of the myriad of GPs in existence but often hard to find.

Filters also include minimum transaction size that (venture capital aside) is often a challenge for small businesses. This may be because their equity need is not sufficient for the particular fund that needs to spend its "dry powder" (money committed by investors but not yet deployed) at speed and across a limited number of businesses to ensure that the PE firm's team can devote sufficient time with the business through to exit.

As allocations to PE continue to grow, this is likely to create a gap in available equity capital for many excellent businesses and management teams. If PE cannot assist, it is highly likely that public markets, focused on businesses in which institutional investors can take a meaningful stake, will be even less accessible. At this point, equity capital choices are almost nonexistent.

In contrast, for the "haves" the availability of PE support has many advantages for management teams as opposed to public markets:

- **Direct engagement** with a single, active and highly informed investor able to support a plan focused on creating mid- to long-term capital value
- **Step-change follow-on equity** dependent on a single decision at speed versus a public market process with potential sourcing and approval requirements
- **Remuneration** without external scrutiny
- **Equity participation/incentivization** structured to drive targeted equity upside assuming base returns are achieved for the PE investor.

- **Removal of external distractions** from intrusive media attention and a diverse shareholder base potentially with a limited understanding of the business and its business plan
- **Meaningful reduction in overheads** without the need for public company regulation/advisers
- **Freedom to make fundamental business changes** without a daily market price being a consideration
- **The absence of a market valuation** where price formation is driven by external market sentiment, liquidity, and shareholder base composition.

The periodic need for a formal liquidity event to return capital to investors (via a sale of the business to a strategic buyer, another PE firm/continuation fund, refinancing or IPO) provides two useful disciplines that are absent in public companies.

Firstly, it provides management with a performance report card, i.e., a checkpoint as to whether the investment has been successful, whereas public companies have no such specific timelines. A public company CEO may have driven great results over years and a growth in market value but an external shock triggering a "correction" in market values could wipe out years of apparent value creation.

The second is a forced re-visit of the business' strategy, which, in a world of continuous and rapid change, should be a prerequisite if the business is to be fit for the next stage of its evolution. Fundamental "re-boots" like this are hard to implement in public markets where linear change is favored so as not to pollute the market perception and valuation.

## 3. Preferred asset class for investors – "inside out" versus "outside in"

### 3.1 Inside out

One of the distinguishing features of private equity as an investment model is the proximity of investors to the operational heartbeat of the businesses they support. Unlike public equity investors who engage at a distance, PE firms operate from the "inside out." Their relationship with management teams is direct, intensive and, ideally, collaborative. This proximity allows PE investors to become deeply informed stakeholders. They are privy to real-time performance data, strategic decision-making processes, and internal challenges. Such access leads to a far more nuanced understanding of the business than any publicly available data could ever provide.

Because they sit alongside management at the board level, PE investors are in a position to influence and support the execution of long-term strategies, capital allocation decisions, and key hiring. Their role extends beyond mere capital provision. They are ideally strategic partners with a clear interest in value creation. This level of operational engagement is not only a differentiator but also a potential driver of outsized returns. It creates a feedback loop between strategy, execution, and oversight that few public investors can replicate.

### 3.2 Outside in

Public company investors operate from the outside looking in. Their view of the business is largely restricted to quarterly or semi-annual earnings reports, investor presentations, and public disclosures. While activist investors may seek more direct influence, the average institutional or retail investor must rely on the

board of directors to relay concerns or suggest change. This structural distance means that most public investors are less likely to fully understand the nuances of strategy, performance, or internal challenges.

As a result, their ability to assess value or influence direction is inherently limited. Even large shareholders can find themselves frustrated by a lack of responsiveness or agility from public company boards. The weight of regulation, the caution of listed company governance, and the dilution of shareholder voices in a dispersed ownership model all constrain effective engagement. Public company non-executive board members are guardians of the interests of all stakeholders, which limits their capacity to contribute to value creation (unlike private companies where governance is a fundamental responsibility but active assistance in value creation is also, rightly, encouraged).

## 3.3 Control

Irrespective of whether or not PE has a majority or minority shareholding, investor "protections" provide multiple levels of control/involvement. These usually become more prominent if there is a deviation from the original business plan, and particularly when new money is needed. These protections enable the investor to take practical steps to safeguard the investment whereas in the public markets, other than voicing concerns and perhaps seeking shareholder backed changes, the only real option is to "vote with your feet" by selling out and moving on. This is total defeat and may crystalize into a loss.

## 3.4 Liquidity and price discovery

Bankers and brokers often promote the benefits of public market liquidity (technically the ability to sell your shares without disturbing the price of the traded securities) and genuine price discovery (the "true" market price for a company as determined by what investors are willing to pay for the relevant securities). If this was what public markets offered investors, then this would offer a clear differentiation with the theoretical fund-driven illiquidity of PE, but (with some exceptions) this is simply not the case.

Firstly, there is confusion as to how to measure liquidity. The London Stock Exchange is reported to have recently circulated a discussion document entitled "Mythbusting – UK vs US", which argues that its liquidity levels (defined by volumes) and price discovery (more about relative valuations rather than whether they are correct) are equivalent to the U.S. exchanges. The subject matter is about choice of venue (London versus New York) not addressing our question as to whether investors can access liquidity in its purest form in public markets and whether the market price is a true reflection of a business.

The answer, not surprisingly, is mixed. Can an investor sell down its shares against a market price? Yes, of course, subject to how much is being sold as a percentage of the shares in issue and/or the total size of the trade. Then there is a need to consider the trading volumes in the specific security alongside shareholder concentration and identity. The more diverse and widely held the shareholder base is, the better the theoretical liquidity would be. If any one investor owned a meaningful minority shareholding, this would probably need to be placed by a bank acting for the seller rather than pressing the "sell" button on a screen.

The liquidity challenge is most obvious in smaller companies with founder shareholders holding high percentages of their business. This results in low liquidity, often coinciding with small sales of shares depressing the price of the business, in turn meaning that raising new capital (the reason for obtaining a public quote in the first place) is virtually impossible. The easiest way out is to sell the company (often to PE) who

may be able to make an offer that is better than what shareholders could ever hope for within an acceptable timeframe (at a substantial premium to the market price) but still compelling for the PE model.

The average U.K. public market bid premium in 2024 was 45% (down from 61% in 2023) [Ashurst (2025)] which, even allowing for a control premium and any leverage used by PE, suggests that price discovery in public markets can be very poor.

In the PE market, the liquidity narrative is being reframed, driven by growing demand for the asset class and also, most recently, by the need for liquidity events for the traditional LP market.

While PE investments remain illiquid relative to public equities, secondary markets have grown significantly. There are now deep, institutionalized secondary markets for PE fund interests, allowing LPs to manage their portfolios dynamically. This has created optionality and flexibility previously unavailable, further enhancing PE's attractiveness.

Even as the U.S. tariff announcements disrupted public markets in April, Carlyle announced a new $4 billion fund to provide PE liquidity through NAV-based and asset-backed financing solutions.

Assuming this trend continues, then the often-cited illiquidity of the asset class will have less relevance.

## 3.5 Fees

A discussion with LPs in PE funds inevitably touches the sensitive subject of PE management and carried interest fees, particularly for large funds where the annual fee can often appear disproportionate to the GP's operating cost base and the potential for life-changing capital gain via carried interest triggers highly emotional Shakespearean "green eyed" reactions.

Some market observers and the media relish the opportunity to focus on the apparent inequity of PE incentives, but, unlike the "fat cat" debate in public companies, LPs are offered a judgment call that focuses on whether net returns after fees from PE remain attractive on a risk adjusted basis. Should a fund fail to deliver compelling investor returns, then Darwinian principles apply and the fund may not raise any more funds in the future.

Given the widely-held view that IPO costs are very substantial, alongside ongoing public company related costs, it feels reasonable to conclude that investors need to take a view on one model or the other and hope that increased competition for future investment in PE, as it becomes increasingly mainstream, may reduce fees.

## 3.6 Returns dispersion

The dispersion in returns between top and bottom quartile PE funds (22-2%) remains high [JP Morgan (2025)]. For investors, this makes manager selection critical. However, for those with access to the best GPs, the return premium is considerable. This reality further cements PE's place as a high-conviction asset class for sophisticated investors.

## 3.7 PE offers diversity of size and value opportunity

With public market investors largely closed to smaller founder-led businesses (as discussed above), investor exposure to growth businesses is most easily achieved through PE and many of the larger GPs have sought to offer investors a mix of early stage, growth and buyout opportunities as a "one stop shop."

The typical 10-year fund life enables investors to access returns across the economic cycle and allocate as they wish to specific transaction types and GPs with specific sector expertise.

### 3.8 Asset prices

PE's influence on asset prices is also reshaping the broader investment landscape. Take-private transactions, PE-led consolidations, and bidding wars for quality assets have become common. In many sectors, PE buyers are now the marginal price setters, often willing to pay a premium due to synergies, longer time horizons, or operational value-add capabilities, not just leverage as often observed.

This dynamic feeds into a perception of PE as a strategic and intelligent allocator of capital that may conflict with historic academic observations that PE is only a temporary steward of a business given the "pass the parcel" nature of secondary buyouts. The implication that the "true" value of a business may only emerge once the business has left PE ownership is hard to agree with given the volatility of public markets and the fact that public to private transactions are "business as usual" deals.

### 3.9 Democratization

New regulatory initiatives and fund structures are continuing to democratize access to PE. Fund managers are opening PE to broader investor bases, in particular HNWIs and the mass affluent. While this introduces new risks around suitability and liquidity management, it also confirms the asset class's transition into the financial mainstream.

### 3.10 Portfolio construction

Looking back, the trusted 60/40 equities/bonds portfolio allocation strategy has been challenged in recent years inter alia by geopolitical uncertainty that shows no sign of easing. The case for allocating to alternatives (PE alongside other private market asset classes) to provide diversification is clear. Over a 20+ year perspective, this adjustment would have typically reduced volatility and increased returns [JP Morgan (2025)].

Within the alternatives space, PE total returns would have exceeded all other alternatives by a significant margin but it remains a small component of the wider alternatives world. See Table 1.

## 4. Default choice of private equity and wider risk considerations

As management teams and investors continue to embrace the PE model, scrutiny will increase as to knock-on effects.

### 4.1 Brain drain

One risk is the "brain drain" from public markets. As more capital and talent flows into PE, public companies may struggle to attract and retain experienced executives in sharp conflict with the historic view that being the CEO of a public company was the pinnacle of executive recognition. Part of the solution will be to increase incentives for public company management to sit more in line with the U.S., but this will need "old world" public company investors to reverse their approach to pay. Failure to stem the brain drain at the executive and non-executive level may result in a deterioration of governance, innovation, and performance in listed companies.

### 4.2 Layered leverage

Leverage is assumed to be a feature of every PE transaction but is, of course, most relevant to buyouts as opposed to growth and venture deals.

What constitutes a "leveraged buyout" is in the eyes of the beholder – but likely starts when debt represents 50-60%+ of the transaction value in a specific investment. Highly leveraged transactions may carry a greater risk of potential distress but generalizations can be misleading.

The term "layered leverage" refers to the use of debt more widely by participants in the PE world and may, over time, be the most relevant risk to

**Table 1:** Headline investment considerations: PE LP versus public equities investor

| Consideration | Private Equity | Public Equities |
|---|---|---|
| **Investment Choice** | • Access to full corporate life cycle (early stage to mature) via different PE fund allocations<br>• Capital gain focus – likely no dividends<br>• GP may offer relevant specialist support to management teams | • Mature and some growth businesses constitute likely investment universe<br>• Subject to specific policy may offer recurring dividend and capital gain<br>• Reliance on company management alone |
| **Proximity & Information** | • GP in close proximity to portfolio business with real time data available<br>• LP periodically updated by GP | • Investor provided with public market disclosures only enabling freedom to trade<br>• Company reports periodically unless required by specific event |
| **Control** | • GP has high level of control over company<br>• LP has direct relationship with GP but bound by overall fund mandate<br>• GP performance determines opportunity for "next fund" | • Investor may have influence but not control<br>• Board determines strategy<br>• Only recourse for investor is to sell shares |
| **Price Discovery** | • Focus is on purchase at price that allows delivery of target returns against future exit value<br>• Interim internal valuation is periodic and likely lags financial performance and external events | • Market-driven valuation may have limited bearing on intrinsic value<br>• Valuations are assumed to be live (per market price) and accurate<br>• Influenced by passive fund flows – positive and negative |
| **Liquidity** | • 10 year + fund life with average hold periods for portfolio investments often 5+ years<br>• GP and LP led secondary market liquidity an option albeit at a cost | • Market liquidity available<br>• Relevant for smaller trades where true liquidity exists but price may not reflect intrinsic value<br>• Larger trades likely require bank to manage block trade |
| **Risk** | • Higher leverage amplifies returns but capital will likely blend preference shares and ordinary shares to mitigate risk and align management upside<br>• Portfolio rather than single company risk | • Lower leverage than PE usual<br>• Portfolio choice made by investor<br>• Market risk continuously impacts irrespective of company performance |
| **Costs** | • Fees on fund commitment<br>• Agreement to management incentive plan "costs" and GP carried interest | • Trading costs only |
| **Returns** | • High levels of returns dispersion but generally outperforms public equities | • Lower levels of returns dispersion and typically delivers lower absolute returns than PE |

the asset class. Specifically, this is debt being used alongside equity to make investments into funds and in the secondaries markets, e.g., the growth in NAV loans in 2024.

Layered leverage can be used to amplify returns but also risks amplifying losses.

### 4.3 Conflicts

Potential conflicts of interest abound in PE: GPs may prioritize IRR (internal rate of return) over long-term value creation; secondaries may be executed in ways that benefit the manager rather than the LPs; valuation marks can be subjective. Robust governance and transparency mechanisms are essential to mitigate these risks.

### 4.4 New investors

As PE becomes mainstream, a broader contingent of investors is entering the market including individuals.

Pension funds, insurance companies, and private investors bring different expectations and liquidity needs. The challenge for GPs is to manage this influx without compromising the long-term orientation and bespoke structuring that defines PE.

## 5. Conclusions: rebalancing the public and private markets

PE has evolved from a specialist corner of the financial markets into a central force in global capital allocation.

This article has argued that PE is no longer simply one option among many. It has become, for many founders and management teams, the default source of growth and transformation capital.

The appeal of PE lies in its flexibility, strategic alignment, and capacity to act decisively. Its "inside-out" investment model fosters close engagement, targeted performance, and capital structures tailored to value creation. By contrast, public markets, constrained by regulatory burdens, short-termism, and increasingly passive capital flows, often lack the responsiveness and conviction required to nurture long-term business transformation.

Nevertheless, PE cannot operate in isolation. It requires functioning public markets for credible exit routes, valuation benchmarks and, at scale, sources of permanent capital. As such, a symbiotic relationship is essential. Robust public markets are not just a useful complement, they are a prerequisite for the healthy operation of private market models. Note also that a number of very prominent PE firms are themselves public companies.

Risks remain and may grow. The layered leverage in PE and new investor profiles bring complexity and systemic concerns. Moreover, the declining vibrancy of public markets, particularly in the U.K., poses long-term structural questions for the capital formation ecosystem as a whole.

Going forward, success will depend on the ability of both public and private capital models to adapt. Public markets must renew their relevance, particularly for smaller and innovative companies, while private equity must balance scale with flexibility, and transparency with performance.

The path is not one of exclusion but of integration. If capital markets can evolve to reflect the strengths of both systems, then PE's rise need not be at the expense of public markets. Instead, it can help usher in a rebalanced financial architecture – one that is fit for disruptive times and capable of delivering both economic growth and investment resilience.

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# The evolving secondary market:
## An integral part of the private markets ecosystem

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## Abstract

Secondary markets for private assets have evolved from a niche liquidity outlet to a cornerstone of modern private-markets investing. Global secondary transaction volume reached a record $162 billion in 2024 – up 45% year-on-year and now representing roughly one-fifth of all private-equity exits. This expansion has been fueled equally by traditional LP-led portfolio sales and the rapid rise of GP-led continuation funds, which alone accounted for about half of 2024 volume. Alongside these deal structures, fund-level NAV-based lending and a new generation of digital trading platforms are broadening access and compressing execution timelines, while a surge of fresh capital – from large institutions to semi-liquid retail vehicles – has deepened market liquidity.

Regulatory reforms on both sides of the Atlantic aim to standardize processes, enhance valuation transparency, and safeguard investors, even as they introduce new governance requirements. For investors, the maturing secondary ecosystem now offers strategic tools to actively manage portfolio liquidity, recycle capital, and extend ownership of high-performing assets. Yet challenges remain: pricing still hinges on volatile NAV discounts, information asymmetry persists, and deal execution can be complex. Mastery of these dynamics is therefore essential for any institution seeking to optimize risk-adjusted returns in an increasingly interconnected private-markets landscape.

## 1. Introduction

Secondary markets in private assets – once a niche mechanism for offloading unwanted fund stakes – have matured into a vibrant, global marketplace. Investors in private equity, private credit, and infrastructure funds are increasingly turning to secondary transactions to manage liquidity, adjust portfolios, and unlock value from illiquid holdings. Innovations such as general partner (GP)-led continuation funds, net asset value (NAV) lending facilities, and dedicated secondary trading platforms are reshaping how institutional investors approach liquidity and risk management in these asset classes. This article provides an in-depth analysis of how secondary markets are evolving from the periphery to the core of private market investing. They provide a crucial linkage between the traditionally illiquid world of private assets and the need for flexibility among investors.

# 2. Global growth of secondary markets

## 2.1 Rapid expansion

The global secondary market for private assets has experienced explosive growth in recent years, repeatedly shattering volume records. According to BlackRock (2025), in 2024, secondary transaction volume reached an all-time high at $162 billion. This marked a 45% surge from 2023's levels, far outpacing growth in primary private markets. To put the scale in perspective, 2024's volume eclipsed the previous peak of $132 billion set in 2021 and showed a 17% CAGR since 2013. The secondary market's momentum continued into H1 2025, with industry leaders predicting yet another record year on the back of robust supply and demand dynamics, fueled by increased investor demand, rising interest in liquidity solutions, and favorable pricing dynamics.

This burgeoning volume has been driven by growth in both traditional limited partner (LP)-led secondaries and GP-led transactions (such as continuation funds). In 2024, roughly half of secondary activity was GP-led [Lazard (2025)], indicating how mainstream these sponsor-initiated deals have become. GP-led deals have become increasingly prevalent due to their flexibility, allowing sponsors to extend investment periods for high-performing assets, offer liquidity to investors, and maintain strategic control of investments. GP-led deals surged in 2024 to $75 billion, while LP-led portfolio sales grew to $87 billion [BlackRock (2025)]. This represents a structural shift: what began as a liquidity outlet of last resort has evolved into a standard tool for private equity value realization. Indeed, in 2024, secondaries comprised circa 20% of global PE exit volume – up from 10-year average of circa 10% [Lodge et al. (2025)]. In other words, secondary processes are now a significant part of how GPs exit investments, alongside trade sales and IPOs.

## 2.2 Global participation

The secondary market's growth has been a global phenomenon, although centered in North America and Europe. Data from 2024 surveys show that North America-focused assets accounted for 66% of LP-led deal volume, with Western Europe around 30% [Lazard (2025)]. Asia's share remains modest (on the order of 4%), but Asia-Pacific secondary activity is rising steadily. Emerging hubs such as Hong Kong and Singapore are developing as key venues for secondary transactions in Asia. Notably, infrastructure secondaries have grown in relevance in Asia as institutional portfolios mature. The Middle East's large sovereign wealth funds are also increasingly active as both buyers and sellers in the secondary market, though their share is still relatively small (e.g., SWFs were ~1% of sellers in one recent survey). Overall, the deepening of secondary market activity across regions suggests a more connected global marketplace, with major financial centers – New York, London, Hong Kong – all hosting dedicated secondary investors and advisors.

## 2.3 New entrants and capital supply

A striking development is the "democratization" of the secondary market's capital base. Whereas a decade ago buyers were mainly a handful of specialized secondary funds, today a much wider array of investors is providing liquidity. Large asset managers, pension funds, insurance companies, and even retail channels have entered the fray. Peter Orszag of Lazard (2023) notes the influx of "new entrants, retail capital flows, and continued fundraising success" creating a deeper pool of secondary buyers. In fact, secondary dry powder (committed capital awaiting deals) hit a record ~$216 billion by end-2024 and more than 80% of secondary firms plan to raise even more capital in 2025 [BlackRock (2025) and Lodge et al. (2025)]. An important portion of this growth comes from semi-liquid vehicles targeting wealth channels – for example, U.S. '40 Act funds (interval

and tender-offer funds), European ELTIFs, and U.K. long-term asset funds that allow high-net-worth and retail investors to access secondaries. BlackRock (2025) reports that an "influx of retail capital, primarily through semi-liquid vehicles ('40 Act, ELTIF, LTAF, etc.), has introduced a new and influential source of capital on the buy side, reshaping how transactions are marketed and transacted." In 2024, these semi-liquid funds accounted for nearly one-third of all secondary fundraising – a remarkable sign of broadening investor participation.

From a macro perspective, the secondary market's growth has outpaced other exit routes. During 2022–2023, when IPO and M&A activity slumped, secondary volumes dipped only modestly, then rebounded strongly [Blair (2024)]. Even in healthier exit markets, secondaries are taking a larger share of liquidity. In 2024, secondary transactions represented 20% of global private equity exit volume (by value), double the historical average of ~10% [Lodge et al. (2025)]. These trends underscore that secondaries are no longer an adjunct to private markets – they are becoming integral to the ecosystem, providing a release valve for liquidity and a strategic tool for investors worldwide.

## 3. Innovations in liquidity: continuation funds, NAV-based lending and dedicated platforms

A defining feature of the secondary market's evolution has been the rise of innovative structures that provide liquidity beyond the simple sale of LP fund stakes. Important innovations are GP-led continuation funds, NAV-based lending facilities and the rise of dedicated secondary market platforms. These tools have expanded the menu of liquidity and financing options available to general partners (GPs) and limited partners (LPs) alike.

### 3.1 GP-led continuation funds (secondary fund recapitalizations)

Continuation funds – sometimes called GP-led secondaries or fund recapitalizations – have moved to the forefront of private markets. In a GP-led secondary, a fund's GP sponsors a new vehicle to purchase one or more assets from an existing fund, giving existing investors the option to sell for cash or roll their stakes into the new entity. This mechanism effectively "continues" ownership of prized assets under a new timeline and often with fresh capital. It solves a fundamental problem in closed-end private funds: how to extend the holding period of high-performing assets beyond the typical 10-year fund life, while still providing liquidity to investors who need an exit. According to Peter Orszag, Lazard CEO, continuation funds have proven "elegant in their simplicity – new capital replaces old, while expertise remains constant" [Lazard (2025)].

#### 3.1.1 Growth and prevalence

The use of continuation funds has exploded. GP-led secondary volume hit $75 billion in 2024, nearly half of total secondary market volume. Surveys indicate there were dozens of GP-led processes each quarter, ranging from single-company deals to multi-asset fund spinouts. The share of single-asset deals has also grown, now comprising almost half of GP-led transaction count in recent periods. What was once an exotic, conflict-ridden idea is now mainstream – by 2024, 34 North American and 20 European managers completed their first-ever continuation fund transactions, highlighting how GPs across the spectrum are embracing this tool [Dawkins (2025)]. Market observers predict continuation vehicles could account for 20% or more of all GP exit events in coming years.

### 3.1.2 Strategic rationale

For GPs, continuation funds offer flexibility in exit planning. Rather than selling a stellar asset to a competitor or rushing an IPO, the GP can retain control and drive further growth, often alongside a supportive secondary investor as a partner. This became especially valuable in recent years when traditional exits were challenged. During those periods, continuation funds provided a "liquidity tool" to bridge the gap. They also allow GPs to resolve end-of-fund timing issues: if a fund is nearing term but still holds a winner, a GP-led secondary can deliver liquidity to legacy LPs (who may be at or beyond their expected fund duration) while giving the GP and rollover investors more time to maximize value. An added benefit is that debt financing for the asset often remains in place through the transfer, avoiding the need to refinance in a potentially unfavorable market.

### 3.1.3 LP considerations

From the selling LP's perspective, a well-structured GP-led deal can be a win-win: they get an option to cash out at a fair price or continue with the asset if they believe in its upside. However, the inherent conflict of interest – the GP is effectively both seller (for existing fund) and buyer/manager (of the new fund) – has drawn regulatory attention. In the U.S., the Securities and Exchange Commission (SEC) has stepped in with new rules. In August 2023, the SEC adopted a requirement that any "adviser-led secondary transaction" (i.e., GP-led deal) by an SEC-registered fund manager must obtain a third-party fairness opinion or valuation opinion and provide it to investors [Mackenzie (2024)]. The intent is to ensure the transaction price and terms are fair to the selling fund's investors, aligning with best practices that many in the industry had already started to implement. This SEC rule, part of a broader private fund transparency initiative, reinforces the need for robust process and disclosure in GP-led secondaries.

### 3.1.4 Case example

Pollen Street Capital structured a $1 billion single-asset continuation vehicle to purchase its stake in Markerstudy Group (a U.K. insurance company), which was concurrently exploring an M&A exit [Le (2023)]. The novel deal, co-led by three secondary buyers, allowed Pollen Street to secure liquidity for existing investors while still participating in Markerstudy's future growth via the new fund. Such creative uses of continuation funds demonstrate the increasingly sophisticated options GPs have to manage exits [Le (2023)].

## 3.2 NAV-based lending (fund-level credit facilities against portfolio NAV)

Another major innovation is the rise of NAV-based lending, also known as asset-backed fund financing. Unlike traditional subscription credit lines (secured by LP capital commitments), NAV facilities are loans secured by the net asset value of a fund's portfolio – essentially, borrowing against the equity value of the underlying private investments. These loans provide GPs with liquidity for their funds without immediately selling assets. NAV loans and preferred equity deals have emerged as flexible tools for GPs to generate liquidity for LPs, fund follow-on investments, or bridge the timing of exits. The increased liquidity through NAV lending has significant implications for market dynamics, including enhancing transparency, enabling more efficient pricing, and altering investor expectations by creating conditions akin to those found in public markets.

### 3.2.1 Growth trajectory

The NAV financing market has grown remarkably fast alongside the boom in GP-led secondaries. One fund administrator [Citco (2025)] reported a 30% compound annual growth rate in NAV facilities from 2019 to 2023 among its clients [With Intelligence (2025)]. By mid-2024, the estimated volume of outstanding NAV loans had reached around $150 billion, and S&P Global forecasts this

could double to $300 billion by mid-2026 [With Intelligence (2025)]. These figures underscore that NAV lending – once a fringe strategy – is now becoming a major adjunct to the secondary market, effectively increasing the pool of capital available to manage liquidity in private funds. The growth in NAV lending stems in part from the sheer growth in private equity NAVs (over $3 trillion of unrealized value in PE funds globally), and the desire to avoid selling in a challenging market. During the recent dealmaking slowdown, many GPs preferred to borrow against assets rather than sell at a steep discount, especially if they had confidence in the assets' long-term value.

### 3.2.2 Strategic rationale

NAV loans are typically employed for several strategic purposes: (1) LP liquidity – a fund can take a NAV loan and use proceeds to finance LP distributions (thus providing liquidity without an asset sale), essentially pulling forward some exit value. (2) Offensive capital – GPs use NAV credit to fund follow-on investments or add-on acquisitions for portfolio companies, aiming to drive growth and higher eventual exit proceeds. (3) Bridge to exit – if an exit is anticipated in a year or two, a NAV facility can provide interim cash that is then repaid once the sale closes. In private credit funds, NAV facilities might finance new loan origination when fresh capital is scarce or facilitate a fund restructuring/roll-up akin to a continuation vehicle. The flexibility is a key attraction.

Crucially, NAV financing has enabled some GP-led secondary deals to be structured in creative ways. For example, a continuation fund deal may combine equity from secondary buyers with a NAV loan or preferred equity injection, thereby requiring less new equity capital and aligning incentives (debt can be serviced by portfolio cashflows, while equity holders retain upside). This was seen in various 2023 continuation funds where rather than selling a large stake outright, GPs raised a smaller amount of equity and some debt against the assets to provide the desired liquidity.

### 3.2.3 Challenges and risks

While useful, NAV loans introduce leverage at the fund level, which elevates risk if not managed properly. Some in the industry have cautioned against using NAV borrowing simply to return capital to LPs, as it could magnify losses in downturns. Regulators have noticed as well. Under the new AIFMD II in Europe, for instance, leverage limits are being imposed on funds (notably private credit funds) to mitigate systemic risk. AIFMD II will cap leverage for open-end alternative investment funds (AIFs) and restrict lending by funds to prevent daisy-chains of fund-level debt. These rules indirectly affect NAV loans by constraining how much leverage a manager can introduce. Nonetheless, when used prudently, NAV facilities are seen as a permanent addition to the toolbox. Industry experts now view NAV loans structures as mainstream fund finance solutions, not signs of distress. In fact, one survey of institutional investors found a growing acceptance: by 2025, many LPs "view options like NAV loans as both GPs and LPs seek liquidity" in an evolving market [Diehl et al. (2025)].

### 3.2.4 NAV financing versus secondaries

It is important to note the interplay between NAV-based lending and outright secondary sales. They are sometimes alternative options to achieve similar goals. For example, if an LP wants liquidity, the GP might either facilitate a secondary sale of that LP's stake or borrow against the fund and distribute cash to all LPs. Which route is chosen depends on pricing, urgency, and fund strategy. We often see in practice a combination: a GP could use a NAV loan to offer a partial payout to all investors, and simultaneously run a secondary process to replace investors who

want a full exit (the loan reducing the amount of new equity required). Both avenues ultimately enhance liquidity in private markets, blurring the lines between traditional secondaries and private credit solutions. The bottom line is that innovation in secondary markets is not limited to trading fund interests – it encompasses financial engineering at the fund level to unlock liquidity while managing risk.

### 3.2.5 Case example

A mid-market European private equity fund in 2024 sought to provide liquidity for its LPs amid a stalled M&A environment and tightening financing conditions. The GP orchestrated a dual-track strategy: it arranged a €75 million NAV loan from a private credit provider to fund a partial distribution to all LPs, while concurrently launching a structured secondary sale process to replace LPs seeking a full exit. The fund bundled three core assets – each with robust performance history but uncertain short-term exit paths – into a continuation vehicle, which was capitalized with €200 million from two secondary buyers. The NAV loan covered 40% of the vehicle's value, reducing the equity ask and accelerating deal closure. This blended approach enabled the GP to deliver immediate cash, retain growth potential, and optimize pricing while giving investors choice in participation. It also showcased how NAV financing and secondary sales can be combined creatively to solve liquidity challenges without compromising strategic control.

## 3.3 Dedicated secondary market platforms

The rise of dedicated secondary platforms is transforming the way private market assets are traded. These platforms are blurring the lines between public and private markets by offering increased visibility, access, and ease of transaction. This includes innovations such as blockchain-enabled marketplaces, digitalized fund units, and real-time pricing tools, which collectively enhance transparency and reduce friction in secondary deal-making. These developments not only improve operational efficiency but also shift investor expectations closer to those associated with public equities, thereby reshaping liquidity dynamics in private markets.

As secondary transaction volume has grown, so too has the infrastructure supporting these markets. Historically, secondary trades were arranged bilaterally or via brokers in a relatively opaque manner. Today, dedicated secondary market platforms and digital innovations (including blockchain-based solutions) are improving market access, efficiency, and transparency.

A number of fintech platforms and exchanges have arisen to connect buyers and sellers of private market interests. These range from online marketplaces for LP fund stakes to exchanges for private company equities. For example, platforms like Palico, SecondMarket/Forge, and Nasdaq Private Market have provided venues for LPs to list fund positions or for shareholders of pre-IPO companies to sell equity. Within fund secondaries, some sponsors have also created internal secondary windows for their investors. For instance, several leading private equity platforms allow their feeder-fund investors to trade units on a periodic basis (e.g., Moonfare, a fintech platform, offers quarterly liquidity events where members can sell their fund stakes to others on the platform). These initiatives bring a measure of marketplace functionality to an otherwise illiquid asset class.

Even incumbents are leveraging technology; major secondary advisors and investment banks host auction processes via secure online data rooms, where dozens of bidders can evaluate portfolios simultaneously. This digitalization has accelerated deal timelines – what once took

many months can sometimes price in weeks if there is enough data transparency for buyers. Furthermore, new software tools are helping match buyers to specific assets; for example, AI-driven analytics can parse portfolio compositions and recommend potential buyers based on their preferences and past behavior (though adoption of AI in secondaries is still nascent).

### 3.3.1 Transparency

A persistent challenge has been the lack of real-time pricing data for private assets. However, as more transactions flow through platforms, a pricing database is slowly being built. Some firms publish secondary market indices indicating average discount levels for recent trades. For instance, secondary market pricing for diversified buyout fund stakes averaged around 85% of NAV in 2023, rising to the high-80s by late 2024 – data that was once closely guarded is now often shared in quarterly reports and even media commentary [BlackRock (2025)]. This enhanced transparency is attracting new participants who previously might have been wary of secondaries. In 2024, 40% of secondary sellers were first timers, a sign that more investors now trust they can get a fair price in the market [Lodge et al. (2025)]. Dedicated platforms contribute to that trust by providing standardized processes and broader reach for finding the highest bidder.

That said, secondary market pricing still requires expertise to navigate. Valuations are based on last reported NAV (often lagged by a quarter) plus analysis of the underlying companies. Information asymmetry remains; buyers with superior insight or modeling capabilities can identify mispriced opportunities, and sellers with limited market knowledge might accept a deeper discount than necessary. As one white paper notes, the secondary market (especially in private credit) is characterized by "information asymmetry and limited liquidity," creating opportunities for skilled investors to capitalize on mispricing. Technology is gradually chipping away at these asymmetries – for example, some platforms use blockchain to verify fund performance data and share it securely with vetted buyers, instilling confidence.

### 3.3.2 Case example

Apollo Global Management announced plans to build a full-fledged private credit marketplace in partnership with banks, exchanges, and fintechs [Bloomberg (2025a)]. This open-architecture platform aims to provide real-time information, indicative pricing, and syndication capabilities for private credit deals, marking a major step toward liquidity and standardization in an otherwise bespoke asset class. While still in development, the initiative demonstrates Apollo's commitment to making private markets more accessible, efficient, and transparent [Armstrong et al. (2025)].

## 3.4 Opening to retail investors

Regulators on both sides of the Atlantic are cautiously supporting the opening of private markets to non-institutional investors, but with guardrails. In the U.S., while there is no broad retail access to private equity yet, there have been moves to let certain retirement plans have limited allocations and to expand the definition of accredited investor. The Department of Labor in 2020 clarified that 401(k) plans could include PE exposure via diversified funds, which implicitly could involve secondary funds for liquidity management. The SEC has also approved interval funds and tender-offer funds that are registered under the '40 Act but invest in illiquid assets – many of these (e.g., certain non-traded BDCs or closed-end funds) invest in credit and could utilize secondary sales for liquidity.

The key regulatory consideration here is liquidity mismatch and investor protection: any vehicle sold to retail must either provide periodic liquidity (hence the interval fund structure) or clearly

disclose that shares are illiquid. The recent issues in products like Blackstone's BREIT (a real estate interval fund that hit withdrawal limits) highlight why regulators are attentive.

In Europe, the ELTIF regime was specifically designed to allow semi-retail investors to access long-term illiquid funds under certain conditions. The ELTIF 2.0 reforms (effective 2024) loosened some rules (e.g., allowing funds-of-funds and facilitating secondary trading of ELTIF units). This means an ELTIF could be used to create a feeder into secondary deals, with retail investors able to buy/sell ELTIF units under lighter constraints than before.

The U.K.'s new Long-Term Asset Fund (LTAF) similarly targets mass affluent investors with controlled liquidity windows. Regulators require such vehicles to have robust liquidity management, so we see features like quarterly redemption limits, notice periods, and importantly, the option for managers to tap secondaries to meet redemptions. Indeed, many interval funds investing in private credit or PE plan for secondary sales or NAV loans as a liquidity source if investor withdrawals exceed new subscriptions.

As private markets open to retail, regulation will continue to require clear communication of risks – including that secondary market liquidity, while improved, is not equivalent to public market liquidity. Both SEC and European regulators have increased oversight of valuations – critical since secondaries ultimately hinge on believable NAVs. We should expect ongoing guidance on best practices (e.g., recent industry standards on portfolio valuations for secondaries by groups like IPEV), and possibly more standardized reporting around secondary transactions (for instance, reporting secondary volumes or prices in fund annual reports someday). Thus far, regulators have not impeded secondary market development; instead, by formalizing some processes, they may well legitimize secondaries further in the eyes of more conservative investors [Levine (2025)].

### 3.4.1 Case example

Apollo Global Management's collaboration with State Street in 2025 illustrates how leading firms are aiming to bring private credit closer to retail investors. Together, they launched a private credit ETF that incorporates elements of secondary market liquidity by publishing real-time pricing inputs and firm bids on credit assets.

The ETF aims to increase accessibility and bring price discovery to traditionally opaque markets, while managing liquidity through structural caps and scheduled redemptions. Although the SEC raised concerns about valuation reliability and transparency, highlighting the inherent risks of extending mark-to-market frameworks into illiquid markets, the initiative reflects the potential for digital platforms and institutional-grade infrastructure to reshape investor expectations [Bloomberg (2025b)].

## 4. Challenges: pricing, transparency, and liquidity constraints

Despite its growth, the secondary market still faces important challenges. Key among them are pricing efficiency, transparency, and residual liquidity risk. Understanding these challenges is crucial for investors looking to utilize secondaries effectively.

### 4.1 Pricing discounts and volatility

Secondary buyers typically demand a discount to NAV to compensate for uncertainty in the underlying assets and the illiquidity. The level of discount fluctuates with market conditions. In benign environments (strong public markets,

easy credit, active exits), secondary pricing can approach NAV or even premiums for very sought-after funds. In stressed times, discounts widen significantly. For instance, amid the market turbulence of 2022, average secondary bids fell to around 80–85% of NAV for diversified portfolios [BlackRock (2025)]. By H1 2024, as sentiment improved, average high bids had rebounded to about 88% of NAV across strategies [Jefferies (2025)]. A Commonfund survey noted pricing climbed ~4 percentage points from 85% to 89% of NAV between 2023 and late 2024 [Lodge et al. (2025)]. Still, pricing remains below prior peaks – in the mid-2010s secondary stakes often traded at or above 100% of NAV for top-tier buyout funds (when distributions were booming).

This pricing volatility reflects both market cycles and supply-demand balance. In 2024, record capital supply (dry powder) and improving exit outlook helped shrink the bid-ask gap, enabling more deals to close. However, if a wave of selling hits the market (e.g., due to denominator effect or a downturn forcing liquidity-raising), discounts could widen again. Many LPs have learned to be patient and time their sales – selling into strength when pricing improves. That said, one challenge is the NAV lag: NAVs are reported quarterly and may not fully reflect current valuations, especially after public market swings.

Additionally, regulatory changes may further influence pricing volatility. Enhanced valuation oversight, mandated disclosure requirements, and leverage limits imposed by frameworks such as AIFMD II and SEC reforms can increase both pricing transparency and scrutiny. While these developments aim to instill investor confidence, they may also introduce heightened mark-to-market volatility, especially if managers are required to update NAVs more frequently or apply more rigorous valuation methodologies. As such, pricing in the secondary market may become more reactive to macroeconomic and portfolio-specific shifts, reinforcing the need for sophisticated pricing frameworks and governance practices. Buyers adjust for this, but it adds uncertainty.

## 4.2 Transparency and information

Unlike public markets, there is no consolidated tape or exchange reporting for secondaries. Details of transactions are often private. This lack of transparency can disadvantage less experienced participants. However, it is gradually improving via the avenues discussed. Another aspect is asymmetric information – the seller typically knows their fund's assets well (through reports from the GP), whereas buyers rely on whatever disclosures the seller and GP provide. If a GP is uncooperative or the portfolio has complex risks (e.g., pending litigation, highly illiquid assets), buyers will price conservatively or avoid the deal. Secondary processes today usually involve detailed due diligence and often GP engagement (most GPs now cooperate with secondary sales to facilitate a smooth process, realizing that doing so benefits their LPs and reputation). Nonetheless, especially in less mature areas like venture capital or emerging markets funds, information quality can be poor. This creates pricing dispersion – one buyer might bid significantly differently from another based on their analysis or if they already hold a stake in the fund (inside position). Skilled secondary investors thrive on this, leveraging their informational advantages.

Forthcoming regulatory frameworks are likely to push for more consistent and detailed disclosure practices across the secondary market. For example, AIFMD II and updated SEC rules encourage transparency by requiring periodic investor reports, valuation disclosures, and formal conflict-of-interest policies. These initiatives aim to level the informational playing field and reduce pricing disparities. However, there is a balance to be struck: increasing transparency may enhance fairness and confidence but also risks exposing secondary markets to public-market-like volatility

and short-termism, potentially undermining the long-term orientation of private capital.

### 4.3 Liquidity and deal execution

While secondaries provide liquidity relative to an otherwise locked-up fund, they are not as liquid as public markets. Deals can take several months from start to finish, especially larger portfolio sales which require buyer underwriting and often regulatory or GP approvals. There's also execution risk – the price agreed at the start (based on last NAV) might be renegotiated if new NAV numbers come out significantly lower (so-called "NAV creep" risk in declining markets). For LPs selling, another challenge is that partial sales may not solve a liquidity crunch – finding buyers for less popular funds in a portfolio can be hard, leaving the seller with residual holdings. This is why many LP sales are packaged portfolios of diverse funds, to ensure the entire bundle is marketable. Even then, a buyer might put "tombstones" on a few line items (refuse to take certain funds), forcing the seller to find alternate buyers or drop those positions. Such complexities mean that transacting in the secondary market requires careful planning, sometimes involving advisors to run structured processes.

Furthermore, regulatory developments are likely to influence liquidity constraints and execution timelines. New rules around enhanced investor disclosures, fund leverage caps, and fund manager responsibilities may extend due diligence and approval stages, particularly in jurisdictions implementing AIFMD II or SEC private fund reforms. These frameworks could require more robust documentation, extended review periods, or limit the pace at which liquidity can be generated. For example, liquidity management tools like redemption gates or suspensions – mandated for semi-liquid funds – could delay exit processes even when counterparties are available. While such regulations aim to protect investors and enhance market stability, they can also introduce friction that must be navigated by both sellers and buyers in an already complex secondary transaction environment.

For smaller investors or those with only one or two fund interests to sell, finding a counterparty at a fair price can be difficult. The rise of secondary platforms catering to smaller lot sizes is addressing this to some extent by pooling many small sellers together or by funneling them to feeder funds that offer periodic liquidity. Regulatory restrictions can also pose a challenge – e.g., some fund partnership agreements have strict consent rights or outright prohibitions on transfer, or they may allow the GP to admit a secondary buyer only at certain times. This non-uniformity means each secondary sale must clear legal hurdles, adding friction.

### 4.4 Valuation uncertainty

Another nuanced challenge is valuing hard-to-sell assets. For example, tail-end funds (nearing end of life) might hold a few remaining assets that are hard to value (say a single private company with uncertain exit timing). Secondary buyers will heavily haircut such assets or use structured offers (like earn-outs or payment deferrals contingent on the asset's eventual sale). Pricing these requires not just financial analysis but sometimes special-situations expertise. Similarly, in private credit secondaries or infrastructure secondaries, if the assets lack frequent marks, buyers must assess credit quality or appraisals, which can lead to a wider bid-ask spread compared to mainstream buyout fund secondaries.

Regulatory guidance and developments may also play an increasingly vital role in addressing this challenge. For instance, AIFMD II emphasizes stronger governance around valuation methodologies and requires asset managers to adopt consistent and well-documented approaches to assessing hard-to-value assets. Similarly, SEC reforms are likely to mandate

enhanced investor reporting and independent valuation opinions, especially for transactions involving potential conflicts of interest. These measures aim to increase accountability and comparability across the secondary market. However, they may also lengthen the valuation timeline and introduce greater conservatism into price setting, particularly for niche or esoteric assets. Consequently, market participants will need to balance regulatory compliance with the need for timely and actionable valuations.

In summary, while secondary markets have vastly improved liquidity in private markets, they have not eliminated liquidity risk. They have transformed it – an LP can often find liquidity if truly needed, but at a significant discount or after a wait. Investors should not assume that private assets can be sold overnight at full value; instead, they should view secondary market use as a strategic tool, one that works best with foresight and in favorable conditions. Transparency and pricing continue to get better as the market matures, but information gaps and execution complexities remain part of the secondary investing craft.

## 5. Conclusion

The secondary market within private equity, private credit, and infrastructure has undergone a profound transformation. Once a relatively obscure backwater used sparingly by LPs in distress, it has evolved into a high-volume, globally integrated market that is central to liquidity provision in private assets. This evolution is characterized by record growth in transaction volumes, a broadening base of participants (including institutional heavyweights, insurance firms, and increasingly retail channels through semi-liquid fund vehicles), and a wave of financial innovation in deal structures (e.g., continuation funds), financing mechanisms (e.g., NAV-based lending), and platform technologies (e.g., online exchanges). These innovations are accompanied by significant regulatory developments (such as AIFMD II and SEC reforms) that aim to balance transparency, fairness, and market resilience.

We see that continuation funds have become a mainstream feature, enabling GPs and LPs alike to solve the tension between holding onto high-quality assets longer and providing interim liquidity. Techniques like NAV-based lending have further expanded the toolkit, offering leverage as a liquidity bridge, and oftentimes working in tandem with secondary sales. The rise of dedicated platforms suggests that the market infrastructure will continue to modernize, potentially bringing greater transparency and efficiency. This modernization comes with new responsibilities and oversight, particularly around valuation practices and information disclosure. While these tools can make private markets feel closer to public markets in terms of access and transactional ease, they also demand a more sophisticated governance approach.

For institutional investors, the implications are significant. Secondary markets allow for active portfolio management in private assets in a manner that was not feasible years ago. Investors can now treat their private fund portfolio with a degree of flexibility – trimming, adding, and rebalancing exposures – which enhances overall risk management and liquidity control. The data shows that secondaries have also been instrumental in delivering liquidity during periods of market stress, effectively acting as a relief valve for the system (witness the substantial uptick in secondary sales when traditional exits slowed). However, this evolving marketplace also brings new challenges: pricing remains volatile and deal execution timelines can be extended by regulatory and operational requirements. Success increasingly depends on timing, structuring sophistication, and information advantage.

Regulators are watching these changes closely and generally view them as positive for market stability – after all, giving investors more options

to manage liquidity can reduce the chance of defaults or crises. The new rules from the SEC and the adjustments in AIFMD II are attempts to codify best practices, increase fairness, and extend the benefits of private markets to a wider investor base without compromising on protection.

Looking ahead, the secondary market is poised to further expand across geographies and asset classes. Areas like venture capital secondaries, real estate secondaries, and infrastructure are expected to gain momentum as those segments catch up in terms of secondary volume share.

The involvement of semi-liquid funds and retail money could also meaningfully increase liquidity – for instance, if a '40 Act secondary fund for mass affluent investors reaches scale, it could become a major taker of secondary supply, thereby deepening the market. However, this democratization will require carefully managed guardrails to protect less sophisticated investors from valuation opacity or liquidity mismatches. Additionally, data and technology are likely to reduce information gaps; one can envision standardized secondary pricing indices and AI-driven analytics for secondary portfolio valuation becoming commonplace for practitioners.

Secondary markets have moved from the periphery to the core of private market investing. They provide a crucial linkage between the traditionally illiquid world of private assets and the need for flexibility among investors. By fostering liquidity, secondaries reduce the risk of investing in private markets and thus, paradoxically, might encourage more allocation to illiquid assets (knowing that an exit route exists). For any institutional or even qualified individual investor in 2025, understanding and leveraging the secondary market is now a key component of managing a private markets portfolio. The developments in continuation funds, NAV financing, platforms, and regulation all point toward a more accessible and resilient private investment landscape – one where investors can be confident, even in committing to long-term illiquidity, that they have tools at hand to manage the unexpected.

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# “Fix one problem, create another?”

## MiFID II and the hidden costs of regulating markets

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## Abstract

Introducing substantial regulation into complex systems, such as contemporary capital markets, creates a series of challenges for both regulators and market actors. In this article, we explore the impact of a major piece of European legislation called MiFID II[1] on long-established practices and relationships. Our findings highlight that, despite well-intentioned efforts to address identified risks, regulatory interventions can sometimes weaken the very systems they aim to improve. Moreover, these unintended consequences are often difficult to foresee. To illustrate this dynamic, we draw on our recent study of investor relations and corporate brokers, providing a real-world example of how attempting to resolve one issue can, inadvertently, exacerbate another.

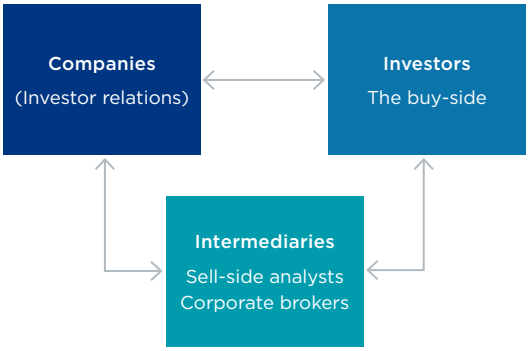
## 1. Introduction

Global capital markets represent increasingly complex and interwoven ecosystems. Embedded within these systems are a myriad of intermediaries that act and interact in highly specialist and unique ways drawing from long-established “rules of the game.” Given this labyrinthine entanglement, steps by regulators to intervene need to be carefully thought through and, so far as possible, preemptively tested and experimented with. This article draws from an academic study we undertook on a major pan-European law (MiFID II) and how the attempt by regulators to deal with one issue arguably resulted in new problems and concerns.

Our story begins with a group of capital market actors, sell-side analysts, and attempts by regulators to change how they get paid for their services. We show how well-meaning intentions on behalf of regulators to tighten regulation have weakened this group of professionals and the work they undertake. We then explore how the ripple effects of these changes have knock-on effects that have extended well beyond the scope of regulators’ original frame of reference, affecting other capital market actors – such as investor relations officers (IROs) and corporate brokers – who were likely ignored by regulators.

[1] MiFID II stands for “Markets in Financial Instruments Directive”

**Figure 1:** The flow of information and communication among key actors in capital markets



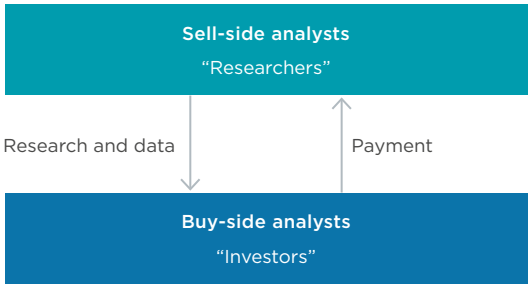

## 2. Key capital market actors

Three key groups drive the flow of information in equity capital markets: sell-side analysts, institutional investors, and IROs. Historically, communication followed a clear sequence. Sell-side analysts, with support from IROs, collected and analyzed information, delivering equity research reports that included performance assessments, earnings forecasts, and investment recommendations. Institutional investors relied on these reports, raising queries that led to a continuous cycle of information exchange. Additionally, sell-side analysts and corporate brokers often acted as intermediaries, fostering relationships between investors and company management. In this process, IROs served as the company's primary engagement point between a company and the actors within capital markets. In Figure 1, we depict the information flow as bidirectional in all cases, however, historically, the direction of one of these information flows would typically dominate. For example, historically, investors would speak to the sell-side more often than directly to companies.

## 3. How the sell-side gets paid

To understand our story, we need to delve a little deeper into the sell-side. In the main, sell-side analysts are industry experts that work for investment banks. Although research can focus on a range of asset classes beyond equities, including fixed income securities, commodities and currencies, for the purpose of our study, and this article, we shall focus on equity capital markets and, consequentially, analysts working on equity research. As shown in Figure 2, the sell-side's clients are investors, often referred to as the "buy-side." The research analysts write reports alongside making projections of earnings and preparing detailed valuation models. This suite of services is provided to the buy-side to enable them to make informed investment decisions. In essence, to some degree the investment community has "outsourced" much of the analytical work to the sell-side[2].

**Figure 2:** Sell-side versus buy-side




One of the most unusual aspects of the world of sell-side research relates to how investors pay for this work. Prior to the introduction of MiFID II, the sell-side was paid using a "bundled" model. This meant that payments for research and other services, such as trading, provided to investors were paid for together. In other words, asset

[2] It is worth noting that many buy-side firms, especially the larger global investment houses, have internal research and analytical resources. However, the sell-side can still bring fresh insights and information to these firms as they tend to be much more specialized in their sector than buy-side analysts. Additionally, as they speak to a wide range of buy-side firms, sell-side analysts develop a sense of market expectations and opinions that can help the buy-side.

managers received *inter alia* research reports, analyst calls, and access to valuation models from brokers without paying directly. Investors would sometimes voluntarily set out what specific services they were paying for, but even then, the amount of such payments varied widely from firm to firm, and there was no invoicing or similar processing from the sell-side. Instead, these costs were covered through higher trading commissions to research providers – a practice known as "soft commissions."

This resulted in little or no discipline in, say, what needed to be paid by investors to get access to research reports or a one-on-one meeting with an analyst. Regulators were concerned that sell-side services could end up being provided to the buy-side for little or no payment, and this could be construed as an inducement or bribe of some sort. This system created financial ties between asset managers and sell-side firms, raising concerns that bundling payments might influence trading decisions rather than prioritizing best execution for clients. For example, as investor X needed to pay for research services from investment bank Y, they would trade with them to provide commission flows, but this may not be consistent with best execution. There were also concerns that payments were being made for research services that were not needed or consumed by buy-side firms, yet these costs were being charged to the investing clients. If this were to be the case, then the ultimate investor (pension funds, retail investors, etc) might be disadvantaged.

## 4. The regulatory "fix"

MiFID II is a comprehensive suite of European regulation, but for our purposes, we shall focus only on the section concerning the payment for research services by the buy-side. Effective from January 2018, MiFID II introduced a requirement for sell-side firms – those providing a mix of research, trading, and investment services – to clearly separate and charge for research costs. Under these rules, asset managers must either cover the cost of sell-side research themselves (from their own profits) or pass it on to clients (via a dedicated client-funded research account), but only if they can demonstrate a direct benefit to clients. This "unbundling" of research payments disrupted the long-standing relationships and incentive structures across the investment ecosystem as described above. It altered the way research is produced, distributed, and consumed, with potential ripple effects on corporate reporting, disclosure practices, engagement between key market participants, and the demand for sell-side research [see for example, Abhayawansa et al. (2024)]. In practice, most asset managers have chosen to cover these costs themselves (rather than passing them on to clients), forcing the buy-side firms to be more selective about the research they purchase (is it really needed?), and raising questions about the long-term viability and quality of independent investment research. In the end, research budgets have been slashed by as much as 30-40% [FCA (2019)].

## 5. The impact of MiFID II

In this section, we shall differentiate between the impact on the sell-side, which was more predictable *ex-ante*, and then present evidence of the impact on the more opaque world of investor relations and corporate broking.

### 5.1 The impact on the sell-side

The implementation of MiFID II, particularly its unbundling of research and trading costs, sparked concerns about a potential reduction in research coverage, especially for small- and mid-sized firms. Coverage of these less-traded, smaller firms tends to generate lower revenues, hence, the expectation that the sell-side would de-emphasize them in favor of targeting higher-revenue opportunities in larger stocks. What picture has emerged of the

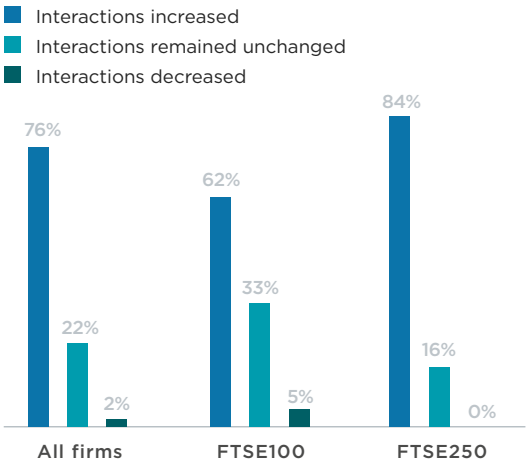
impact of the regulation? A range of studies paint a somewhat confusing and mixed picture with some findings supporting the initial concerns, while others suggest the impact has been more nuanced.

Research by Fang et al. (2020) points to a post-MiFID II decline in analyst coverage across European firms, particularly smaller ones. Their analysis indicates a noticeable rise in companies without any coverage, which contrasts with North American trends, hence, could be attributed to a "MiFID II" effect. Similarly, a survey from the CFA Institute (2019) highlights that both buy-side and sell-side analysts have reported a reduction in coverage of smaller firms. This is largely attributed to analysts adjusting their strategies, focusing on firms with more substantial trading volumes or more strategic importance due to tighter research budgets.

However, it is important to note that other studies come to a different conclusion. For example, Lang et al. (2024) and others suggest that the reduction in coverage has primarily affected larger, well-established firms with no significant reduction in research for smaller firms. They suggest that demand for sell-side research on well-covered large companies has declined as investors reduce their list of research providers. This points to a shift in how analysts allocate resources, with large firms seeing less attention as they are already well-covered, making it increasingly difficult to find a unique research "edge."

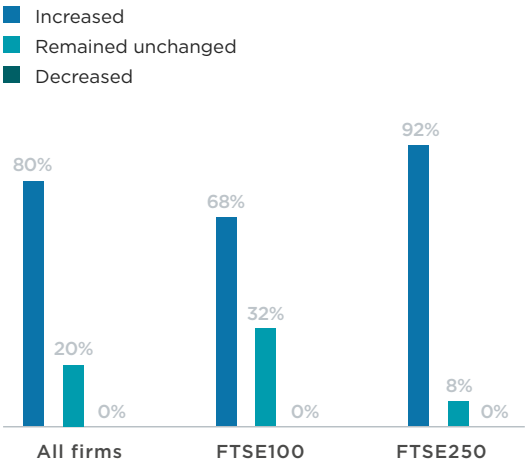
In terms of research quality, the effects of MiFID II are similarly mixed. Some research, such as that by Fang et al. (2020), shows improvements in analysts' forecast accuracy post-MiFID II, while others, including a CFA Institute (2019) survey, suggest a decline or stagnation in quality. Despite these varied findings, there is a trend indicating that analysts who remain active in the market tend to produce higher-quality research, as those less able to compete exit the field. This shift may lead to a concentration of higher-quality analysis for the firms that analysts continue to cover, particularly those that remain strategically important.

**Figure 3:** Changes in the amount of post-MiFID II one-on-one interactions with investors




**Note:** Based on 49 valid responses for ALL FIRMS, with 21 responses from IROs of FTSE100, 25 from FTSE250, and 3 from IROs that did not indicate their firms' index.

**Figure 4:** Changes in the volume of incoming requests from investors




**Note:** Based on 50 valid responses for ALL FIRMS, with 22 responses from IROs of FTSE100, 25 from FTSE250, and 3 from IROs that did not indicate their firms' index.

### 5.2 Impact on other capital market actors

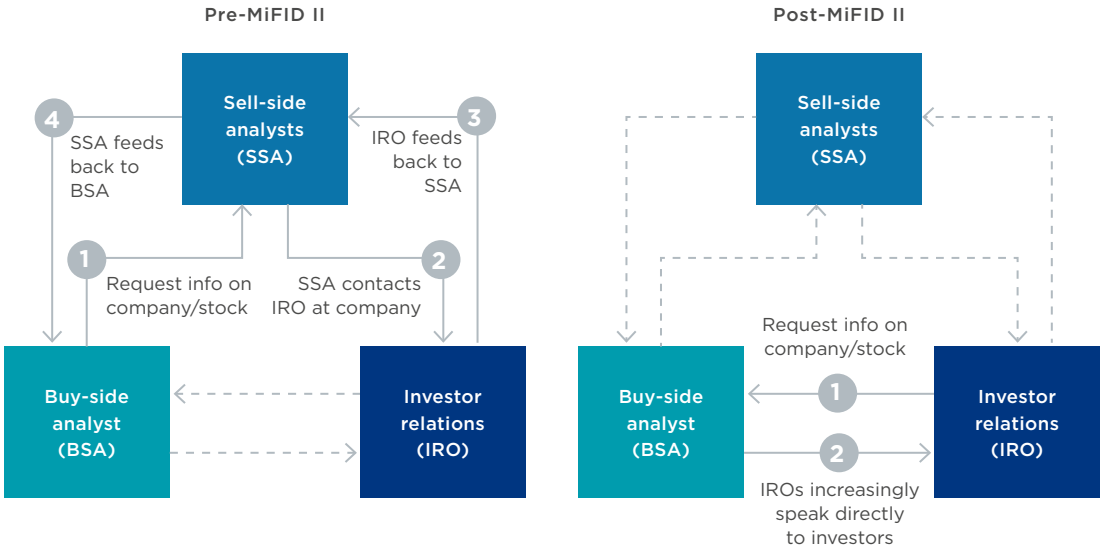
Our own research [Abhayawansa et al. (2024); Aleksanyan et al. (2025)] draws from a survey of, and interviews with, IROs to gain their insights into how MiFID II has impacted their interactions and practices. Our research reveals that the regulation has significantly amplified the role of IROs in engaging directly with investors. This shift is evident in both the increased volume and frequency of direct, two-way communication with investors, as well as a heightened recognition of the importance of IRO-investor interactions. The evidence of this change is clear in the survey data set out in Figures 3 and 4. We can observe that the vast majority of our surveyed IROs representing both the large-cap (FTSE100) and mid-cap (FTSE250) firms experienced a post-MiFID increase in investor requests for information and one-on-one interactions.

What is behind this increase in direct investor-IRO engagement? Our evidence suggest that the genesis of this change is the disintermediation of sell-side analysts, largely fueled by the growing perception of analysts' diminishing expertise, juniorization of staff and deteriorating research quality. The new economic reality for the sell-side model – driven in part by MiFID II and the research budget reductions of the buy-side – appears to be a major culprit for many of these developments. Faced with this new paradigm, IROs have stepped in to fill the gaps as investors increasingly seek to avoid expensive analyst interactions for many of their routine information requirements. Such a change has reinforced the IROs pivotal role in facilitating investor communication and enhancing their perceived value to both investors and corporate management. The change is visualized in Figure 5 below.

## 6. MiFID II and the corporate brokership model in the U.K.

Next, building on the context and research set out above, we delve deeper into how MiFID II has changed one of the unique and central features of U.K. capital markets – the role of corporate broking.

**Figure 5:** The disintermediation of the sell-side. Dotted lines represent less frequent interactions



## 6.1 The corporate broking model

In the U.K., listed companies rely on corporate brokers, who act as the conduit between the company and the market. Each listed company appoints one or more investment banks to act as "corporate broker."[3] Amongst their core functions are information intermediation and relationship broking – i.e., connecting companies (IROs) with institutional investors. Corporate brokers are usually conceived as the "eyes and ears of the board," constantly relaying views of shareholders to the board and "giving the company a good feel for what investors more generally are looking for at any particular stage in the cycle" [Kelly (2010), p. 37]. In addition to market feedback, corporate brokers would also be involved with companies in crafting corporate communications for the market, arranging investor roadshows, and offering advice on potential future transactions (e.g., M&A, rights issues, etc.). Corporate brokers are embedded deeply in the fabric of markets, yet their practices remain relatively opaque to outsiders. Consequently, any impact from regulation on their work is likely to be less well understood and harder to predict. Figure 6 visualizes most prevalent pre-MiFID II dependencies and links between corporate brokers, investors, companies and analysts.

To examine the impact of MiFID II on corporate brokers' practices and their interactions with IROs, we conducted a series of research interviews[4], from which three broad themes emerged.

### Theme 1: Reduced ability of corporate brokers to link corporates/IROs with desired target investors

Before the introduction of MiFID II, corporate brokers could – and typically would – promote companies to any prospective investor (buy-

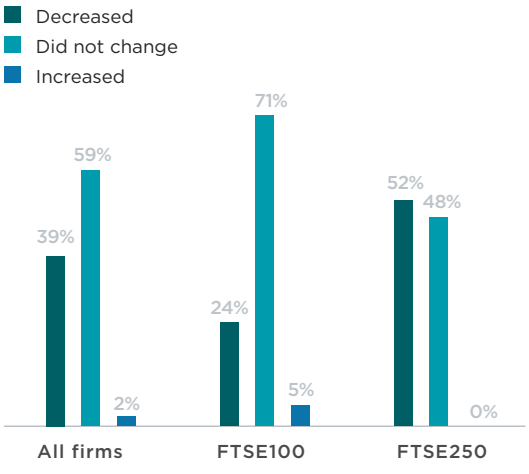
**Figure 6:** The links and dependencies between corporate brokers, companies, buy side investors (BS) and sell-side analysts (SS).


[3] We appreciate that the term "broker" can be rather confusing as it is used in so many different contexts. Here we are referring to a specialist "corporate broking" role on the private side of (mainly) investment banks, a role uniquely found in the U.K. and Ireland.

[4] See table of interviewees in Appendix 1

side firm). This was because in a pre-MiFID II world there was much less contractual formality between buy- and sell-side firms and so in a sense all investors were clients of all investment banks. However, MiFID II transformed the landscape for corporate brokers by limiting their dealings to investors with whom they hold formal contractual agreements. As part of the transition to charging for research services, as required by MiFID II, investment banks had to formalize their arrangements with buy-side firms regarding the nature and level of charges with new contracts. But not every buy-side firm will "sign-up" with every investment bank whose research they had access to before MiFID II, as they seek to reduce costs by limiting the number of research providers. And if there was no contractual agreement with a particular buy-side firm in the post-MiFID II period, then there would be little to no interaction with them. Consequently, the days of corporate brokers freely promoting companies to a broad range of prospective investors and aiding IROs in engaging with non-client investors are gone. Indeed, the results of our survey of U.K. IROs – shown in Figure 7 below – indicate that a large minority of IROs overall, and a majority of IROs of FTSE 250 companies, observed a post-MiFID II decline in corporate brokers' ability to connect IROs with target investors.

**Figure 7:** Change in corporate brokers' ability to help IROs with investor targeting after MiFID II?




**Note:** Based on 46 valid responses for ALL FIRMS, with 21 responses from IROs of FTSE100 and 25 from FTSE250 firms.

The ensuing quotes from our research interviews of IROs not only exemplify this transformation but also allude to the diminished significance of corporate brokers' services to IROs and the level of trust IROs place in their intermediary capabilities.

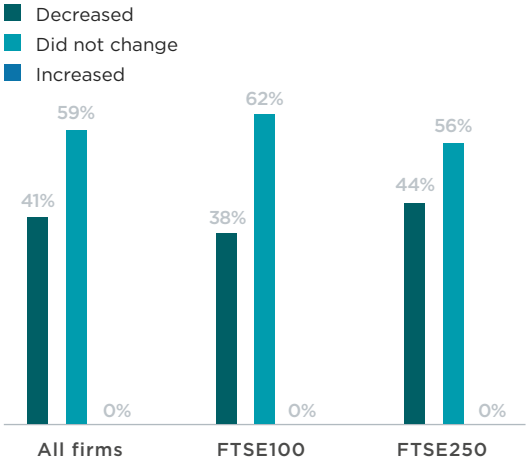
"Whereas before [MiFID II] you could probably go to [corporate broker A] or [corporate broker B], for example, and you could probably get access to 95% of the market, it doesn't feel like you can now" (IRO12).

"Corporate brokers are limited by their client list and although we deal with people like [corporate broker A] who have large client lists, this is not as broad as it could be or used to be, and their ability to engage with people, you know, they just don't actually know who to call within an institution. So, we spend more time giving them names than we used to … but there's a constant thing about whether the bank [corporate broker] ever called the client that you wanted them to, did they speak to the wrong person and got 'no' or didn't try hard enough" (IRO5).

## Theme 2: Curtailed ability to deliver company roadshows and conferences

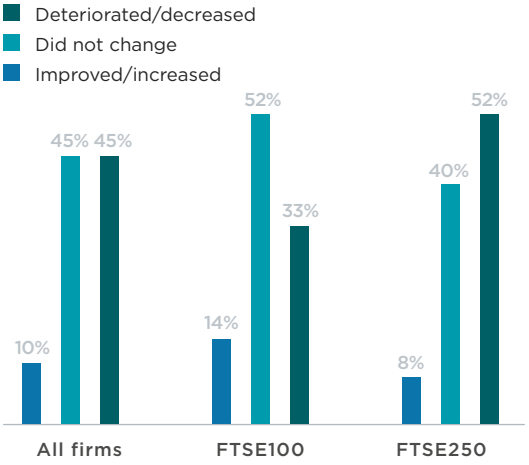
Another component of corporate broker services that has been curtailed is organizing investor roadshows and conferences. Traditionally, these events have served as crucial platforms for IROs to establish and nurture relationships with current and potential investors. They provide access to diverse investors and efficient means of engaging with them, enhance company visibility, help build trust and credibility through face-to-face interaction, and enable market intelligence gathering. Indeed, a large minority of the U.K. IROs that we surveyed pointed out a reduction

**Figure 8:** Change in corporate brokers' usefulness in organizing company roadshows and investor conferences after MiFID II




**Note:** Based on 46 valid responses for ALL FIRMS, with 21 responses from IROs of FTSE100 and 25 from FTSE250 firms.

**Figure 9:** Change in perceived quality of corporate broker service and value created for companies



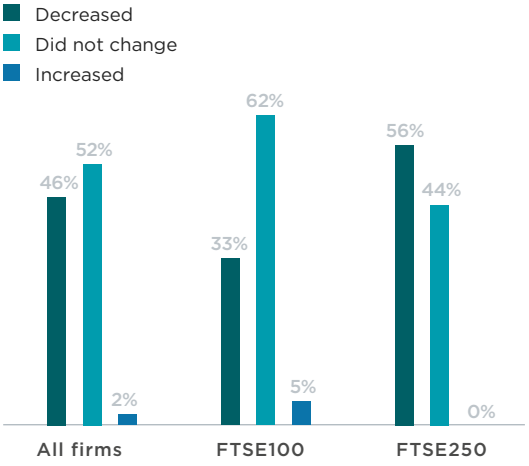

**Note:** Based on 49 valid responses for ALL FIRMS, with 21 responses from IROs of FTSE100, 25 from FTSE250, and 3 from IROs that did not indicate their firms' index.

in corporate brokers' usefulness in organizing company roadshows and investor conferences (see Figure 8).

More broadly, our survey findings emphasize a perceived diminution in corporate brokers' value proposition as their service potential declines. For instance, Figure 9 shows that a significant proportion of IROs (particularly from mid-cap companies) experienced a post-MiFID II reduction in quality of service and value that their corporate brokers offer.

Corporate brokers no longer are perceived to have the breadth of relationships they once had, signifying a diminution of their ability to connect companies with the widest range of investors. Indeed, the reduction in corporate brokers' service levels is recognized by certain IROs as the foremost challenge imposed by MiFID II on their practice. Constrained by their client lists, corporate brokers are now less capable of gathering comprehensive investor feedback and capital market intelligence. IROs now feel "less

**Figure 10:** Change in corporate brokers' ability to collect (and provide IROs with) feedback from investors after MiFID II




**Note:** Based on 46 valid responses for ALL FIRMS, with 21 responses from IROs of FTSE100 and 25 from FTSE250 firms.

confident to be able to go to the broker and say: Tell me what the market will think" (IRO 6) – a view shared by nearly half of the surveyed U.K. IROs (see Figure 9).

These limitations have further encouraged IROs to engage with investors directly, as implied in the following quote.

"If I take the corporate brokers, I don't think they necessarily have the depth of insight or the kind of anecdotal feedback from investors that maybe they had pre-MiFID … I tend to get more honest and detailed feedback when I ask an investor directly, be that at the end of a meeting as you walk back to the lift" (IRO12).

### Theme 3: Expanded opportunity for IROs

While the need for direct engagement comes out of necessity, it appears that some IROs are embracing the opportunity to leverage their social capital – ability to cultivate relationships with investors – as highlighted in the following quote, among many others:

"… Despite all the challenges I've pointed to, the ability to speak to people directly because they don't want to go through a [corporate] broker, for me that's personally a positive. Other people may feel less comfortable with that because maybe they prefer the established third-party route through corporate access etc. etc." (IRO12).

By internalizing some of the corporate brokers' functions, such as elements of investor targeting and relationship building, and by using direct engagement with investors to collect and synthesize market intelligence, IROs have increased their relative power and importance in the field. However, the IR function cannot subsume all technical and relationship building roles that corporate brokers accumulated over decades of being an indispensable fixture in the field of investment advice in the U.K. Millo et al. (2023) argue that investment advice involves diverse actors collaborating to enhance decision-making. They point towards Brown et al. (2015) who showed that sell-side analysts and buy-side actors collaborate, enriching each other's outputs. Accordingly, it can be argued that, despite the promotion of IROs as actors and IR as a function in the field, the reduced interaction between corporate brokers, sell-side analysts and investors (together with diminution of technical and social capital amongst the sell-side and corporate brokers) is a net loss to the field.

## 7. Conclusions

Throughout this article, we have employed various examples to illustrate a central theme: in complex systems, addressing one issue can inadvertently disrupt or weaken another aspect of the market. Our research, and studies by other scholars, suggests that MiFID II diminished the role of sell-side analysts by undermining the economic model of equity research that has persisted, broadly uninterrupted, for decades. Was this model perfect? Clearly not and the regulators across Europe acted in good faith to improve the system and protect investors. However, predicting and anticipating how others will react, as well as the ultimate consequences of disrupting long-established ways of working, can be challenging. MiFID II appears to have greatly weakened the sell-side, juniorized research, left smaller companies with less coverage and encouraged companies to make less use of analyst services even where needed. Additionally, the long-established and valued role of corporate brokers in the U.K. and Ireland has been disturbed. IROs perceive that these specialists' ability to fulfill key responsibilities, such as providing market feedback and organizing roadshows, remain diminished. Although these developments would clearly appear negative, they have bolstered IROs' influence in the field of investment advice. If investment in investor relations grows to meet this vacuum, and the steps to professionalize their work continues, then perhaps the unintended consequences will not be uniformly negative.

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**Appendix I:** Interviewee details for Abhayawansa et al., 2024

| Interviewee | IR role/position | Industry | Years of IR experience |
|---|---|---|---|
| IR1 | Head of IR | Transport | 14 |
| IR2 | Head of IR and Communication | Financial services and investment | 15 |
| IR3 | Head of IR | Technology | 13 |
| IR4 | Director of IR | Support services | 20 |
| IR5 * | Head of IR | Basic materials | 10 |
| IR6 | Director of IR | Retail | 12 |
| IR7 | Director of IR | Retail | 7 |
| IR8 | Director of IR | Technology | 8 |
| IR9 | Chief IR Officer and Communications Officer | Media | 8 |
| IR10 | Head of IR Consultancy | Various | 11 |
| IR11 | Head of IR | Luxury | 3 |
| IR12 | Director of IR | Beverages | 9 |
| IR13 | Head of IR | Healthcare | 10 |

* Two interviews were conducted with this interviewee.

# Nature as an asset class:
## Unlocking financial value in a changing world

**Author** | **Eoin Murray** | CIO Rebalance Earth

## Abstract

Existing approaches to sustainable finance all too often view nature and ecosystem services from a cost perspective. Dominant frames around ESG go further by emphasizing the value that nature can deliver, but generally within quite constrained parameters that don't move us significantly beyond the status quo. This article presents a more penetrating perspective that advances the notion of nature as a genuine asset class that is now a practical necessity rather than a theoretical nicety. In turn, this leads to a view of nature as the infrastructural backbone of resilient economies and financial markets.

### 1. Introduction: The case for valuing nature

Ecosystem services – from pollination powering agriculture to forests soaking up carbon – are worth a staggering $125-140 trillion annually to the global economy [Costanza et al. (2014)], dwarfing the GDP of any single nation. Yet these natural engines remain ghosts in most financial models, unpriced and undervalued while they quietly prop up markets. In the U.K. alone, the Green Finance Institute warns that nature's decline could erase up to 12% of GDP [Ranger and Oliver (2024)] – a hit that makes the 2008 crash look tame. Meanwhile, philanthropy and government reports, like the U.K.'s 2024 Food Security Report [DEFRA (2024)], scramble to patch the gaps, funding conservation and flagging risks to food and water systems. But here's the rub: the $100 trillion financial services industry – banks, insurers, pension funds – has barely scratched the surface of nature's potential as a driver of value, not just a cost to mitigate.

This disconnect is no longer tenable. Climate shocks, like London's 2022 heatwave or 2021 floods [Howard Boyd (2024)], and biodiversity losses, from pollinators to soil health, are slamming economies with real costs – costs that Exeter University's research says current climate scenarios woefully underestimate [Trust et al. (2025)]. Treating nature as an asset class isn't just an ethical moonshot; it's a financial frontier that promises to redefine risk, return, and resilience for the 21st century. This paper explores why and how financial leaders must act – drawing on emerging frameworks, market innovations, and hard data – to turn nature from a silent partner into a cornerstone of value creation. The stakes are high, and the clock is ticking.

### 2. Defining nature as an asset class

Nature isn't just a backdrop for human activity – it's a portfolio of assets with intrinsic value, measurable returns, and strategic potential for financial markets. Treating ecosystems like

wetlands, forests, or coral reefs as an asset class mirrors how we handle real estate or infrastructure: they have tangible worth, generate returns (e.g., flood protection, carbon sequestration, crop pollination), and require active management to sustain their utility [Ranger et al. (2023)]. For instance, a mangrove forest isn't just a habitat and a nursery – it's a natural barrier reducing flood damage, potentially saving billions in insurance claims, as seen in Bloomberg's case studies on nature-related financial risks [Bloomberg Intelligence (2023)]. It's also a significant sequester of carbon.

The framework for this shift is taking shape. The Natural Capital Protocol offers a standardized way to measure ecosystem services [NCC (2016)] – think water purification or pollination – while the Taskforce on Nature-related Financial Disclosures (TNFD) pushes companies to report nature's impact on their operations and vice versa [TNFD (2023)]. Pioneering efforts like the Intrinsic Exchange Group's Natural Asset Companies (NACs) are even exploring listing ecosystems on stock exchanges, turning biodiversity into tradable value. In the U.K., UKRI's work on integrating finance and biodiversity hints at similar ambitions, aiming for a "nature-positive" future where ecosystems are as bankable as bonds. Yet, this isn't just about numbers – nature's value extends beyond markets, raising questions about cultural, spiritual, and ecological worth that defy pure financial metrics [IPBES (2024)].

## 3. Trends driving nature's financialization

Nature's march into finance isn't a fluke – it's propelled by a perfect storm of regulation, markets, tech, and investor appetite. It's also propelled by real world experience and the increasing frequency of extreme weather events, which are with us for good now. Here's what's fueling the shift.

**Regulatory push:** Governments are turning up the heat. The E.U. Taxonomy for Sustainable Activities [EC (2020)] and the Taskforce on Nature-related Financial Disclosures (TNFD) are forcing firms to map their exposure to nature risks [TNFD (2023)] – think supply chain disruptions from deforestation or water stress. In the U.K., the 2024 London Climate Resilience Review calls for urgent adaptation investment [Howard Boyd (2024)], while the COP15 biodiversity framework (echoed in UKRI's nature-positive finance work) sets global targets that ripple into national policy. Even the U.S. SEC's climate disclosure rules were nudging firms to peek beyond carbon at ecosystems. It's not optional anymore – regulators are making nature a boardroom issue. And in a few rare, pioneering instances, nature also has a seat at that table.

**Market innovation:** New financial toys are popping up fast. Blue bonds, like the World Bank's $150 million Seychelles deal, are channeling cash into ocean health, while Australia's biodiversity offset markets show how to monetize conservation [World Bank (2018)]. The Intrinsic Exchange Group's Natural Asset Companies (NACs) are pushing the envelope further, aiming to list ecosystems on stock exchanges – controversial, sure, but a sign of where things are headed. The Green Finance Institute's advisory group [Ranger and Oliver (2024)] also pitches adaptation-linked instruments, blending resilience with profit. It's not that we didn't value nature before – it's simply that the value we assigned to nature was zero. Markets are catching on: nature is getting an appropriate price tag, with it's biophysical, social and associated health benefits much better understood [IPBES (2024)].

**Technological enablers:** Tech's the secret sauce. AI and satellite imagery – like Global Forest Watch tracking deforestation in real-time – let investors see nature's pulse with precision. Ortec Finance's

climate risk models for U.K. pension funds lean on these tools to flag long-term threats [Ortec Finance (2024)], while Exeter's critiques of outdated scenarios highlight how tech can fix blind spots [Trust et al. (2023)]. Data's turning fuzzy ecosystem value into hard numbers – think carbon sinks measured in tons or flood protection in avoided losses.

**Investor demand:** Money is talking louder than ever. "ESG" assets, despite recent seismic political shifts, are on track to hit $50 trillion in 2025 [Bloomberg Intelligence (2023)], and nature-focused funds are stealing the spotlight. Institutional giants – like BlackRock's $1 billion tie-up with Conservation International – are betting on nature-based solutions, driven by clients who want returns and a planet that doesn't sink [BlackRock (2025)]. The actuaries' "Planetary Solvency" [Trust et al. (2025)] puts it best: ignoring nature risks isn't just bad ethics – it's bad business. Demand is there too; and supply is racing to keep up.

Together, these trends are dragging nature beyond just the philanthropy bucket and onto the balance sheet. The question's not if, but how fast – and who'll lead.

The momentum towards recognizing nature as an asset class has accelerated in recent weeks with groundbreaking announcements from major financial institutions. Goldman Sachs, managing $1.3 trillion in assets, launched a $500 million biodiversity bond fund, investing in both labeled and unlabeled corporate bonds across developed and emerging markets. This fund targets bonds that directly fund biodiversity-related projects or are issued by companies generating revenue aligned with biodiversity protection and restoration, adhering to four sustainable development goals (SDGs). This move signifies a maturation of nature finance, where indirect financial incentivization based on nature investments becomes feasible.

Similarly, Norges Bank Investment Management (NBIM), overseeing the $1.6 trillion Norwegian sovereign wealth fund, disclosed its climate and nature disclosure methodology, applying it to 96% of its portfolio. This methodology evaluates companies on their policies, strategies, risk management, stakeholder engagement, and disclosure related to biodiversity and ecosystems. NBIM's approach, which can lead to divestment if companies fail to address material nature issues, sends a strong signal to global boardrooms about the necessity of integrating nature into corporate strategies.

BlackRock, the world's largest asset manager, released an opinion paper on natural capital [BlackRock (2025)], highlighting the current underpricing of natural capital as both a risk and an opportunity. With "over half" (in reality, "all") of the market cap on the world's largest stock exchanges dependent on nature, BlackRock's stance emphasizes the need to include all forms of capita – economic, human, and natural – in financial markets to ensure sustainable growth.

These developments are complemented by the alignment of Japanese accounting standards with international sustainability frameworks. The Sustainability Standards Board of Japan (SSBJ), closely linked to the ISSB, has included specific mentions of nature and biodiversity in its standards for publicly-listed companies on the Tokyo Stock Exchange. This marks a critical step in recognizing thriving nature as an essential asset for business and economies.

Moreover, there is growing policy support for nature-based solutions in flood risk management. A recent U.K. report, From Risk to Resilience, recommends that the upcoming Spending Review allocate at least £1.5 billion annually for flood risk management, explicitly supporting both structural and natural flood protection methods [Norman et al. (2025)]. This underscores a shift towards recognizing nature-based approaches as

essential for building resilience against climate-related risks, aligning with global frameworks like the E.U. Taxonomy and TNFD.

## 4. Nature's capacity to act as a revenue-generating asset

Pricing assets for revenue generation involves placing a value on future income streams, typically using discounted cash flow (for ecotourism or PES contracts, for example) or market prices (for carbon and biodiversity). Such a system is evolving slowly but is not without its challenges. Green bonds are typically used for funding environmental projects but arguably do not generate revenue from nature; rather, they finance conservation or renewable energy initiatives. Nature assets, to be truly revenue-generating, need predictable income. What might that look like?

Cities already pay landowners to ensure clean water, generating revenue through payment for ecosystem services (PES). New York City, for example, found it handsomely cost-effective to protect the Catskill watershed, saving billions compared to a treatment facility, with landowners earning revenue through easements. Similarly, Forest Resilience Bonds fund nature restoration, with beneficiaries like utilities paying back investors for reduced wildfire risks. These activities are clearly asset-like, with predictable income from well-defined contracts. Being able to move beyond nature's commoditization feels critical to it playing its proper part in our economic system.

## 5. Challenges in treating nature as an asset class

Turning nature into a financial asset isn't a slam dunk – it's riddled with hurdles that could trip up even the savviest executive. First, valuation is a minefield. Unlike carbon, which has a standardized price per ton, biodiversity lacks a universal unit of measure. How do you price a pollinator's role in a wheat field or a wetland's flood protection? The Natural Capital Protocol and TNFD are trying, but consensus remains elusive, leaving investors wary of unreliable data – exacerbated, as Exeter University's research notes, by climate models that underplay nature's risks [Trust et al. (2023)].

However, there are promising developments like the SEED Biocomplexity Index from the Crowther Lab, which aims to provide a standardized metric for biodiversity assessment [Fournier de Lauriere et al. (2023)]. With its underlying nine essential biodiversity variables, this state of nature framework seeks to offer both disaggregated and aggregated information. This index could potentially offer a way forward for globally standardized financial valuation of nature, integrating genetic, species, and ecosystem diversity using field data and satellite imagery, though it remains in development.

Then there's the moral quagmire. Commodifying nature risks turning sacred ecosystems into spreadsheets, sparking backlash from environmentalists who fear "greenwashing" or the neglect of non-monetizable but equally important areas – like arid lands with low carbon value but high cultural significance to Indigenous communities [WWF (2025)]. Critics, as hinted in the Green Finance Institute's nature-risk reports, warn this could prioritize profit over preservation, skewing investment toward flashy projects (e.g., carbon forests) while ignoring less "sexy" but critical ecosystems [Ranger and Oliver (2024)].

Financial hurdles add fuel to the fire. It is a sad truism that our myopic view is incredibly short-term. Natural assets often lock capital into decade-long cycles – think reforestation or coral restoration – clashing with the quarterly focus of most portfolio managers. Liquidity is difficult too: you can't sell a forest tract overnight like a stock. Ortec Finance's analysis of U.K. pension funds flags this as a structural risk [Ortec Finance (2024)], while the actuaries' "Planetary Solvency"

> **Turning nature into a financial asset isn't a slam dunk – it's riddled with hurdles that could trip up even the savviest executive.**

critique [Trust et al. (2025)] underscores how long-term nature investments demand a shift in mindset that many firms aren't ready for. Until these barriers fall, nature's ascent as an asset class will remain a work in progress. But this is not an insurmountable problem – pension fund assets, with the long duration characteristic of their liabilities, are arguably extremely well suited.

## 6. Opportunities for financial services

Treating nature as an asset class isn't just a risk mitigator – it's a haven for financial innovation. First, new products are blooming. Nature-based insurance, like parametric policies tied to mangrove health, could pay out when ecosystems degrade, blending risk management with conservation – think payouts for flood protection losses if wetlands vanish, as hinted in the Green Finance Institute's adaptation advice [Ranger and Oliver (2024)]. Biodiversity credits are heating up too, with pilot projects in Colombia and the U.K. showing how companies can offset nature impacts while generating returns. They may not be perfect, but the risk of doing nothing is surely far greater. Blue bonds, like the aforementioned World Bank's $150 million Seychelles deal, are channeling cash into ocean health [World Bank (2018)], while green bonds tied to reforestation offer steady yields for investors.

Reputation is another potential jackpot. Firms embracing natural capital can ride the green wave – data shows companies with strong nature and climate credentials enjoy 10-20% higher valuations [McKinsey (2023)]. In the U.K., the London Climate Resilience Review's push for adaptation signals a market where nature-savvy players stand out [Howard Boyd (2024)], especially as regulators like the TNFD demand transparency. Collaborations, like BlackRock's $1 billion partnership with Conservation International, prove the ROI: nature-based solutions scale impact and burnish brands, drawing in institutional investors hungry for both profit and planet.

Also, there's the untapped market of nature-positive returns. UKRI's biodiversity finance initiative suggests ecosystems can deliver long-term value – think carbon credits, water purification, or tourism revenue from restored landscapes. For financial services, this isn't just about dodging losses (e.g., Ortec Finance's (2024) pension fund risks); it's about capturing upside in a world where nature's health drives economic stability.

Beyond biodiversity bonds, opportunities exist in financing natural flood management (NFM) projects. A recent report on NFM emphasizes the need for innovative financing mechanisms to scale these initiatives, which offer multiple benefits including flood risk reduction, biodiversity enhancement, and carbon sequestration [Morris et al. (2025)]. Financial institutions can lead by developing blended finance models and leveraging ecosystem service stacking to make NFM projects more attractive to investors.

Another area of opportunity lies in financing nature-based flood management projects. The From Risk to Resilience report highlights the Leeds Flood Alleviation Scheme as a successful example, where traditional engineering was combined with natural flood management techniques to protect communities and deliver economic benefits [Norman et al. (2025)]. Financial institutions can play a crucial role by investing in these projects, either directly or through partnerships with local authorities and water companies. The report

notes that every £1 invested in flood prevention, including natural methods, can prevent £8 in future flood damages, offering a compelling economic case for such investments.

Furthermore, the mandate for Sustainable Drainage Systems (SuDS) in new housing developments in high-risk areas presents an opportunity for private sector involvement in nature-based infrastructure. Financial services can develop products and services to support these requirements, such as green bonds or impact investments focused on sustainable drainage solutions.

## 7. Nature as green infrastructure: The backbone of resilient economies

Nature's role as green infrastructure is crucial for providing services such as coastal erosion protection, flood mitigation, drought resilience, and water quality improvement. Recent events in Valencia, Spain, and Porto Alegre, Brazil, starkly illustrate the consequences of neglecting these natural systems [McGovern and Branford (2025)].

In October 2024, Valencia experienced catastrophic flooding when torrential rains, equivalent to a year's worth of precipitation, fell in just eight hours. The urban area, situated on a flat alluvial plain around a riverbed, was particularly vulnerable. The flooding resulted in over 200 deaths and substantial property damage, exacerbated by poor preparation and disaster response. Satellite imagery documented the extent of the devastation, highlighting the need for resilient water infrastructure [McGovern and Branford (2025)].

Similarly, in May 2024, Porto Alegre faced record rainfall and flooding due to El Niño and high Atlantic temperatures, receiving three times the average rainfall in a short period. The Guaiba River breached its banks, causing severe flooding in the city. These events underscore the importance of maintaining and restoring natural systems like wetlands and floodplains, which can absorb excess water and reduce flood risks [McGovern and Branford (2025)].

Natural flood management (NFM) has been proven to effectively mitigate flood impacts by reducing peak flows in both urban and rural settings. A recent report by Stantec for the Royal Society of Wildlife Trusts and RSA Insurance highlights that NFM not only reduces flood risks but also delivers significant economic, social, and environmental benefits [Morris et al. (2025)]. These include enhanced biodiversity, improved mental health, carbon sequestration, and better water quality. Cost-benefit analyses of Wildlife Trust projects showed positive ratios, with benefits increasing over time (e.g., £1:4.47 over 10 years, rising to £1:10.79 over 30 years).

Communities near NFM projects report reduced flood risks and increased recreational opportunities, underscoring the social benefits of these initiatives. However, the report notes that public funding for NFM is minimal compared to traditional flood defences, and private investment is hindered by barriers such as lack of confidence in NFM's effectiveness and insufficient data [Morris et al. (2025)]. To address these challenges, the report recommends mainstreaming NFM in all flood and coastal erosion risk management projects, developing standardized data collection frameworks, and creating mechanisms to attract private investment by leveraging multiple benefit outcomes.

Nature's role in flood mitigation is increasingly recognized, as evidenced by successful projects like the Leeds Flood Alleviation Scheme [Norman et al. (2025)]. This £200 million initiative combines traditional engineering with natural flood management techniques, protecting communities while unlocking £774 million in economic growth and creating over 3,000 jobs. According to the

From Risk to Resilience report, such investments deliver a compelling return, with every £1 spent on flood prevention (including natural methods) preventing £8 in future damages. Additionally, mandating Sustainable Drainage Systems (SuDS) for new housing in high-risk areas presents an opportunity for private sector involvement in nature-based infrastructure, further scaling these solutions.

Financing resilient and sustainable water infrastructure is critical. The U.S. Environmental Protection Agency (EPA) emphasizes the need for innovative financing mechanisms to support water infrastructure projects that enhance resilience and sustainability. Such investments not only protect communities from natural disasters but also provide long-term economic benefits by reducing the costs associated with disaster recovery [van't Klooster and Prodani (2025)].

Asset managers like Rebalance Earth (2024) are leveraging payments for ecosystem services (PES) to fund green infrastructure projects. By connecting investors with initiatives that restore and conserve ecosystems, these platforms ensure that nature's services are maintained and enhanced, offering both environmental sustainability and financial returns.

## 8. Practical roadmap for financial executives

Financial leaders can't afford to sit on the sidelines – so here's a clear, four-step path to quickly integrate nature into their strategies:

1. **Assess portfolio exposure to nature-related risks:** start with the TNFD's disclosure framework to map how biodiversity loss and climate change hit your assets. Use tools like Ortec Finance's climate risk models or Exeter's updated scenarios to spot vulnerabilities – whether it's water stress for utilities or supply chain disruptions from deforestation. The U.K.'s 2024 Food Security Report and Green Finance Institute's nature-risk assessments offer U.K.-specific data to benchmark against.
2. **Pilot investments in nature-based products:** dip your toes into green and blue bonds, biodiversity credits, or natural asset companies (NACs) via the Intrinsic Exchange Group. Test parametric insurance tied to ecosystem health or fund reforestation projects with measurable returns, as seen in Bloomberg's case studies. Start small, scale smart – UKRI's biodiversity finance work provides models for nature-positive pilots.
3. **Explore partnerships for nature-based solutions:** collaborate with local authorities, water companies, and environmental organizations to co-fund and implement nature-based flood management projects. Leverage public funding streams, such as those recommended in the From Risk to Resilience report (e.g., £1.5 billion annually for flood risk management), to de-risk investments and enhance project viability.
4. **Develop financial products for sustainable infrastructure:** create innovative financial instruments, like green bonds or blended finance models, that support investments in nature-based solutions for flood risk management and other environmental challenges.

This roadmap isn't just about compliance – it's about seizing a first-mover advantage in a nature-driven economy.

## 9. Conclusion: A call to action

In conclusion, the transformation of financial services through the recognition of nature as an asset class is not just a theoretical concept but a practical necessity, as evidenced by recent developments and reports. The From Risk to Resilience report underscores the critical role of nature-based solutions in building resilience against climate-related risks, offering both

environmental and economic benefits. Financial leaders who embrace this paradigm shift will not only contribute to a sustainable future but also position their institutions for long-term success in a world where nature's value is increasingly acknowledged and integrated into financial decision making.

By assessing risks, piloting investments, scaling through partnerships, and advocating for policy changes, financial executives can lead the way in redefining the relationship between finance and the planet. The time to act is now, as the opportunities for sustainable value creation through nature are vast and the stakes are higher than ever.

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# Structural challenges

# Healthy purposeful culture in finance:
## Instrumentalization and key drivers

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## Abstract

Our study on culture in finance is one of the first in its field to be grounded in extensive, original qualitative data on the lived experiences of senior managers in financial firms. This article presents key findings from 29 semi-structured interviews with current and former senior managers in U.K. financial firms and regulatory personnel. It then links the findings to practical takeaways that financial regulators, professional bodies in finance and senior managers and culture champions in financial firms can embrace to support the Financial Conduct Authority's regulatory vision of a healthy, purposeful culture.

## 1. Introduction

Transforming culture in financial services is a priority for the Financial Conduct Authority (FCA), although it steers away from prescribing a one-size-fits-all culture for the industry.[1] The FCA envisions healthy cultures as purposeful and safe. Safe culture relates to an environment where "leaders at all levels need to foster an environment in which employees feel comfortable to express their opinions, and crucially, are listened to when they do."[2] A purposeful culture is described as "what a firm is trying to achieve – the definition of what constitutes success" and purpose may be social, ethical, consumer-driven, or people-driven.[3] Purpose is one of the four drivers of culture that the FCA focuses on in its supervision, alongside leadership, the approach to rewarding and managing people, and governance.[4] The aim of our project, funded by the British Academy Leverhulme Small Grant, was to decipher the nuances and lived experiences of healthy, purposeful culture in financial firms.[5]

## 2. Methodology

We conducted 29 semi-structured interviews from July 2022 to October 2023. Although not amenable to generalizations, measurements and statistical claims, qualitative empirical research enabled us to form a detailed and in-depth study of organizational culture as a vague and contested concept. We developed an indicative list of questions to discuss and adapted it slightly depending on the experience and background of each interviewee. All interviews were conducted

[1] Financial Conduct Authority, 2020. "Transforming Culture in Financial Services Driving Purposeful Cultures," Discussion Paper 20/1, 3, March, https://tinyurl.com/57trw7mk
[2] ibid.
[3] ibid, 4.
[4] ibid.
[5] Operationalising Purposeful Culture in Financial Firms to Deliver Better Outcomes for Consumers: An Empirical Analysis, 2021/22 Round, SG2122\210367.

online via video conferencing, with durations ranging from just over 30 minutes to nearly an hour, and most lasting approximately 45 minutes. To protect the anonymity of our participants, we retained only transcripts of the discussions. Most interviewees were current and former senior staff from a range of firms representing various segments of the sector, while a smaller number were regulatory staff and other professionals who take a critical stance toward the financial services sector.

## 3. Results of the survey

### 3.1 Findings I: The concept and importance of organizational culture

All interviewees were asked whether they view culture as purely an outcome, with the operative cause being incentives, or if they perceive it as one of the factors shaping outcomes alongside incentives. There was an overwhelming consensus that culture matters in shaping behavior and only one interviewee saw culture purely as an outcome. This finding is important because it demonstrates that focusing on organizational culture as an objective in its own right is sensible from a policy and regulatory perspective. To bring about a cultural transformation in finance, it is not enough to simply change incentives, for example, by imposing regulatory sanctions on firms that misbehave or by regulating executive remuneration in financial institutions.

Still, although all but one interviewee highlighted the importance of culture, their observations often reflected an instrumentalization of culture and people for the competitive advantage of a firm and its profit-making. For instance, as one interviewee observed, "Although banks and financial institutions are not usually associated with ethics … there is a strong drive…in most institutions to cultivate [a] distinct culture, not only because we want to disassociate ourselves with the bad examples of the industry, but it also comes across as a matter of comparative advantage…"

In the same vein, viewing culture as a compliance exercise or "window dressing" was a common thread that ran through many of the interviews. As one interviewee aptly put it, "On a fundamental level, we need to do the tick-box exercise … We have huge diversity programs and diversity champions and positive examples, yes. In practice, if you see another area that is heavily contested, that is gender pay gap, yes, we have all of these examples, but if you see the numbers, the problem is still there … If we have a specific aspect, it relates to business and marketing reasons, it doesn't relate to someone that wants to change the world…"[6] Another senior manager genuinely admitted that, "I think diversity and inclusion has got better if that's part of the story, but it's only got better because people say that it has to get better as opposed to a natural sort of completely blind view of what people are … In truth, women in investment banking, particularly in that sort of advisory space in other parts of the business. I think it's better … very underrepresented."[7]

Many interviewees identified a strong connection between "purposeful culture" and ESG, emphasizing diversity and inclusion as top priorities for financial firms. However, many also admitted that there are practical impediments to achieving diversity and getting it through the pipeline. This narrow approach can be contrasted with the FCA's broader view, which regards culture as a construct that can ultimately lead to socially beneficial outcomes.[8]

[6] Interview No 9.
[7] Interview No 6.
[8] Although diversity and inclusion are frequently emphasized as important elements of a healthy culture. See, for instance, Shepperd, E., 2023. "How to Flex you Organisation's Power through Culture and Conduct," speech given at City & Financial's Culture and Conduct Forum, November 23.

In such an environment, interviewees agreed that culture is not easily amenable to change and that the greatest opportunity for change lies not in the extreme cases, but rather in those that are not as clear-cut: "The really extreme examples of where something happens which is really not acceptable from a culture perspective. I think all organizations deal with that stuff now, certainly in the kind of financial services, bigger organizations, it's clear that it's not acceptable … The really good things [and the really bad things] at the top 10%, bottom 10% … get dealt with. It's all of that stuff in the middle that you let slide every day, and nobody picks up on it … That's where I think there's the biggest opportunity to drive change."[9]

## 3.2 Findings II: The drivers of culture – leaders, language, markets, metrics, incentives and regulation

When inquiring whether measuring culture could be an effective mechanism for promoting a healthy culture in finance, we detected a more nuanced approach and duality of attitudes. On the one hand, senior managers often believe that "business means metrics" and that culture can and should be measured, considering it critical for embedding good culture in financial firms. As one interviewee pointed out, "what gets measured gets done" and that "there is a whole suite of metrics around culture, around behaviors, around tone from the top, inclusion and diversity and all of the metrics around that would be really critical."[10] On the other hand, interviewees also doubted whether metrics really reflect culture, suggesting that it is " … so easy to manipulate … you can smell it and taste it, but putting that into a dashboard when we all love dashboards … is more difficult."[11] Some thought that metrics can only provide signposts and indicators, which then must be fully explored and understood to expose their drivers.[12]

Although language and artifacts may seem to be a simplistic form of cultivating a healthy, purposeful culture, they still play a key role in financial firms, creating a sense of collective identity. Such diffusion of culture is often achieved organically, from the bottom up, rather than top down. For instance, it manifests through peer-to-peer internal communication platforms or "self-help groups" that highlight common employee challenges and offer ways to address them.[13] Moreover, the choice of specific terms used within the firm can play a key role in shaping the trajectory of a healthy culture. As such, one interviewee explained that the use of the term "back office" was perceived as derogatory: "In a lot of financial service firms … that generic group of non productive resource would be referred to as back office. Which I found culturally to be quite insulting. And because I was there for so long, I kind of eliminated that term … We used the term infrastructure to describe everything that wasn't investing. And so there was cultural point around that made those people feel that they weren't just back office and it made everyone who was doing the investing and the marketing probably think of them in a little bit different light."[14]

When asked what drives a change in culture in financial firms, interviewees often highlighted market pressure as a key factor. When market pressure is present, it becomes a commercial imperative for a firm to adopt a purposeful culture; otherwise, it will struggle to attract a large pool of candidates. As one interviewee mentioned, "having a more purposeful culture

[9] Interview No 8.
[10] ibid.
[11] Interview No 3.
[12] For instance, Interview No 1.
[13] ibid.
[14] Interview No 2.

has enabled [firms] to employ younger people."[15] Similarly, another interviewee suggested that "...when a business realizes that they're really going to not have ... the largest pool [of candidates] to recruit from, or they're not going to keep a certain demographic within their workforce, if they do not seem to be more active [in] this area, it becomes ... a commercial imperative for commercial advantage at least."[16] This quote highlights, once again, the instrumentalization of culture as a driver of behavioral change and a vehicle for remaining competitive and maximizing profits. Interviewees, however, were cognisant of the downsides of such a sceptical and narrow approach: "You've got four generations within your workplace. All of whom have had very distinct and different sort of introductions to the workplace and all act very differently. This is where you've got this lack of sort of alignment between different generations ... my fear is ... financial services because they're cash-rich, they will pay more money. That will be their solution. They won't choose to innovate in that space. They'll just choose to buy them what they need. But the individuals who are prepared to take that offer up are maybe not the types of individuals who are going to be connected to the next level of consumers coming through."[17]

Perhaps surprisingly, many interviewees did not view regulation as a strong driver for a change in behavior but rather as a framework that can introduce more clarity and focus within the realm of financial services provision. Some thought the threat of punishment was real and resulted in a change in behavior, while others knew that, in practice, enforcement cases against individual senior managers, for instance, based on the Senior Managers and Certification Regime, are few and far between. Acknowledging the limitations of regulation in driving good behavior, a senior manager stated, "I believe you can't just manufacture it by having a rule ... it is never going to work" and "You should have the rules to try and encourage it but it won't change it – all it will do is get compliance."[18]

In addition, it was evident that embedding culture throughout all management levels of a financial firm is far from straightforward. Many interviewees pointed out the noticeable differences between senior and mid-level managers in fostering a healthy culture. At the senior level, there is often a clear understanding of and buy-in to the culture and its importance. This observation aligns with the willingness of senior managers to participate in our project and dedicate their time to discussing culture with us. It stood in stark contrast to the mid-level management, who were overwhelmingly silent in their willingness to participate in the project. One interviewee offered an explanation to such disparity across the management levels in financial firms: "I think the reality of day-to-day pressures are different ... [I see] a huge level of buy in at a very senior level to purpose, to values, how would do things driving the right behaviors and a real commitment to driving purpose and driving change. I don't think that our middle management layers disagree with that as a purpose, but often you hear about the sticky middle permafrost ... where it's just harder because they're the ones stuck. They're the reality of and they're often the generation ... in the millennials bucket. They're managing families and two careers and a household and often elderly parents and they're the ones managing these Gen Z with all of their wild expectations of what it is to be in the world of work ... so I don't think it's a lack of desire, but it's the reality of what we are expecting that population to deliver that often gets in the way."[19]

[15] Interview No 11
[16] Interview No 2.
[17] Interview No 12.
[18] Interview No 6.
[19] Interview No 8.

While all interviewees felt that culture is an independent factor that shapes the behaviors of individuals within organizations, they also recognized that incentives and the structure of remuneration are a major driving force of organizational culture in finance. Senior managers often discussed the prevalent "culture around rewards" in financial firms, but believed that this was an area that could and should be changed. For instance, introducing incentives that are more group- and team-based, rather than individual-based, is seen as an effective mechanism for encouraging collaboration and fostering a good culture: "Financial services is phenomenally efficient in a purely economic point of view. The market drives behavior. It drives pricing … there is a very big bonus culture as you know. There's a very big culture around rewards. Financial service firms go to a far greater extent than any other industry … to clarify the relationship between activity, output and financial reward. That means that if a company in financial services is serious around societal benefit, it needs to build it into the incentive structure. It's not the only way, but it'll be the most efficient way."[20]

## 4. Implications for policy

Beyond its theoretical interest, our analysis reveals ways to improve culture in finance and provides recommendations for the development of financial regulation and broader policymaking. Indeed, there is a broad consensus among regulators, policymakers, academics and the finance industry regarding the need for change. Regulators should avoid imposing excessively detailed and complex layers of regulation, as these drive compliance-oriented processes and lead to undue dominance of bureaucratic culture. At the same time, principles-based regulation must be thoroughly and consistently enforced; otherwise, it decays into de facto self-regulation with serious repercussions in the development of firm culture.

Furthermore, remuneration regulation should seek to prevent the excessive concentration of power in the hands of individuals, such as senior management or highly-paid income generators. Strengthening the collective nature of performance measurement and restricting very high pay differential are policies worth considering. Regulators should also take steps to encourage and nurture the rise of professionalization in finance, working together with relevant professional bodies. Professionalism highlights the autonomy and moral agency of each

**Figure 1:** A schematic representation of the drivers of culture in finance


[20] Interview No 2.

**Table 1:** Key strategic takeaways

| | |
|---|---|
| For financial regulators | • Simple, clear, and consistently enforced body of rules<br>• Tighter rules on remuneration<br>• Encourage professionalization |
| For professional bodies in finance | • Advocacy for professionalism<br>• Development of ethics codes |
| For senior management in financial firms | • Setting the right tone – healthy culture above short-term profits<br>• Ensure sufficient resources for mid-level management<br>• Restructure performance metrics in remuneration towards team and firm level outcomes |
| For culture champions in financial firms | • Advocate the value of culture to senior management<br>• Balance strong culture with individual autonomy for all workers |

individual professional, while also emphasizing the need to strictly comply with high ethical standards and meet public benefit expectations. A strong culture of professionalism in finance could enable individuals to resist pressures to resort to unethical short-term profit maximization and contribute to better customer outcomes and broader societal benefits. In this regard, financial services professional bodies have a major role to play in advocating for the value of professionalism and ethics in finance.

From the perspective of financial firms themselves, senior managers must be proactive in setting the right tone and ensuring that mid-level management have the time, resources and incentives needed to drive desirable cultural change. Culture champions, such as chief people officers and heads of HR departments, need to work closely with senior management and often persuade senior management of the long-term value of a healthy culture above short-term financial results. A balance needs to be kept between having a strong cohesive culture with a shared common purpose and vision on the one hand and safeguarding the individual professional autonomy and moral agency of each member of staff on the other. Too weak a culture can lead to the formation of silos and individualist short-term agendas but, equally, too strong a culture can erase the moral compass of individual and facilitate uncritical compliance with socially destructive top-driven business practices.

## 5. Conclusion

Our research and analysis offer practical insights into the day-to-day implementation of a multifaceted construct, "purposeful culture," as a regulatory objective, as well as into organically developed internal cultural practices. The 29 interviews with senior managers in financial firms reveal a complex picture of culture in finance, which is in transition, pulled in different directions by the demands of markets, regulators, employees and broader societal expectations. While the discourse around good culture in finance currently operates mostly as an instrument to preempt and defend against intrusive regulation, research that sheds light on a nuanced and in-depth understanding of culture can enhance regulators' ability to design and implement more effective regulatory regimes. Our project recommendations, which will be fleshed out in future outputs, can thus support the regulatory vision of a purposeful culture, strengthen trust between financial firms and society, and lead to improved outcomes for financial services consumers.

# Chasing alpha:

## Can better psychological safety within investment teams lead to more robust cultures, faster innovation and better investment returns?

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## Abstract

The concept of psychological safety within organizations has gained increasing traction since the term was made popular by Amy Edmondson in 1999. Defined as perceived safety and freedom to voice different perspectives in a work unit, the concept has been adopted as a tool to drive learning and improve performance, particularly in healthcare-related fields. In this article, we examine its expansion to the field of investment management, a $145 trillion global industry that depends on the ability of professionals to manage assets and deliver positive investment performance. We study the role of culture within investment teams, and whether creating more psychological safety enables better learning from mistakes, increases innovation, and drives improved investment performance. We found that at a leadership level in investment management there is enhanced awareness of the importance of culture and talent retention and that these factors can add to organizational stability, even if at the present time there is an absence of concrete causal links to better investment performance.

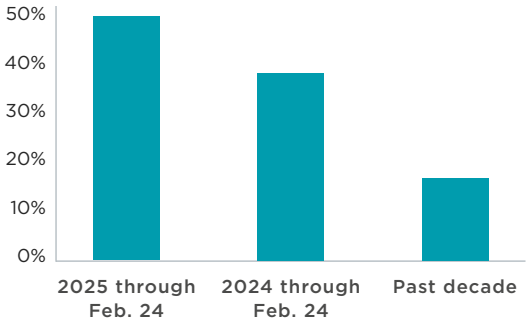
## 1. Introduction

The global investment management industry currently manages assets of approximately $145 trillion globally.[1] It is a classic knowledge industry, with the talent of the professionals (human capital) deemed to be the among the most valuable assets of a firm. As public participation in investing has grown (over 60% of U.S. citizens currently own stock)[2], the industry has found itself frequently under the microscope, as active managers have struggled to consistently add value versus a passive benchmark. The majority of active equity managers have not beaten their benchmark over the past decade (see Figure 1) and this has led to asset flows away from active management and into passive management, a trend that has persisted for the last nine years.[3]

In light of this challenge, we were interested in exploring how the human capital or "skill" on which active management is based was being nurtured, and the role that culture and psychological safety played in driving learning and performance within investment management firms.

[1] https://www.pwc.com/ng/en/press-room/global-assets-under-management-set-to-rise.html
[2] https://news.gallup.com/poll/266807/percentage-americans-owns-stock.aspx
[3] https://www.morningstar.com/business/insights/blog/funds/active-vs-passive-investing

**Figure 1:** Making a comeback? More actively managed funds are beating their benchmarks this year




Actively managed U.S. equity open-end funds & ETFs that outperformed their primary benchmark, the S&P 500

**Source:** Morningstar Direct

## 2. Defining psychological safety

The concept of "psychological safety" within work culture, and teams in particular, has gained increased traction in recent years, particularly as a tool to drive learning and improve performance. Psychological safety is defined as perceived safety and freedom to voice different perspectives in a work unit.[4] Edmondson states that "more specifically, when people have psychological safety at work, they feel comfortable sharing concerns and mistakes without fear of embarrassment or retribution. They are confident that they can speak up and won't be humiliated, ignored, or blamed."[5] Edmondson has a website containing a seven point questionnaire that can be used to conduct a psychological safety audit of a team. These questions relate to team members' responses to mistakes, their comfort level bringing up problems and tough issues, acceptance of differences, perceived safety to take risks, and the ease of asking other members of a team for help, as well as whether another team member might undermine them.[6]

In this framework set out below (see Figure 2) teams are deemed to be at their highest performing when both psychological safety and motivation are high. Most of the initial studies around psychological safety have centered on medical and aviation settings and studies draw a link between higher levels of psychological safety and increased performance, reduced errors, better employee wellbeing and engagement.[7] A recent article by Edmondson and Kerrissey revealed that there are many misconceptions arising with psychological safety as it attains more traction within the study of organizational behavior. Our research was conducted before the publication of this article, but we noticed very few of these misconceptions at work within the investment firms we studied, suggesting a sophisticated understanding of the concept and how it should be applied.

**Figure 2:** Under conditions of uncertainty and interdependence


**Source:** Edmondson (2018), The Fearless Organization

[4] Edmonson, A.C., 2018. The Fearless Organization: Creating Psychological Safety in the Workplace for Learning, Innovation and Growth, Wiley
[5] Ibid.
[6] https://amycedmondson.com/psychological-safety
[7] Lakonishok, J., A. Shleifer and R.W. Vishny, 1992. "The Impact of Institutional Trading on Stock Prices," Journal of Financial Economics, 32: 1
[8] Edmondson, A.C. and M.J. Kerrissey, 2025. "What People Get Wrong About Psychological Safety: Six Misconceptions that Have Led Organizations Astray," Harvard Business Review, May-June

There is currently very sparse literature on the penetration of this concept into the arena of money management and the financial sector. Given the high public awareness of this sector, the question as to whether improved psychological safety within investment management firms could lead to better team dynamics and ultimately better firm performance seems a pertinent one.

## 3. Key differences between asset management and other industries

Investment management is a particularly nuanced industry with key differences compared to other industries. It is clearly not an industry where physical safety might be an issue – as in medicine or aviation. It does have high stakes, however, but these are the high financial stakes rather than a matter of life and death. Further, the backdrop against which investment management exists is that of financial markets – themselves dynamic, constantly changing and prone to boom-and-bust cycles. This volatile backdrop may create a fear of losing one's job, enhance the sense of pressure in an environment, and may create a particular kind of stress dynamic for employees against which psychological safety must be assessed.

### 3.1 What is a successful outcome?

What constitutes "success" within investment management is also somewhat subjective – some firms define it exclusively in performance terms, while others consider it delivery of excess return against a benchmark. The question arises as to what time period is relevant to measure that performance, and the issue of client satisfaction is also central.

### 3.2 What is an error?

Errors in investment management, too, can take many forms – they can be technical, trading, errors or more qualitative errors of judgment that may not even be objectively judged as errors according to the time frame examined (e.g., mistiming the holding period of a stock, such as entering or exiting "too early" or "too late," or mis-sizing a position, where the error is only clear in retrospect). While eliminating or minimizing trading errors may be an outcome of better psychological safety, this might be more deemed a "hygiene" factor within a firm and not necessarily related to adding value over an investment cycle.

Given these nuances, linking improved psychological safety to investment performance in investment management may take time and multiple investment cycles. It is beyond the scope of this paper to prove a link between improved psychological safety and better "investment skill" at this stage. However, it is interesting to explore the emerging awareness of the importance of culture, and efforts to improve psychological safety and improve the quality of risk taking within firms on a global basis today.

### 3.3 Exploring the emphasis on firm culture and psychological safety within investment firms – an initial study

We spoke with 14 groups of professionals at 14 different investment management firms, including a mix of executives and portfolio managers. The discussions took the form of long-form qualitative interviews rather than surveys, as we were keen to capture nuance and subjective understandings of situations. Interview questions related to the importance afforded to culture within the firm, how it was defined, whether they recognize the

concept of psychological safety, and, if so, how they encourage it. We discussed decision making, accountability, feedback, compensation, other incentives, the role of leadership, and finally asked whether there was any discernable link between more effective culture and investment returns, innovation or team wellbeing.

## 3.4 Culture

The interviews revealed that there is increased awareness of the role of culture in building organizational strength within investment management. A head of strategy at a $43 billion emerging markets equity firm described it as "critical to perpetuating an organization," and, as such, required careful attention and monitoring. It was stressed by her to be a dynamic and "living and breathing thing" and by a founder of a $75 billion credit firm as a "gold standard" that could be inculcated and sustained in many ways. He suggested that frequent reinforcement was necessary and that it needed to be repeated to employees so often as to be akin to a "barrage." The role of leadership in "walking the walk" was considered critical to ensure authenticity and optimize employee buy in. One CEO talked about having zero tolerance for when things are done outside the cultural expectations, and the need to continuously reinforce culture intentionally.

The former CEO of a $160 billion asset manager suggested that some elements of culture should be universal, while some should be localized. Examples of "universal" culture would be treating everybody with due respect, providing feedback, a culture of accountability, and of putting the client first. Examples of local cultures would include different regional investment teams governed by different regional norms, or differing cultures within, say quantitative investment teams or fundamental investment teams.

## 3.5 Coping with stress

Sometimes the strains of the volatile market environment can contribute to a stronger culture – a professional who had spent time at the firm affected by the Barings Crisis in 1995 suggested that going through something "terrible" and coming close to losing "everything" led to a sense of "being in the trenches together" and on the same side. She spoke of this culture as being "humble" and "mutually supportive."

In light of the growing awareness of culture across a cross-section of asset managers globally, we were interested in how this was manifesting itself in creating a climate that endowed psychological safety.

## 3.6 Creating safety or belonging through empowerment and trust: Questioning "star" culture

One founder cited the work of Daniel Coyle's The Culture Code[9] frequently during our interview. The executive incorporated the lessons around establishing purpose and creating safety through building "trust" – a term he preferred to Coyle's "vulnerability," and how this trust leads to a sense of "belonging."

Others stressed the importance of team dynamics and the president of a $650 billion multi-asset firm spoke about actively surrendering star culture for a team-first approach. She said, "Today we're doing a lot of training around what's called playing the bigger game. Playing the bigger game is this idea that you have to leave your department, your agenda, your role at the door, to come in a cohort or a team, to try really hard not to judge, but to bring curiosity." A value-oriented stock picker deliberately used generalists instead of specialists as stock pickers to avoid a specialist "dominating the conversation" as a keeper of domain knowledge.

[9] Coyle, D. 2018. The Culture Code: The Secrets of Highly Successful Groups, Penguin

By eliminating moats on knowledge in this way, the firm hoped to allow for more unencumbered exchange of ideas and safety to challenge others.

Another portfolio manager, from a smaller ($32 billion) mid-cap value manager, manages his team to ensure that they are free to develop stock picking expertise without the pressure to put something into a portfolio, and multiple leaders discussed techniques that are employed in team meetings to encourage junior staff to speak up, voice their opinions, and feel "valued" or "empowered and trusted" as shown below.

## 3.7 Processes to encourage dialogue, challenge, and debate

To create psychological safety many firms had intentional processes and safeguards in place around decision making. For one emerging markets manager the first step is maintaining a paper trail. This is to document the process and the judgment call so that they can later pinpoint where errors may have been made. This is all done against a context of encouraging disagreement and debate and shepherding these discussions in a respectful and constructive way.

Another, a mid-sized asset manager, refers to these as "retrospects" – particularly necessary when it comes to problematic investments. A retrospect consists of a whole re-underwriting and a revisiting and rehashing of the stock idea. This process avoids distorted recollection of the decisions and understandings that prevailed at the time based on the information available then. The meticulous documentation and investment notes enable the team to trace their thinking at the time that facts become known and to trace the investment process behind mistakes that may have been made.

Besides maintaining a paper trail, team dynamics can be deliberately structured to encourage debate – particularly from junior team members. One former head of investment at an $800 billion asset manager referred to many different ways to encourage contributions and frank debate, including "the good old blue team, red team approach" (in which team members are assigned a role of arguing for or against a stock or investment idea), the pre-mortem idea, which he explained as: "an idea, you might say to a junior analyst, okay, we're looking at this or entering into this position. These are all the reasons that we want to do it, I want you to go away and tell me in a year's time, it's gone horribly wrong, what happened." Another technique was at the end of every single team meeting for the senior analyst to go around the room and ask each analyst, "If this was your portfolio, which three current positions do you feel least comfortable about?"

A fixed income focused manager, with over $1 trillion in assets under management, described how investment committee meetings were run: "We give our speakers 10 minutes to deliver their presentation uninterrupted before going into the Q and A and make sure that we have an odd number of voting members when voting, ensuring that the meeting lead speaks last, or rather, votes last when surveying, so … they don't influence others." The manager also described having "open mic" days in the investment committee: "we read our best ideas from our investment professionals on an anonymous basis, really, to ensure that we're not being influenced by the name on the piece of paper or their seniority. Other things we do is in our quarterly forum process, after a presentation, we'll often ask if there's any dissenters to speak up to avoid that group think or assuming that everyone's on the same page."

### 3.8 Using psychological safety to probe errors

The process improvements highlighted above can affect how errors are treated, and how they are used as a tool for learning – instead of "blame" – a key hallmark of a psychologically unsafe environment. This is not the same as inviting or celebrating failure, however – possibly a key difference between the fiduciary-duty filled investment management industry and the more innovative field of, say, technology. The founder of a large private credit manager suggested that it was important to differentiate between creating a culture of challenge and allowing failure, stating, "We can't let individuals make mistakes on a bad loan, right? That's not a strategy for success for our business. What we can do is create an environment in which people can feel comfortable saying what they believe and saying it with passion and with analytical reasoning and being part of spirited debates."

A global equity manager with close to $300 billion in assets under management stressed the importance of not having a "culture of blame" within the firm that ensured that the team could "continue to take risks even where things have not gone well." The flip side of that (instead of a culture of blame) is that there is better individual accountability as well as team accountability.

### 3.9 Using feedback to eliminate errors and build trust and learning

Outside the stock picking process, feedback was seen as an essential tool to ensure team development and growth. Both public and private managers cite the importance of feedback with one stressing that key to fostering a culture of learning is frequent and actionable feedback. According to the former CEO, this feedback should be direct "so that you know where you stand – for better or for worse." He admitted that

**"We can't let individuals make mistakes on a bad loan, right? That's not a strategy for success for our business. What we can do is create an environment in which people can feel comfortable saying what they believe and saying it with passion and with analytical reasoning and being part of spirited debates.**

cultures where feedback is freely given may not necessarily be the most convivial or "feel good" of cultures but that a culture where that feedback is given indicates a generosity and engagement and a desire for young investors to learn and grow. He further suggested that challenge is key to developing a critical thinker and investor.

Another stressed the importance of a feedback loop in which the team member should "feel safe," receive constructive feedback, and that the shorter the feedback loop the faster the learning would be. He suggested that this would encourage them to act on this feedback and repeat this cycle. This practice of providing early and actionable feedback should ideally commence early on in someone's tenure at the firm in order to shape behaviors, build trust, and build confidence in investing

### 3.10 How compensation can be a tool for feedback and trust

Within financial services compensation might be seen as a particularly inflammatory topic, whether as an instrument of feedback, a motivator, or something that could undermine trust and drive a wedge between staff. A former CEO had a particular focus on transparency

around compensation – he is transparent about why individuals are paid what they are, seeking to remove opacity, which can breed distrust, he suggested. He also rejected the suggestion that compensation in asset management was the main way to motivate a workforce, "I mean you pay them once a year. If you do it well, there's a period of a few days around the comp window where people are bothered by that. But most of the time, that's not what drives people … people are driven by succeeding at what they're doing."

## 3.12 Transformation in line with an industry in flux

While we are mindful of the fact that there may have been selection bias in our sample, it is clear that at the leadership level in investment management there is enhanced awareness of the importance of culture, a sense of belonging, and talent retention. There is a focus on having better discussions, presenting challenge to ideas, building accountability, and learning from mistakes, even in the absence of concrete causal links to better investment performance. We observed that the understanding of the value of psychological safety as a way to enhance learning within these firms was nuanced and sophisticated, and was not distorted by what has been described as common misperceptions of psychological safety by Edmondson and Kerrissey.[10] There was no conflation of psychological safety with job security, "niceness," freedom from challenge, getting one's way, comfort, lower levels of performance, or the need for the policy to be in some way codified or mandated. There was an acknowledgment of the role of leadership in setting expectations, but also an awareness that individual team interactions had to reflect behavioral changes in order to ensure learning and enhanced contributions by all group members.

Investment management is a relatively high margin industry, where human capital is one of the most significant costs. Maybe this aspect enables cultural enhancement to be prioritized and money assigned to training and process enhancements.

The recent article by Edmondson and Kerrissey cites the importance of centering firms around their root mission and purpose, and of instilling processes like feedback, effective meetings and robust debate. Many of the firms interviewed had developed a mission around the client experience – the ex-CEO asserted that key mission of the firm: "it's about the client. It's about their experience. They're the only ones taking risks with the money."

The former head of investment echoed this, and also accepted that this may not meet every definition of success in terms of investment performance. He suggested that the true measure of success was the "outcomes that we deliver to our clients. So the things that we can influence. So whether you're given a global small cap, mandate, emerging market debt mandate, whatever it is, if you can deliver against the benchmark that you're set, then I think that probably has to be success. Because at the end of the day, we are hired by our clients to do that. Is that the same though, as being a successful investment person? No, not necessarily."

Ben Philips, a consultant with Broadridge Financial Solutions, recently[11] cited trends in asset management such as the movement from a product industry into a service industry. This entails more customization, more of a focus on client partnership than mere product delivery, and a wider spectrum of outcomes that correspond to the varying needs of a client. He notes an evolution in how the asset management industry is measuring service, and why retention is more important than acquisition.

[10] See Footnote 8 above

[11] https://www.fiftyfaceshub.com/219-ben-phillips-of-broadridge-financial-solutions-looking-into-the-crystal-ball-for-the-asset-management-industry-of-the-future

If client relationships with an asset manager are ultimately deemed to matter more than raw performance, then the efforts in place at investment management firms to ensure a collegial culture, better employee retention, and an overall mission of client service are likely to generate a good return on investment.

At the time of writing we can see multiple examples of process changes and efforts to derive the most from an investment team. Much of this is still a work in progress, but the increased momentum around the practice suggests that the efforts have yielded positive or at least promising results. We hope that by sharing some early examples of process improvements, which encourage dialogue and more of a sense of being "valued" among employees, more such improvements continue.

# Habits and routines
## in financial markets[1]

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## Abstract

Markets are simultaneously hotbeds of dynamism, innovation, creative destruction, and characterized by habit, routine and inertia. Yet dominant understandings of market activity emphasize the former over the latter. Taking the latter seriously isn't just about being negative but can productively help identify barriers that need to be overcome in order to ensure value creation rather than value destruction. We illustrate this line of thinking through an analysis of the active fund management community in the U.K. and the U.S.

### 1. Introduction

Financial markets are often portrayed as dynamic arenas of constant innovation, where new technologies, strategies, and players continually reshape the landscape. Yet, beneath this veneer of change lies a paradox: despite compelling evidence of underperformance by many market actors and questionable utility of markets as economic institutions, many financial intermediaries continue to thrive. Why do such practices and costly strategies persist in an industry where competition should, in theory, weed them out? We explore this question by looking beyond traditional economic explanations and into the social and institutional structures that underpin financial decision making.

Rather than treating markets as purely rational systems, we argue that they function, not unlike other social fields, through a continuous shaping by entrenched relationships, long-standing traditions and power structures that resist change. While markets share many structural features with longstanding institutions – exhibiting inertia as well as bursts of innovation – recognizing the underlying social forces can help financial professionals adapt more creatively and position themselves to seize emerging opportunities. This is not to say that markets are not rational at all, merely that rationality is bounded [Simon (1990)] in certain ways. Moreover, the limits of rationality are not merely due to cognitive capacity or behavioral factors à la behavioral economics; market behavior is influenced by social dynamics as well.

[1] This article is derived from the authors' recent book, Inertia: Purposeful Inefficiencies in Financial Markets, Columbia University Press, 2025

Understanding these dynamics helps explain a number of phenomena that continue to puzzle commentators, such as:

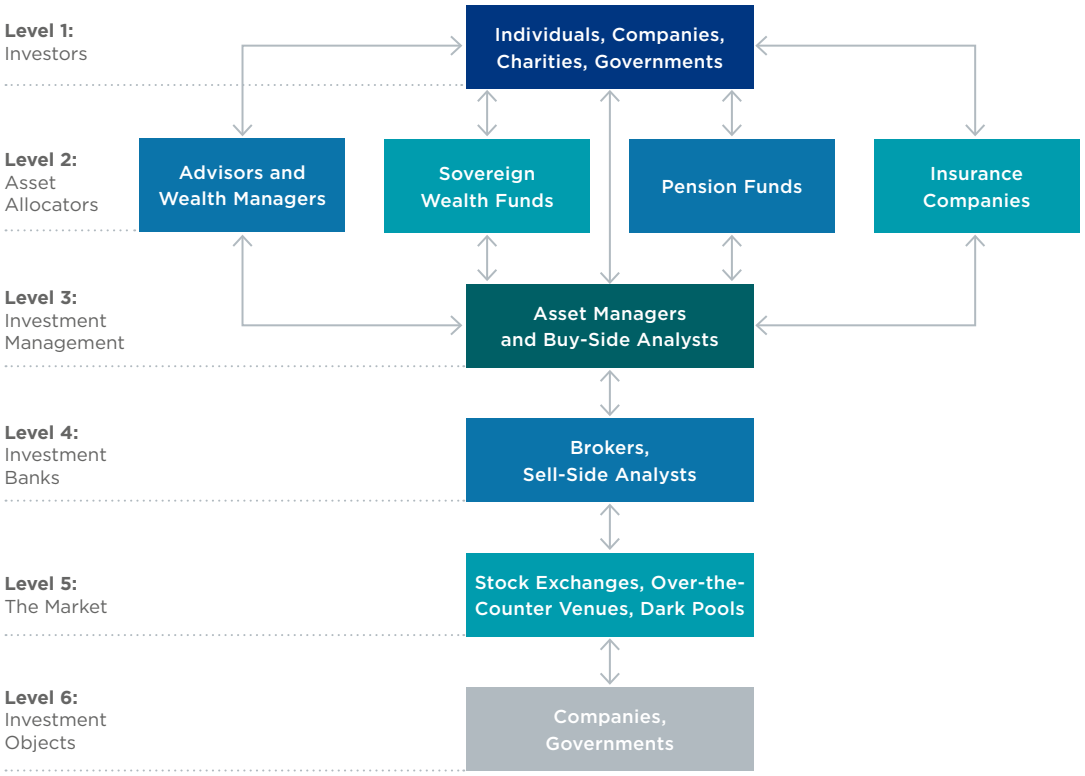
- Why active fund management still retains such a dominant position despite the longstanding case against it
- Why technology has not revolutionized financial decision making as expected
- Why financial professionals often operate in ways that contradict their economic interests.

## 2. Methods

To understand the persistence of financial intermediaries and the social structures that support them, we drew on extensive qualitative research. The study involved in-depth interviews with both buy-side and the sell-side investment professionals across key financial hubs, including New York, London, and Chicago. We spoke to 70 professionals across the different sites, conducting interviews that generally lasted about an hour. Participants were located at levels 3 and 4 in the investment chain (see Figure 1 below). This included portfolio managers, hedge fund analysts, investment bankers, and equity researchers, providing a comprehensive view of the inner workings of investment decision making.

The interviews were conducted over several years, with a focus on uncovering not just explicit decision making processes but also the implicit norms, habits, and social networks that shape financial behavior. Additionally, ethnographic observations of industry conferences, earnings calls, and private networking events helped reveal the underlying social dynamics that quantitative data alone cannot capture.

**Figure 1:** The investment chain adapted from Arjaliès et al. (2017)



This methodological approach allows for a richer, more nuanced understanding of how and why certain practices exist in investment decision making even when such practices don't always result in the production of value.

## 3. Theorizing financial intermediaries

Financial intermediaries play an essential role in markets by facilitating transactions, offering investment advice, and helping to allocate capital efficiently. However, their persistence cannot be explained solely in terms of economic utility. Instead, financial professionals operate within a network of relationships and institutional norms that shape their behavior.

Drawing from the work of sociologists Pierre Bourdieu (2005) and Marc Granovetter (1985), we posit that financial markets function as social fields where decisions are influenced as much by relationships and traditions as by rational analysis.

- **Granovetter's Theory of Embeddedness:** Economic actions are embedded in networks of personal relationships, meaning that financial professionals often rely on long-standing ties rather than objective data.
- **Bourdieu's Concept of Habitus:** Professionals internalize industry norms and develop ingrained ways of thinking that shape their decision making, making change difficult even when it is rationally warranted.

These frameworks help explain why habits and routines often drive investment decision making, nested as these are in a complex web of social expectations, career incentives, and institutional pressures.

## 4. Active fund management and underperformance

For decades, the efficacy of active fund management has been under scrutiny, with a growing body of research challenging its value proposition. Critiques of active fund management have abounded since the 1970s. Charles Ellis's "Winning a Loser's Game" (1975) was one of the first to articulate the case against stock picking. William Sharpe's (1991) analysis is equally well cited and, of course, there is the series of books written by Jack Bogle, Vanguard's founder, or Burton Malkiel's A Random Walk Down Wall Street (2019), all of which make the case for long-term investments in passive, low-cost index funds rather than more costly actively managed portfolios. More recently, SPIVA data is routinely used to demonstrate just how few active managers beat their relevant benchmarks over specific time periods, geographies, and strategies. Even with mounting evidence that active managers struggle to outperform passive index funds over any time frame, they continue to attract significant capital. This paradox also highlights the potential for innovative managers to differentiate themselves, provided they align their strategies with well-founded research and deeper client relationships. The reasons for this, we suggest based on our interviews, are deeply social rather than economic and often revolve around relationships between the buy side and the sell side who, collectively, comprise the active investment community.

**Relationships sometimes matter more than performance:** Buy-side firms maintain long-term relationships with sell-side analysts, even if their stock recommendations do not consistently yield better returns. Indeed, buy-side firms often complain about the value produced by some

sell-side researchers, even when they keep these sell-side researchers on their broker list. They may do this for a number of reasons:

1. They have longstanding relationships with counterparts whom they don't want to see kicked onto a garbage heap: ("We hire people that we like. A lot. That is not corruption. It is just human," fund manager, Chicago.)
2. The advice of some sell-side analysts is not considered valuable, but they are kept on the roster because of the other services that their firm provides, such as execution, non-deal roadshows, and access to IPOs.
3. Buy-side analysts tend to have more interaction with sell-side analysts than portfolio managers do, yet the portfolio managers make the decision about which analysts to reward with commissions. Where buy-side analysts might be better positioned to determine which sell-side analysts truly provide more meaningful insights, their views are often overridden by their portfolio managers.
4. Some sell-side analysts persist in networks simply because they have the longest tenure among the group, even though their research may not yield insights.
5. While buy-side firms often complain about the value brought by the sell side, the sell side simultaneously complain that the buy side should listen to them more when it comes to stock recommendations. There are often internal status struggles on the buy side that involve showing colleagues that one is not beholden to the external sell-side research. So in order to save face or exercise agency, perfectly good suggestions from sell-side researchers may be overlooked or contradicted.

These dynamics speak to the broader point that financial markets are not just economic systems but social fields where change is constrained by ingrained habits, professional loyalties, and institutional pressures.

## 5. The role of conformity and consensus

Another key theme is the tension between differentiation and conformity in financial markets. On the one hand, investment professionals need to stand out to justify their fees and attract clients. On the other hand, they must conform to industry norms and expectations to maintain credibility.

- Sell-side analysts are expected to provide differentiated views but must also conform with market consensus to maintain credibility.
- Buy-side managers claim to seek unique insights but often rely on aggregated consensus estimates when making decisions.

This duality creates a system where genuine innovation is constrained, and the status quo is reinforced. While industry norms sometimes reward those who play it safe, the growing emphasis on data-driven insights and niche strategies suggests that those willing to push boundaries may find new avenues for outperformance and differentiation.

This scenario is broadly consistent with the Bourdieu's (2005) insight that "excellence in most societies means playing in accordance with the rules of the game." While we like to lionize rule breakers and mavericks when it comes to financial markets or business leaders in general (think of the pedestals that Ray Dalio, Jamie Dimon or Larry Fink are routinely put on), the rule-breaking maverick is less common than the popular imagination suggests. Most professionals

become successful within specific fields by decoding the formal and informal rules of the game and playing in accordance with them. Quite often, those formal and informal rules of the game are in conflict with each other.

## 5.1 The pressure to conform in financial markets

The investment industry is built on an inherent contradiction: while differentiation is necessary to attract attention, diverging too far from the consensus carries significant career risks. Fund managers and analysts operate within a framework where deviation from the accepted wisdom can lead to professional isolation, reputational damage, or even job loss.

- **Career risk and the safety of consensus:** Many portfolio managers and analysts fear that making bold, contrarian calls, especially those that turn out to be wrong, can lead to career-ending consequences. As a result, they often hedge their views, aligning closely with the market consensus to avoid standing out too much.
- **Institutional pressures to follow the herd:** Large asset management firms and investment banks have established research methodologies that reinforce collective thinking. Analysts working within these institutions are incentivized to align their forecasts with consensus estimates, as significant deviations could raise questions about their judgment. Where analysts produce estimates that are more than 5 or 10% out of consensus, they might be asked to adjust them accordingly. After a while, they start to self-discipline in this respect.
- **Media and public perception:** Financial news outlets play a critical role in shaping industry sentiment. Analysts who go against the prevailing market view may struggle to gain visibility or credibility, while those who confirm existing narratives are more likely to be quoted and promoted.

## 5.2 The role of earnings consensus and forecasting

Sell-side analysts are frequently judged on their ability to forecast earnings accurately. However, rather than truly independent analysis, much of this forecasting process involves clustering around a consensus number. This is because:

- Investment banks and brokerage firms often pressure their analysts to align with their corporate clients to maintain good relationships and ensure future investment banking revenue.
- Analysts who consistently deviate from consensus may be viewed as unreliable or contrarian for the sake of it, rather than insightful.
- Market participants often focus on the consensus estimate rather than the range of estimates, further discouraging deviation.
- Analysts are often given too many stocks to cover to realistically have a differentiated view for each and therefore “hug the consensus” to avoid exposing their ignorance about neglected stocks within their coverage.

## 5.3 The social reinforcement of market narratives

Beyond formal structures, social interactions among financial professionals reinforce conformity. Informal networks, industry conferences, and even social media platforms create an echo chamber where dominant ideas are repeated and validated.

- **The power of networking:** Senior professionals often mentor younger analysts and fund managers, passing down entrenched beliefs and reinforcing established investment philosophies.
- **Reputation and influence:** A strong track record of aligning with consensus while making only modest, incremental adjustments is often rewarded with credibility and career advancement.
- **Groupthink and market cycles:** In bull markets, positive narratives gain momentum, while in bear markets, pessimism spreads rapidly. Market participants reinforce each other's views, leading to cycles of euphoria and panic.

Despite the problems created by consensus-driven decision making, financial professionals continue to operate within this framework because it offers stability, reduces risk, and aligns with industry incentives. This inertia creates a system where genuine innovation is rare, and the status quo is reinforced. Contra dominant media images such as that of the "star fund manager," the financial industry often rewards those who play it safe, leading to a cycle where analysts and fund managers perpetuate existing narratives rather than challenging them.

## 6. Technological resistance and the myth of innovation

One might expect technology to disrupt financial markets more thoroughly, and indeed, pockets of genuine innovation do exist, ranging from advanced analytics platforms to AI-driven research tools. However, our research reveals that technology adoption often remains selective and geared toward efficiency rather than full-scale transformation.

> **The financial industry's resistance to change is partly accidental, partly purposeful.**

- **Technology is used for efficiency, not strategy:** While active management firms embrace tools for managing workflows and tracking clients, they are skeptical about replacing human judgment with algorithms. Customer relationship management systems have been integrated into buy-side and sell-side firms in recent years. This helps with logging interactions with clients and ensuring more accurate billing and compliance practices, but there is more resistance to technology when it comes to improving investment decision making, at least among the more seasoned bottom-up stock pickers.
- **Small data over big data:** Fund managers prioritize qualitative insights from industry relationships over statistical models, even when empirical research shows that data-driven approaches outperform human intuition. Again, this is a reflection of our sample, which was primarily those using fundamental analysis. However, the attachments that individuals have to fundamental analysis and uncovering unique nuggets of information from industry sources are potentially more a product of how analysts and portfolio managers have been trained rather than they are the outcome of any sober reflection of what leads to better investment outcomes.

- **Fear of disruption:** Many professionals view technological disruption as a threat to their status and income, leading to selective adoption of innovations that do not challenge their authority. This is not unique to fund management or equity research, of course, and has been demonstrated across a number of different financial domains, including both financial audit and tax. Indeed, resistance to technological innovation is to be entirely expected from anyone whose job is potentially threatened by it.

These factors explain why, despite the availability of powerful machine learning models that are routinely used by high frequency and algorithmic trading firms, many investment decisions are still made based on human judgment and traditional analysis. We are not suggesting that the former are more effective than the latter so much as the reasons for remaining attached to existing ways of doing things often have more to do with what people are actually comfortable with rather than what works best.

## 7. If you can't beat them, join them: the rise of passive investing

Fight or flight are common psychodynamic reactions to an external threat. We see both of these in the active investment community when they talk about the rise of passive investing, which we were told represents the most significant challenge to the active investment community in decades, which our interviewees responded to with a mix of denial, recognition, and adaptation.

### 7.1 The psychological and institutional response

One of the most striking aspects of the rise of passive investing is the cognitive dissonance it has created within the active investment community. Many fund managers and analysts who have built their careers on the premise of skill-based investing wrestle with reconciling the evidence supporting passive strategies. Yet, this very shift presents a chance for active managers to refine their offerings by leveraging technology, sharpening their focus on specialized niches, and better articulating the distinct value they can offer investors.

- **Cognitive dissonance:** Many professionals in active management acknowledge that index funds are a superior investment choice for most people. Yet, because their own careers depend on the belief that active investing adds value, they often find ways to rationalize their continued involvement in the industry.
- **Institutional justifications:** Active fund managers frequently argue that they are necessary to maintain market efficiency. The claim is that without active managers attempting to identify mispriced securities, markets would become inefficient. However, this justification ignores the fact that the majority of active managers do not outperform their benchmarks, raising questions about their actual contribution to price discovery.
- **The fear of obsolescence:** The shift toward passive investing is an existential threat to many financial professionals, particularly those who rely on the fees generated from active fund management. As a result, firms and individuals often resist acknowledging the full implications of the passive revolution.

### 7.2 Rebranding and strategic adaptation

Rather than admitting defeat, the active investment industry has responded by reframing its services in ways that make them appear distinct from traditional active management.

- **Smart beta and factor investing:** Many active managers now market their funds as "smart beta" or "factor-based" strategies. These approaches still involve systematic investing based on factors such as value, momentum, and quality but are presented as a more sophisticated alternative to traditional indexing. In reality, these strategies share more in common with passive investing than with traditional active management as they have very low tracking errors.
- **Private markets and alternative assets:** As public market investing becomes increasingly dominated by index funds, many active managers have shifted their focus to private equity, venture capital, and hedge fund strategies. The argument is that inefficiencies are greater in these markets, providing more opportunities for active managers to add value. However, these investments also come with higher fees, more risk, and less transparency, making it difficult to assess whether they genuinely outperform over time on a risk-adjusted basis.
- **The myth of "customized solutions":** Some firms now market their active strategies as "personalized" or "customized" solutions for high-net-worth individuals and institutional investors. By framing their services as bespoke and exclusive, they seek to justify their fees, even if the core principles of their investment approach remain unchanged.

### 7.3 The future of active investing in a passive world

Despite the continued growth of passive investing, active management is unlikely to disappear entirely. However, the industry is being forced to evolve in response to changing market realities.

- **Hybrid models:** Some firms are embracing hybrid approaches that combine passive strategies with selective active management. These models attempt to capture the cost efficiency of passive investing while still allowing for some level of discretionary decision making.
- **Regulatory pressures:** Governments and regulatory bodies are increasingly scrutinizing the fees charged by active managers, particularly in retirement and pension plans. Greater transparency may force more active funds to justify their costs or lower their fees.
- **A shift toward niche strategies:** While broad-based active management struggles to justify itself, specialized strategies, such as thematic investing, ESG (environmental, social, and governance) investing, and quantitative approaches, may offer a path forward. These strategies attempt to appeal to investors who are looking for more than just market returns.

Ultimately, the rise of passive investing is not just a financial shift – it represents a fundamental challenge to the ideology of active management. The way the industry has responded to this challenge reveals much about the nature of purposeful inertia: rather than embracing change, entrenched groups find ways to reframe, adapt, and justify their continued relevance.

## 8. Purposeful inertia: the key takeaway

The financial industry's resistance to change is partly accidental, partly purposeful. Finance, like many other fields, relies on routines and habits to provide consistency and stability. Part of this is unconscious and taken for granted. However, many aspects of continuity are more conscious in orientation. Financial professionals

invest significant effort into maintaining existing structures because these structures serve their interests. This "purposeful inertia" is evident in:

- Continued survival of underperforming active managers
- Reliance on outdated, often "follow-the-herd" research practices
- Resistance to fully embracing technological advancements.

Understanding these dynamics is crucial for anyone working in financial markets, as it reveals both the resilience and the overlooked potential for improvement that exist side by side. By recognizing purposeful inertia, professionals can more effectively identify where genuine innovation is both feasible and urgent, positioning themselves and their organizations to thrive.

## 9. Implications for financial professionals

This article is not a standard critique of the active fund management community and their advisors in investment banks. Such critiques tend to emanate from a conceptual position that is effectively some variation of the efficient markets hypothesis [Fama (1970)]. As stated above, the position we start from here is not one of economics and efficient markets, but a sociological standpoint that views markets as embedded in social networks [Bourdieu (2005); Granovetter (1985)]. From this point of view, active fund management is often ineffective because of the inertia that characterizes social networks in finance and because the future is generally impossible to predict, not because prices already accurately reflect fundamental values.

For those working in financial services, the insights offered by this study are both a critique and a call to action. Recognizing the power of social structures can help professionals navigate career decisions, understand market inefficiencies, and anticipate where true disruption might occur. Firms that genuinely embrace innovation and challenge ingrained habits may be better positioned for long-term success. In practical terms, financial professionals who embrace a culture of measured experimentation, using data-driven methods, forging deeper client connections and questioning entrenched practices, stand to benefit. Indeed, by balancing tradition with innovation, institutions can remain competitive in a market that is potentially receptive to new approaches.

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# Future-proofing adoption strategies with behavioral science[1]

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## Abstract

Financial institutions face increasing challenges in designing effective and sustainable adoption strategies for new products and services. In a rapidly evolving digital and regulatory landscape, many firms rely heavily on short-term adoption metrics, often overlooking the underlying behavioral factors that drive long-term customer engagement. This paper demonstrates how behavioral science, particularly choice architecture, can help financial services firms structure adoption strategy decisions in a way that supports both immediate business goals and long-term customer relationships.

A key obstacle to effective adoption strategies is the presence of cognitive biases in decision making. Firms often rely on familiar habits and short-term gains while overlooking strategic trade-offs that could lead to more sustainable growth. This research introduces a structured decision-making approach that helps broaden strategic thinking by addressing biases, such as narrow framing, availability bias, and present bias. By applying this approach, financial institutions can design more customer-centric, commercially viable, and resilient adoption strategies.

This framework is particularly valuable for firms looking to strengthen decision-making processes, reduce behavioral risks, and optimize adoption strategies to drive lasting customer value.

## 1. Introduction

In high-stakes environments like financial services, strategic choices that address consumer behavior and decision-making processes can help firms engage customers and maintain competitiveness. To support these strategies, choice architecture alters the decision context or how information is structured and framed to mitigate biases and improve decision making [Fasolo et al. (2024)]. This tool can nudge individuals and organizations towards better decisions while preserving freedom of choice. One effective choice architecture technique is expanding objectives, which broadens considerations by identifying additional relevant goals and counteracts biases like narrow framing, which limits the outcomes, often overlooking alternative perspectives or long-term impacts.

This essay explores how expanding objectives can improve decision making in designing customer adoption strategies for financial services. The

[1] This paper was originally developed by the author, Martha Lucía Férez Blando, as part of the Executive MSc in Behavioural Science at the London School of Economics and Political Science (LSE), for the Behavioural Decision Science course.

following sections examine key decision-making challenges, solutions using the expanding objectives technique, limitations and conclusions.

## 2. Decision-making challenges to enhance adoption strategies

The financial services sector faces distinctive pressures, including stringent regulatory requirements, rapid technological change, and a reliance on fast and intuitive thinking. The complex and intangible nature of financial products often prompts decision makers to rely on straightforward approaches to navigate uncertainty. Such reliance on quick judgments limits analytical and rational thinking, often neglecting long-term goals and endangering decision quality.

When designing customer adoption strategies in financial services, decision makers often face significant behavioral obstacles. Narrow framing, a cognitive bias, causes them to overlook complex organizational objectives that take longer to materialize. This can lead to overconfidence in limited predictions, narrowing assessment of potential outcomes, and compromising the quality and effectiveness of customer adoption strategies in dynamic environments.

The integration of financial services and technology has modified behaviors in digital finance settings, making it crucial to design customer adoption strategies that foster long-term engagement rather than just immediate use [Chuahan and Chavda (2024)]. Addressing this is challenging, as financial professionals operate in high-pressure, noisy environments where inconsistent decisions stem from varying interpretations of complex inputs, compounded by constant data inflow, market fluctuations, and evolving regulations. Consequently, professionals often prioritize immediate outcomes over long-term goals, driven by decision-making biases that expose behavioral risks, resulting in suboptimal outcomes.

> **Behavioral science enables financial firms to design adoption strategies that drive immediate business impact and build lasting client relationships.**

Digital transformation strategies frequently emphasize short-term metrics and quick wins to demonstrate value. This narrow focus can lead institutions to overlook critical stages of the customer journey, missing opportunities to optimize long-term outcomes. The lack of best practices for adoption strategies mirrors broader organizational failures stemming from missing unified frameworks. Employees may rely on recent, familiar experiences (availability bias) or favor short-term gains (present bias).

When designing adoption strategies, financial services institutions often address decision-making challenges by focusing on a singular objective: increasing customer adoption rates. While this focus provides clear direction and aligns with immediate priorities, it can perpetuate short-term thinking and narrow decision-making frameworks. Instead, addressing these challenges requires incorporating multiple attributes to balance competing objectives and manage trade-offs effectively [Raiffa (2006)].

**Table 1:** Current singular objective in financial services customer adoption strategy

| Objective |
| --- |
| Increase customer adoption rates |

# 3. Expanding objectives to improve decisions in adoption strategies

## 3.1 Benefits of applying the "expanding objectives" technique

Expanding the range of objectives in decision making offers a robust solution for enhancing choice architecture in financial institutions to design adoption strategies for new products. By broadening the decision frame to encompass diverse and competing priorities, institutions can create adaptable strategies. The technique provides three key behavioral solutions to improve the decision framework: reducing cognitive overload, enhancing decision-making rigor and balancing short- and long-term goals. Together, these solutions can lead to adoption strategies that are comprehensive, customer-centric and aligned with both immediate and strategic goals [Chuahan and Chavda (2024)].

Reducing cognitive overload involves breaking down complex objectives into smaller, manageable sub-objectives, minimizing the noise that often undermines decision quality in high pressure environments like financial services. Organizing expanded objectives clearly and their timely communication helps maintain focus and prevent decision makers from being overwhelmed by excessive information, addressing challenges from complex financial data and regulations.

Enhancing decision-making rigor ensures critical objectives are systematically considered. A master checklist can help broaden the objectives by ensuring all known critical objectives are considered, improving decision hygiene judgment and mitigating behavioral risks. This structured approach fosters deliberative, System 2 thinking, enabling more thorough evaluations of relevant factors.

Balancing short- and long-term goals in the expanded objectives mitigates present bias by integrating overlooked objectives into strategy frameworks. This balance enables institutions to align immediate metrics, such as adoption rates, with broader goals like fostering trust and building loyalty. By doing so, financial services firms can develop sustainable, customer-centric strategies that address both immediate priorities and long-term organizational visions.

## 3.2 Techniques to expand objectives

Expanding objectives in decision making relies on both formal and informal techniques. Formal approaches include multi-attribute decision-making frameworks that systematically evaluate diverse objectives and trade-offs, ensuring adoption strategies meet user needs and avoid narrow framing. Similarly, scenario analysis assesses how objectives perform under varying conditions, which can help align short- and long-term goals and enhance decision robustness.

Informal techniques, such as reframing, broaden decision frames by presenting information through alternative conceptual lenses, revealing overlooked objectives for better decision making. The "Five Whys" method uncovers fundamental objectives by probing beyond surface-level goals, ensuring priorities like sustained engagement and perceived value are identified. Checklists provide consistency and comprehensiveness pragmatically, reducing risks of omission. Involving cross-functional teams incorporates diverse perspectives, capturing objectives that may otherwise be missed. Together, these techniques create a holistic approach to expand objectives when designing adoption strategies.

**Table 2:** Objective expansion approaches to design adoption strategies in financial services

| ID | Approach | Relevance to improving adoption strategy decision making |
|---|---|---|
| A1 | Multi-attribute considerations | Enables systematic evaluation of trade-offs between consumer and organizational value and short- and long-term gains. |
| A2 | Scenario analysis | Reveals diverse customer journeys, offering insights into opportunities for strategic engagement and planning for contingencies. |
| A3 | Reframing | Inspires innovative approaches by reimagining adoption rates as opportunities to penetrate new markets. |
| A4 | Checklists | Provides structured guidance for decision makers, ensuring critical drivers of customer adoption are systematically addressed. |
| A5 | Integration of diverse perspectives | Enhances decision making by incorporating holistic insights from varied organizational and customer viewpoints. |

## 3.3 Improving decision making to design adoption strategies

Building on the techniques outlined in Section 3.2, this section selects the most relevant approaches and demonstrates their practical application in expanding objectives to improve decision making in the design of adoption strategies for financial services. This aims to address the core issue with the original objective, "increase customer adoption rates," which is too broad and lacks nuance to guide decision making effectively in the dynamic environment of financial services.

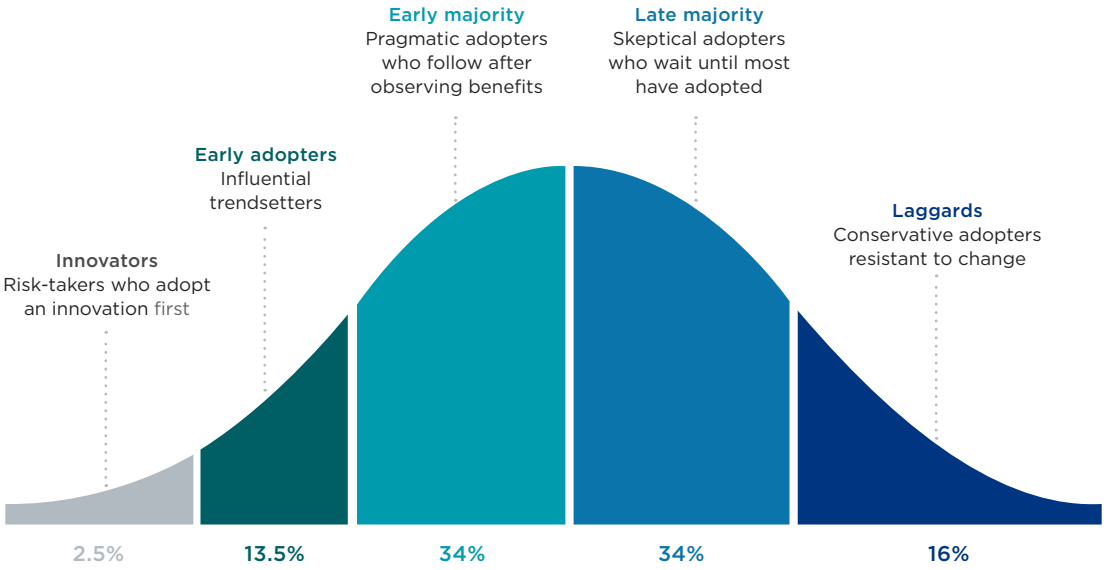
By applying "decision hygiene" [Kahneman et al. (2021)], this goal is refined into targeted sub-objectives, addressing customer behavior and organizational priorities. This process reduces cognitive overload, enhances decision rigor and balances short- and long-term goals. Structured approaches that foster deliberate System 2 thinking support this refinement. Multi-attribute considerations systematically evaluate trade-offs between consumer and organizational value, and short- and long-term gains. Scenario analysis reveals insights into customer journeys revealing strategic engagement opportunities. And, reframing repositions low adoption rates as opportunities to access new markets.

While no universal master checklist exists for adoption strategy design, this paper proposes a structured approach by integrating diverse perspectives from established frameworks. Leveraging Ettlie's (1980) six-stage product-adoption model (Figure 2) and Rogers' (1995) innovation-adopter categories (Figure 1) as key components will support customer-centric strategies while enhancing organizational success.

## 3.4 Use case: applying expanded objectives to a digital product launch

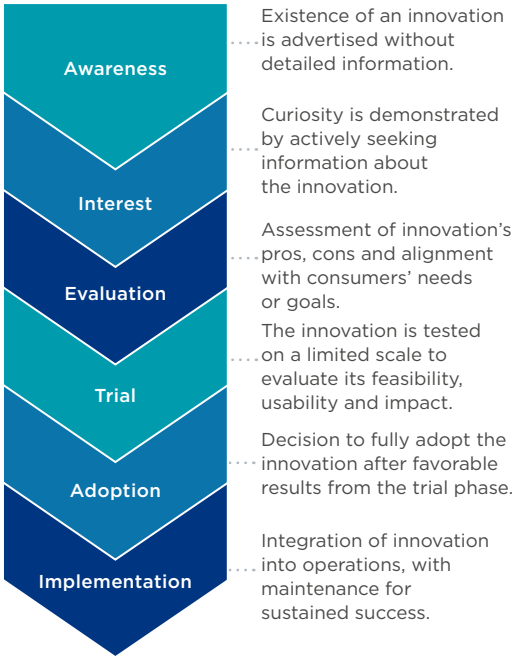
To illustrate the practical application of the expanding objectives technique, this section presents a use case involving the launch of a digital financial product. The scenario demonstrates how behavioral insights can be translated into six actionable sub-objectives aligned with customer-adopter segments and the stages of the product adoption journey. This structured approach enables financial institutions to design more targeted, effective, and sustainable adoption strategies.

**Figure 1:** Rogers' innovation-adopter categories




**Source:** Rogers (1995)

**Figure 2:** Ettlie's adoption model categories




**Source:** Ettlie (1980)

### 3.4.1 Objective 1: Promote product exposure

In the earliest stage of adoption, building awareness and trust is essential. Financial institutions can encourage initial engagement by highlighting ease of use through simple, intuitive messaging and user-friendly visuals. Social proof can be leveraged through influencer partnerships, customer testimonials, or early access programs that showcase real users interacting with the product. These approaches help establish credibility, reduce uncertainty, and spark interest among innovators and early adopters.

**Table 3:** Expanded objectives aligned with adoption stages and adoption categories

| Objective ID | Expanded objectives | Innovation-adopter categories [Rogers (1995)] | Adoption model stages [Ettlie (1980)] | Behavioral relevance |
|---|---|---|---|---|
| Objective 1 | Promote product exposure | Innovators | Awareness | Ease of use and social proof campaigns |
| Objective 2 | Demonstrate value and accessibility | Early adopters | Interest | Make benefits salient and personal; encourage interaction to build familiarity |
| Objective 3 | Facilitate comparative analysis | Early majority | Evaluation | Mitigate cognitive load and increase salience via structured comparisons |
| Objective 4 | Encourage risk-free exploration | Early majority | Trial | Mitigate loss aversion via ethical low-risk trials |
| Objective 5 | Support informed decision making | Late majority | Adoption | Highlight objective information to support rational decision making |
| Objective 6 | Sustain engagement | Laggards | Implementation | Gamification and user feedback loops |

### 3.4.2 Objective 2: Demonstrate value and accessibility

To support early-user engagement, financial institutions can offer guided demos to help customers understand how a product works. They can also provide interactive tools that personalize the calculation of the forecasted value a potential customer might expect. By keeping information transparent and easy to explore, organizations can make new products feel more accessible and their benefits more tangible.

### 3.4.3 Objective 3: Facilitate comparative analysis

When users enter the evaluation stage, the decision making process can feel overwhelming. Financial institutions can support this stage by offering simplified, curated comparisons presented in visual formats such as decision tables. These tools break down key product features, benefits, and costs in a way that is easy to scan and compare. By streamlining the evaluation pathway, institutions reduce cognitive load and enable customers to make more confident, informed choices.

### 3.4.4 Objective 4: Encourage risk-free exploration

To motivate hesitant users toward action, financial institutions can offer free trials or money-back guarantees that allow customers to test the product without commitment. When designed to allow easy withdrawal without loss, these approaches build trust, reduce perceived risk, counteract loss aversion, and encourage low-pressure exploration. By creating a safe and transparent trial experience, organizations can build confidence and support adoption.

### 3.4.5 Objective 5: Support informed decision making

Once users have trialed the product, supporting their informed decision is critical. Independent user reviews, usage data, and ethical default settings (such as opt-in trials with transparent cancelation options) can help ensure the transition to full adoption feels both safe and seamless. Usage data can validate the user's experience by highlighting objectively how they've engaged with the product and the benefits they've already gained. This builds confidence and supports rational, low-pressure decision making.

### 3.4.6 Objective 6: Sustain engagement

Adoption is not a one-time event. As customer needs and external conditions evolve, institutions must regularly revisit and refresh engagement strategies. Tools like gamification, achievement badges, and personalized feedback can help maintain interest, particularly among late adopters or previously disengaged users who may need ongoing motivation to stay engaged [Firmansyah et al. (2023)].

## 4. Discussion and conclusion

### 4.1 Limitations

The proposed approach to expanding objectives for improved decision making to design relevant adoption strategies in financial services faces several limitations. Decision makers must navigate complex, evolving multi-attribute frameworks, including diverse target markets, channels, behavioral interventions, customer engagement maturity, investment requirements, and expected return of investments. This complexity can complicate the prioritization of expanded objectives and may lead to "analysis paralysis." Without effective tools to streamline this process, professionals in high-pressure environments are vulnerable to cognitive overload, reducing decision efficiency and effectiveness.

Furthermore, aligning adoption strategies with evolving financial services regulations is crucial to ensuring the ethical implementation of behavioral interventions. Failure to do so introduces legal, financial, and reputational risks, undermining customer trust and the long-term sustainability of adoption strategies.

Additionally, while advanced tools such as AI-driven decision-support systems offer potential to reduce cognitive burden and adapt to changing conditions, their implementation is still in the early stages. Challenges include ensuring ethical use, regulatory compliance, and appropriate governance, particularly as financial regulators continue to develop their approach to AI-related risks.

### 4.2. Conclusion

The expanding objectives choice architecture technique significantly enhances the decision of how to design adoption strategies that are fit for purpose. By broadening the decision-making frame, this technique reduces cognitive overload, fosters systematic evaluation and balances short- and long-term priorities. This results in strategies that better align with organizational goals while delivering meaningful outcomes for clients.

While promising, the approach must be applied with consideration of certain limitations. These include the complexity of balancing several

considerations in the decision-making process, the need for regulatory alignment, and the challenges of implementing advanced tools such as AI responsibly. Addressing these factors is essential to ensure ethical, compliant, and scalable solutions.

The use case presented illustrates how this technique can be operationalized in a real-world financial services context, highlighting its value in re-engaging diverse customer segments, supporting confident decision making, and sustaining adoption over time. By embedding this structured yet adaptable approach into their decision processes, financial institutions can proactively respond to evolving customer needs, navigate regulatory complexity, and deliver sustained engagement, ultimately driving better customer and business outcomes.

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# Shared value in cocoa farming:

## Value for whom? And who gets the lion's share?

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## Abstract

Shared value is an economic and business strategy that advocates helping poor farmers increase productivity, leading to higher incomes. I examine Nestlé's shared value ambitions in the cocoa supply chain, mainly in Côte d'Ivoire and Ghana, through Nestlé's Cocoa Plan and Income Accelerator Program. Unfortunately, after almost two decades of implementing shared value, few cocoa farmers earn a living income and productivity has not significantly increased. In 2024, cocoa yields decreased due to climate change, plant disease, aging farms, and the Ivorian governments' resistance to planting higher-yielding cocoa trees. Cocoa farmers are also powerless to determine prices because they receive farmgate prices set by their governments that are less than world market prices. In the good times, when harvest productivity is higher, cocoa supplies for Nestlé are locked in at traditionally lower prices. However, if the harvest is down, farmgate and world prices increase, but Nestlé transfers the supply risk to the farmer because Nestlé does not pay farmers for the cocoa they can't harvest. As cocoa prices increase, so do retail prices, but chocolate demand is inelastic, causing sales dollars to increase and volumes to decline, which can still increase Nestlé's profit. Cocoa traders and speculators profit from the increased and wildly fluctuating cocoa prices. Ultimately, Nestlé, other chocolate manufacturers, traders, and speculators keep the lion's share of the profits, while most farmers still do not earn a living income. Ironically, producers can subsidize traders and companies if they can't supply their contracted quantities because of lower production due to climate change and diseases, which results in lower cocoa production.

## 1. Introduction

The market is tense. The industry is tense. Cocoa prices are still high, although coming down slightly from the peaks of 2024. The sector mainly worries about weakened demand, limited cash flow, and weather conditions in West Africa [Myers (2025)].

If there is one economic sector going through "transformation in disruptive times," it is the chocolate industry. Cocoa prices hit record highs of over $12,000 a metric ton in 2024 and were about $8900 in May 2025 [Trading Economics (2025)]. However, productivity and farmer incomes are falling in the two main cocoa-producing countries, Côte d'Ivoire and Ghana, with climate change, crop diseases, and aging cocoa trees all taking their toll.

To complicate matters, the world's largest importer of cocoa, the E.U., is introducing deforestation and due diligence legislation to protect native forests and human rights, and it is unclear how these new regulations will impact farming communities. The impact of E.U. legislation is compounding the situation, where African government regulation is hampering some farmers because they do not allow the chocolate companies to assist them. Therefore, farmers with aging farms and disease cannot renovate or replant their farms with healthier, more productive trees. Unsurprisingly, many smallholder farmers are leaving the industry. Hence, in the future, it is likely to be more difficult to meet the demand for cocoa that goes into the chocolate we all know and love [Myers (2025)].

Chocolate's main ingredient is cocoa. Most of our chocolate comes from cocoa beans grown in two West African countries, Côte d'Ivoire and Ghana. Farmers harvest the beans from the fruit pods of the cacao tree. Typically, the farms are small, between two and five hectares, yielding less than 500 kg of beans per hectare [Suh and Molua (2022)].

Farm workers, often the farmer's children, break open the pods, exposing the white cocoa beans inside a sticky, sweet pulp called the placenta. The beans and pulp are then placed on banana leaves on the ground and left to ferment for about a week, allowing natural enzymes to transform them into dark cacao beans that develop characteristic chocolate flavors and aromas. After fermentation, farmers dry the beans in the sun before packing them into sacks for transport to sell to local cooperatives at a farmgate price set by the Ivorian and Ghana governments.

The cooperatives clean and quality-check the beans before selling some to local processing plants that grind them into cocoa butter, liquor, or powder. However, the cooperatives send most of the harvest directly to a local port for export based on set prices. In the case of Côte d'Ivoire, the government sets export prices based on forward contracts; in Ghana, market prices prevail [Smith and Morawiecki (2024)].

> **"The market is tense. The industry is tense. Cocoa prices are still high, although coming down slightly from the peaks of 2024. The sector mainly worries about weakened demand, limited cash flow, and weather conditions in West Africa.**
>
> **Myers (2025)**

Processors and cocoa companies in both countries do not add much value to the beans. Rather, the world's major processors and manufacturers are responsible for most of the value added to the cocoa supply chain [FAO and BASIC (2022)]. Typically, farmers get about 11% of the price of a chocolate bar, while local exporters and processors share another 13%. Next, the international manufacturers and retailers share 37% each. Unfortunately, profits for farmers are almost nonexistent, so they barely survive [Ferdjani (2024)]. Most do not earn a living income and many live in poverty [Perkiss et al. (2021)].

Local exporters and processors do make some profit and pay some taxes. However, this pales compared to the profits made by international manufacturers, retailers and traders and the taxes they pay their respective governments. Thus, international companies and governments make significantly more money from cocoa than the people and countries that produce the

raw materials for your beloved chocolate bar. In this article, I explore what contributes to the imbalance in the "shared value" business model [Nestlé (2007); Porter and Kramer (2011); Nestlé (2023a)]. However, the shared value business model is not immune to the impacts of climate change and reduced cocoa supply, causing an increase in cocoa prices.

I reveal how increasing cocoa prices impact manufacturers' production costs, demand and profitability. The high prices and volatility mean the once-stable commodity is now open to speculation [Nudelman (2025)]. The instability increases risks to market players, so they seek to transfer that risk to other parts of the supply chain, usually to the poor farmer who has very little say in the price of cocoa. Hence, large companies and speculators still profit at the expense of farmers and producing countries. Ironically, speculators who never own cocoa can profit from trading in cocoa. It is also ironic that cocoa producers like Ghana are becoming poorer because they can't supply the contracted volumes and continue to receive lower prices until they do.

## 2. Shared value in Nestlé's cocoa supply chain

In this section, I focus on the shared value business model and the financial implications for companies like Nestlé, farmers, traders, speculators, and the supply chain. I chose Nestlé as an example because, since 2006, Porter and Kramer (2006; 2011; 2019) have cited Nestlé as one of the early adopters of the shared value model. Nestlé is wedded to the shared value business model as evidenced by its sustainability reports, which are called shared value reports [for example, Nestlé (2007, 2011, 2023a)]. At the heart of the shared value business model in the cocoa supply chain is the Nestlé Cocoa Plan, established in 2009. This plan applied to about 85.5% of the cocoa Nestlé sourced in 2024, but the goal is for the plan to cover 100% of their stocks by the end of 2025 [Nestlé (2025)]. Other companies have similar sourcing business models, such as Mondelēz's (Cadbury's) Cocoa Life.

According to Porter and Kramer (2006), "The mutual dependence of corporations and society implies that both business and social policies must follow the principle of shared value. That is, choices must benefit both sides." Nestlé was an early adopter of shared value in the cocoa industry, articulating that it is more than just a business model. It is a way of doing business that impacts the entire community in the countries in which it works.

"For a business to be successful in the long term it has to create value, not only for its shareholders but also for society. We call this Creating Shared Value. It is not philanthropy or an add-on, but a fundamental part of our business strategy. Simply stated, in order to create value for our shareholders and our Company, we need to create value for the people in the countries where we are present. This includes the farmers who supply us, our employees, our consumers and the communities where we operate" [Nestlé (2007)].

Under the Nestlé Cocoa Plan, supporting communities translates into helping farmers increase productivity, restoring destroyed rainforests, planting shade trees to protect cocoa trees, helping children attend school, developing other agricultural activities to bring in additional income, and addressing child labor through their Child Labor Monitoring and Remediation System (CLMRS) [Nestlé (2025)]. The list is not comprehensive, but central to the success of the Nestlé Cocoa Plan and the shared value business model is increased productivity to help boost the farmer's income and do good for the community.

**Table 1:** Shared value – cocoa productivity claims made by Nestlé and Porter and Kramer (2011, 2019)

| Shared value aspirations | Source |
|---|---|
| Nestlé is also funding a three-year sustainable cocoa project with three cooperatives of about 3000 farmers in Côte d'Ivoire. This scheme [...] aims to improve cocoa farmers' incomes, protect the environment, combat child labour, improve school attendance and increase HIV awareness. | Nestlé (2007, pp. 32-3) |
| Our new R&D Centre in Abidjan, Côte d'Ivoire, will provide farmers with 1 million high potential cocoa trees each year from 2012. | Nestlé (2009, p. 19) |
| 50-200% more cocoa (up to 1500 kg of cocoa beans per hectare) from trees typically provided through The Cocoa Plan. | Nestlé (2010, p. 27) |
| Our R&D Centres in Abidjan, Côte d'Ivoire and Tours, France, work with other research institutes around the world to propagate higher-yielding, disease-tolerant cocoa plantlets. The trees can produce typically 50%–200% more cocoa (up to 1500 kg of cocoa beans per hectare). | Nestlé (2011, p. 129) |
| Early studies of cocoa farmers in the Côte d'Ivoire, for instance, suggest that while fair trade can increase farmers' incomes by 10% to 20%, shared value investments can raise their incomes by more than 300%. Initial investment and time may be required to implement new procurement practices and develop the supporting cluster, but the return will be greater economic value and broader strategic benefits for all participants. | Porter and Kramer (2011, p. 65; 2019, p. 326) |

Both Porter and Kramer (2011; 2019) and Nestlé articulate the need for increased productivity and originally projected some astonishing targets for what is possible. Table I lists examples of these claims.

As evidenced in Table 1, the key to increasing farmer incomes is to increase the size of the pie by growing more cocoa, not by giving away more of the pie and not by paying farmers more for their cocoa. As Porter and Kramer (2011, p. 65; 2019, p. 326) argue, giving the farmers more money for their cocoa through certification programs such as Fair Trade and Rainforest Alliance is not an option because it has a limited impact on incomes. However, some companies, such as Tony's Chocolonely (2024), have already implemented a business model that supplements farmers with a living wage for all their cocoa purchases. Thus, a business model that allocates more of the pie to farmers is possible and a real option that other companies could exercise now [BSF (2024)]. However, Tony's business model is not yet profitable as they reported an operating loss for the financial year 2024 (September) of 2.9 million, after record increase in sales of 33%. Thus, paying more for ethically produced chocolate increases sales but diminishes Tony's slice of the pie [Reul (2025)].

Moreover, simple supply and demand economics tells us that increasing the size of the pie without a corresponding increase in demand will cause an oversupply and falling prices. History has shown that cocoa prices are highly volatile and experience extreme drops when there is an oversupply, as evidenced in 2012 [ICCO (2012)] and 2018 [Green America (2018)]. Therefore, without a corresponding increase in demand,

**Table 2:** Nestlé's Cocoa Plan farmer productivity from 2020 to 2022 for Côte d'Ivoire, Ghana, Brazil, Ecuador, and Mexico (kg/ha)

| Year | Côte d'Ivoire | Ghana | Brazil | Ecuador | Mexico |
|---|---|---|---|---|---|
| 2020 | 620 | | | | |
| 2021 | 635 | 464 | | | |
| 2022 | 541 | 412 | | | |
| 2023 | 594 | 444 | 860 | 698 | 289 |

**Source:** Nestlé (2020; 2021; 2022; 2023b)

farmers will be poorer, not wealthier [Green America (2018)]. That said, paying more for cocoa might entice farmers to grow more, causing another oversupply that will eventually force prices back to the traditionally low equilibrium [ICCO (2012)].

Regardless of the economics of paying more versus producing more, a crucial test of the shared value business model is whether the promised increased yields are possible. Unfortunately, according to data from Nestlé, the productivity increase has not happened. Nestlé (2019, p. 6) states, "The average farmer is a male 46-year-old, with one plot of 3 hectares, and with a yield of 578 kg/ha. He has been in a sustainability programme for four years." Table II shows the low farming productivity figures for Nestlé's Cocoa Plan farmers from 2020 to 2022 in Côte d'Ivoire, Ghana, Brazil, Ecuador, and Mexico.

Increased productivity is at the heart of Nestlé's shared value, accomplished by planting higher-yielding trees. However, Nestlé (2019) reports in Côte d'Ivoire that the government does not allow companies to distribute more productive plants. The food giant Cargill, a key supplier of cocoa to Nestlé, echoed the same problem in 2021. According to Taal et al. (2021):

"Swollen shoot [virus] and plantation age should trigger the planned renovation of cocoa plantations to avoid net income declining beyond a point of no return. 29% of Cargills farmers in 2020 have plantations of which the average age is higher than 25 years. Swollen shoot[s] and plantation age are both critical triggers for renovation, but renovation should be approached differently in both cases in order to be effective. The CCC [Conseil du Café-Cacao][1] currently prohibits companies like Cargill from supporting farmers with renovation."

Therefore, in Côte d'Ivoire, Nestlé can not help farmers renovate their farms for the future because the Ivorian regulators do not allow it. Consequently, Nestlé's promise of shared value is doomed to fail in Côte d'Ivoire since planting more productive cocoa trees is prohibited. I suspect that mass planting cocoa trees with a vastly increased yield scares the Ivorian Government because oversupply through massive productivity

[1] In Côte d'Ivoire, CCC stands for the Conseil du Café-Cacao (Coffee and Cocoa Council). This organization is responsible for regulating and overseeing the coffee and cocoa sectors in the country.

increases will lead to a collapse in the cocoa price. In turn, that would lead to poorer farmers and unhappy constituents who could threaten the government's grip on power.

However, what is much worse is that other countries like Ghana, where planting better cocoa trees is not prohibited, have also not seen yields of 1500 kg/ha as promised under the Nestlé Cocoa Plan. Thus, farmers are not getting the extra income from extra forecast productivity as Porter, Kramer, and Nestlé have promised. And if it did, it is unlikely that prices would be the same – supply and demand economics says that prices and farmer income will likely be lower.

**Farmers are not getting the extra income from extra forecast productivity as Porter, Kramer, and Nestlé have promised. And if it did, it is unlikely that prices would be the same – supply and demand economics says that prices and farmer income will likely be lower.**

So, if in Côte d'Ivoire, the premise of the Coca Plan is banned and Nestlé is not delivering the promised outcomes to the other farmers, why is Nestlé persisting? The answer is that the ultimate goal of the Cocoa Plan is not only to "improve productivity and incomes" for the farmers but to "make agriculture more attractive and secure long-term supplies" [Nestlé (2018), p. 36]. Hence, while productivity is not increasing as planned, Nestlé is still working to make a life devoted to agriculture more attractive while securing long-term supplies, albeit at lower prices.

The main initiative Nestlé relies on to make farming more attractive is its Income Accelerator Program [Nestlé (2024b)]. In line with shared value principles, the Income Accelerator Program aims "to close the gap to a living income and reduce child labor risks by encouraging changes in behavior and rewarding positive practices – both within the home and on the farm" [Nestlé (2024b)]. The Income Accelerator Program is now central to Nestlé's shared value ambitions.

Initiated in 2020, with a pilot involving 1000 families in Côte d'Ivoire, the program had, by 2024, recruited 10,000 families. Nestlé aims to involve more than 160,000 farming families in the program in Côte d'Ivoire and Ghana by the end of 2030 [Nestlé (2024b)]. Because the Ivorian government is preventing Nestlé from planting more productive cocoa trees, it is resorting to training farmers and developing agroforestry practices to increase productivity [Nestlé (2024b)]. The focus on these solutions impacts productivity, with the 2023 participants producing an average of 730 kg/ha and up to 21% of farms producing more than 1000 kg/ha. However, this figure is far from Porter and Kramer's (2011; 2019) forecast of 1500 kg/ha. While Porter and Kramer (2011; 2019) admit that "investment and time may be required to implement new procurement practices and develop the supporting cluster," it is worth highlighting that nearly two decades have passed since Nestlé began investing in its shared value business model. So, how much time do they need?

Unfortunately, countering these slight gains in productivity, the Cocoa Swollen Shoot Virus is devastating farms. Farmers are also clearing significantly less land to grow more cocoa because of deforestation concerns, and some

farms are replacing cocoa with coffee, rubber, or palm oil crops [Habraken et al. (2024), pp. 55-6]. Additionally, climate change has significantly reduced productivity. In 2024, Côte d'Ivoire produced approximately 1.76 million metric tons of cocoa in the 2023/2024 season, a 24% decrease from the 2.3 million metric tons produced in 2022/2023 [U.S. Department of Agriculture (2025)]. It is highly unlikely that farmers participating in the Nestlé Cocoa Plan and Income Accelerator Program would have escaped similar declines.

Despite some of these underwhelming statistics, the Income Accelerator Program was having some positive impact on farmers' income and future. For example, Nestlé (2024b) reported an overall increase in farmer income of 38% based on bonuses paid for school enrollment, good agricultural practices, agroforestry activities, diversified incomes, and increased productivity. Unfortunately, this increase only translated into 10% of those farmers earning a living income, which is ironic since not all 21% of the farms producing more than 1000 kg/ha could secure a living income. The results also demonstrate that Porter and Kramer's (2011; 2019) forecast of a 300% increase in income would not be possible even if farmers could harvest 1500 kg/ha.

## 3. Financial implications of shared value

Nestlé continues with the Income Accelerator Program and the Cocoa Plan because they help improve productivity and supply and contribute to the overarching outcome of securing long-term supplies at traditionally lower prices. By enrolling farmers in the Cocoa Plan and then the Income Accelerator Program, they lock the farmers in the Nestlé cocoa supply chain and their cocoa harvests are also locked in. Coupled with income based on a farmgate price set by the Ivorian government, farmers have little power to raise prices, and if productivity falls, they just don't get paid. In the good times, when harvest productivity is higher, cocoa supplies for Nestlé are locked in at the farmgate price. But if the harvest is down, Nestlé transfers downside the risk to the farmer – Nestlé does not pay farmers for the cocoa they can't harvest.

Unfortunately, in 2024, farmers bore the brunt of a lower harvest. Due to supply shortages caused by poor harvests blamed on climate change impacts, the price of cocoa hit record highs in 2024, and the farmers received an increase of 50% in the farmgate price. However, coupled with rising costs and reduced harvests, the increase is unlikely to increase farmer incomes significantly. The result is that "Ivorian cocoa farmers barely survive while chocolate company profits soar" [Ferdjani (2024)].

In 2023, Nestlé's chocolate confectionery sales reached 6208 million CHF ($6.6 billion), which increased to 6567 million CHF ($7.5 billion) in 2024 [Nestlé (2024a)]. Nestlé reported a trading operating profit margin of 16.0% in 2024, meaning that it made approximately 1051 million CHF ($1.2 billion) from chocolate confectionery sales, which does not include the profit from other chocolate products such as snacks and drinks. To bridge the living income gap in 2023 and ensure farmers earn a minimum of $531 per month [Medinaceli et al. (2024)], I estimate it would cost Nestlé between $300 and $420 million – a fair bit of its chocolate profits but a fraction of its overall profits. Ultimately, despite Nestlé's commitment to shared value, it keeps the lion's share of the value it creates in the chocolate supply chain for itself. But how does Nestlé manage to increase profits while cocoa prices rise?

First, Nestlé and other chocolate companies are raising prices. As Reuters (2024) reports, "Over the past three years, Nestlé and other consumer goods companies have raised prices across their

brands to cover sky-high input costs amid supply chain issues after the pandemic." While this has led to declining sales volume, chocolate is a luxury product with inelastic demand. For example, in 2023, "Americans spent $19.3 billion on chocolate at grocery and convenience stores last year, spending 5.8% more than the prior year for the treat, but buying 5.4% less" [Gibson (2024)]. Similarly, Nestlé's confectionery sales (chocolate is 77.7% of confectionery sales) are up 6.2%, yet their sales volumes fell by 0.2% [Nestlé (2024a), p. 38]. Nestlé (2024a, p. 1) reported a 0.5% profit margin increase in 2023. Thus, sales and profits increase even while volume subsides.

Second, Nestlé and other large "chocolate companies buy cocoa up to 12 months in advance" and only pay when it is delivered [Reuters (2024)]. Forward cocoa contracts and fixed prices lower than market prices allow chocolate companies to increase prices ahead of increased costs. However, rising prices are starting to bite as new forward contracts come with higher prices, but the chocolate companies will have no choice but to pass these higher costs on to consumers [Reuters (2024)]. However, forward contracts and speculation also mean farmers do not benefit from increased prices, and some profits go to speculators who never own any cocoa.

## 4. Financial implications for the cocoa supply chain

The increasing and widely fluctuating cocoa prices also allow traders to profit in a bullish market. First, "The Intercontinental Exchange (ICE) cocoa futures market has seen heightened trading activity, with institutional traders driving prices higher" [Nudelman (2025)]. Chocolate producers, exporters, trade houses, processors and manufacturers use the London Cocoa futures contract as the global benchmark for physical cocoa pricing. However, managed funds and institutional and short-term investors also speculate on the cocoa market using different financial instruments, such as Contracts for Difference, whereby investors speculate on asset price movements rather than owning the asset. When prices increase, the speculator profits, but if prices decrease, they lose.

Options traders make further profits in cocoa trading with volatility-based strategies. Since cocoa prices can fluctuate at more than $1000 per day, speculators are also willing to make informed gambles on the market and reap large short-term profits [Nudelman (2025)]. However, any trading profits do not reach the poor cocoa farmers.

Cocoa traders, processors and companies often lock in fixed prices for their cocoa to provide price stability and liquidity. Traders with long positions in cocoa have already made significant profits. For example, cocoa futures on the ICE (ICEU) were £2037 per metric ton on May 13, 2023, and on May 7, 2025, reached £6890, an increase of 338%. When prices and production are relatively stable, forward contracts work reasonably well at securing a fixed price for producers and traders. Thus, producers and traders benefit in a market where supply equals demand.

However, climate change and disease are lowering cocoa production, and some producers cannot fulfill contracted volumes and must roll over their contracts until the promised volumes are delivered. In Ghana, this impacts the government because they sell its cocoa through the government-owned Ghana Cocoa Board (COCOBOD) using forward contracts. Unfortunately, COCOBOD cannot supply enough cocoa to meet its contractual obligations, negatively impacting COCOBOD's and the Ghanaian government's income [Distinguished (2025)]. According to Distinguished (2025):

"[Ghanian] President John Dramani Mahama has revealed that Ghana will lose $4,000 on every ton of cocoa delivered in 202S due to contracts rolled over from the 2023/l024 cocoa season. He explained that during the 2023/2024 cocoa season, COCOBOD was unable to supply 333,767 metric tons of cocoa that had already been sold at $2,600 per ton. The contracts were therefore rolled over into the 2024/2025 season, a situation which would significantly cut revenue."

The inability to take advantage of the higher world cocoa prices drives COCOBOD and the Ghanaian government deeper into debt, which in February 2025 stood at GH¢32.5 billion ($2.4 billion). Until then, COCOBOD has also "supplied 210,000 tonnes out of the rolled-over contract, resulting in a revenue loss of U.S.$ 840 million for both COCOBOD and the Ghanaian farmer" with a further estimated loss of over $400 million, by the time COCOBOD fulfills the contracts [Anku (2025)]. Hence, we have an ironic situation where an entire nation suffers low productivity, lost income and subsidizes cocoa traders and companies who still profit from producing and selling chocolate confectionery. Meanwhile, COCOBOD and the Ghanaian government do not have the income and resources to build roads and other infrastructure to support the future of cocoa farming [Anku (2025)].

## 5. Discussion and conclusion: optimism versus pessimism

I prefer to be optimistic about the future of cocoa farming in West Africa. On the surface, Nestlé's Cocoa Plan and the Income Accelerator Program are making some inroads into improving the incomes and lives of cocoa farmers. The impression is that Nestlé is doing some good, but Nestlé is renowned for its ability to use all forms of media to make a good impression while, behind the scenes, it could be doing more. As Perkiss et al. (2021) find, Nestlé is skilled at presenting the impression that the company is dutifully discharging its corporate social responsibility and sustainability obligations. Nestlé's impression management resembles a pragmatic approach to repairing and gaining legitimacy by appeasing civil society through the shared value strategy and the Income Accelerator Program.

However, as my analysis based on Nestlé data shows, it still has not achieved Porter and Kramer's (2011; 2019) forecast of 1500 kg/ha and a 300% increase in farmer income. It seems like a utopian ideal. What Nestlé seems not to have predicted is the refusal of the Ivorian government to allow them to help farmers increase yields. Nor did they predict that climate change would lead to much lower productivity. Today, society has come to accept that climate change is a burgeoning environmental issue, regardless of whether one believes in it, and this does not appear to be a central concern for shared value. These factors are beyond the economic and strategic ideology that doing good for the farmer is also profitable, which is not the answer.

The main issue is that after nearly two decades, most farmers are still not earning a living income. As Ryerson (2023) observes,

"Instead of putting money into so-called sustainability programs and advertising, Nestlé should pay each farmer a true living income. However, this would require Nestlé (and other companies) to double the price they pay for cocoa."

While some companies, like Tony's Chocoloney, pay a living income price for their cocoa, it pressures prices and profits, and Tony's is still more expensive than Nestlé and is struggling to be profitable. Still, survival is not impossible, and time will tell if consumer demand for more ethically produced chocolate will prevail. There are signs that this tide is turning as Tony's Chololonely supplies raw materials to other producers, and the number of producers sourcing from them is increasing [Reul (2025)].

In the end, securing secure, low-cost and long-term supplies and keeping the lion's share of the profits is the desired outcome. Nestlé, other chocolate companies and traders are profiting more even as costs increase. Nestlé and the cocoa companies keep raising prices ahead of predictable cost increases because they lock in the price of their cocoa well in advance. Traders and speculators also have the opportunity to profit from the increasing prices and volatility. However, these profits do not filter down to the farmer. Worse yet, because of lower productivity, the Ghanaian government effectively subsidizes traders and cocoa companies who remain profitable.

There is the ability to pay farmers a living income, but this still has not eventuated. I am hopeful that living income will one day be a concern of the past, that climate change will reverse, and that the cocoa price will stabilize. I also hope the Ivorian government can see the writing on the wall and do something more about helping farmers replace aging and diseased trees with more productive trees. I also hope that productivity, supply and demand stabilize so that forward contracts benefit producers and purchasers. However, I think this is my utopian optimism. I am concerned for the future of cocoa farming in West Africa, not just for those farmers involved in the Nestlé Cocoa Plan. At least these farmers have some corporate support. I am more concerned for those who don't.

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# Europe at a crossroads:

## East-West financial networks in a context of geopolitical polarization

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## Abstract

The case of Evergrande – a Chinese property developer – received much business press attention when Western investors in its corporate bonds lost billions of dollars as it went into liquidation and was eventually delisted. The case illustrated the strong financial relationship that has evolved between Eastern debt markets and Western investors. However, the Evergrande example highlights a less well understood issue: that Western firms have also been centrally involved in the structuring and marketing of Chinese debt securities, effectively enabling the globalization of Chinese finance. Using social network analysis, drawing on data extracted from legal documents (offering circulars), our paper shows the roles played by Chinese, European and North American financial institutions in the construction of Evergrande's debt securities. Evergrande therefore provides a window on our entwined economies. But it also illuminates an unknown: how these historic relations may change as geopolitical tensions grow. We reflect on the unanticipated outcomes that may arise from U.S.-China political polarization, in a context where European states seek to steer their financial centers towards domestic geopolitical priorities, but are also responsive to their financial interests. One possible outcome is that a more isolationist and recalcitrant U.S. partner may drive European financial actors towards the pursuit of their historic business interests in China, while being less mindful of U.S. foreign policy interests.

## 1. Introduction

China Evergrande Group, established in 1996 by Hui Ka Yan and headquartered in Shenzhen, was one of the largest real estate conglomerates in China. The company played a significant role in the country's rapid urbanization by developing large-scale residential and commercial projects across numerous cities. Leveraging an expansionist strategy, Evergrande diversified its business portfolio beyond real estate, investing in sectors such as finance, healthcare, electric vehicles, and entertainment.

Evergrande's growth strategy was heavily reliant on extensive debt financing, making it one of the most indebted property developers globally. At its peak, the company had accumulated liabilities exceeding U.S.$300 billion, consisting of various forms of debt, including bank loans,

corporate bonds, trust loans, and commercial paper issued to suppliers and contractors [Sutter and Sutherland (2024)]. Evergrande also issued offshore U.S. dollar bonds, making it one of the largest issuers of high-yield bonds in Asia. This debt was pitched towards foreign investors and sold on international markets. Consequently their structuration and sale contained a mix of Chinese and Western organizations.

The company encountered a severe liquidity crisis in 2021, primarily due to this unsustainable debt burden, leading to concerns about financial contagion within Chinese and global markets. Evergrande's defaults triggered a sector-wide crisis that saw both a spike of bond defaults by Chinese real estate firms and a collapse of bond issuance since [ICMA (2024); Chang and Li (2024)]. Real estate firms' defaults peaked at a collective U.S.$64 billion in 2022 affecting nearly 28% of offshore (U.S.$) debt, representing virtually all default events in Chinese offshore debt during the 2021-23 period [Chang and Li (2024), p. 7].

In January 2024, a Hong Kong court ordered the liquidation of Evergrande, marking a significant turning point in the company's prolonged financial crisis [Reuters (2025)]. The ruling came after Evergrande failed to present a viable restructuring plan for its liabilities, including substantial offshore bond obligations. While Evergrande's domestic operations, including its ongoing housing projects, are likely to be handled under Chinese regulatory oversight, offshore creditors face significant uncertainty regarding debt recovery, as China has historically prioritized domestic stability over foreign investor claims. In August 2025, Evergrande was officially delisted from Hong Kong's stock exchange.

The liquidation of Evergrande has shone a light on broader challenges in China's real estate sector, where several major developers continue to struggle under high debt burdens, weakening demand, and strict regulatory measures aimed at curbing speculative lending. It also revealed the deep interpenetration of Western and Chinese financial markets, as buyers of Evergrande's shares and debt, including BlackRock, HSBC and UBS took substantial hits on their investments [Randall (2021)]. Indeed, Evergrande was even incorporated in the Cayman Islands, a British Overseas Territory, precisely in order to access international capital markets and allow it to restructure under U.S. bankruptcy law [Sutter and Sutherland (2024)]. Outside of these market relations, there are, however, deeper and more extensive ties which are less well understood. These ties relate to Western involvement in how Chinese debt securities are assembled. The globalization of Evergrande's debt securities has historically required considerable Western firm involvement, raising important policy questions about what happens to these relations going forward and how they may get bound up in, or indeed foster, wider shifts in geopolitics.

## 2. Chinese debt securities: an East-West assembly network

The role of Western financial actors in the globalization of Chinese debt goes back to the return of Hong Kong (HK) to China in 1997. Hong Kong has historically had strong ties to the West, and became an important financial center for China after 1997, facilitating East-West cooperation and the globalization of Chinese finance [Fang et al. (2023); Hall (2018, 2021); Heritier and Schoeller (2020); Wójcik and Camilleri (2015)]. Hong Kong is a financial entrepot – an offshore financial center providing restricted access for mainland Chinese financial actors – yet China also retains political control over it, effectively onshoring it [Yue (2021)]. Hong Kong performs a brokerage function between Western and Chinese financial market activities [Fang et al. (2023)], operating as a gateway between mainland China's debt markets and global capital, allowing those debt products to become investable internationally by conforming to global expectations. Recent policy

initiatives – Stock Connect and Bond Connect – aim to reinforce the role of Hong Kong in the internationalization of China's capital markets by extending it privileges not afforded to other Chinese financial centers and by opening up new channels to direct flows from mainland Chinese exchanges through Hong Kong [Lau (2022)].

The rise of Hong Kong as the international market place for mainland China was a strategic choice. Hong Kong's historic legal and regulatory alignment with Western financial markets and established technical financial expertise provided the foundation for China's strategic aim to globalize its financial market interests while lacking international experience [Fang et al. (2023); Petry (2021)]. China's international integration via Hong Kong generated an opportunity to access expertise developed by Western financial institutions and advanced business services (FABS) to facilitate debt issuance and enhance the reputation of the offering by "lending their reputation" [Heritier and Schoeller (2020), footnote 10]. Doing so also enabled Chinese firms to become more globally recognized by gaining expertise and enhancing their reputation. These developments created an intertwined system that binds geographies, forming lasting corporate, spatial, and social network structures. Western FABS, traditionally active in Hong Kong via subsidiary undertakings, have maintained their central brokerage roles for Chinese firms to access global financial markets.

There is little public recognition of this, outside sporadic discussion of this involvement in the mainstream business press. For example, the Financial Times noted the involvement of organizations like PWC in the auditing of Evergrande [Financial Times (2021a, 2021b)] and the role of Credit Suisse as a former underwriter of Evergrande's U.S.$-denominated bonds [Financial Times (2021b)]. However, it is possible to get a more systematic understanding of these relations through the legal documentation selling firms produce when marketing debt securities [Beaverstock et al. (2023)]. Because most securities are sold on a buyer beware basis, this means that a vast amount of information is provided to buyers so that they are fully aware of the return and risks of any prospective securities purchased.

While these documents are generally used by legal advisors of securities investors, it also provides a rich source of data through which to analyze the corporate and spatial networks of financial activities involved in the assemblage of Evergrande's international debt. We will now explain how we used documents and the basis of our social network analysis in our methodology section before presenting findings. We hope to stimulate debate amongst academic and non-academics and encourage additional research into the globalization of Chinese corporate debt more broadly.

## 3. Method and data

We use legal documents – Offering Circulars – to trace the spatial footprint of Evergrande's offshore debt issuance [Tischer et al. (2019)]. By focusing on actors who structure securities, rather than buy them, our approach provides a more complete picture of East-West collaboration and coordination. This brings into view a whole range of new actors, including those in the professions of law, accounting, auditing but also in financial advanced business services (FABS) [Lai (2018)].

From the offering circulars, we extract data provided on actor role, organization and domicility to analyze the network structure and positions of individual actors using standard social network analytic tools in UCINET [Borgatti et al. (2013); see also Beaverstock et al. (2023)]. The results of our descriptive analysis offer insights into

**Table 1:** Overview of Evergrand (and subsidiaries) international debt issuances 2010-2020

| | Type | Total | Matured | Outstanding | Interest range | Dates |
|---|---|---|---|---|---|---|
| **China Evergrande and Evergrande Real Estate Group Limited** | | **U.S.$bn** | | | | |
| 10 new issuances | Senior Notes | 14.1 | 4.8 | 9.3 | 6.25%–13% | 2010–2020 |
| 2 Consolidations Senior Notes | Senior Notes | 4 | 3 | 1 | 6.25%–8.75% | 2013; 2019 |
| 1 new issuance in HKS | Secured and Guaranteed Convertible Bonds | ~2.3 | 0 | ~2.3 | 4.25% | 2018 |
| 1 new issuance in RMB (U.S. Settled) | Senior Notes | ~1.5 | ~1.5 | 0 | 7.5%–9.25% | 2011 |
| **Scenery Journey Limited (Hengda Real Estate Group)** | | | | | | |
| 3 new issuances | Senior Notes | 6.4 | 1.2 | 5.2 | 9%-13.75% | 2018-2020 |
| 1 Consolidation | Senior Notes | 1 | 1 | 0 | 11% | 2018 |
| **Total Values** | | **29.3** | **11.5** | **17.8** | | |

the organization of the structuration focused on core actors and legal jurisdictions from which actors operate.

In total, our dataset comprises 18 large-scale debt issues by Evergrande and Evergrande subsidiaries. We have included all products for which information is available, including new issuance as well as consolidations, hence the overall value of included products is higher than reported in the media. In addition to U.S.$-denominated bonds we have also included one offering in HK$ and one in RMB, the latter of which is settled in U.S.$. Whilst many of the debt tranches have matured, these products were included to provide a longitudinal account of change in network terms.

### 3.1 Data overview and detail

We collected data on all actors – banks and FABS – involved in the structuration of these debt products, as well as other information – including type of debt, volume, interest rates and maturity dates – for each of the debt products. These are summarized in Table 1. We have complete data for 13 of 18 products. The remaining five products may be missing information on certain functions, such as administration, legal advisors and auditors. As a result some analysis will have to account for missing data. Where this is the case, this will be made explicit.

## 4. Findings

Our analysis offers insights into three structural and positional aspects of Evergrande's debt structuration network that we will discuss in turn.

First, in geographical terms, the network centers around Hong Kong as a financial center in which most of the subsidiaries of Chinese and Western firms are based (Figure 1). 24 out of 37 actors participating in the assemblage of Evergrande debt are based in Hong Kong, mainly managers and bookrunners (i.e., 16 Western and Chinese investment bank subsidiaries), five international legal advisers, Tianji Holding[1], as well as the main auditor (PWC) and trustee (Citicorp International). This finding illustrates the

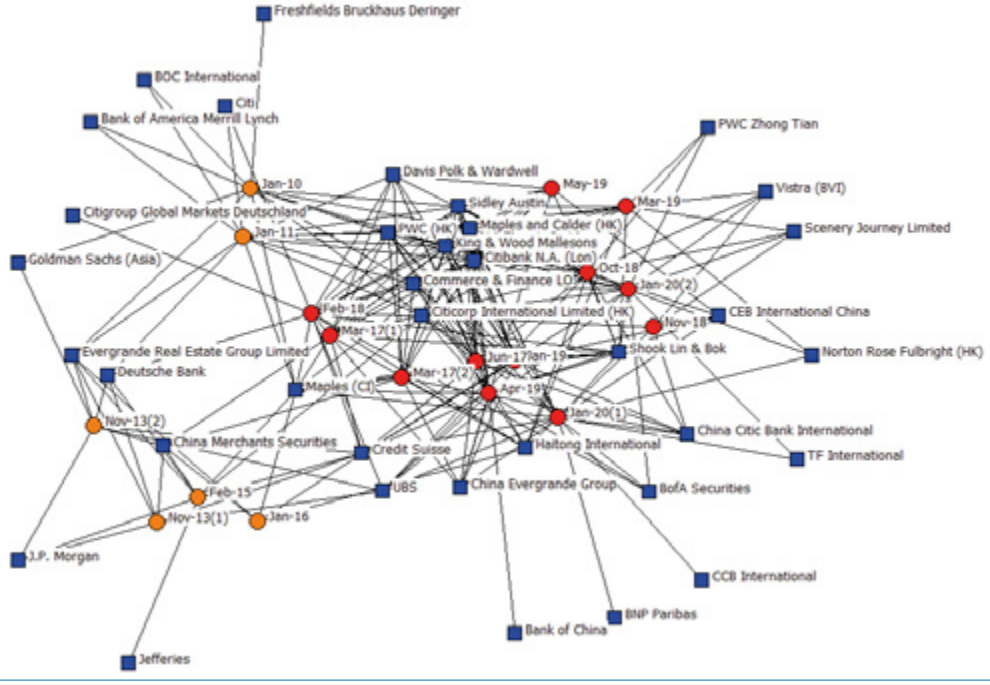
significance of Hong Kong as acting as a switchboard connecting mainland Chinese firms with international debt markets.

In addition to Hong Kong we also find other on- and off-shore financial centers within the network: London, which hosts Citibank N.A. in the capacity of paying and transfer agent and registrar as well as the Cayman and British Virgin Islands in which issuers are based. The expansion into offshore jurisdictions is a response to China's restrictions on Chinese onshore companies to raise foreign debt capital directly. As a result, "Chinese borrowers use a variety of offshore financing structures ... often incorporated in a tax-efficient jurisdiction" [Kidd and Warboys (2016)].

**Figure 1:** Geographical mapping of actors participating in Evergrande's debt issuance

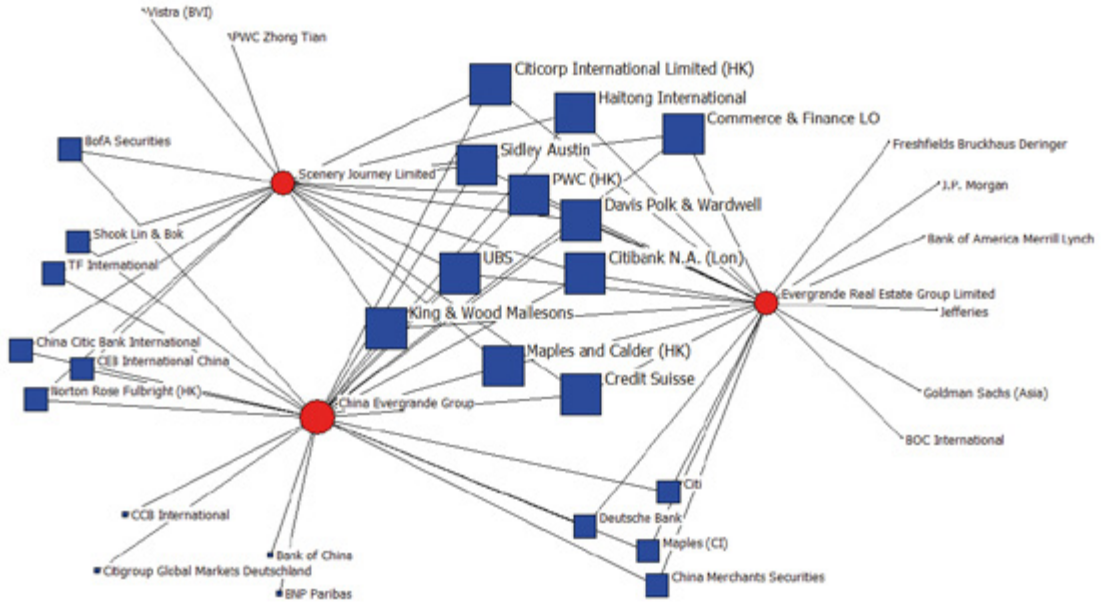

Second, an examination of the network structure itself highlights the centrality of a group of actors involved in the structuration of multiple Evergrande bonds. Early bonds issued before 2017 (orange) are separate from the core network to the right of the main cluster (red) (Figure 2). The nodes in the center of the core network are of key interest as they show the actors repeatedly involved in the structuration of Evergrande bonds in recent years (Figure 3). This network highlights the international character of debt origination via Hong Kong: the most central actors are

**Figure 2:** Structuration network for Evergrande bonds by date of issuance (n=18)




[1] The sole overseas financing platform for Hengda Real Estate, a subsidiary of Evergrande

**Figure 3:** Structuration network for Evergande bonds by issuing subsidiary (n=18)




subsidiaries of international banks, legal representatives and various law firms advising the various parties involved with respect to the various legal jurisdictions involved (Cayman/BVI, U.S./HK, and PRC). Only two firms headquartered in China are also represented in the core network – Haitong International (through its HK subsidiary) and Commerce & Finance Law Offices (via Beijing and Shanghai).

Third, the analysis of degree centrality (Table 2), which measures the importance of a node by quantifying the number of connections it has to other nodes in the network, confirms the existence of a core network with highly concentrated administration and trustee, legal and audit functions. PWC (HK), Citibank N.A. (London/Dublin), Citicorp International (HK) and various law firms are involved in the 15 debt products for which we have complete data. The overseas issuer and auditors show some variation that is determined by the incorporation of the entity that issued the debt – China Evergrande is incorporated in the Cayman Islands, while Scenery Journey is incorporated in the British Virgin Isles – which also impacts the involvement of specific auditing entities (PWC's Hong Kong office and PWC Zhong Tian – its PRC undertaking is based in Guangzhou).

The only function that shows more variability is that of the managers (see Figure 4) – a consortium of banks who coordinate and manage the debt issuance. Here Credit Suisse takes a leading role and is involved in arranging 12 of the 15 debt products with a total value of ~U.S.$10 billion – a number much higher than, for example, the U.S.$4.6 billion reported by the FT in 2021[2]. Haitong and UBS follow with nine and eight involvements each. Other banks participate less frequently and across different periods. For example, while JP Morgan and Goldman Sachs were involved in early debt issuances (up to 2015), China Citic and CEB International only engage from 2017 onwards. Credit Suisse co-arranges most debt products (Figure 5) with UBS (7), followed by Haitong International (6) and China Citic (5).

[2] https://www.ft.com/content/490c34fd-bc22-47b3-9e1c-b33caf826ece

**Table 2:** Concentration of top three actors by degree centrality (complete networks only; n=15)

| Managers and bookrunners | | Administration | | Overseas issuer | | Legal | | Audit | |
|---|---|---|---|---|---|---|---|---|---|
| Credit Suisse (HK) | 12 | Citibank N.A. (U.K./IRE) | 15 | Maples (CI) | 12 | Commerce & Finance (PRC) | 15 | PWC (HK) | 15 |
| Haitong International (HK) | 9 | Citicorp International (HK) | 15 | Vistra (BVI) | 3 | King & Wood Mallesons (PRC) | 15 | PWC Zhong Tian (PRC) | 3 |
| UBS (HK) | 8 | | | | | Maples and Calder (HK) | 15 | | |

Our analysis therefore reveals the centrality of U.S. and European organizations in the globalization of Chinese financial securities. Overall, our findings show little variability in the network positions of legal, issuing and administrative actors, but also highlights close relationships between managers/bookrunners and Evergrande and its subsidiaries through repeat interactions. The interrelations between East and West are typical of long-standing, trust relations built slowly over time rather than impersonal market forces that chop and change regularly.

## 5. Discussion

This study shows that Western financial actors have been deeply embedded in the globalization of Chinese finance. The Evergrande saga is a case in point: major Western investors – including BlackRock, HSBC, and UBS – were among the largest buyers of Evergrande's international bonds, while Western institutions helped Evergrande construct and sell those securities. These entanglements underscore how intertwined East and West have become. Recent geopolitical tensions, however, threaten to unravel these ties. In the wake of rising U.S.–China friction, policymakers have voiced fears of a fragmenting global financial market. Successive U.S. administrations (Trump, Biden, and now Trump again) have employed both hard and soft power levers to discourage investment in China, reflecting a more confrontational stance. China has responded in kind – tightening controls on outbound investment into U.S. assets and steering more financial activity from Hong Kong to onshore hubs like Shanghai and Shenzhen. Notably, Beijing's efforts to centralize finance (and ongoing political tensions in Hong Kong) have already prompted some Chinese market activities to relocate to alternative Asian centers such as Singapore. These moves on both sides point to a potential bifurcation of global finance along East–West lines, heightening polarization risks [Hale et al. (2024); JP Morgan (2024)].

European international financial centers (IFCs), meanwhile, find themselves pulled in two directions. On one hand, their historic linkages with Hong Kong and active roles in structuring Chinese offshore securities position them to capitalize on lucrative business opportunities in China. Indeed, there is evidence that some European financial hubs are quietly competing for Chinese deals – even lobbying for greater latitude to engage Chinese markets despite U.S. strategic reservations. On the other hand, European states are under pressure to align with Western foreign-policy priorities. They are now weighing a delicate choice: tighten financial controls in solidarity

**Figure 4:** Banks' participation in Evergrande debt products

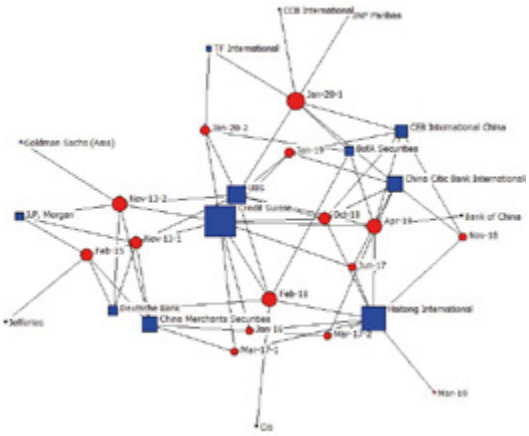
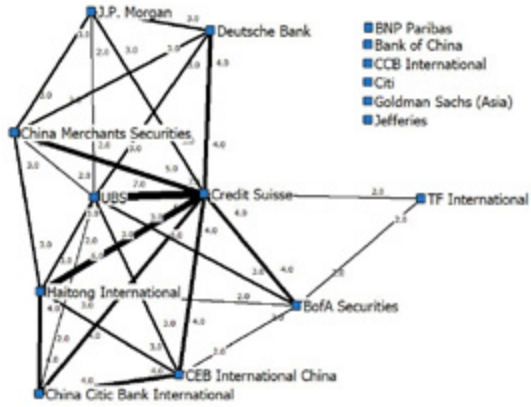


**Figure 5:** Banks' joint participation in Evergrande debt products




with U.S. efforts to isolate China (at the risk of driving banks and investors to more permissive jurisdictions), or liberalize engagement to pursue growth in Chinese markets (at the risk of straining transatlantic relations). The outcome of these centrifugal forces will depend on each nation's ability (and willingness) to steer its domestic financial sector in line with geopolitical goals. History suggests this will not be easy – financial actors are notoriously adept at innovating around restrictions to preserve their interests [Leaver and Martin (2021)]. Even states inclined to support U.S. strategy may find their private sector pushing back if profitable Chinese opportunities are foregone. In short, market forces and national interests may diverge, complicating any unified Western stance.

In this context, a more isolationist or uncompromising U.S. approach could prove counterproductive. Aggressive trade measures, threats against allies' industries, and departures from cooperative norms have already begun to chip away at the decades-long goodwill between the U.S. and Europe. If Washington's pressure on its allies becomes too unilateral, European officials may increasingly heed the voices of their own financial industries (which have long-cultivated ties with China) over calls for decoupling. Our findings suggest that Sino-European financial networks – the very networks illustrated by cases like Evergrande – could become a pivotal channel that reshapes geopolitical incentives in Europe. Should these networks deepen and endure, Europe's collective sense of obligation to U.S. policy will likely dwindle, weakening the U.S. ability to rally allies in isolating China. In essence, the transatlantic alliance faces an inflection point: long-standing financial interdependencies are tugging against emerging political fault lines. Whether global finance splinters into rival blocs or adapts through new alignments will hinge on decisions made in the coming years.

## 6. Strategic recommendations for key actors

In light of these tensions, our analysis points to several potential developments that may determine the future shape of global finance.

**By proactively managing risk and engagement, Europe's financial centers may remain competitive bridgebuilders in global finance rather than becoming casualties of a new freeze in global financial relations.**

- European financial centers may balance engagement and security. European IFCs (e.g., London, Frankfurt, Luxembourg) may calibrate their China strategies to safeguard both geopolitical and market interests. This may mean pursuing a dual approach: remaining compliant with allied security imperatives (for instance, performing enhanced due diligence on Chinese deals and honoring international sanctions), while diplomatically securing continued access to Chinese markets for their firms. Financial hubs in Europe are encouraged to work with policymakers on clear guidelines or special frameworks (such as narrowly-targeted licenses, cooperation agreements, or regulatory "sandboxes") that allow sustainable East–West financial activity without undermining domestic oversight. These centers may diversify their portfolios – deepening links with other emerging markets and sectors – so that they are not overly reliant on either U.S. or Chinese business. Finally, European regulators and industry leaders may strengthen risk management for any China-related exposures, learning from the Evergrande collapse to ensure that foreign investment structures are transparent and shock-resistant. By proactively managing risk and engagement, Europe's financial centers may remain competitive bridge-builders in global finance rather than becoming casualties of a new freeze in global financial relations risk and engagement, Europe's financial centers may remain competitive bridge builders in global finance rather than becoming casualties of a new freeze in global financial relations.
- Hong Kong firms may adapt and reposition in a changing landscape. Hong Kong's financial institutions and service providers face the challenge of preserving Hong Kong's role as a gateway amid shifting currents. Firms in Hong Kong may benefit from a strategic realignment that hedges against both Beijing's internal consolidation and Western disengagement. Practically, this could involve expanding partnerships with mainland Chinese financial markets (to align with China's integration efforts) and nurturing ties with alternative international investors (for example, in Southeast Asia, the Middle East or Europe) to compensate for any decline in U.S. participation. Hong Kong firms could continue to emphasize their world-class regulatory standards and expertise as a value proposition – positioning the city as an indispensable hub for complex financial services (asset management, insurance, fintech) that complement mainland markets rather than compete with them. At the same time, investing in compliance and transparency will be crucial to maintain global investor confidence. By innovating in products (such as offshore RMB instruments or green finance where Hong Kong has a lead) and demonstrating agility, Hong Kong's financial sector may try to underscore its relevance. Their goal is to remain a key broker in East–West finance even if the political center of gravity shifts: Hong Kong firms can do this by being connectors and problem solvers, helping channel capital in ways that meet both Chinese regulatory expectations and international norms.

- Cross-border financial regulators may attempt to enhance cooperation and oversight. Regulators overseeing cross-border finance (from European and Asian securities commissions to transnational standard setters) may collaboratively fortify the global financial system against fracturing. This may involve a number of steps. A first step could be to revive and strengthen dialogues – for example, E.U.–China financial forums or international working groups – to ensure mutual transparency about regulatory changes. Joint frameworks could be developed to handle cases like Evergrande's default, so that when a large multinational debtor fails, there are agreed protocols to manage creditor claims across jurisdictions. Regulators should also push for harmonized disclosure standards for offshore bond issuance: when firms from one market sell debt to foreign investors, the offering documents and risk assessments need to be fully credible and accessible (a lesson reinforced by the opacity surrounding Evergrande's liabilities). Greater data sharing between regulatory bodies would help monitor systemic risks that span markets. Crucially, cross-border regulators ought to prepare contingency plans for a scenario of financial decoupling – for instance, coordinating on capital flow safeguards or parallel market infrastructure – so that if political mandates restrict East–West investment, it can be done in a way that minimizes market shocks. While respecting their respective mandates, regulators collectively have a responsibility to prevent needless fragmentation: by identifying common ground (such as maintaining financial stability and investor protection), they can keep channels open for dialogue even as geopolitical tensions rise.
- North American industry practitioners may focus on strategic foresight and agility. Banks, asset managers, and other finance practitioners in the U.S. and Canada could actively develop strategies for a more polarized financial world. On the one hand, North American firms need to rigorously evaluate their exposures to Chinese markets under different scenarios – ranging from business-as-usual to severe capital market restrictions. Incorporating geopolitical risk into investment decisions is now essential; for example, debt or equity positions in Chinese companies (or funds heavily invested in China) should be stress-tested against potential policy shocks. On the other hand, industry practitioners can seek alternative growth avenues to compensate for any lost opportunities in China. This might mean deepening involvement in India, Southeast Asia, Africa, or Latin America – regions where demand for capital is rising and geopolitical alignments may be less restrictive. North American firms are also encouraged to engage constructively with regulators and policymakers at home: by sharing on-the-ground insights, they can help shape balanced policies that address security concerns without unduly hampering global market access. Importantly, industry leaders should remain adaptable – ready to pivot business models if a bifurcated global system emerges. This could entail developing new products tailored for allied markets (in line with "friend-shoring" trends) or leveraging technology to connect with overseas clients in compliant ways. With prudent planning, North American practitioners can sustain their competitive edge and global reach, even as the rules of international finance are being redrawn.

## 7. Conclusion

Europe stands at a crossroads. Our findings highlight how Europe's financial centers, long instrumental in bridging East and West, are now confronted with a defining strategic choice that will reverberate across the global political economy. In one direction lies closer alignment with a U.S.-led stance of financial containment of China – potentially reinforcing a bifurcated world of rival financial systems. In another direction lies a more independent path, where European interests continue to engage with Chinese finance, fostering a multipolar network of capital flows. This decision is not merely about economics; it is about the future architecture of global finance and Europe's place within it. A cautious reading of the evidence suggests that if the U.S. maintains a hard line while Chinese markets remain attractive, European actors may pragmatically lean toward their historic business ties in China, thereby softening the edges of an intended East–West divide. The "so what?" is clear: the actions of European financial hubs could determine whether global finance fragments into antagonistic blocs or adapts into a more complex, interdependent equilibrium.

Looking forward, we offer a broader strategic foresight on the implications for the United States and the wider international system. If U.S.-China polarization continues unabated, the world may see the emergence of two semi-integrated financial spheres. In such a scenario, Washington would dominate one sphere (comprising North America and like-minded allies), and Beijing the other (anchored in Asia), with Europe as the swing player that interacts with both. This outcome would test the foundations of U.S. financial hegemony. The U.S. dollar's role as the unrivaled global currency could come under gradual challenge if, for instance, Sino-European financial flows deepen through direct RMB channels or new digital payment systems outside U.S. influence. American policymakers will need to weigh the security gains of a hard decoupling against the economic costs of forfeiting deep global financial integration, which has historically benefited U.S. markets and firms. From an internal political economy perspective, a retreat from global finance might encourage the U.S. to refocus on domestic industrial revitalization and tighter knit trade-finance blocs with allies. However, it could also mean reduced foreign capital inflows and fewer avenues for global portfolio diversification, factors that might raise funding costs or volatility in U.S. financial markets over the longer term. The strategic trade-off for the U.S. is therefore profound: pushing allies to choose sides may secure short-term geopolitical advantage, but it risks diminishing American influence in the very financial networks that have underpinned its power for decades. A more farsighted U.S. approach would be to reaffirm collaborative leadership – working with Europe and other partners on fair standards for engagement with China, rather than imposing strict bifurcation. Such an approach could sustain Western unity and global financial stability, ensuring the U.S. remains at the center of an open (albeit recalibrated) world economy.

For China, the trajectory of Europe's choice will also carry significant consequences. Successful outreach to European financial centers could secure China continued access to global capital and expertise despite U.S. pressure, enabling Beijing to internationalize its financial system on its own terms. This may embolden China's state-capitalist model [Petry (2021)] while softening the blow of U.S. sanctions or investment restrictions. Conversely, if Europe sides firmly with the U.S., China would likely double-down on building self-reliant financial infrastructures and alternative

alliances (as seen in projects like the BRICS Bank or regional payment systems), accelerating the advent of a de facto bifurcated order. In either case, the global financial landscape is poised to become more heterogeneous. We may witness the rise of new funding hubs, currency arrangements, and legal norms as each bloc seeks to buttress its financial autonomy [Schindler et al. (2023)]. Yet, it is also possible that pragmatism will prevail over polarization: mutual self-interest can still motivate cooperation on issues like financial stability, climate finance, and debt resolution for developing countries, even if strategic rivalry endures.

In conclusion, the evolving East–West financial nexus exemplified by Evergrande provides a window into a world in flux. Rather than a simple decoupling, we are likely entering a period of selective realignment – a nuanced reorganization of global finance where alliances and networks are redrawn but not completely severed. Europe's financial centers, firms in Hong Kong, regulators, and industry practitioners all have agency in shaping this future. By heeding the recommendations outlined above – balancing interests, staying engaged but vigilant, and prioritizing collaborative governance – these actors can help steer the system toward a stable and open outcome, even amid great power tensions. The stakes are high: global finance is at a delicate tipping point where decisions

**“ Rather than a simple decoupling, we are likely entering a period of selective realignment – a nuanced reorganization of global finance.**

made in London, Brussels, New York, Hong Kong, and Beijing will collectively determine whether the coming decades are defined by heightened financial polarization or adaptive integration. Our analysis urges cautious optimism – with informed, strategic action, the worst outcomes of fragmentation can be avoided. In navigating this crossroads, stakeholders must remain alert to both the dangers and the opportunities presented by a rapidly changing geo-financial landscape. Ultimately, maintaining a workable balance between national security and global market integration will be the key to sustaining prosperity and peace in the international political economy.

**Note:** The diagrams were created using specialised statistical software focused on analytical precision. As such, their visual style may differ from the Journal's standard design language.

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# Gender differences in financial advice:
## Lessons from a secret shopper study

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## Abstract

In the world of personal finance, gender disparities aren't just about gaps in income or wealth accumulation – they also extend to the quality of financial advice. This study explores whether financial advisors give women systematically worse advice than they give men and, if so, why. Through a secret shopper study conducted in Hong Kong, we uncover gendered patterns in financial advice that could have implications for women's financial empowerment.

## 1. Introduction

It is generally believed that the professional wealth management and financial advice industry segment their clients by wealth, risk profile and so on, but they do not customize their offerings for "non-traditional" client groups e.g., women. And yet, although not overt, there may be covert differences in the way that financial advisors respond to and advise women clients. This article describes our research that was inspired by the question whether financial advisors – consciously or unconsciously – deliver advice of different quality to women compared to men. And if they do, we wanted to understand why.

We report the results of a one-of-a-kind secret shopper study in Hong Kong's financial advisory sector. By deploying trained male and female secret shoppers with identical financial profiles to solicit advice from financial advisors, our study examines whether there are quality differences in the advice that women receive, compared to men.[1] These insights have implications for regulators, firms, and clients striving for equitable wealth management practices worldwide.

## 2. The secret shopper study: uncovering gender differences in financial advice

As Asia's premier financial hub, Hong Kong boasts a stock exchange with $4.9 trillion market capitalization, representing one of the world's most vibrant equity markets. Retail investors are the lifeblood of this ecosystem – more than a third of the adult Hong Kong population directly owns stocks and/or derivatives listed on the exchange, with women constituting nearly one-

[1] Bhattacharya, U., A. Kumar, S. Visaria and J. Zhao, 2024. "Do Women Receive Worse Financial Advice?" Journal of Finance 79: 5, 3261-3307

half of these individual investors.[2] This gave us the opportunity to study how this important yet relatively understudied demographic is treated by wealth managers.

A persistent financial literacy gap undermines women's market position. In a representative sample of Hong Kong adults, men scored higher than women on a financial literacy test and reported higher levels of confidence in their financial knowledge.[3] This dual disparity in both competence and self-assurance provides a setting where financial professionals, whether consciously or not, may adapt their recommendations when engaging with female clients.

The financial advisory industry in Hong Kong is tightly regulated. The Securities and Futures Commission licenses financial advisors through a comprehensive vetting (Type 4 license) process. In addition to examining them on specialized knowledge, the process considers candidates' education, qualifications, and experience as well as their personal financial status and solvency, and reputation and character.[4] This multilayered vetting suggests advisors are likely to be technically competent and able to provide high-quality advice to everyone. However, there is no explicit mechanism to ensure that male and female clients receive advice of equally high quality.

A unique feature of Hong Kong's financial advisory industry is that there are two different business models at work. On the one hand, securities firms operate like discount brokerages and earn revenue primarily through trading commissions – a structure that inherently rewards transaction volume over long-term portfolio performance. On the other hand, financial planning firms offer private wealth management services and charge a fee for assets under management, as well as earning commissions by selling a broader range of products.

Both types of firms employ staff who meet with walk-in clients and advise them on investments. Partnering with a local market research firm, we deployed trained secret shoppers (50% were female and the other 50% were male) to visit all retail-facing advisory firms in Hong Kong. These auditors posed as regular walk-in clients while following the study protocol – they reported similar financial profiles, investment objectives, investment amounts, and investment horizons and varied only three randomly assigned behavioral attributes. Within 24 hours after their visit, they answered an exit survey reporting key facts about the conversation they had. Since we sent both a male and a female secret shopper (on independent visits) to each advisory firm, we are able to detect any systematic differences in the extent to which they receive suboptimal advice.

The study's contribution to our understanding of gender differences in advice quailty stems from four design elements:

1. **A clear, objective measure of advice quality:** Since clients vary along a host of dimensions, the advice that is optimal for them varies as well. This makes it difficult for a researcher to evaluate advice quality objectively. We address this by examining the entire list of products that was recommended in each visit and classifying the advice as "suboptimal" if it exposed clients to uncompensated risk. This would happen if, for example, the advisors only suggested that the clients purchase individual risky securities (under-diversification bias) or local Hong Kong securities (home bias). Investing in this way would expose the client to idiosyncratic risk, foregoing the benefits of diversification.

[2] Hong Kong Exchange and Clearing Limited, 2015. "Retail Industry Survey 2014," March, https://tinyurl.com/5hxsymbk
[3] Investor Education Centre, 2018. "Financial Literacy," August, https://tinyurl.com/4nf88btr
[4] Securities and Futures Commission, 2024. "Licensing Handbook, Hong Kong," https://tinyurl.com/3hh3n7ry

This provides a conservative measure of suboptimal advice.[5]

2. **Randomly assigned behavioral attributes:** The study was also designed to try to uncover factors that could be driving any gender difference in advice quality. To that end, we attempted to experimentally manipulate (advisors' perceptions of) three latent attributes of the advisees relevant for financial advice: risk tolerance, confidence, and geographic outlook. Each shopper was assigned an avatar, consisting of either high or low levels of each attribute. The attribute levels were signaled through the script that shoppers used.
   - **Risk tolerance:** A shopper roleplaying a highly risk tolerant client would highlight the fact that they wanted to make high upside gains, but could afford to lose some money if the economic outlook turned poor. In contrast, a shopper signaling low tolerance for risk was instructed to highlight their need for safe returns and a willingness to accept lower returns as a result.
   - **Confidence:** A shopper roleplaying a highly confident client would mention that they don't usually need any guidance to make financial decisions, whereas someone with low confidence would highlight their inexperience and the need for support.
   - **Geographic outlook:** A shopper signaling an international outlook would mention they intended to migrate to Canada for their retirement, whereas one with a domestic outlook would avoid mentioning any relatives that lived abroad and emphasize that they wanted to retire in Hong Kong, the place they were born.

By randomly matching shoppers to advisory firms, we could cleanly identify the effect of client characteristics (attributes as well as gender) on the quality of advice given.

3. **Business model interaction:** Hong Kong's financial advisory landscape – comprising both commission-driven securities firms and fee-based financial planners – offers a unique institutional setting, in which to examine how advisor incentives shape gender disparities in advice quality. Securities firms, reliant on transaction commissions, may prioritize frequently-traded products over diversified investments. Meanwhile, financial planners, with fee-based models, might demonstrate different patterns of advice. This dual structure allows us to obtain critical insights into whether financial incentives, rather than just cultural or cognitive biases, systematically disadvantage women investors.
4. **Naturalistic observation:** Importantly, neither the market research firm nor the auditors knew what our research question was, so as to avoid "demand effects," where study subjects report their answers to align with the research hypothesis. In addition, we took several precautions to ensure that the secret shoppers did not "blow their cover." Each shopper was assigned to a single avatar throughout the study, minimizing the chance that they might forget their lines or mistakenly signal the wrong avatar. In addition, anticipating that financial advisors would administer a risk profile questionnaire before making recommendations, we trained each auditor to give answers that would match their avatar.

Our experimental methodology advances beyond previous studies in finance by:

[5] It is possible that advice that we do not classify as suboptimal is also suboptimal, but we can be sure that the advice that is classified as suboptimal is so. In this way we stack the deck against finding that advice is suboptimal, which makes our results even more striking.

1. Capturing real-world advisor behavior rather than hypothetical scenarios.
2. Disentangling gender-based patterns from patterns across wealth or financial sophistication categories.
3. Identifying the specific mechanisms through which biases operate.
4. Measuring differences in actual recommendation quality rather than perceived discrimination.

Our results illuminate not just whether gender differences exist, but under what conditions they emerge most strongly.

## 3. Findings: gender matters – but business model matters more

We found that:

1. **Advice is frequently suboptimal:** Across all visits, 38% of advisors recommended only individual risky securities, and 39% recommended only local securities. These recommendations expose clients to idiosyncratic risk without sufficient compensation.
2. **Advisory firms' business models influence advice quality:**
   - **Securities firms gave suboptimal advice more often, although they were gender-neutral:** These firms, which earn primarily through trading commissions, recommended individual risky securities in 41% of visits and local securities in 40% of visits. However, their advice did not show significant gender differences.
   - **Financial planning firms gave suboptimal advice less often, but their advice quality varied by gender:** These firms, which rely less on trading commissions, recommended individual risky securities in 25% of visits and local securities in 35% of visits. However, they were significantly more likely to give such suboptimal advice to women (37% and 45% respectively) than to men (14% and 24% respectively).
3. **At financial planning firms, highly confident and risk tolerant women received suboptimal advice more often:** Suboptimal advice was more likely when female shoppers signaled high-risk tolerance than when they signaled low-risk tolerance (54% versus 28%), and also when they signaled high confidence versus low confidence (50% versus 27%). Women with a domestic outlook were also steered towards local Hong Kong stocks more often than similar men (47% versus 21%).

## 4. Insights into the mechanisms: the intersection of advisors' incentives and clients' financial knowledge

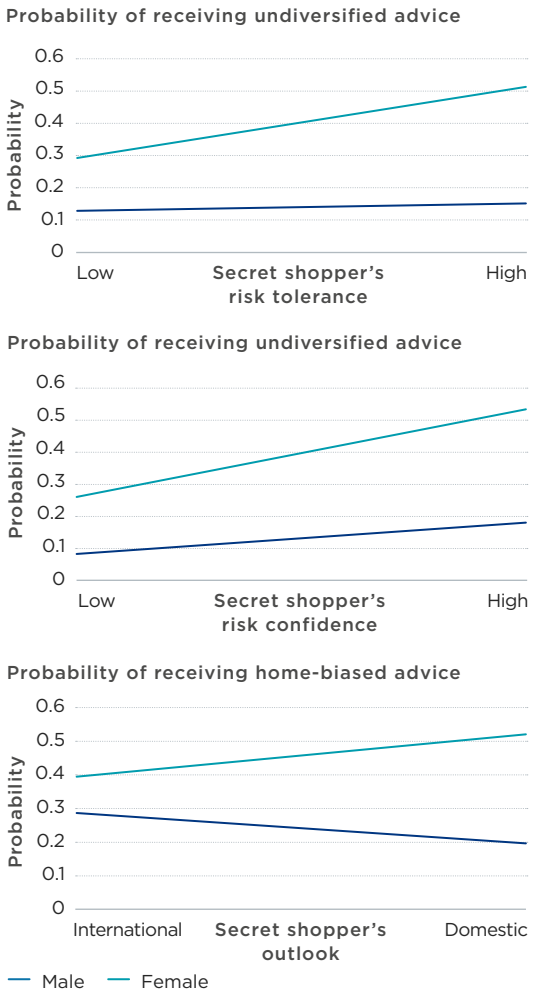
Financial advisors face a trade-off. On the one hand, their compensation often depends on commissions generated from client transactions, incentivizing them to recommend frequent trading or high-fee investment products. On the other hand, clients who perceive that they receive poor quality advice may terminate the relationship, causing the advisor to lose business. To balance these competing interests, advisors may cater to the clients' underlying preferences, such as favoring familiar single securities, to prolong the relationship, even if such strategies are not optimal for wealth growth.

The gender difference stems from the well-documented gender gap in financial literacy. Research consistently shows that women, on average, possess lower financial knowledge than men, making them less likely to detect suboptimal or biased advice. Advisors can exploit this knowledge asymmetry by steering female clients toward investments that serve the advisor's interests rather than the client's optimal financial outcomes.

The advisory firm's business model plays an important role. Securities firms (SFs) and financial planners (FPs) attract distinct client segments: Although FPs offer more in-depth advice, they charge higher fees, and so highly knowledgeable clients who are better able to make their own investment choices are less likely to use their services and work with SFs instead. This implies that both men and women who visit SFs generally have high financial knowledge, and so advisors at SFs perceive little difference between them, giving them little incentive, if any, to vary the quality of advice they give to women versus men. In contrast, FPs tend to serve less financially literate clients. Since there are many more low-literacy women than men, FPs female clients are on average less knowledgeable than their male clients. As a result, advisors at FPs may perceive female clients as easier targets for unsuitable recommendations, such as individual risky or local securities.

These dynamics become especially pronounced when female clients display characteristics that contradict traditional gender stereotypes, such as high-risk tolerance or investment confidence. Advisors may interpret these traits as license to recommend speculative strategies and underestimate the client's vulnerability to poor outcomes. The result is a systematic pattern where women, particularly those displaying "atypical" investor profiles, receive advice that exposes them to unnecessary risk while generating disproportionate fees for advisors.

**Figure 1:** Gender differences in advice quality




## 5. Implications

Women are estimated to own 30% of global private wealth, and so are an essential segment for the professional finance industry. The quality of the advice they receive, and their investment decisions based on this advice, can shape their economic outcomes. This research provides insights for regulators crafting targeted interventions, as well as firms optimizing their advisory practices.

**Policy implications:** Structural reform of advisors' incentives may improve advice quality. Transparent fee structures, standardized advice protocols, and decoupling individual advisors' incentives from trading commissions could all reduce the pressure to sacrifice clients' long-term financial interests for short-term commissions.

**Industry practice:** Training and development programs for financial advisors could emphasize an educative rather than prescriptive approach, focusing on explaining recommendations and investment risks clearly to clients. Financial advisory firms should enhance their service

quality and minimize disparities across different client groups. Feedback systems that allow clients to express their satisfaction and concerns with the advice received can highlight key areas for improvement.

**Financial education:** Although the onus of responsibility for providing quality advice lies with the advisor, reducing gender disparities in financial knowledge is a worthy goal in itself. To the extent that financially knowledgeable clients are better equipped to accept high-quality advice (especially when it does not match their preconceived biases), our study suggests that improving women's knowledge could also improve the quality of advice they receive.

## 6. Why this still matters

Although the fieldwork for this study took place in 2017–2018, many of the fundamental features that drive our findings remain in place. Male investors in Hong Kong continued to have more diversified portfolios in 2023 than female investors and to hold more types of financial products (1.85 versus 1.44 types on average).[6] Women investors were also more likely to report that they had made financial losses, perhaps because of their relative under-diversification.

Some evidence suggests that women investors avoid seeking professional financial advice, preferring to rely on family and friends instead. Wealth managers who advise women report that their clients are often seeking help to understand the recommendation or the investment risk, and once they understand these they are willing to follow the advice.[7]

It is sometimes argued that recent advances in financial technology, such as robo-advisors and large language model (LLM)-based advising, could reduce the bias in advice quality across different groups, particularly by gender. However, the output of AI tools is only as good as the data that go into training it. If they are currently trained on few instances of female clients, existing LLM-based advisors may not display a gender bias[8], but that may change over time as new training data become available.

Understanding the boilerplate risk warnings on AI-generated advice requires financial knowledge. AI tools could be designed to better address the knowledge gaps between men and women, but that requires appropriate incentives for those who design and implement the tools.

## 7. Conclusion

The financial advisory landscape is shaped by a complex interplay of advisor incentives, gender disparities in financial knowledge, and institutional client matching processes. Because advisors often earn commissions based on product sales or trading frequency, they face inherent conflicts between their own financial gain and clients' best interests. This problem is exacerbated for when they face women clients, who on average, possess lower financial literacy and may struggle to identify unsuitable recommendations. Securities firms and financial planners further segment the market, with less knowledgeable clients – disproportionately women – often receiving suboptimal advice. To combat these systemic problems, comprehensive reforms are needed, including stricter fiduciary standards, enhanced financial education programs targeting women, and greater transparency in fee structures to align advisor incentives with client outcomes and promote equitable financial guidance.

[6] Hong Kong Investor and Financial Education Council, 2023. "Retail Investor Study 2023," September, https://tinyurl.com/5ecu7acp

[7] Cheung, C., 2022. "Five Female Advisors on How they Advise Women," March 31, https://tinyurl.com/4cn7msek

[8] Fieberg, C., L. Hornuf, M. Meiler and D. Streich, 2025. "Using Large Language Models for Financial Advice," working paper, SSRN, https://tinyurl.com/3ubv2bhf

## About Capco

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## About King's Business School

King's Business School is a triple-accredited business school in the heart of London. It ranks amongst the top 10 business schools for research in the UK, based on the Research Excellence Framework 2021, and is consistently ranked in the top ten in the UK for business by the Times and Sunday Times Good University Guide, the Complete University Guide and the Times Higher Global University rankings.

The School advances world-leading education and research across four knowledge frontiers: (1) developing a modern workplace, (2) creating sustainable and socially responsible business, (3) Improving health and public services organisation and (4) strengthening economic and financial systems.

It is the ninth faculty of King's College London, leveraging interdisciplinary potential across the College. It drives pioneering thinking and engages the limitless energies of the city's businesses, policymakers, entrepreneurs and change-makers. King's Business School puts its commitment to drive positive change at the heart of its life-changing research and "London as a classroom" experiential education.



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