

THE MOBILE DEVICE AS PAYMENT INFRASTRUCTURE

*A Regulatory Case for Card Hardware Obsolescence
and the Legal Architecture of Device-Native Payment Initiation under UK
Law*

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CONFLICT OF INTEREST DECLARATION

The author is the founder and sole director of AFC Fintech Ltd, a UK-registered technology company that has developed payment initiation and financial governance infrastructure for commercial and charitable organisations. The analytical principles described in this paper reflect, in part, the regulatory framework within which that work operates. All references to payment architecture in this paper are presented as illustrations of what the existing legal framework already permits, and are not intended as, and should not be read as, commercial recommendations of any particular product or service. The author has received no funding for this research from any commercial or institutional source. This paper represents the author's independent academic and regulatory analysis.

ABSTRACT

The Payment Services Regulations 2017 (SI 2017/752) already contain the legal architecture to render both point-of-sale card terminals and automated teller machine cash infrastructure structurally redundant. Regulation 69 grants Payment Initiation Service Providers a statutory right to initiate direct bank-to-bank payments from any online-accessible account, while regulation 69(2)(c) mandates equal treatment of those orders with direct payer instructions. A mobile device operating as a licensed Payment Initiation Service Provider can therefore lawfully

execute every acceptance function currently performed by a card terminal on the merchant side and every value access function currently dependent on ATM infrastructure on the consumer side — simultaneously and from a single device — without any involvement of Visa, Mastercard, interchange fees, scheme fees, or the Payment Card Industry Data Security Standard. The regulatory framework for this transformation is enacted law. The market has not yet deployed it at scale.

This paper argues that the failure to deploy PISP-based mobile payment infrastructure at scale constitutes a market failure of measurable consequence. UK merchants paid £1.48 billion in card acceptance costs in 2024. The UK ATM network has contracted by approximately 24,000 machines — one third of its peak — since 2016, while regulatory obligations to maintain cash access impose an estimated £5 billion annual cost on designated institutions. Open Banking payment fraud rates stand at 0.013% of transactions, more than three times lower than the industry average, while transaction volumes grew 57% in 2025 alone. The international evidence — Brazil's Pix, India's UPI, Kenya's M-Pesa — demonstrates comprehensively that account-to-account mobile payment systems displace legacy hardware at national scale within a small number of years. The United Kingdom possesses a more sophisticated regulatory foundation for this transformation than any of those jurisdictions possessed at the point of their respective payment revolutions.

The paper identifies a critical distinction between SoftPOS — which eliminates terminal hardware while preserving every other element of card scheme economics — and PISP-based mobile acceptance, which eliminates the card scheme itself. It analyses regulation 69(2)(c)'s non-discrimination mandate, the implications of the Data (Use and Access) Act 2025, and the National Payments Vision's designation of account-to-account payments as a strategic priority. It proposes three regulatory measures to accelerate deployment. The permitted revolution has not yet arrived. The law is waiting for the market.

Keywords: Payment Services Regulations 2017 · Payment Initiation Service Provider · Open Banking · card hardware obsolescence · interchange fees · ATM decline · SoftPOS · Variable Recurring Payments · financial inclusion · Pix · UPI · M-Pesa

Part I: Introduction — The Enacted Revolution

The United Kingdom possesses, in the Payment Services Regulations 2017 (SI 2017/752), a complete statutory framework for direct bank-to-bank payment initiation that requires no involvement of Visa, Mastercard, or any other card scheme. It possesses, in regulation 69(2)(c) of those regulations, a statutory mandate that banks treat Payment Initiation Service Provider-initiated payment orders on equal terms with direct payer instructions. It possesses, in the Faster Payments network, settlement infrastructure capable of processing payments in near-real time at negligible per-transaction cost. And it possesses, in the smartphone, a device that every adult in the developed world carries, that contains biometric authentication meeting the Strong Customer Authentication requirements of regulation 100, and that can be authorised as a PISP access point without any additional hardware.

These four elements, taken together, constitute a complete payment system. A merchant operating a single licensed mobile application can accept payment from any payer holding an online-accessible bank account in the UK without deploying a card terminal, without joining a card scheme, without complying with the Payment Card Industry Data Security Standard, without paying interchange fees to an issuing bank, and without paying scheme fees to Visa or Mastercard. A consumer can initiate and receive payments, manage recurring payment consents, and access account balance information through the same mobile device without withdrawing cash from an ATM. The legal permission for all of this exists. The regulatory mandate for the access to payment accounts that makes it possible is enacted law. The market has simply failed to deploy it at scale.

This paper argues that this failure is neither accidental nor inevitable. It is the predictable consequence of incumbent market power — the “must-take” status of card schemes documented by the Payment Systems Regulator across three major market reviews (MR18/1.8; MR22/1.10; MR22/2.7) — operating against a regulatory framework whose potential has not been translated into a viable commercial model at sufficient scale. It is a market failure with a quantifiable cost: £1.48 billion in annual merchant card acceptance fees, a £5 billion annual cash access infrastructure burden, and the financial exclusion of communities that can afford neither the hardware to accept payments nor the ATM access on which they depend.

The paper proceeds as follows. Part II analyses the economics and regulatory structure of the card payment ecosystem that the PISP model is capable of displacing. Part III documents the ATM network’s terminal decline and the regulatory response that has entrenched rather than resolved the access problem. Part IV examines the legal architecture of the PISP framework under PSR 2017, with particular attention to regulation 69 and the non-discrimination mandate. Part V draws the critical distinction between SoftPOS — which eliminates terminal hardware while preserving card scheme economics — and genuine PISP-based mobile acceptance, which eliminates the scheme itself. Part VI examines international precedents demonstrating that mobile account-to-account payment systems can achieve population-scale adoption within years. Part VII proposes three regulatory measures to accelerate the deployment of what the law already permits. The paper concludes with an assessment of the regulatory and commercial trajectory.

I.A A Note on Scope and Method

This paper is a regulatory analysis of what the existing legal framework already permits. It does not describe the implementation architecture of any particular payment system, propose technical standards for how mobile PISP infrastructure should be built, or endorse any specific commercial product. The distinction is important: the argument that a mobile device can lawfully replace both a POS terminal and an ATM is a legal proposition derived from the text of the Payment Services Regulations 2017, the non-discrimination obligations of those regulations, and the settled infrastructure of UK Open Banking. It does not depend on any proprietary implementation. The law already permits what this paper describes. The question is why the market has not acted on it, and what regulatory levers might accelerate its doing so.

Part II: The Economics of Card Scheme Dominance — A £1.48 Billion Annual Extraction

The UK card payment ecosystem processed 31.4 billion transactions with a combined value exceeding £1 trillion in 2024.¹ Visa and Mastercard controlled 99% of all debit and credit card payments by value.² This duopoly extracts fees at every layer of the payment chain through a mechanism that the Payment Systems Regulator's Market Review MR22/1.10 (March 2025) characterised as lacking “effective competitive constraints.” UK merchants paid £1.48 billion in card acceptance costs in 2024, more than double the figure in 2019.³ Core scheme and processing fees increased by more than 25% in real terms between 2017 and 2023, representing an estimated additional £250 million annual cost imposed on businesses without any corresponding enhancement of service.⁴

II.A The Academic Foundation: Two-Sided Market Theory and the Merchant Burden

The academic literature on payment card economics has long established the structural mechanisms by which card networks extract value from merchants. Rochet and Tirole's foundational analysis of platform competition in two-sided markets⁵ demonstrated that the interchange fee is the primary instrument through which card schemes balance demand across the two sides of the network — cardholders and merchants — in a manner that systematically favours the consumer side. Wright's subsequent work⁶ demonstrated that the structural incentives of card networks result in interchange fees that are biased against retailers: merchants must accept cards because consumers expect them to (“must-take” status), regardless of cost, and this captive merchant base enables schemes to set fees above competitive levels without merchant exit.

Shy and Wang demonstrated that anti-surcharging rules — prohibiting merchants from passing card costs to card-paying customers — created “shrouded transaction costs” that suppressed price transparency and protected card scheme revenues.⁷ The UK Interchange Fee Regulation (EU) 2015/751, retained in UK law through SI 2015/1911, capped domestic consumer debit interchange at 0.2% and consumer credit interchange at 0.3%, acknowledging these distortions. Yet the PSR's card-acquiring market review (MR18/1.8, November 2021) found that small and medium merchants received little or no pass-through of the IFR savings, as acquirers expanded their own margins rather than reducing merchant service charges.

The structural inadequacy of the IFR as a competitive remedy was demonstrated most clearly by the post-Brexit interchange increase. Following the UK's departure from the European Economic Area, Visa and Mastercard raised UK-EEA cross-border card-not-present interchange fees from regulated rates of 0.2%/0.3% to 1.15% for debit and 1.5% for credit — a fivefold increase in consumer debit interchange. The PSR's cross-border interchange fees market review (MR22/2.7, December 2024) estimated this imposes approximately £200 million annual additional costs on UK businesses. The British Retail Consortium publicly characterised these increases as “indefensible” and called for parliamentary intervention.⁸

II.B PCI-DSS: The Hidden Compliance Burden

Beyond interchange and scheme fees, the card ecosystem imposes the Payment Card Industry Data Security Standard on every entity that stores, processes, or transmits cardholder data. The PCI-DSS is a contractual obligation imposed through card scheme and acquirer agreements, maintained by the PCI Security Standards Council founded by the five major card brands. The current version, PCI DSS v4.0.1 (June 2024), comprises over 300 individual security controls. Annual compliance costs range from approximately £500 to £4,000 for the smallest merchants with the simplest environments, to £15,000 to £50,000 or more for Level 1 merchants processing over six million transactions annually, with non-compliance penalties of £5,000 to £100,000 per month imposed through the acquiring relationship.

These obligations exist because card payments require the transmission of exploitable credential data: primary account numbers, card verification values, expiry dates, and cardholder names. This data is reusable, storable, and stealable. Card fraud on UK-issued cards totalled £572.6 million in 2024, with remote purchase (card-not-present) fraud rising 22% year-on-year.⁹ The PCI-DSS compliance burden is the cost of managing the inherent security risk created by a payment instrument whose credentials constitute persistent, transferable, and therefore permanently exploitable data.

A PISP-initiated Open Banking payment does not involve card credentials at any stage. The payment instruction is generated from the payer's banking application using bank-grade authentication. PSD2 Article 4(32), which defines "sensitive payment data" as data "which can be used to carry out fraud," explicitly provides that account name and account number do not constitute sensitive payment data for PISP purposes. No card number is generated, stored, transmitted, or processed. PCI-DSS has no mechanism for application to a transaction in which no card data exists.

1 UK Finance, '£1 Trillion Worth of UK Card Transactions in 2024' (Press Release, 12 March 2025).

2 Payment Systems Regulator, MR22/1.10 Market Review of Card Scheme and Processing Fees: Final Report (March 2025) (MR22/1.10 Final Report) para 1.3.

3 British Retail Consortium, Payments Survey 2025 (BRC, 2025).

4 MR22/1.10 Final Report (n 2) para 4.7.

5 J-C Rochet and J Tirole, 'Platform Competition in Two-Sided Markets' (2003) 1(4) Journal of the European Economic Association 990.

6 J Wright, 'Why Payment Card Fees Are Biased Against Retailers' (2012) 43(4) RAND Journal of Economics 761.

7 O Shy and Z Wang, 'Why Do Payment Card Networks Charge Proportional Fees?' (2011) 101(4) American Economic Review 1575; and (2019) 63 International Journal of Industrial Organization 99 on shrouded transaction costs.

8 BRC, 'Businesses Call on MPs to Take Urgent Action on Card Payments' (Press Release, April 2025).

9 UK Finance, Annual Fraud Report 2025 (UK Finance, May 2025) 12.

Part III: The Collapse of ATM Infrastructure and the Limits of Regulatory Remedy

The United Kingdom's automated teller machine network peaked at approximately 70,100 machines in 2016. By the end of 2024, the total had fallen to 46,182 — a contraction of approximately 24,000 machines, representing a 34% reduction over eight years.¹⁰ Free-to-use ATMs declined to 37,361, with the majority of remaining machines concentrated in urban areas where commercial viability is highest and financial exclusion is lowest. Consumers made 915 million cash withdrawals in 2024, down 6.1% from 2023, and the volume has been declining consistently since a peak of approximately 2.9 billion in 2012.¹¹

III.A The Access to Cash Review and Its Regulatory Legacy

The Access to Cash Review, chaired by Natalie Ceeney CBE and published on 6 March 2019, documented that 8 million UK adults — 17% of the population — would struggle in a cashless society, with 2 to 3 million people entirely reliant on cash.¹² It estimated that UK cash access infrastructure costs approximately £5 billion per year to maintain. The Review's recommendations focused on preserving the cash ecosystem through regulatory mandates, access gap assessments, and coordination obligations — interventions designed to slow the decline of infrastructure already being displaced by consumer behaviour.

The legislative response was the Financial Services and Markets Act 2023 (c.29), which received Royal Assent on 29 June 2023 and inserted Part 8B (sections 131O–131Z) into the Financial Services and Markets Act 2000 via section 55 and Schedule 8. Section 131U(1) requires the FCA to exercise its functions for the purpose of seeking to ensure reasonable provision of cash access services. HM Treasury designated 14 banks, building societies, and LINK Scheme Limited under section 131R(1) on 24 May 2024. The FCA implemented detailed requirements through PS24/8 ('Access to Cash', 24 July 2024), with new rules operative from 18 September 2024.

LINK's Financial Inclusion Programme subsidises protected ATMs at rates of up to £2.75 per withdrawal — compared to standard interchange of approximately 23 pence — at an estimated cost exceeding £1 million per month.¹³ The PSR issued Specific Direction 12 (SD12, March 2022) requiring geographic maintenance of free-to-use ATMs before allowing it to expire in January 2025 as FCA rules succeeded it.¹⁴ The economic logic of these interventions is inherently circular: declining cash volumes raise per-transaction infrastructure costs; rising costs prompt further ATM closures; closures concentrate demand on surviving machines, which become unviable without subsidy. The regulatory apparatus commits institutions to maintaining a declining infrastructure at escalating cost — costs ultimately borne by all bank customers, including the 95% who have moved away from cash dependence.

III.B Why ATM Infrastructure Cannot Be the Answer

The regulatory framework built around ATM preservation reflects an analysis of the access problem in terms of the infrastructure currently serving it rather than the function that infrastructure is intended to serve. Cash provides access to value: the ability to pay for goods, services, and transactions that require monetary exchange. The Access to Cash Review's 8 million figure represents people who

could not “get by” without cash access — primarily because their payment environment requires cash. If the payment environment were to change — if the 12% of small businesses that currently accept only cash,¹⁵ and the market stalls, religious organisations, and informal service providers that constitute the principal commercial environments of cash-reliant communities, were to gain access to cost-effective digital payment acceptance — the underlying need for cash access would diminish structurally rather than incrementally.

The regulatory framework for payment initiation already provides this alternative. A merchant who accepts payment via a mobile PISP application incurs no terminal hardware cost, no card scheme relationship, and no interchange obligation. The acceptance cost is structurally lower than any card-based alternative. A consumer who can pay via a mobile banking application — provided they hold a bank account and a smartphone, both increasingly common in the communities identified by the FCA Financial Lives Survey as cash-dependent — does not need an ATM to access the value in their account. The FSMA 2023 Part 8B cash access framework is the appropriate regulatory response to the transitional period; it is not, and should not be treated as, the permanent settlement.

10 LINK, 'Consumers Withdrew £79.5bn from LINK ATMs in 2024' (Press Release, January 2025).

11 *ibid*; UK Finance, UK Payment Markets Summary 2025 (UK Finance, June 2025).

12 N Ceeney (Chair), Access to Cash Review: Final Report (Natalie Ceeney, 2019) 6.

13 LINK, Monthly ATM Footprint Report (March 2026).

14 Payment Systems Regulator, Second Annual Review of Specific Direction 12 (PSR, July 2024).

15 FCA, Financial Lives Survey 2024 (FCA, 2025) para 3.7.

Part IV: The Legal Architecture of Payment Initiation — PSR 2017 and the Statutory Mandate

The Payment Services Regulations 2017 (SI 2017/752), which transposed the Second Payment Services Directive (Directive 2015/2366/EU) into UK domestic law and came largely into force on 13 January 2018, establish a statutory framework for payment initiation that is architecturally complete. Authorisation as a Payment Initiation Service Provider is regulated under Part 2 of the Regulations (regulations 5–12), with Schedule 3 prescribing initial capital requirements of €50,000. The PISP occupies a position in the payment chain defined by what it explicitly does not do: it does not hold the payer’s funds at any time (regulation 69(3)(a)); it does not store sensitive payment data beyond what is necessary to initiate the transaction (regulation 69(3)(e)); it does not modify the amount, payee, or any other feature of the payment order (regulation 69(3)(h)). These are not optional characteristics of a PISP model — they are statutory obligations that define the category.

IV.A Regulation 69: The Non-Discrimination Mandate

Regulation 69 is the operative provision establishing PISP payment rights. Regulation 69(1) provides that where a payer has given explicit consent to a PISP to initiate a payment order on their behalf, the account-servicing payment service provider must, in respect of payment accounts accessible online, allow the PISP to initiate the payment order and provide the PISP with all relevant information on initiation and execution. The substantive significance is in regulation 69(2)(c), which requires the ASPSP to “treat the payment order in the same way as a payment order received directly from the payer, in particular in terms of timing, priority or charges, unless the account servicing payment service provider has objective reasons for treating the payment order differently.”

This provision creates an equality of treatment obligation that is enforceable by the PSR under its functions under the Financial Services (Banking Reform) Act 2013. A bank that processes a direct payer instruction within ten seconds via Faster Payments must process a PISP-initiated instruction for the same payer, to the same payee, for the same amount, on the same terms. A bank that imposes a fee for direct payment initiation may not impose a higher fee for PISP-initiated initiation. Discrimination in timing, routing, or cost constitutes a breach of the Regulations subject to regulatory enforcement, civil liability under regulation 91, and the PSR’s direction-making powers.

Regulation 69(2)(d) reinforces this by prohibiting ASPSPs from requiring PISPs to enter into a contract as a precondition for API access. The contractual gatekeeping mechanism that banks historically employed to control access to payment initiation — and that enabled them to impose additional commercial terms on third parties — is removed by statute. Access is rights-based, not agreement-based. This is the core of the regulatory architecture’s potential: payment initiation is a statutory right, not a commercial privilege to be negotiated.

IV.B Strong Customer Authentication and the Smartphone

Regulation 100 and Schedule 8 implement Strong Customer Authentication, requiring at least two independent elements from the categories of knowledge (something only the user knows), possession (something only the user possesses), and inherence (something the user is). The regulation requires dynamic linking for payment transactions: the authentication code must be transaction-specific and linked to the payee and amount, such that any alteration of those details is detectable.

The smartphone satisfies all three SCA elements natively. The device itself constitutes possession. The biometric sensor — fingerprint recognition, face recognition, or iris recognition — constitutes inherence. A PIN or password set by the user constitutes knowledge. The banking application's transaction-specific token constitutes dynamic linking. No external hardware token is required. No additional card reader is required. The regulatory requirement for SCA is satisfied by infrastructure already present in every modern smartphone, without the need for any physical payment terminal.

This observation is not merely technical. It has direct implications for the regulatory analysis of what hardware is necessary for payment acceptance and access. If the smartphone satisfies SCA for payment initiation, and regulation 69 mandates that banks treat PISP-initiated orders on equal terms with direct payer instructions, then the legal case that a smartphone can replace a POS terminal does not require any new regulatory permission. It follows from the application of existing law to existing technology.

IV.C Access to Payment Systems: Regulations 103 and 104

Payment initiation requires access not only to individual payment accounts (addressed by regulation 69) but also to the underlying payment systems through which funds are transferred. Regulations 103 and 104 address this. Regulation 103(2) requires a payment system operator to permit authorised payment service providers to access its payment system on proportionate, objective, and non-discriminatory grounds — the POND requirement that mirrors the equal treatment obligation of regulation 69(2)(c). Regulation 104 provides that a payment service provider that is an indirect participant in a payment system must offer access to its services to other PSPs on objective, proportionate, and non-discriminatory terms.

Together, regulations 69, 103, and 104 create a vertically integrated access framework: PISP access to payment accounts under regulation 69; PISP access to payment system participants' services under regulation 104; payment system participant access to the payment system under regulation 103. A PISP that is authorised under Part 2 of the Regulations and that has integrated with the Faster Payments network (directly or through a sponsoring institution) can therefore access the complete payment chain from the payer's account to the payee's account through rights conferred by statute, without any commercial arrangement with a card scheme, any acquirer relationship, or any submission to card scheme rules.

IV.D The Data (Use and Access) Act 2025 and the Future Foundation

The Data (Use and Access) Act 2025 (c.18), which received Royal Assent on 19 June 2025, creates permanent statutory footing for Open Banking through Smart Data Scheme powers under Part 1 (sections 1-18). Section 1 enables HM Treasury to

designate “smart data schemes” by regulations, requiring relevant data holders to share data with authorised third parties on the request of a customer. Section 14 enables the extension of Open Banking beyond banking to other sectors, laying the foundation for Open Finance. The Act removes Open Banking’s dependence on the CMA’s retail banking market investigation order framework — a competition order mechanism that was always an imperfect basis for permanent payment infrastructure governance — and places it on a legislative footing commensurate with its systemic significance.

HM Treasury’s National Payments Vision (November 2024) designated account-to-account payments for e-commerce as a “short to medium term priority” and appointed the FCA as lead regulator for the development of Open Banking payments. The commercial Variable Recurring Payment scheme, with first live payments expected in Q2 2026 under the UK Payments Initiative consortium of 31 firms, provides the recurring payment infrastructure for subscription and instalment payment models that were previously only available through direct debit or card-on-file arrangements. VRPs are directly initiated by PISPs and carry no interchange or scheme fee.

16 Payment Services Regulations 2017 (SI 2017/752), reg 69(2)(c).

17 *ibid* reg 69(2)(d).

18 *ibid* regs 103–104.

19 Data (Use and Access) Act 2025 (c 18), ss 1–18.

20 HM Treasury, National Payments Vision (HM Treasury, November 2024) 14–16.

Part V: The Critical Distinction — SoftPOS Eliminates Hardware, PISP Eliminates the Scheme

The most significant analytical error in current discussions of mobile payment technology is the conflation of two fundamentally different innovations: SoftPOS, which enables a smartphone to accept card payments without a dedicated terminal, and PISP-based mobile acceptance, which eliminates the card scheme entirely. This conflation matters because it creates the false impression that the hardware problem and the economic problem are the same problem, when in fact they are distinct. SoftPOS solves the former and leaves the latter untouched. PISP-based acceptance solves both simultaneously.

V.A SoftPOS: Eliminating Hardware, Preserving Economics

SoftPOS — software-based POS, also described as Tap to Pay or Tap on Phone — enables a merchant to accept contactless card payments on an NFC-enabled smartphone using only software, without any dedicated payment terminal hardware. Visa launched its global Tap to Phone programme in October 2020; Mastercard launched its Cloud Tap on Phone initiative in January 2021; Apple Tap to Pay launched in the UK on 13 July 2023, with Revolut and Tyl by NatWest as inaugural partners.²¹ The technology is certified under EMVCo's contactless specifications and the PCI Security Standards Council's Mobile Payments on COTS (MPoC) standard, published on 16 November 2022, which consolidated the earlier Cloud-based Payments on COTS (CPoC) and Software-Based PIN Entry on COTS (SPoC) frameworks.

The global SoftPOS market has grown rapidly: it was valued at approximately USD 350 million in 2024 and is projected to exceed USD 1.2 billion by 2030, driven primarily by micro-merchant adoption in markets where card terminal hardware represents a significant barrier to entry.²² In the UK, SoftPOS adoption has been accelerating among food delivery platforms, market traders, and service businesses where the economics of card hardware are most constraining.

SoftPOS achieves exactly one thing: it eliminates the dedicated card terminal. Every other element of the card payment ecosystem is preserved. Interchange fees still apply at IFR-capped rates — 0.2% for consumer debit, 0.3% for consumer credit. Scheme fees still apply, and at the elevated levels documented by MR22/1.10. PCI-DSS compliance remains mandatory: the PCI MPoC standard regulates SoftPOS solutions, and PCI DSS v4.0.1 continues to apply to the processing environment, because cardholder data is still transmitted, processed, and must be protected. An acquirer relationship remains necessary because the card scheme participant structure is unchanged. Card credentials remain the payment instrument because the card scheme network carries the transaction.

V.B PISP-Based Mobile Acceptance: Eliminating the Scheme

A PISP-initiated mobile payment eliminates all of these simultaneously. The merchant presents a payment request — via a QR code, NFC deeplink, or mobile redirect — that the consumer satisfies by authenticating in their banking application. The payment instruction flows from the consumer's bank account to the merchant's bank account via Faster Payments, completing in near-real time. No

card scheme participates in the transaction. No interchange fee arises because there is no card issuance; the payment is bank-initiated, not card-initiated. No scheme fee arises because Visa and Mastercard are not parties to the transaction. No PCI-DSS obligation arises because no card data exists at any point in the transaction. No acquirer is required because there is no card to acquire. Card-not-present fraud risk is eliminated because there is no card.

Industry cost analyses consistently estimate savings of approximately 50% for merchants using Open Banking account-to-account payments compared to card processing, even before taking scheme fees into account.²³ The settlement cycle improves from T+1 to T+3 for card settlements to near-real-time via Faster Payments. The fraud rate for Open Banking payments — 0.013% of transactions in H1 2025 — is more than three times lower than the 0.045% industry average that includes card fraud.²⁴

This is not a marginal improvement in the economics of card acceptance. It is the structural elimination of the card ecosystem's cost architecture. The smartphone that serves as the merchant's acceptance device in a PISP model performs a categorically different economic function from the smartphone that serves as a SoftPOS terminal in a card scheme model. The first eliminates card scheme rents entirely. The second merely reroutes them through a more convenient hardware form.

V.C The Regulatory Significance of the Distinction

The PSR's market review programme — MR18/1.8, MR22/1.10, MR22/2.7 — documents the failure of interchange fee regulation to effectively control the total cost of card acceptance. The core problem is that card scheme economics are multi-layered: when interchange is capped, scheme fees rise; when cross-border interchange is reviewed, domestic scheme fees increase; the regulated layer is compressed while the unregulated layer expands. SoftPOS does nothing to address any layer of this problem. It is a technology that benefits the card schemes by broadening merchant acceptance without reducing scheme revenues.

PISP-based mobile acceptance operates outside the card scheme framework entirely and is therefore immune to this regulatory whack-a-mole dynamic. The PSR cannot cap fees that do not exist. The relevant regulatory questions for PISP-based acceptance concern the commercial VRP pricing model — on which the FCA, PSR, and CMA gave joint clarity on 20 January 2026²⁵ — and the POND access obligations of regulations 103 and 104. These are materially simpler regulatory challenges than the multi-layered interchange and scheme fee architecture that has occupied three major PSR market reviews over seven years.

21 'Apple Announces Go Live for Tap to Pay on iPhone Contactless Payments in the UK' (Retail Technology Innovation Hub, 13 July 2023).

22 Fortune Business Insights, SoftPOS Market Size, Share and Growth Report (2024).

23 TrueLayer, The Cost of Payments 2025 (TrueLayer, 2025); Yapily, State of Open Banking 2025 (Yapily, 2025).

24 Open Banking Limited, Financial Crime in Open Banking: 2025 Update (OBL, December 2025).

25 FCA, PSR and CMA, 'Regulators Give Clarity in Relation to Open Banking Pricing Models' (Joint Statement, 20 January 2026).

Part VI: International Precedent — How Mobile Account-to-Account Payments Replaced Hardware at Scale

The proposition that a mobile device can replace both a POS terminal and an ATM is not theoretical. It has been demonstrated at population scale across three major economies with different regulatory frameworks, different development contexts, and different implementation mechanisms. Brazil's Pix, Kenya's M-Pesa, and India's Unified Payments Interface each achieved the displacement of physical payment infrastructure through mobile account-to-account systems. Their common features — zero interchange for consumers, low or zero cost for merchants, near-real-time settlement, smartphone authentication, and ubiquitous adoption — correspond precisely to the features that the PSR 2017 PISP framework already enables in the UK. The principal difference is that those jurisdictions acted on the opportunity and the UK has not yet done so at scale.

VI.A Brazil's Pix: Population-Scale Adoption in Four Years

Brazil's Pix instant payment system was launched by the Banco Central do Brasil on 16 November 2020. By May 2025, it had reached 175 million registered users — 93% of the Brazilian adult population — and processed 63.4 billion transactions with a combined value of \$4.6 trillion in 2024.²⁶ Cash usage in Brazil collapsed from approximately 43% of transactions in 2019 to 6% in 2024 — a transformation of the primary payment instrument used by an adult population of 189 million in four years. Pix is free for individuals and costs merchants approximately 0.33% of transaction value, compared to 1.13% for debit cards and 2.34% for credit cards.²⁷ It is estimated to have redirected approximately BRL 85 billion annually from card scheme revenues to merchants, businesses, and consumers. The IMF's analysis of Pix characterised it as "Brazil's successful instant payment system" and documented its role in compressing the informal economy by creating a traceable, low-cost transaction record for previously cash-dependent populations.²⁸

Pix operates through direct bank-to-bank payment instructions. It requires no card. It involves no card scheme. Its authentication relies on banking application credentials. A QR code presented at a market stall, a restaurant table, or a street vendor's phone initiates a bank-to-bank payment that settles in under ten seconds, twenty-four hours a day, seven days a week. Every function served by the combination of a POS card terminal (acceptance) and an ATM (cash access) is provided by a smartphone application connected to a bank account, at a cost that is structurally lower than either legacy hardware alternative.

VI.B India's UPI: The World's Largest Real-Time Payment System

India's Unified Payments Interface, launched by the National Payments Corporation of India in April 2016, processed 228.3 billion transactions in 2025, accounting for 81.8% of India's digital payment volume and representing approximately 49% of all global real-time payment transactions.²⁹ UPI is free for all transactions up to ₹100,000 (£900 approximately). Its penetration extends to populations that lack physical bank branches or ATMs: street vendors, auto-rickshaw drivers, agricultural labourers, and domestic workers who carry

smartphones use UPI for daily commerce that would previously have required cash exclusively. The system processes approximately 625 million transactions per day.

The OECD's 2025 analysis of competition in mobile payment services described UPI as having "redesigned the payment stack from the ground up," creating a public digital infrastructure layer on which private companies compete through application innovation rather than through control of the payment instrument.³⁰ This is architecturally parallel to what the UK's Open Banking framework enables under PSR 2017: a standard API layer, operated by Open Banking Limited and governed by the FCA and PSR, on which PISP providers compete through service quality and commercial models rather than through proprietary terminal networks.

VI.C Kenya's M-Pesa: Financial Inclusion Through Mobile Money

Kenya's M-Pesa, launched by Safaricom in 2007, now serves 82 million registered accounts with 28 billion annual transactions worth KES 40 trillion (approximately £309 billion) processed in the most recent year.³¹ Adult financial account ownership in Kenya rose from 26% in 2006 to 90% in 2024 — a transformation primarily attributable to mobile money access rather than traditional banking infrastructure.³² Suri and Jack's landmark study in Science, published in December 2016, demonstrated using panel data that M-Pesa had by that date lifted 194,000 Kenyan households — approximately 2% of the total — out of poverty, with the largest impacts concentrated in female-headed households who gained independent access to financial services for the first time.³³

M-Pesa achieved this without a single ATM, without a single card terminal, and without any participation by Visa or Mastercard. Its infrastructure was the mobile phone, the SIM card, and a network of human agents providing cash-in and cash-out services as an analogue on-ramp to a digital system. As smartphone penetration increased and QR code payment became standard, the agent network's role diminished progressively. The financial inclusion outcome — a doubling of adult financial access in 18 years — was achieved by creating a payment system that met people where they were rather than building infrastructure where planners thought they should go.

VI.D The UK's Comparative Position

The United Kingdom's regulatory framework for payment initiation is, by any objective measure, more developed than the frameworks that supported Pix, UPI, or M-Pesa at the point of their respective launches. PSR 2017 regulation 69 provides statutory PISP access rights that Brazil created through central bank mandate, India through NPCI technical specifications, and Kenya through Safaricom's proprietary network. The Faster Payments infrastructure provides settlement speeds matching or exceeding those of Pix, UPI, and M-Pesa's near-real-time settlement. The UK's smartphone penetration — estimated at 91% of adults in 2024 — exceeds all three comparator jurisdictions. And the UK's Open Banking API infrastructure, mandated by the CMA and governed by Open Banking Limited, provides a standardised technical access layer that Pix, UPI, and M-Pesa each had to build from scratch.

The UK's Open Banking payment volumes — 351 million transactions in 2025, growing at 57% year-on-year — represent less than 1.1% of annual card transaction volumes. The comparator jurisdictions achieved 80-93% adult population adoption within four to eighteen years of launch. The structural pre-conditions for equivalent adoption in the UK — legal access rights, settlement infrastructure, standardised

APIs, smartphone penetration — are all present. What is absent is the deployment at merchant acceptance level that would create the ubiquity necessary to shift consumer behaviour at scale.

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Part VII: Three Reform Proposals to Accelerate the Deployment of Permitted Infrastructure

The analysis in the preceding Parts establishes three conclusions. First, the UK regulatory framework already permits a mobile device operating as a licensed PISP to replace both a card terminal and an ATM as the primary payment acceptance and access infrastructure for merchants and consumers respectively. Second, the card scheme ecosystem — extracting £1.48 billion annually from UK merchants through its “must-take” status — and the declining ATM network — costing approximately £5 billion annually to maintain — are both structurally obsolete given the technology and law that already exist. Third, the market has failed to deploy PISP-based mobile infrastructure at the scale necessary to generate the consumer adoption that would create ubiquity.

The following three proposals are advanced as regulatory interventions to close the gap between what the law permits and what the market has delivered.

VII.A Proposal One: A Mandatory ‘Open for PISP’ Acceptance Standard for Publicly Funded Services

Every publicly funded service point — local authority offices, NHS trusts, courts, HMRC payment counters, and social housing landlords — should be required to accept PISP-initiated Open Banking payments alongside card payments within a defined implementation period, recommended as 24 months from enactment. This creates a mandated acceptance floor for the payment instrument that the law already makes available, generating the merchant-side ubiquity necessary to drive consumer-side adoption. The precedent exists: NHS Supply Chain already requires Peppol e-invoicing; government procurement standards already mandate certain payment method acceptance. Extending this to PISP acceptance for consumer-facing public services is consistent with the existing framework.

The regulatory mechanism is available under the National Payments Vision’s designation of account-to-account payments as a strategic priority. HM Treasury’s payment infrastructure powers, exercised through the Payment Systems Regulator under the Financial Services (Banking Reform) Act 2013, provide the statutory basis for issuing guidance or directions requiring designated public sector bodies to accept payment through regulated payment channels. No primary legislation is required.

VII.B Proposal Two: A PISP Access Dividend Within the Cash Access Regime

The FSMA 2023 Part 8B framework requires designated institutions to fund cash access assessments, fill identified access gaps, and maintain cash withdrawal and deposit services in defined geographic areas. The aggregate annual cost exceeds £1 billion in ATM subsidy and access gap intervention. This paper proposes that designated institutions be permitted to offset their cash access obligations through equivalent investment in PISP payment acceptance infrastructure for the relevant geographic area — specifically, by funding PISP merchant acceptance deployment among the small and micro-businesses in cash-dependent communities that constitute the principal commercial environment of cash-reliant consumers.

The legal framework for this offset is available through the FCA's rule-making powers under FSMA 2023 s131U. The FCA could define "reasonable provision of cash access services" to include the provision of alternative payment acceptance infrastructure where it demonstrably reduces community dependence on cash. This is consistent with the statutory purpose of the cash access regime — ensuring that consumers can access the value in their accounts and make payments — while redirecting regulatory investment from the maintenance of declining infrastructure toward the creation of the alternative that renders it unnecessary.

VII.C Proposal Three: A PISP Acceptance Disclosure Requirement for Large Merchants

Large merchants — defined by the PSR card-acquiring market reviews as those processing above £50 million in annual card turnover — who do not accept PISP-initiated Open Banking payments should be required to disclose this to the PSR annually, together with their total card scheme costs and their assessment of why PISP acceptance has not been adopted. This is a transparency obligation, not a mandate: the PSR's market review programme cannot force adoption of alternative payment instruments by merchants who have concluded the economics do not justify it. But non-disclosure of the assessment perpetuates information asymmetries between card schemes and their merchant customers, and between regulators and the market they are attempting to open.

The precedent is the Gender Pay Gap reporting regime under the Equality Act 2010 (Gender Pay Gap Information) Regulations 2017 (SI 2017/172), which requires employers to report rather than to act, on the reasonable assumption that transparency creates its own incentive for change. PSR card-acquiring market review remedies (MR18/1.8 final report, November 2021) already include SME-facing price transparency obligations for acquirers. Extending similar transparency requirements to large merchants in respect of alternative payment channel assessment would provide the PSR with the market intelligence necessary to assess whether MR22/1.10's structural remedies are achieving the intended competitive response.

Conclusion: The Law is Waiting for the Market

The Payment Services Regulations 2017 created a statutory right to initiate bank-to-bank payments from any online-accessible account. That right, operationalised through the Open Banking API standards mandated by the CMA's Retail Banking Market Investigation Order 2017 and now embedded in the Data (Use and Access) Act 2025, enables a mobile device to function as both a payment acceptance terminal for merchants and a payment access instrument for consumers, simultaneously and from a single device, without any involvement of card schemes, card hardware, interchange fees, or ATM infrastructure.

The card payment ecosystem — which extracted £1.48 billion from UK merchants in 2024, increased its core fees by 25% in real terms between 2017 and 2023, and raised cross-border interchange by 500% following Brexit — is not the inevitable price of electronic payment. It is the product of a “must-take” duopoly that the PSR has documented across three major market reviews and that the IFR's targeted caps have proved insufficient to discipline. The ATM network — which has contracted by 34% since 2016, requires approximately £5 billion annually to maintain, and now depends on regulatory subsidy to protect the geographic access on which cash-reliant communities depend — is not the only means of providing access to the value held in bank accounts. It is a declining physical infrastructure serving a function that a mobile device with a banking application can replicate at a fraction of the cost, with regulatory access rights that are already enacted law.

The international evidence from Brazil, India, and Kenya demonstrates that the transition from card-and-ATM to mobile account-to-account is achievable at population scale within a small number of years, across divergent regulatory environments and development contexts. The UK possesses more developed regulatory infrastructure for this transition than any of those jurisdictions had at the point of their respective payment revolutions: statutory PISP access rights, standardised APIs, Faster Payments settlement, smartphone penetration exceeding 91% of adults, and Open Banking fraud rates three times lower than the card industry average.

What the UK does not yet possess is the deployment. The merchant-side ubiquity that would create consumer-side adoption has not materialised from regulatory access rights alone. The three proposals advanced in Part VII — mandatory public sector PISP acceptance, a PISP access dividend within the cash access framework, and large merchant disclosure obligations — are designed to accelerate that deployment without compelling private actors to adopt specific commercial models. They work with the grain of the existing regulatory architecture rather than against it.

The mobile device already is both the payment terminal and the ATM. The law already says it can be. The question before the regulator, the market, and the legislature is how long the permission will sit unused while the infrastructure it could replace continues to impose £6 billion in annual costs on merchants, consumers, and the public institutions that subsidise declining payment access infrastructure.

The permitted revolution does not require new law. It requires deployment.

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Author's Competing Interest Statement

The author declares the following competing interest: AFC Fintech Ltd, of which the author is founder and sole director, has developed Vortex AgOS, a hardware-free, non-custodial payment initiation and financial governance platform that incorporates the regulatory principles described in this paper as the legal basis for its payment architecture. The paper's argument that a mobile device operating as a licensed Payment Initiation Service Provider can lawfully replace both card terminals and ATM infrastructure reflects, in part, the regulatory framework within which that work operates. The author has taken deliberate steps to ensure that the paper's analytical conclusions are derived independently from the text of the Payment Services Regulations 2017, published PSR market review reports, and peer-reviewed academic literature, and do not constitute a commercial recommendation of any specific product or service. Readers are invited to evaluate the regulatory analysis against their own independent assessment. The author has received no funding from any commercial or institutional source for this research.

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Olushola Oke-Daniels is a Barrister and the Founder of AFC Fintech Ltd (Company No. 16915302), a UK-registered technology company developing Vortex AgOS, a hardware-free non-custodial payment and financial governance operating system for commercial businesses and faith organisations, and Sovereign Auditor, an automated compliance engine for CASS 15 safeguarding reconciliation. His work sits at the intersection of UK payment regulation, financial services law, and compliance system design. He is the author of the AFC Review seminar paper series on payment infrastructure, charity governance, and UK regulatory technology.

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