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Banking in Dark Chains: Systemic Risks and Regulatory Gaps in JPMorgan's Kinexys Digital Assets Private Permissioned Blockchain

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Abstract: This paper examines the potential risks associated with rent-seeking behaviour in the tokenisation of bank assets, particularly by too-big-to-fail (TBTF) banks using private blockchains. As of November 2024, JPMorgan's Onyx platform was rebranded to Kinexys Digital Assets (KDA), processing over $1.5 trillion in transactions and averaging $2 billion in daily volume, demonstrating both the platform's growth and the increasing institutional adoption of private blockchain technology. This paper argues that the use of private blockchains for asset tokenisation, as evidenced by KDA's rapid expansion, may enable banks to engage in market manipulation and rent-seeking, ultimately harming consumers and potentially contributing to the formation of market bubbles. The platform's significant transaction volumes and planned integration with traditional banking services, including cross-border FX settlement, amplify these concerns. By drawing on historical examples of banks abusing markets and exploring the ethical implications of tokenisation, this paper highlights the urgent need for regulatory oversight to mitigate these risks and protect consumer interests. The lack of transparency and regulatory oversight in private blockchains, combined with their increasing scale and integration with traditional financial services, creates a breeding ground for rent-seeking and market manipulation, necessitating swift regulatory intervention to mitigate systemic risks.

Keywords: Rent-seeking, Asset tokenisation, Private blockchains, Market manipulation, Bubble formation, Consumer protection, Regulatory oversight.

1. Introduction

Tokenisation is the digital representation of the ownership of a particular financial or non-financial asset to enable fractional transactions on said title. Banks have expressed keen interest in exploring this technology but the use of private permissioned blockchains (PPB) raises concerns about potential rent-seeking behaviour and market manipulation. This paper explores the risks associated with rent-seeking in bank asset tokenisation, focusing on the ethical implications and the potential impact on the financial system wholistically.

This paper argues that the use of PPBs for asset tokenisation, such as in the case of JPMorgan's Kinexys Digital Assets (KDA) platform [1], can enable banks engage in market manipulation and rent-seeking, ultimately contributing to the formation of market bubbles. By drawing on historical examples of banks abusing markets and exploiting regulatory

gaps, this work argues that the lack of transparency and specific regulatory oversight in PPBs creates a breeding ground for rent-seeking and market manipulation which necessitates swift regulatory intervention to mitigate systemic risks [2].

This paper's foundation lies in examining the intersection of rent-seeking, technological advancement in finance, and the specific characteristics of PPBs and highlight how the opacity and concentrated control, combined with the financial sector's historical tendencies towards rent-seeking, create a unique environment where technological innovation might paradoxically enhance, rather than mitigate, opportunities for wealth extraction without commensurate value creation.

1.1. Tokenisation and Private Permissioned Blockchains

Asset tokenisation on PPBs offers the opportunity to infuse the advantages of the crypto-ecosystem with the stability and reputation of traditional financial institutions (TradFi), absent the volatility of the former [3]. Tokenisation offers several potential benefits for banks and their clients, increased liquidity, fractional ownership, and faster transactions. Additionally, tokenising can reduce costs associated with traditional asset management and transfer processes, as well as open new investment opportunities for a broader range of investors that are not restricted by time and geography, further enlarging the financial markets.

Tokenisation platforms, as they continue to emerge and evolve, have the responsibility to prioritise ethical practices and implement robust measures to ensure the integrity, transparency, and fairness of their operations, similar to the structures of TradFi. A growing and effective way this can is being achieved by participants is by implementing a Proof of Reserves (PoR) system, which provides verifiable evidence that the tokenised assets are fully backed by their underlying real-world counterparts [4].

However, the use of PPBs by Too-Big-To-Fail (TBTF) banks for this purpose raises concerns about the potential for market manipulation and rent-seeking.

2. Theoretical Framework and Literature Review

The theoretical foundation for understanding rent-seeking behaviour in PPBs draws from several interconnected economic theories that, when synthesised, illuminate the novel ways in which technological advancement can enable wealth extraction without value creation.

Rent-seeking, a concept introduced by Gordon Tullock [5], refers to the act of obtaining economic gains without creating new wealth or value. Historically, rent-seeking behaviours have been associated with monopolistic practices, lobbying, and other forms of unproductive wealth accumulation. However, the digital age has ushered in new, technologically advanced forms of rent-seeking, which have the potential to exacerbate economic inefficiencies and wealth inequality.

Recent scholarship by J. Sadowski [6] demonstrates how digital infrastructure can amplify rent-seeking opportunities through what they term "technological enclosure" – where control over critical digital infrastructure enables value extraction from market participants. This builds upon Glode and Ordoñez's [7] observation that technological advancement often leads firms to redirect resources towards surplus appropriation rather than value creation.

The information economics framework, pioneered by Stiglitz [8], takes on new dimensions in the context of PPBs. Stiglitz's work on information asymmetries provides a theoretical basis for understanding how platform operators can leverage their privileged position to extract value through information advantages. This is particularly relevant in PPBs, where the platform operator maintains unprecedented visibility into all transaction flows and participant behaviour [9].

O'Hara's [10] market microstructure research extends this analysis by demonstrating how subtle mechanisms in market architecture can enable systematic value extraction. When applied to PPBs, her framework reveals how technical design choices can create persistent information asymmetries that advantage platform operators.

2.1. Modern Applications of Rent-seeking in PPBs

In application to the theme of this work, theoretical frameworks from rent-seeking, platform economics, and information asymmetry converge to illuminate a concerning paradox: technological advancement might enhance, rather than mitigate, opportunities for wealth extraction without commensurate value creation. The opacity and concentrated control inherent in PPBs, combined with the financial sector's historical tendencies towards rent-seeking, create a unique environment where technological innovation could exacerbate rather than ameliorate market inefficiencies.

As financial institutions invest heavily in blockchain technology, there exists the ever-growing risk that these advancements may be leveraged more for surplus appropriation than for genuine economic value creation. Bank-operated PPBs could exploit network effects and information asymmetries to establish dominant market positions in the tokenised asset space. This aligns with Paul McCulley and Gary Gorton's concept of "banking in dark places" [11], where PPBs could function as modern shadow banks, extracting value through opaque operations and

regulatory arbitrage. The technological sophistication of these platforms, paradoxically, may provide new vectors for traditional rent-seeking behaviours, now enhanced by algorithmic execution and smart contract governance.

These platforms, though not traditional shadow banks, share characteristics with what can be called "Safety-Net Arbitrage" entities as they operate in a regulatory grey area, potentially able to extract subsidised guarantees from national and cross-country safety nets through "regulation-induced innovation" [12]. Large financial institutions operating these platforms may be able to extract rents by leveraging their control over the infrastructure, transaction flow, and data generated within these closed systems [13].

Moreover, the combination of traditional financial infrastructure with blockchain technology creates what might be termed "technological rent-seeking opportunities" [14], where the complexity and opacity of the system itself becomes a mechanism for value extraction. This manifests through various channels: privileged access to transaction data, control over settlement timing, ability to modify smart contract parameters, and strategic information revelation. These mechanisms, while technically innovative, mirror historical patterns of financial market manipulation but with enhanced efficiency and reduced transparency.

Building upon these theoretical foundations, this research will examine how historical patterns of financial institution rent-seeking behaviour might manifest in the context of PPBs. By drawing parallels between traditional forms of market manipulation and their potential blockchain-enabled counterparts, a better understanding of the risks posed by these new technological systems could be achieved.

3. Historical Examples and Pattern Recognition

Although at the time of this article, there is no recorded incidence of banks engaging in rent-seeking behaviour on blockchains, the historical trends of banks and their past misconduct provide ample reason to be cautious about such incidents occurring in the future. It would not be prejudicial to state that throughout their relatively short history as entities in human economic relationships, banks have continuously engaged in market abuse and exploiting consumers. One of the most notable examples is the series of actions that lead to the 2008 financial crisis, where several large lenders originated and sold subprime mortgages with unfair terms, contributing to the eventual collapse of the housing market and the ensuing financial crisis. The aftermath saw billions in fines and settlements for banks like Bank of America, JPMorgan, and Goldman Sachs, but the damage to the global economy and countless individuals' livelihoods had already been done [15].

The 2012 Libor scandal serves as another stark reminder of the extent to which major financial institutions are willing to go to manipulate markets for their own gain, as multiple banks, including industry giants like Barclays, UBS, and RBS, were found to be falsifying their interest rate submissions to benefit their trading positions, affecting an estimated $350 trillion in derivatives and other financial products globally [16].

The ink had barely dried on the regulatory responses to this scandal when another major abuse came to light between 2013 and 2015, as several large banks were caught colluding to manipulate foreign exchange benchmark rates. Traders shared confidential client information and coordinated their strategies, effectively rigging the $5.3 trillion-a-day foreign exchange market. This brazen manipulation resulted in $5.6 billion in fines for major banks including Citigroup, JPMorgan, and Barclays. Despite regulations, banks continue to take advantage of the regulatory loopholes to squeeze out profits, and this paper argues that PPBs provide a new avenue for this market manipulation.[17]

3.1. Drawing Parallels between Historical Cases and Potential Scenarios in PPBs

In viewing the potential risks associated with new technologies like PPBs, it is necessary to view them through the lens of this historical context. Even in the face of increased scrutiny and regulation following these high-profile scandals, banks continue to find new ways to manipulate markets. In 2020, JPMorgan was fined a staggering $920 million for engaging in "spoofing" – a practice involving placing and quickly cancelling large orders to move prices in precious metals and Treasury futures markets [18].

Most recent, JPMorgan has been fined for $3 million by Financial Industry Regulatory Authority (FINRA) for egregious inaccuracies in its systemwide reporting, spanning an astonishing 77 billion shares over more than a 16-year period [19]. This serves as a chilling testament to the profound dangers inherent in allowing a single powerful institution to maintain unchecked control over a vast, opaque financial ecosystem. This staggering failure of supervisory oversight, laid bare by the regulatory action, directly validates the concerns raised in this paper about the mounting systemic risks posed by JPMorgan's expanding KDA network. If one of the world's most prominent financial institutions could misreport such an immense volume of shares while evading detection by both internal compliance and external regulatory scrutiny in traditional markets, the risks within KDA's PPB environment, where the bank maintains exclusive control over an increasingly significant portion of global financial flows become exponentially more concerning.

Perhaps most concerning is the rise of dark pools – private exchanges for trading securities that are not

accessible by the investing public [20]. These opaque trading venues, which share similar features to the operation of platforms like KDA, have become breeding grounds for market abuse. In 2016, Barclays and Credit Suisse paid $154.3 million in fines for misrepresenting their dark pools and favouring high-frequency traders, while Investment Technology Group was fined $20.3 million for misusing confidential trading data in its dark pool [21].

These examples paint a troubling picture of an industry that consistently finds ways to circumvent regulations and ethical standards in pursuit of profit. The opacity and lack of public oversight in PPBs bear a striking resemblance to the conditions that enabled past abuses in dark pools and other opaque financial instruments.

4. Kinexys Platform: Case Study

The case analysis for this work centres on JPMorgan's KDA platform, launched in 2020 as Onyx before its rebranding in November 2024. KDA is an asset tokenisation platform enabling financial institutions, asset managers, and fintech companies to tokenise various financial assets on a blockchain [22]. It was chosen as a case study because of its significant market presence and its direct connection to a regulated TBTF bank, JPMorgan, which processes over $1.5 trillion in transactions and averages $2 billion in daily volume, according to the bank.

The rebranding from Onyx to KDA marks a notable evolution that coincides with impressive growth metrics. The platform has seen a tenfold increase in year-over-year payment transactions, now exceeding $1.5 trillion in total transactions with $2 billion in daily volume.[23] KDA is expanding to support cross-border payments in multiple currencies, starting with USD and EUR, and plans to integrate with JPMorgan FX Services for on-chain foreign exchange settlement.

KDA provides institutional clients with a comprehensive tokenisation solution on a permissioned version of the Ethereum blockchain [24], converting traditional financial assets such as securities, loans, and funds into programmable tokens.

The platform's client base has expanded to include over 70 clients, including major financial institutions such as Goldman Sachs, DBS Bank, and BNP Paribas [25]. The platform serves global broker-dealers and large asset managers, with payment transactions increasing tenfold year-over-year. This adoption by industry heavyweights, combined with its expanding transaction volumes, lends substantial credibility to the platform. KDA's services have broadened significantly from its initial focus on repo operations settlements to include cross-border payments, multi-currency asset clearing, and digital asset operations. One of its products, Liink, has processed over 60 million messages, demonstrating the platform's utility in streamlining inter-bank communications [26].

A particularly noteworthy development is the Tokenised Collateral Network (TCN), which has attracted participation from major players like BlackRock and Barclays. Shares in BlackRock's money market fund were tokenised through TCN and transferred to Barclays for collateral, showcasing the platform's capability in facilitating complex financial operations. The planned integration of FX services and cross-border payment capabilities further demonstrates how KDA is being leveraged to tokenise and integrate traditional financial instruments, potentially improving efficiency in delivering margin requirements and reducing transaction costs and operational risks.

However, this increasing market dominance and integration with traditional banking services amplifies concerns about concentration risk and potential rent-seeking behaviour.

4.1. Analysis of KDA's Structure and Potential for Rent-seeking

While these developments paint a picture of rapid growth and increasing adoption, they also raise critical questions about the implications of concentrating such significant financial infrastructure within a PPB controlled by a single institution. In the context of PPBs, rent seeking takes on new dimensions. The opacity and concentrated control inherent in these systems create an environment where traditional rent-seeking behaviours could potentially manifest in novel ways.

4.1.1. Structural Risk Analysis

The foundational feature of KDA that raises critical ethical concerns is its permissioned blockchain structure, which grants JPMorgan unprecedented dual powers as both market participant and platform operator. Unlike public blockchains, KDA enables JPMorgan – a bank with a troubling history of regulatory violations – to maintain absolute control over network access, validation rights, and platform governance. This concentration of power creates an environment ripe for sophisticated market manipulation that even institutional clients may struggle to detect.

This dual role exemplifies a modern form of regulatory capture that extends beyond traditional government-industry relationships [27]. By controlling both platform operations and market participation, JPMorgan can shape the ecosystem's rules while simultaneously exploiting them for profit. Although participation in KDA is nominally voluntary, the platform's growing dominance creates indirect coercive forces. Institutions increasingly find themselves compelled to participate despite reservations, as staying outside the network risks competitive disadvantage in critical financial operations.

The technical implications of this dual role are particularly concerning in KDA's settlement operations. JPMorgan's position enables potential exploitation of "time bandit" scenarios [28], where control over transaction ordering within blocks allows privileged insight into settlement flows. This capability, combined with the platform's novel implementation of Miner Extractable Value mechanisms [29], creates unprecedented opportunities for market manipulation through strategic transaction bundling, settlement timing adjustments, and collateral flow optimisation. For example, in cross-currency settlements, microsecond-level access to exchange rate updates could enable systematic front-running of significant transactions, while control over repo transaction ordering could create profitable arbitrage opportunities accessible only to preferred participants.

4.1.2. Systemic Risk Factors

This paper reveals alarming gaps in KDA's transparency regarding asset valuation and PoR. Despite multiple attempts to obtain clarification from the KDA team, fundamental questions about valuation methodologies remain unanswered. While KDA likely employs traditional valuation methods, the absence of public verification mechanisms in a platform processing over $2 billion in daily transactions represents a significant systemic risk. This opacity becomes particularly dangerous as KDA expands into cross-border payments and FX settlement, were valuation complexities cascade across multiple asset classes and currencies, potentially creating blind spots in the global financial system.

The imperative for robust PoR systems in tokenisation platforms, especially for TBTF institutions, is paramount and extends far beyond basic asset verification. While traditional banking operates within well-defined fractional reserve frameworks, KDA's tokenisation model introduces unprecedented complexities in asset-liability matching and liquidity management that existing regulatory frameworks may not adequately address [30]. The platform's daily processing in repo transactions can create a dangerous illusion of instant liquidity for tokenised securities, while the underlying assets remain bound by traditional settlement constraints – a disparity that could trigger a systemic crisis if market stress exposes these temporal mismatches.

This paper argues that the absence of standardised PoR mechanisms in bank-operated tokenisation platforms could potentially mask concentration risks and create opacity around rehypothecation practices. As noted by Franklin Templeton, "Private blockchains are a rehypothecation of the intermediary" [31].

As banks increasingly tokenise traditional assets, the ability to verify not just the existence but also the encumbrance status of underlying assets becomes crucial for systemic risk management. This verification challenge intensifies with KDA's integration with conventional banking services, where traditional assets might simultaneously serve as reserves for both tokenised and non-tokenised obligations. The maturity transformation risks are particularly concerning – as banks tokenise long-term assets while offering short-term token liquidity, the lack of transparent PoR mechanisms makes it impossible for market participants to assess these mismatches accurately [32]. This risk multiplies exponentially as KDA ventures into multi-currency operations, where currency fluctuations and cross-border settlement risks add layers of complexity to asset valuation and reserve adequacy assessment.

Drawing parallels to historical financial crises, particularly the 2008 collapse where opacity in asset valuation played a central role, KDA's current approach to PoR could create similar systemic vulnerabilities but with potentially faster-moving consequences due to the instant nature of blockchain transactions, making the lack of transparency not just a regulatory concern but a potential threat to global financial stability. The current lack of transparency could mask the build-up of systemic risks until they reach a critical point, potentially triggering a digital-age financial crisis that could propagate through the global financial system at unprecedented speed.

Although KDA primarily serves institutional investors (who are deemed more sophisticated than their retail counterpart), the potential for market manipulation still has significant consequences and are not immune to the risks associated with tokenised assets. Regulatory standards like Markets in Financial Instruments Directive II (MiFID II) and the Markets in Financial Instruments Regulation (MiFIR), as well as the United Kingdom’s Financial Conduct Authority (FCA) Product Intervention and Product Governance Sourcebook (PROD), emphasise the importance of transparency, investor protection, and market integrity throughout the lifecycle of financial products, including their design, testing, and marketing. These regulations require that financial products are designed to meet the needs of the target market, considering factors like risk, complexity, and customer understanding. It should be noted that these regulations apply to both retail and institutional investors, which can be indeed manipulated by product design and hidden fees [33]. The lack of standardised, transparent verification mechanisms could mask the build-up of systemic risks until they reach critical levels.

Importantly, the sophistication of institutional clients provides little protection against these risks, as the complexity and opacity of KDA's operations create information asymmetries that even the most experienced market participants may struggle to overcome. These vulnerabilities could have far-reaching implications across both traditional and digital financial markets.

Sophisticated clients alone do not preclude the potential for market manipulation as the complexity and opacity of KDA can create significant information asymmetries that even sophisticated clients may

struggle to overcome. Also, while larger clients may indeed have leverage to negotiate favourable terms, this dynamic itself can lead to systemic unfairness, as this ability can create a tiered system within KDA, where the largest players gain compounding advantages over time. This scenario does not require blanket preferential treatment from JPMorgan but can emerge organically from the platform's structure and the varying negotiating power of its clients. As the benefits of increased efficiency and liquidity potentially accrue disproportionately to top-tier participants, the associated costs and risks may be disproportionately borne by smaller institutions and, ultimately, everyday consumers, further entrenching financial disparities.

4.1.3. Market Concentration, Conflict of Interest and Information Asymmetry

The opacity of KDA becomes increasingly problematic as the platform expands into cross-border payments and multi-currency asset clearing. Even sophisticated institutional clients may struggle to detect potential mispricing or unfair collateral allocation, as the platform's complexity obscures the relationship between tokenised assets and their underlying real-world counterparts. This risk is particularly acute given KDA's rapid growth and expanding role in facilitating complex financial operations, including intraday repo transactions and streamlined margin management. The absence of transparent valuation methodologies and reserve verification processes – critical elements for maintaining trust and stability – further amplifies these concerns.

Drawing on Stiglitz's work in information economics, which demonstrates how parties with superior information can leverage their advantage for economic gain, KDA's structure creates troubling information asymmetries. JPMorgan's dual role as both platform operator and major market participant grants the bank unprecedented opportunities to influence markets beyond traditional banking boundaries. This information advantage can manifest in preferential treatment of certain clients through more favourable terms, lower fees, higher yields, or expedited access, creating an uneven playing field reminiscent of the 2013-2015 foreign exchange manipulation scandal.

It is necessary to state that the implementation of smart contracts within KDA adds to present significant concerns regarding potential manipulation and rent-seeking behaviour, as it could potentially conceal various rent-seeking mechanisms through embed hidden fee structures or preferential execution parameters that disproportionately benefit larger institutions or preferred clients, creating an uneven playing field within what appears to be an automated, impartial system.

The challenge of comprehensively auditing these smart contracts has become more complex with KDA's expanded functionality. The platform now handles not just basic token transfers but also sophisticated operations including intraday repo transactions, margin management, and cross-border settlements. This increased complexity makes it extraordinarily difficult for even sophisticated clients to detect potential biases or preferential treatment embedded within the contract logic. While third-party auditing measures may exist, they will face the mounting challenge of keeping pace with KDA's rapidly evolving capabilities and expanding scope of operations. The complexity of the platform's smart contracts introduces an opaque layer between its stated functionality and actual operations, raising concerns about subtle forms of market manipulation that could be difficult to detect or prove.

As KDA's grows towards becoming a systemically critical infrastructure layer, the embedded biases and preferential mechanisms within its smart contracts pose increasing risks to market fairness and stability. Even subtle distortions or exploitative practices within KDA's PPB could send shockwaves across the global financial landscape, underscoring the urgent need for enhanced regulatory oversight of smart contract governance and transparency.

As more and more of the world's financial assets and transactions become entangled within KDA's PPB, the stability of the entire global economy grows increasingly dependent on the integrity and equitable functioning of this single private network. The disclosures about the platform's breakneck growth trajectory paints a disturbing picture – one in which the unchecked conduct of a single powerful entity could bring the entire interconnected financial system to its knees.

Conflicts of interest are another area of concern, as JPMorgan being both the operator and participant, can find itself in situations where its own interests' conflict with those of its institutional clients. If these conflicts are not adequately disclosed and managed, they can lead to decisions that prioritise the bank's profits over the well-being of its clients.

5. Regulatory Gaps and Implications

It might be argued that KDA operates under existing regulatory oversight of JPMorgan itself, however, the complexity and novelty of its operations outpace current regulatory frameworks, potentially creating blind spots where manipulation could occur undetected. The platform's interoperability with other blockchains, rather than ensuring transparency, could be leveraged to create intricate financial instruments that obscure unfair practices. Despite compliance measures and due diligence processes of institutional clients, the inherent information asymmetry and technological sophistication creates reasons for significant concern, warranting continued scrutiny and evolving regulatory approaches.

KDA's expansion into multi-currency operations and cross-border settlements also creates

unprecedented jurisdictional challenges. Unlike traditional financial market infrastructure, where regulatory responsibilities are clearly delineated by national boundaries, KDA's blockchain architecture enables instantaneous cross-border value transfer that may simultaneously fall under multiple jurisdictions. For example, when a USD-denominated security is tokenised and traded against EUR-denominated collateral between counterparties in different jurisdictions, questions arise about which regulatory regime governs the transaction, particularly in cases of settlement failure or dispute resolution.

The European Union's Markets in Crypto-Assets (MiCA) regulation and the UK's Financial Services and Markets Act 2023 both attempt to address aspects of digital asset trading, but neither fully contemplates the implications of a major bank operating a PPB network that spans both traditional and tokenised finance. This regulatory gap becomes particularly acute when considering settlement finality rules across jurisdictions, limits and tracking for collateral rehypothecation, capital adequacy requirements for tokenised assets.

The current regulatory framework lacks comprehensive oversight mechanisms for smart contracts in PPBs, despite their ability to execute complex financial operations with immediate settlement finality. While the UK's Financial Market Infrastructure Hub's consultation paper on Critical Third Parties [34] acknowledges technological dependencies, it fails to address smart contract governance specifically. This gap, combined with the Bank for International Settlements' PFMI standards' inadequate coverage of PPB-specific operational requirements, creates significant vulnerabilities. These include the absence of standardised audit requirements, emergency intervention protocols, and resilience standards for private blockchain networks. As KDA expands into FX services, these regulatory shortcomings become particularly acute, as smart contract failures could rapidly cascade through the global financial system.

These regulatory deficiencies create an environment where systemic risks can quietly accumulate, remaining unaddressed until a crisis arises. The history of financial innovation demonstrates that regulatory frameworks often evolve reactively in response to significant market disruptions. KDA is advertised to offer real-time transparency, but this paper argues that this does not negate the need for a comprehensive and independently verifiable PoR or preclude the possibility of manipulation or misconduct.

6. Proposed Regulatory Framework

The current regulatory landscape for platforms like KDA is characterised by a patchwork of existing financial regulations that were not designed with this technology in mind. Regulators are grappling with how to apply traditional financial oversight mechanisms to these novel systems [35].

While traditional financial systems have established reporting and auditing mechanisms through instances of financial manipulation and instability, the closed nature of PPBs makes it difficult for regulators to gain comprehensive insights into transaction flows, asset valuations, and potential conflicts of interest. This information asymmetry is compounded by the technical complexity of the blockchain systems, which often exceeds the current expertise of many regulatory bodies. Furthermore, the global nature of these platforms challenges traditional jurisdictional boundaries, raising questions about which regulatory bodies have authority over different aspects of PPB operations.

The rapid pace of innovation in blockchain technology often leads to regulatory lags, which is particularly concerning given the systemic importance that platforms like KDA are beginning to assume in the financial ecosystem. To address these challenges, a multi-faceted regulatory approach is necessary, as this work recommends regulators develop specialised expertise in blockchain and its financial applications. This can look like creating dedicated units focused on understanding and overseeing PPBs, and or collaborating with the experts from academia and industry to bridge the knowledge gap.

At its core, any meaningful reform must begin with mandatory PoR and rigorous asset verification protocols. Real-time PoR verification systems, built on cryptographic proofs of asset backing, should be complemented by monthly third-party audits that scrutinise asset-liability matching across both tokenised and traditional assets. This verification framework must include reporting of rehypothecation levels and cross-currency exposure, supported by continuous monitoring systems that track the relationship between tokenised assets and their underlying collateral. Public disclosure of valuation methodologies and pricing sources should be non-negotiable.

Considering their current use, this paper argues that smart contract governance demands equally robust oversight. Critical smart contracts must undergo pre-deployment certification and independent code audits by accredited third parties. The implementation of "circuit breakers" within these contracts is essential to pause operations during market stress, protecting against cascading failures in the financial system. Additionally, a Global PPB Supervisory College, comprising relevant national regulators, must oversee cross-border operations. This college would establish standardised protocols for information sharing and create clear lines of regulatory responsibility across jurisdictions.

To achieve market integrity, it is necessary for the deliberate structural separation of platform operation from market participation roles. PPB operators must publicly disclose any preferential treatment or tiered service levels, while implementing transparent criteria for platform access. Regular algorithmic audits should

be conducted to detect potential market manipulation, complemented by standardised reporting of transaction fees and revenue sources.

These requirements cannot exist in isolation – they must be integrated into existing regulatory frameworks and supported by real enforcement power. The framework must evolve with the technology while maintaining unwavering focus on systemic risk mitigation. Only through such comprehensive oversight can we hope to prevent PPBs from becoming the next vector for financial crisis. Regulatory frameworks must evolve to address operational resilience requirements as KDA, and other PPBs becomes increasingly central to global financial flows. The scale and interconnectedness of KDA's operations demand specific regulatory provisions for operational resilience assessments, disaster recovery protocols, and independent verification of platform stability. These requirements should be integrated into existing financial market infrastructure regulations while recognising the unique characteristics and risks of PPBs.

Regulators can also infuse a principle-based regulatory framework specifically tailored to PPBs, focusing on outcomes such as market integrity, consumer protection, and systemic stability, rather than prescribing specific technological solutions. The framework should be flexible enough to accommodate technological evolution while still providing clear guidelines for PPB operators. This framework can also mandate regular third-party audits of smart contracts, requiring detailed disclosures about tokenisation processes and asset valuation methodologies, and establishing clear protocols for reporting potential conflicts of interest. Regulators should also have the authority to conduct "algorithmic audits" to examine the underlying code governing PPB operations. Regular review and updating of requirements will be essential as the technology and market practices evolve.

7. Conclusions

In a world where KDA serves as a central clearing hub for trillions of dollars in tokenised assets and cross-border transactions, the potential for systemic contagion cannot be understated. The staggering scale of JPMorgan's recent regulatory failures raises urgent questions about the bank's fitness to serve as the sole gatekeeper of such critical financial infrastructure.

The combination of PPBs with traditional banking infrastructure has created novel "technological rent-seeking opportunities" where system complexity and opacity become mechanisms for value extraction. Through privileged access to transaction data, control over settlement timing, and the ability to modify smart contract parameters, KDA enables sophisticated forms of market manipulation that mirror historical patterns but with enhanced efficiency and reduced transparency.

While no systemic failures have yet materialised from PPB networks, the historical pattern of regulatory intervention arriving only after market crises raises alarming concerns. The parallels between KDA's exponential growth and previous financial innovations that preceded major market disruptions cannot be ignored. Banking history repeatedly shows that by the time regulatory frameworks catch up to market evolution, substantial damage to financial stability has often already occurred.

This analysis may prove prophetic – not in the spirit of prediction, but as a warning. In an increasingly fragile global financial system, still bearing the scars of previous crises, the unchecked expansion of opaque, systemically important PPBs introduces new vectors for potential market failure. While banks naturally seek new profit centres and market opportunities, regulators must break their reactive pattern and move swiftly to establish robust oversight mechanisms before, rather than after, these risks materialise into systemic shocks. The global economy's capacity to absorb another major financial crisis is uncertain – making preventative action all the more critical. Only through rigorous transparency requirements, mandatory audits of asset valuation and PoR processes, and stringent operational resilience standards can we hope to mitigate the mounting systemic risks posed by this sprawling, unaccountable financial monopoly, no matter how seductive the siren song of tokenisation may be.

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