Stablecoin Integration Opportunities for Google[1]

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1. Executive Summary

The global financial landscape is undergoing significant transformation, driven by the limitations of traditional infrastructure and the emergence of blockchain-based innovations like stablecoins. Stablecoins are digital assets that are typically backed by liquid or near liquid dollar denominated assets. pegged to fiat currencies. They offer potential solutions to long-standing challenges in speed, cost, and efficiency, particularly for international transactions.

The primary objective of this analysis is to identify and evaluate viable use cases for stablecoins across Google's operations.

- We estimate that customers with $1,000 of annual transactions to Google could reduce total transaction costs, that Google covers, by $20 dollars if they did so using stablecoins, an amount that adds up quickly as transaction sizes increase. Google could pass on these savings to customers or consider internalizing the gains.
- We demonstrate the steps customers would take to obtain and use stablecoins with Google and highlight the frictions that might prevent adoption.
- The savings benefits likely only exceed the hassle of setting up and using the cryptocurrency ecosystem for US customers with $1,000 in annual transactions. As a lower bound, there are 8mn Youtube TV customers whose annual payments reach this level.
- Consumers in some foreign countries are more receptive to USD-backed stablecoin usage due to issues with inflation in their home currencies. We survey and summarize the current level and growth of stablecoin usage in these countries, current regulatory regimes, and link these to current Google business operations in these countries.
- Beyond consumers, using stablecoins for B2B merchant payouts, supplier settlements, and treasury management could reduce transaction fees, accelerate settlement times from days for international transactions to near-instantaneous.
- Integrating stablecoin functionality in Google Pay could unlock new capabilities for peer-to-peer payments, reduce merchant transaction costs, and strengthen Google's competitive position in the digital wallet market against rivals.

2. Introduction

The infrastructure underpinning global commerce has evolved significantly, moving from physical ledgers to sophisticated digital systems. However, many core payment processes – particularly for cross-border transactions – retain legacy inefficiencies related to speed, cost, and complexity. Simultaneously, the financial technology landscape is rapidly innovating, with blockchain technology and stablecoins emerging as potentially disruptive forces. Stablecoins, digital assets designed to maintain a stable value relative to a reference asset, present a novel approach to value transfer, promising near-instant settlement and reduced intermediation costs.

This report provides a comprehensive analysis of the potential applications and implications of stablecoin technology specifically for Google's multifaceted business operations. Our primary objective is to evaluate how Google might leverage stablecoins to enhance efficiency, reduce costs, and potentially unlock new capabilities across its diverse payment ecosystem, which spans transactions with Google exceeding the aforementioned $1,000 threshold. This covers advertising payouts, cloud services transactions, developer and creator earnings distribution, and consumer-facing digital wallets and more.

Examining stablecoin use cases is particularly relevant for a global technology leader like Google. As competition intensifies in digital payments and the demand for faster, cheaper global transactions grows, understanding the strategic value of adopting or integrating stablecoin technology becomes crucial. This analysis explores how such adoption could impact Google's operational efficiency, treasury management, relationships with partners and creators, and competitive standing in the broader financial technology sector.

Our analysis relies on an examination of current payment system functionalities and limitations, the mechanics and characteristics of leading stablecoins, the evolving global regulatory environment, and the specific payment flows inherent in Google's business model. We assess potential use cases qualitatively, considering both the opportunities and the inherent technological, operational, and regulatory challenges.

This report is structured to guide the reader from foundational concepts to specific applications. Following this introduction, the **Discussion** section delves into the mechanics of stablecoins, the context of current payment infrastructures, the pertinent regulatory landscape, and an overview of Google's relevant business operations. Subsequently, we conduct an **Analysis of**

Stablecoin Use Cases for Google, exploring applications in B2B transactions, creator payouts, and digital wallets. We then address key **Implementation Challenges**, including technical hurdles and operational concerns. Finally, the **Conclusion** synthesizes our findings on the opportunities and strategic considerations for Google regarding stablecoin adoption.

3. Discussion: The Stablecoin and Payments Landscape

3.1. Understanding Stablecoins

Stablecoins represent a significant innovation within the digital asset ecosystem, designed to bridge the gap between the volatile nature of traditional cryptocurrencies (like Bitcoin or Ether) and the stability of fiat currencies (like the US Dollar or Euro). At their core, stablecoins are digital tokens deployed on blockchain networks that aim to maintain a stable value relative to a specified asset or basket of assets. For most stablecoins relevant to commercial applications, this peg is to a major fiat currency, most commonly the US Dollar, effectively aiming for a 1:1 value ratio (e.g., one stablecoin token equals one US Dollar). In fact, approximately 99% of stablecoin volume is tied to USD.[7] For that reason, this report will focus primarily on Circle's USDC and Tether's USDT, as they are currently the two largest, most trusted, and widely adopted USD-collateralized stablecoins. Both of these tokens are examples of off-chain collateralized assets, meaning their reserves are maintained using traditional assets such as bank deposits or short-term government securities. While we are focusing on these, there is a rapidly growing landscape of stablecoin creators like Paypal, Paxos, and Ripple, however they are much less prominent. These contrast with on-chain collateralized stablecoins, which use reserves consisting of other crypto assets, adding another layer of complexity and risk.

The primary motivation behind stablecoins is to combine the technological benefits of blockchain, such as faster transaction settlement, reduced processing costs, increased transparency, and programmability, with the price stability required for practical financial transactions. Unlike unbacked cryptocurrencies, whose prices fluctuate based on market supply and demand, stablecoins are designed to minimize volatility, making them suitable for use cases like payments, remittances, and as a temporary store of value within the digital asset market.

[7] https://fortune.com/2025/03/21/stablecoin-market-dollar-blockchain/

Several mechanisms are used to maintain this price stability, but the most prevalent and generally considered the most robust for large-scale use are fiat-collateralized stablecoins. USDC and USDT tokens are both examples of tokens backed with fiat collateral. Their issuers hold reserves of the underlying fiat dollars (or highly liquid, low-risk assets equivalent to USD, like short-term government debt) that match, or exceed, the value of the stablecoins they have issued. These reserves are typically held in regulated financial institutions (for example, BlackRock manages Circle's reserve assets) and are often subject to audits or attestations to assure users about the backing. This model allows users to redeem their stablecoins for the equivalent fiat currency from the issuer. If the stablecoin deviates from its peg, arbitrageurs can take advantage of the mismatch between the issuer and the secondary market pricing, re-anchoring the stablecoin's peg to the dollar and generating profit for the issuer.[8] For example, in March 2023, USDC fell below 87 cents to the dollar following the collapse of Silicon Valley Bank, where Circle held $3.3 billion in reserves.[9]

Other types, such as crypto-collateralized stablecoins (as mentioned earlier) and algorithmic stablecoins (which use automated rules and smart contracts to manage supply and maintain the peg), also exist. However, these often carry higher complexity and risk profiles, particularly algorithmic stablecoins, which have proven vulnerable to failure under market stress. The biggest algorithmic stablecoin, TerraUSD, collapsed in May 2022, wiping out over $40bn in value. FEI was the biggest crypto-collateralized stablecoin, but it was winded down in August 2022 because of an unreliable redemption mechanism of its collateral Etherum.[10] For institutional and commercial applications, fiat-collateralized stablecoins are generally the focus due to their simpler structure and perceived lower risk.

Regardless of the specific type, the use of blockchain technology means that stablecoin transactions can often be settled much faster and potentially cheaper than traditional bank transfers, especially across borders, by reducing the number of intermediaries involved in the process. This potential for near-instantaneous value transfer, 24/7, is a key driver of interest in stablecoins for business applications. Moreover, these stablecoins are often designed to be compatible across multiple blockchain platforms, greatly increasing their versatility. For example, USDC is currently available on 18 blockchain networks, including Ethereum, Solana, Stellar, and Avalanche, enhancing its interoperability and practical use cases.

[8] https://www.federalreserve.gov/econres/notes/feds-notes/the-stable-in-stablecoins-20221216.html
[9] https://www.wsj.com/articles/crypto-investors-cash-out-2-billion-in-usd-coin-after-bank-collapse-1338a80f
[10] https://blog.mezo.org/risks-of-non-btc-stablecoins/

3.2. Using Stablecoins

3.2.1. Obtaining and using stablecoins

For consumers to send stablecoins to another party, they need to follow three steps.

First, they obtain stablecoins through an exchange or platform. This requires users to create accounts on platforms like Coinbase or Binance and complete Know-Your-Customer (KYC) verification to comply with anti-money laundering (AML) regulations.[11] Essentially, this means sharing a form of identity proof. After doing this, you can obtain stablecoins on the exchange, and there are many exchange-specific options that alter how this can be done. We describe how to buy USDC on Binance and Coinbase in Appendix 2 and 3, respectively.

Second, consumers need to store the stablecoins in a compatible wallet that allows them to send the stablecoin to other parties. Stablecoins bought on Coinbase are stored in a Coinbase Wallet by default. This is different from Coinbase, and is discussed further in Appendix 3. To use stablecoins obtained via Binance, users need to use either a Binance Spot Wallet, for general crypto use including buying selling or holding, or a Binance Funding wallet in the case that a user is making peer-to-peer transactions which can link to external payment methods like Binance Pay or Binance Card.[12] In both of these cases, the user also has the self custody option where they can move their USDC into an external wallet by withdrawing, selecting the network of choice, entering a wallet address, and confirming the transaction.[13]

Third, to transfer stablecoins from your wallet to another user, you need the wallet address. It is important to verify the address, as transactions can not be reversed. This is a virtue of blockchain transactions, but it is unfamiliar to general consumers using traditional payment rails, though sending cash on Venmo is also irreversible.

Eventually, consumers may want to convert stablecoins back to fiat. To do this, they need to move the stablecoin from their wallet to the exchange, and then sell their stablecoin. The cost of withdrawing money from exchange varies by exchange and withdrawal method.

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[11] https://www.binance.com/en/square/post/15917991332305
[12] https://www.binance.com/en/how-to-buy/usd-coin
[13] https://www.ledger.com/academy/topics/security/what-is-self-custody-in-crypto

3.2.2. Accessibility and Fees

In most developed countries with high stablecoin volume, obtaining stablecoin through Centralized Exchanges (CEX's) is easy. The major CEX platforms which all sell USDC (Coinbase, Binance, Crypto.com, Kraken, OKX, CEX.IO) can provide stablecoins to users via transactions where users pay in either fiat or cryptocurrency. People can be more confident using exchanges that are within countries that have more advanced regulatory frameworks or countries where the framework is being pushed. For a more comprehensive look for each country, see Appendix 1. The key jurisdictions that Coinbase, Crypto.com, Kraken, and CEX.io operate in are the U.S., U.K., EU, Singapore, and Australia. On the other hand, OKX has a heavier presence in Hong Kong, EU, and Latin America, while Binance operates almost everywhere globally.

The fees that are charged for people to move money off and on the exchanges depends on the exchange and the method being used. Kraken will offer users free ACH withdrawals that can take up to 2 business days.[14] If you want to withdraw money via SWIFT from Crypto.com, there is a $45 fee with a minimum withdrawal of $500.[15] For Coinbase, ACH transfers are free, but there is a $10 fee for USD wire deposits[16] and a $25 fee for USD wire withdrawals.[17]

Currency exposure for non-USD economies for individuals and businesses who are using USD-backed stablecoin, introduces a foreign exchange risk. When an individual converts their local currency to USDC or USDT, a following change in the exchange rate of their local currency to USD, can affect how much money they are actually holding. This is especially important for businesses to understand for treasury management reasons, as they can be exposed to more losses or gains depending on the USD/local currency rate. In a country with a high inflation rate and unstable currency like Argentina or Nigeria, individuals and businesses might prefer holding USD backed stablecoins. However, in a country with a stable currency it is possible for individuals and businesses to think that holding USD backed stablecoin is riskier for them.

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[14] https://support.kraken.com/hc/en-us/articles/360000423043-Cash-withdrawal-options-fees-minimums-and-processing-times-
[15] https://www.cryptoninjas.net/exchange/crypto-com-review/
[16] https://help.coinbase.com/en/exchange/funding/depositing-with-fedwire
[17] https://help.coinbase.com/en/exchange/funding/withdrawing-with-fedwire

3.2.3. Regulatory Background

From a regulation standpoint, there are two different classifications of jurisdictions: (1) Countries that have a clear regulatory framework that has already been implemented, and (2) Countries that are still in the development process of a regulatory framework or have not started drafting a framework at all.

Typically, in countries that have established frameworks (the EU, Japan, or Singapore for example), exchanges that consumers receive stablecoin from are required to get some sort of license or authorization to be able to operate. The second kind of jurisdiction are countries that do not have a clear regulation in place; in these, transacting and obtaining stablecoin falls under a grey area. Some countries in the second category, are very innovative and are very close to implementing a regulatory framework. However, many countries in the second category, usually emerging and developing countries, are not close to implementing or even drafting a framework. In these emerging countries, stablecoin is still easy and accessible for most individuals to obtain through person to person exchanges, but for a business it is most likely not as safe to interact with stablecoin.

For more on the contrasting regulations by jurisdictions, we looked at a study that analyzed seven different jurisdictions – EU, Hong Kong (regulation system separate from China because it is a special administrative region (SAR)[18]), Japan, Singapore, UAE-FSRA, UAE-VARA, United Kingdom.[19] Regulatory frameworks have already been implemented in the EU, Japan, UAE-FSRA and UAE-VARA, but in Hong Kong, Singapore, and the UK, the rules are still being developed. More information on other jurisdictions is accessible in Appendix 1.

In all seven countries listed above, issuers are required to have authorization, which can either be a specific stablecoin authorization or a banking license, depending on the jurisdiction. Issuers are also required to disclose the terms of redemption (which must be done at par value) in each of the seven jurisdictions. Users need to understand that jurisdictions also differ in the amount of fees as well as the speed of redemption that is required by the government. For example, the European Union (EU, UAE-VARA, and the UK) require issuers to offer free redemption, so redemption fees cannot be a part of the issuer's business model. The EU and

[18] https://www.investopedia.com/terms/h/hong-kong-sar-china.asp

[19] https://www.jbs.cam.ac.uk/wp-content/uploads/2024/10/2024-2nd-global-cryptoasset-regulatory-landscape-study.pdf

Hong Kong typically have timely redemption, while the UK and UAE-VARA have redemption requirements of one day, while Singapore allows for redemption periods for up to five days.

In the EU, the key framework for stablecoin usage is MiCA, which has been in effect since June 2024. EU regulators are wary of the fact that a stablecoin could become too dominant and affect their monetary sovereignty, so they impose two main extra restrictions on stablecoins that are not backed by the euro (e.g., USDC and USDT). The European Central Bank (ECB) has the power to cancel an issuer's licence (Circle issues USDC and Tether issues USDT) if the ECB thinks that a stablecoin is beginning to operate as a secondary currency or if the token is used in more than 1mn transactions and the total daily transaction exceeds 200mn euros.[20]

Compliance with MiCA imposes costs on the exchanges and stablecoin issuers. Crypto exchanges are more actively working to comply with the new regulations. Bitstamp, Kraken, Binance, Coinbase, and Bitpanda all claim that they are compliant or close.

However, as of April 2024, the only USD backed stablecoin to be fully compliant with MiCA is USDC. Tether is facing significant challenges to adjust to the new regulations, and once the regulation is fully enforced (experts say within the next 6-12 months from the beginning of 2025) USDT could be completely banned from retail markets in the EU.[21] Functionally, this would mean that USDT could be used on a peer-to-peer basis; but getting and withdrawing USDT would become hard for consumers and businesses would not be able to use them.

Currently in the United States, there is a fragmented stablecoin regulation that is upheld by states individually. However, there is significant progress in congress with the GENIUS Act in the Senate and the STABLE Act in the House. The GENIUS Act passed through the Senate Banking Committee on March 13th, 2025 and is awaiting consideration on the senate floor, and the STABLE Act passed through the House Financial Services Committee on April 2, 2025 and is awaiting a full vote on the House floor. Both bills have a slightly different approach, with the STABLE Act focusing on stricter federal oversight and the GENUS Act focusing on a more dual approach between the federal government and the states.

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20 https://www.coindesk.com/policy/2022/05/11/eu-commission-favors-ban-on-large-scale-stablecoins-document-shows

21 https://tangem.com/en/blog/post/swap-mica-stablecoins/

3.3. Alternatives to the Current Payments Infrastructure in Stablecoins

3.3.1. Inefficiencies in the Legacy Payments Infrastructure

Google's transactions today rely heavily on legacy payment infrastructure, where inefficiencies rooted in historical paper check-based processes, costly intermediaries, and transaction delays are commonplace. Payments systems traditionally separate three steps: authorization (verifying transaction legitimacy), clearance (validating transaction details between institutions), and settlement (actual movement of funds). Credit cards are the most visible example of this three step process for consumers, but all of the legacy payment rails that will be discussed work the same way. Stablecoins, by contrast, offer near-instant authorization and compress clearance and settlement into an extremely efficient ledger entry via blockchain technology. This significantly cuts back on the intermediaries and associated costs necessary with the legacy infrastructure. Still, there are several important legacy institutions to cover, as they each have different efficiencies and scale. One must compare and contrast stablecoins to traditional payment rails on a case-by-case basis to properly assess the marginal benefit of various potential implementations.

3.3.2. Large-Value Domestic Transactions

FedWire and CHIPS, created in 1918 and 1970 respectively, are two of the biggest payments institutions. FedWire is used for high-value domestic payments – mainly by banks, but also by large corporations like Google, which can use FedWire for treasury management and major vendor payments. FedWire provides real-time gross settlement (individual payments clear and settle immediately) but charges substantial fees, typically ranging from $15 to $35 per transaction, and even higher depending on the bank involved. Additionally, FedWire's operating hours are limited, restricting transaction availability to specific hours.[22] CHIPS, alternatively, reduces transaction fees by netting multiple transactions and settling positions collectively at the end of the day. This approach offers cost advantages but introduces delays as settlement does not occur in real-time. Businesses and large institutions are the primary users, with many multinational corporations and foreign currency transactions.[23] CHIPS also has restricted operating hours (9AM to 6PM ET), adding complexity for companies needing flexibility.

[22] https://www.finofo.com/blog/fedwire-fundamentals-in-the-us
[23] https://www.bill.com/learning/clearing-house-interbank-payments-system

Stablecoins promise instant, cost-effective settlement without limitations on transaction timing or high individual fees. Eliminating intermediary bottlenecks significantly reduces transaction costs and liquidity constraints, enhancing efficiency and flexibility in managing large-value transfers. Still, it is important to consider the immense scale of these two legacy institutions today. FedWire is the backbone of domestic payment rails, as it transferred $1,133tn[24] in funds in 2024 ($4.3tn per day on average).[25] CHIPS is another essential institution in the payments ecosystem, clearing and settling an average of $1.8tn in payments every day.[26] USDT and USDC have approximately $55bn and $10bn in daily trading volume respectively, so they will not be replacing these institutions entirely any time soon.[27]

3.3.3. Small-Value Domestic Transactions

Automated Clearing House (ACH), founded in 1974, processes smaller-value recurring transactions efficiently, such as payroll, subscription payments, or regular vendor payments, by batching transactions for processing. ACH transactions typically clear within one to three business days, balancing cost-efficiency with a delay unsuitable for urgent payments. This batching mechanism enables ACH to offer extremely low transaction fees, making it ideal for predictable, frequent, and non-urgent transactions. However, batch processing and delayed settlement can introduce cash flow management issues, particularly for smaller businesses that rely on timely payments to manage operational liquidity. Stablecoins improve upon ACH by providing immediate settlement without batch-processing delays. This immediate liquidity benefit can greatly reduce financial uncertainty, streamline cash management processes, and still maintain transaction cost efficiency due to reduced reliance on multiple intermediaries. Nonetheless, the benefit of replacing ACH transactions with stablecoins is not as significant as it is for other institutions.[28]

3.3.4. Consumer Payments and Merchant Transactions

Card networks like Visa and Mastercard facilitate consumer payments, providing rapid authorization at the point of sale but delayed clearance and settlement, often managed through

[24] https://www.frbservices.org/resources/financial-services/wires/volume-value-stats/annual-stats.html
[25] https://www.federalreserve.gov/publications/2023-ar-payment-system-and-reserve-bank-oversight.htm?
[26] https://www.theclearinghouse.org/payment-systems/CHIPS
[27] https://coinmarketcap.com/
[28] https://stripe.com/resources/more/ach-payments-vs-wire-transfers-differences-similarities-and-how-to-choose

ACH. Merchants pay Merchant Discount Rates (MDRs) ranging from 1% to 3% per transaction, a cost indirectly transferred to consumers via increased prices.[29] The card authorization process involves multiple entities – the payment processor, acquiring bank, card network, and issuing bank – each adding complexity and potential points of failure or delay. Additionally, card settlements usually take one or more business days to complete, tying up merchant liquidity. Stablecoins present the possibility of immediate settlement at significantly lower fees, potentially reducing overall transaction costs, eliminating lengthy settlement periods, and simplifying the payment process. This improved cost-efficiency and immediate liquidity would benefit merchants and consumers, potentially enhancing Google's competitive position in payment facilitation and e-commerce.[30]

3.3.5. Peer-to-Peer and Small Merchant Digital Payments

The first broadly used payment service provider was PayPal, founded in 1998. As rapid growth emerged in the e-commerce space, a demand for secure online transaction capabilities exploded. By 2023, PayPal, which also facilitates peer-to-peer mobile payments through Venmo, processed 25bn payment transactions worth a total of $1.53tn.[31] Another key third-party payment platform was Stripe, which was created in 2010. They have comparable scale, reaching $1.4tn in total payment volume in 2024, which was 38% greater than the prior year.[32] These platforms all enable convenient, secure digital transactions, often charging fees around 2-3% per transaction plus fixed fees per transaction. These services offer robust authorization mechanisms and ease of integration with online platforms, driving rapid adoption among small businesses and individual consumers. Google Pay directly competes in this space as well, integrating digital wallets for mobile transactions and seamless ecommerce experiences. Despite their convenience, these platforms typically face delays in transferring funds to users' bank accounts, sometimes requiring several days to fully settle funds. Additionally, transaction fees can significantly impact small merchants' profitability. Stablecoins could further streamline these services by drastically reducing transaction fees, accelerating settlement times to nearly instantaneous, and providing seamless, cost-effective international transactions. These enhancements could significantly improve small merchant cash flow management and consumer satisfaction, strengthening Google's value proposition in digital payments.

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[29] https://www.investopedia.com/terms/m/merchant-discount-rate.asp
[30] https://stripe.com/resources/more/card-authorization-explained#what-is-settlement
[31] https://about.pypl.com/who-we-are/history-and-facts/default.aspx
[32] https://stripe.com/newsroom/news/stripe-2024-update

3.3.6. Instant Domestic Payments

Recently introduced in 2017 and 2023 respectively, the Real-Time Payments (RTP) and FedNow systems enable instant domestic transactions 24/7, representing significant efficiency improvements compared to ACH.[33] Despite rapid adoption and clear efficiency advantages, RTP and FedNow still face limitations. RTP, operated by a consortium of major banks, supports higher transaction limits (up to $10mn), while FedNow, operated by the Federal Reserve, currently caps transactions at $500,000. Both are strictly domestic systems with no international transaction capability, limiting their utility for globally operating companies like Google. Additionally, while both institutions are growing quickly, the scale of adoption and integration into existing financial ecosystems is insignificant relative to the alternative rails discussed earlier. RTP processed 343mn transactions totaling $246bn in 2024, 94% greater than in 2023.[34] FedNow is also growing at a rapid rate, with fourth quarter payments totaling $20bn in 2024 after being just $13mn in 2023.[35] Stablecoins offer similar instant capabilities, and already operate at a larger scale. Seamless international integration separates them further. The inherent flexibility of blockchain infrastructure ensures immediate, secure, and cost-effective transactions domestically and internationally, making stablecoins especially attractive for Google's expanding global financial interactions.

3.3.7. Cross-Border B2B and High Value Transactions

Currently, Google's cross-border payments often rely on the SWIFT network, involving multiple correspondent banks, currency conversions, and significant fees and delays. As of December 2022, Swift recorded an average of 44.8mn messages per day.[36] Typically, international transactions take 2-5 business days due to intermediary banks and extensive manual reconciliation processes. Correspondent banks create trust between two parties' banks who don't have an existing relationship. The SWIFT network connects two parties with a correspondent bank that has relationships with both sides, or multiple correspondent banks if necessary to create trust between more disconnected parties.[37] Each intermediary charges fees – initially $25-$50, plus additional charges of $10-$30 per correspondent bank – cumulatively

[33] https://stripe.com/resources/more/real-time-payments-explained
[34] https://www.theclearinghouse.org/payment-systems/Articles/2025/01/RTP_2024_Year_Records_01-08-2025
[35] https://www.jackhenry.com/fintalk/fednow-and-rtp-how-do-they-differ-and-how-do-you-choose
[36] https://www.swift.com/about-us/discover-swift/fin-traffic-figures
[37] https://www.sofi.com/learn/content/what-is-correspondent-banking/

resulting in substantial transaction costs. Exchange rates charged during currency conversion further inflate overall transaction costs and reduce financial efficiency.[38] Additionally, transactions through SWIFT involve considerable opacity, providing limited visibility into transaction progress and potential risks of errors and delays. While remittance services like Wise and products like PayPal's hyperwallet enable cross-border payments as well, SWIFT enables the largest transactions.[39] Stablecoins, leveraging blockchain technology, could substantially eliminate these intermediary layers, reduce transaction costs dramatically, enable near-instant settlement, and offer transparent transaction tracking. This capability would drastically improve operational efficiency, reduce risks, and lower costs associated with Google's international B2B payments.

3.3.8. Cross-Border Consumer Payments

Card networks and specialized remittance providers (Wise and Remitly) handle international consumer transactions, typically charging substantial foreign transaction fees, hidden currency exchange markups, and experiencing significant delays due to multiple intermediaries involved. In 2022, $79bn in remittances was sent out of the U.S. and about 20% of the total value of the transfers was lost to fees.[40] Google Pay, integrated with these systems, similarly incurs substantial inefficiencies, directly affecting consumers through higher transaction costs and slower fund availability. Stablecoins provide immediate, transparent settlement with minimal transaction fees and significantly reduced currency conversion costs. Their ability to offer real-time, direct peer-to-peer international transactions eliminates many traditional intermediaries, dramatically enhancing efficiency, reducing costs, and improving consumer experience for cross-border retail payments. These advantages could strengthen the efficiency of Google's payouts to foreign YouTube creators and developers.

[38] https://payglocal.com/blog/swift-charges-explained
[39] https://wise.com/us/blog/wise-limits
[40] https://ourfinancialsecurity.org/2024/10/blog-rethinking-remittances/

4. Analysis of Stablecoin Use Cases for Google

4.1. Google's Business Model & Payment Flows

Google's business model revolves around an integrated portfolio of services.[41] Google collects payments from advertisers (Google Ads), consumers (YouTube Premium, YouTube TV, Google Play), and enterprise customers (Google Cloud, Google Workspace). They also make payments to content creators (Youtube Partnership Program), application developers (Google Play), advertising publishers (Google AdSense), and suppliers/vendors across their global operations. Also, through Google Pay/Wallet, the company facilitates consumer and merchant payment transactions, operating as a payment processor and digital wallet provider.

The core of its revenue comes from advertising ($265bn out of $350bn total revenue, or ~75.6%), where payment flows come from millions of advertisers located both domestically and internationally. Google's advertising ecosystem includes search ads, YouTube ads, and display network ads. Search ads generated $175bn in 2024, accounting for 56.9% of total revenue; YouTube ads contributed $32bn (10.3%), reflecting strong growth in streaming watchtime and podcasts; Google Network ads added $31bn (10.2%). Google remains dominant in the digital advertising market, controlling 39% of global digital ad revenues in 2023, far outpacing competitors like Facebook (18%) and Amazon (7%).[42] This strength is bolstered by its global reach and innovative AI-powered advertising solutions.

Google also makes money through subscriptions, platforms, and devices ($40bn or ~11.5%) and Google Cloud ($43bn or ~12.4%). Google Cloud operates on a consumption and subscription-based business model, where enterprise customers send Google payments from around the world. Revenue is also generated through app and in-app purchases on Google Play, consumer subscriptions like YouTube Premium and Google One, and hardware sales. Payments are coming from a wide range of Google's products and services.

The nature of these offerings is such that revenues come from all over the world. In 2024, 51% of Google's revenues came from outside the US, underscoring the importance of efficient international payments. Specifically, $102bn, $57bn, and $20bn of their revenue came from

[41] https://abc.xyz/assets/77/51/9841ad5c4fbe85b4440c47a4df8d/goog-10-k-2024.pdf
[42] https://www.statista.com/statistics/290629/digital-ad-revenue-share-of-major-ad-selling-companies-worldwide/

EMEA, APAC, and Other Americas, respectively. Stablecoins have particularly high value for international transactions, making this breakdown of their business model and revenue sources critical.

4.2. Consumer Transactions

4.2.1. Payments to Google

For consumers to use stablecoins for payments to Google, they would need to (1) Obtain stablecoins through an exchange or platform, (2) Store them in a compatible wallet, and (3) Initiate payment through an integrated checkout process. Ideally Google can conduct USDC business transactions on the Solana network due to its minimal network and transaction costs, ease of use, and speed. However, these benefits may be offset by the network's potential for volatility, and other networks can be compared and contrasted in Appendix 4.

4.2.2. Payments from Google

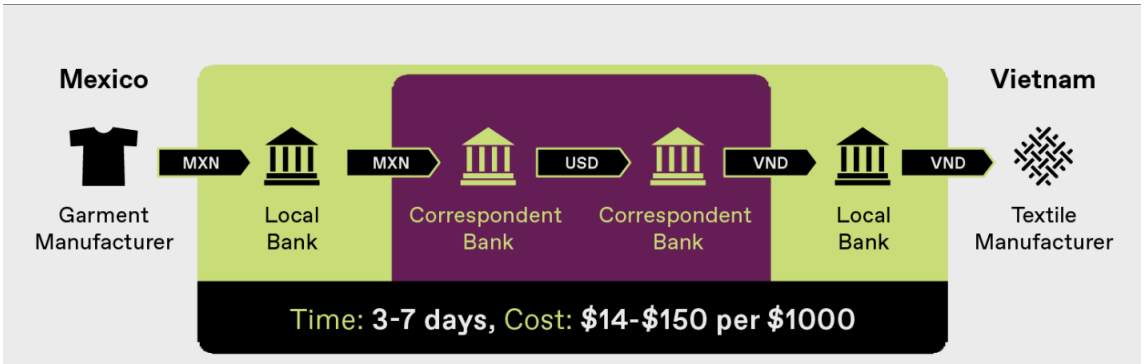
For Google to use stablecoins to pay its creators and developers, Google would need to (1) Establish relationships with stablecoin issuers or exchanges, (2) Create intuitive interfaces for creators/developers to receive and manage stablecoin payments, and (3) Provide educational resources and support for users unfamiliar with digital assets. Creators receiving YouTube earnings in stablecoins face conversion costs when cashing out. When transferring stablecoins to regulated exchanges like Coinbase, sales to fiat incur 0.05%-0.60% trading fees plus 0.5%-2% withdrawal fees depending on payment method. There's also the option of direct banking integration, where platforms like PayPal allow instant USDC-to-USD conversions at 1.5% fees through partnerships with Paxos.[43]

4.3. Cross-Border Business-to-Business (B2B) Transactions

4.3.1. Opportunity - Current Cross-Border B2B Transactions

International business payments have to deal with high fees and very slow transaction times as well. For example, here is a visual of a B2B payment from Mexico to Vietnam.

[43] https://www.paypal.com/us/digital-wallet/paypal-consumer-fees



Stablecoins can be used to skip the intermediaries, which can take a long time and prevent businesses from having access to cash flows. It is important to understand that the actual business will need to find its local offramps to convert the stablecoin to native currency in the case that they don't want to keep it in stablecoins. This process varies and has different levels of ease, though there are usually several person-to-person exchanges. Traditional, current, cross-border payment systems have significant inefficiencies. International wire transfers incur costs ranging from $25-$50 per transaction, and require a 3-5 business day holding period while the funds settle and clear. For global businesses such as Google, these challenges compound across regions, currencies, and jurisdictions. Fees range from 1.5% to 2.9% of the transaction when making cross-border payments. The scale of this issue is significant as businesses spent approximately $40tn in international transactions in 2024.[44] This is also a substantial issue for Google as it is expected to invest $75bn in capital expenditures in 2025, close to 50% of which is likely to be international.[45] For large transactions over $500,000 there are already serious challenges around limited liquidity, extended settlement periods, and complicated integrations, according to Stable Sea CEO.[46]

4.3.2. How stablecoins can improve merchant payouts

Google's current payout system – to creators, developers, publishers, and vendors – is constrained by traditional banking schedules, creating unnecessary friction for businesses reliant on consistent cash flow. Currently, if a merchant payout date falls on a Saturday, they will

[44] https://www.circle.com/blog/transforming-cross-border-payments-with-usdc
[45] https://www.datacenterdynamics.com/en/news/google-expects-2025-capex-to-surge-to-75bn-on-ai
[46] https://www.pymnts.com/news/cross-border-commerce/cross-border-payments/2025/

not start the payout until the following Monday. Stablecoins, by design, operate continuously on blockchain networks. According to Visa, there is a strong stablecoin trading volume on weekends, sometimes averaging even more than weekdays.[47] While recent data (from six months before 3/4/25, adjusted to exclude high-frequency trading and bots) indicates average weekday transaction volume ($23.5bn) and count (4.2mn) exceeded average weekend day transaction volume ($12.8bn) and count (3.7mn), weekend activity remains substantial. This demonstrates the need for stablecoins to provide financial services outside of traditional banking hours and facilitate transactions at any time.

For example, let's consider a global software engineer who operates across multiple time zones and derives their primary income from Google Play Store sales. Under the current system, a weekend or holiday payout delay could disrupt their ability to immediately pay international contractors or invest in critical software updates. By leveraging stablecoins, Google can provide this developer with continuous, uninterrupted access to their earnings, regardless of traditional banking hours. This not only enhances their financial agility but also empowers them to operate with greater efficiency on a global scale. Moreover, Google could even explore a "payout on demand" feature, allowing merchants to trigger stablecoin payments instantly at any time, providing extreme control and flexibility over their finances, and potentially even enabling real-time micro-payments for certain services.

This problem opens a compelling use case for Stablecoins as an alternative to traditional payment rails. Firstly, reduced transaction costs. Stablecoin transfers cost 0.1%-0.15% of the total transaction volume, compared to 1%-3%. This represents a 90%-95% cost reduction on transaction and conversion fees for cross-border payments. Next, the settlement time. As previously stated, traditional transfers may take 3-5 business days to settle, while stablecoin transactions will be settled in a matter of minutes, and it operates 24/7/365. According to Visa, weekends have roughly 50% of the transaction volume that weekdays have.[48] That means if there is $20bn in transaction volume on a given business week, there will be $10bn the following weekend, $10bn of which will have to wait until Monday for the settlement process to begin. Another advantage Stablecoins hold is the elimination of pre-funding requirements. With Stablecoins, businesses do not have to deposit money upfront with payment partners before sending funds. This means they can keep more cash on hand for other needs, and face less

[47] https://visaonchainanalytics.com/transactions

[48] https://visaonchainanalytics.com/transactions

risk if there is an issue with the payment partner between the deposit and payment times. Finally, the other advantage is lower costs for currency conversions. Stablecoins eliminate the hidden foreign exchange fees and markup rates for intermediaries. This can reduce currency conversion expenses by 1-2% per transaction, which is substantial with large transactions.

4.3.3. Case study: Worldpay, Visa, and Crypto.com

Worldpay is one of the largest non-bank merchant acquirers in the world, processing billions of transactions each year across 146 countries and 135 currencies.[49] Facing the universal challenge of slow merchant settlements, Worldpay decided to explore stablecoins. The initiative piloted with Crypto.com, a Singapore-based company, and Banxa, an Australian based company. They partnered with Fireblocks, leveraging their platform to essentially bypass the traditional banking bottlenecks. This resulted in a significant reduction in settlement times, cutting processing by 50%. As a result, merchants gained access to their funds far more rapidly, implementing T+0 settlements, improving their cash flow and overall operational efficiency. Instead of relying on a system that operates within limited hours, they implemented a 24/7 solution. This directly addressed the issue of weekend delays and the difficulties faced by international businesses dealing with traditional U.S. bank accounts. Beyond the speed, this move also reduced costs and streamlined reconciliation, which are key concerns for any business. They were able to do this in major economic regions including North America, Europe, Asia-Pacific, Latin America, Africa, and the Middle East. Essentially, Worldpay and Fireblocks demonstrated a practical application of stablecoins, showcasing their potential to revolutionize payment processing by making it faster, more efficient, and more accessible.

Building on the success of its initial stablecoin settlement implementation, Worldpay expanded its capabilities through a significant collaboration with Visa, announced in September 2023. Visa had already been testing how USDC could be used inside its treasury operations, which led to a pilot with Crypto.com in 2021.[50] The success of this pilot, which utilized USDC and the Ethereum blockchain for cross-border volume on Crypto.com's card program in Australia, laid the groundwork for the expanded collaboration with Worldpay. While Visa's treasury operation continued to test receiving funds on-chain from multiple issuer partners, the new settlement options allowed Visa to send funds on-chain to acquirers like Worldpay to help speed up

[49] https://www.fireblocks.com/customers/worldpay/
[50] https://usa.visa.com/about-visa/newsroom/press-releases.releaseId.19881.html

settlement times for their merchants.[51] This was particularly valuable for merchants interacting with the blockchain and crypto economy, including on-ramp providers, games, and NFT marketplaces, who might prefer to receive stablecoins over traditional fiat currencies for the card payments they accept.

A key aspect of this expansion was the integration of the Solana blockchain. Visa chose to add support for Solana as a "high performance blockchain that its partners can choose to send or receive USDC settlement payments," making Visa among the first major payment firms to use Solana for live settlement between clients.[52] Solana brought significant performance advantages, seeing 400 millisecond block times, averaging 400 transactions per second (TPS), and typically surging to more than 2,000 TPS across various use cases during periods of peak demand. These capabilities enabled even faster and more cost-effective settlements compared to other blockchain networks.

Crypto.com is both a client and a catalyst in these developments. As a merchant, Crypto.com participated in Worldpay's stablecoin settlement pilot, benefitting from faster access to funds. Separately, as a Visa partner, Crypto.com was the first issuer to settle directly with Visa in USDC for its card program, proving the viability of stablecoin settlements on the issuer side and paving the way for Visa's broader expansion to acquirers like Worldpay.[53]

4.3.4. Implementation Solutions

The infrastructure for B2B stablecoin payments is quickly maturing with solutions like Stripe, which is already a partner of Google.[54] Stripe offers a "Pay with Crypto" option that allows merchants to accept stablecoin payments that settle as fiat currency, and charge 1.5% of the transaction amount.[55] In the first 24 hours of adding this feature, Stripe saw 70 countries use it to make purchases with stablecoins.

Specialized B2B Payment Provider companies also offer dedicated B2B services using stablecoins for cross-border transactions, including Conduit, Stable Sea, and Infinite. Google

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[51] https://caribbean.visa.com/about-visa/newsroom/press-releases/visa-network-to-settle-transactions-in-usd-coin-usdc.html
[52] https://usa.visa.com/about-visa/newsroom/press-releases.releaseId.19881.html
[53] https://www.forbes.com/sites/ninabambysheva/2021/03/29/visa-to-start-settling-transactions-with-bitcoin-partners-in-usdc/
[54] https://stripe.com/resources/more/google-pay-an-in-depth-guide
[55] https://docs.stripe.com/crypto/stablecoin-payments

Cloud can help businesses build stablecoin-based payment systems that make sending money across countries faster, cheaper, and more reliable by reducing bank delays and fees.

4.4. Treasury Management Applications

Google can also leverage stablecoins for treasury management to increase operational efficiency. Google can reduce reliance on traditional banking networks for cross-border transactions, and hold stablecoins to diversify its cash reserves. To put this in perspective, Tether (USDT) is the 7th largest holder of U.S. Treasury bonds in the world.[56] By holding stablecoins across Google's global entities, it can have near-instant settlement between regions, which would simplify the reconciliation process and reduce administrative costs. This approach aligns with emerging trends where corporations like MicroStrategy and Tesla have adopted crypto-based treasury strategies to enhance financial performance.[57]

Stablecoin's programmability allows treasury operations to automate complex processes such as reconciliation, compliance checks, and reporting. Smart contracts – self-executing programs embedded in blockchain – can automatically trigger payments or generate real-time financial reports when specific conditions are met.[58] This reduces manual errors and enhances operational transparency.

Stablecoins enable real-time liquidity management across multiple jurisdictions. Programmable liquidity pools can optimize cash positions by automatically rebalancing funds between regions based on operational needs. This eliminates idle cash and reduces pre-funding requirements for cross-border transactions. Google could deploy similar mechanisms to optimize its cash flow across EMEA, APAC, and the Americas – regions that collectively contribute over $179bn in annual revenue.

A recent data-driven analysis on over 200 enterprise implementations highlights the profound impact stablecoins are having on corporate treasury management by enabling real-time settlements, automating liquidity management, and reducing operational inefficiencies.[59] Key metrics from the study include an average cost reduction of 71%, a 99% improvement in

[56] https://www.coindesk.com/business/2025/03/20/tether-ranks-among-top-foreign-buyers-of-u-s-treasuries-in-2024-firm-says
[57] https://www.circle.com/blog/usdc-stablecoins-for-treasury-management-digital-transformation
[58] https://www.onesafe.io/blog/crypto-treasury-management-best-practices-for-financial-stability
[59] https://www.nilos.io/blog/15-ways-stablecoins-are-transforming-treasury-operations-2025-analysis

settlement times, and an 85% increase in operation efficiency. One standout example is a Fortune 500 manufacturer that implemented stablecoin settlements across 12 countries. By replacing traditional cross-border payment systems with blockchain-based solutions, the company reduced settlement times from three days to just two minutes. This transition also eliminated correspondent banking fees and saved $45mn annually in transaction costs. Similarly, a global e-commerce platform leveraged stablecoins to automate liquidity management across 15 countries, reducing idle cash by 45% and optimizing working capital by $120mn. These examples demonstrate the potential for stablecoins to revolutionize treasury operations at scale. For Google, integrating stablecoins into its treasury framework could address inefficiencies in cross-border transactions, streamline reconciliation processes, and improve cash flow management. By adopting programmable liquidity pools and smart-contract enabled automation – similar to the strategies employed by these enterprises – Google could achieve significant cost savings while enhancing financial transparency and flexibility. This aligns with Google's broader goals.

4.5. Integration with Digital Wallets (Google Pay/Wallet)

4.5.1. Opportunity

Google has a significant opportunity to integrate stablecoins into its Google Wallet. This move could enhance its competitive advantage against Apple Pay while addressing critical pain points in the payments ecosystem. Stablecoins offer unique benefits, including faster cross-border payments, access to unbanked populations, lower transaction fees, and shorter settlement periods. By leveraging these advantages, Google can position itself as a leader in financial innovation.

4.5.2. Seamless Transactions

Imagine you could walk into a coffee shop, order a latte, and to pay you can tap your Android phone to the payment terminal and have Google Pay automatically select USDC for the transaction. This would result in lower fees for the merchant, which would trickle down to lower prices. You will have instant settlement, improving cash flows for businesses, and you don't have to worry about exchange rates when traveling abroad. Google can return some of these savings to the customer as perks of using USDC in early phases of rolling this out to increase reach and usage.

To gauge some numbers: traditional credit card fees can exceed 3% per transaction, whereas crypto processors charge less than 1%. For a coffee shop that processes $500,000 in annual sales, this can reduce costs from over $15,000 to $5,000 – an annual saving of $10,000 or more. Customers can also reap benefits, if merchants pass on even half of said savings to customers, products will get cheaper, a 3% cheaper latte can add up quickly. This can lead to broader retail profitability, which can unlock spend for everyday customers leading to a more thriving business for all parties involved.

4.5.3. Barriers

Despite the promising benefits, several challenges must be addressed for successful integration. First, in terms of user education, many customers may find setting up a new payment method intimidating due to unfamiliarity with stablecoins. Educating users about how stablecoins work and their benefits will be essential. Secondly, in terms of security concerns, robust security measures must be implemented to protect against unauthorized transactions and fraud. Lastly, in terms of merchant adoption, merchants may hesitate to adopt stablecoin payments if they already have agreements with major payment processors like Visa or Mastercard. These companies might resist losing transaction volume on their networks.

5. Addressing Implementation Challenges

With all of the previous information in mind, we must first understand blockchain's fundamental characteristics in order to explore how Google might use stablecoins in its payment systems. Blockchains are typically known for three key qualities: (1) Decentralization that reduces corruption risk, censorship, and single points of failure by distributing power across the network (2) Transparency that makes all transactions and rules visible to participants to reduce information asymmetry and eliminate intermediaries, and (3) Immutability that ensures blocks and transactions cannot be deleted for a concrete audit trail. While these foundations create tremendous value, they also present significant challenges for industry-wide adoption. This leads us to the "blockchain trilemma," which explains how blockchain technology struggles to simultaneously achieve three essential goals: maintaining network security, preserving decentralized control, and processing transactions quickly and efficiently. Blockchain systems typically excel at only two of these goals while sacrificing the third.

Our research has identified several potential hurdles from these two concepts for Google's implementation of stablecoins: keeping sensitive payment information private, handling refunds when needed, scaling the system for widespread use, and making different blockchain systems work together smoothly. To address each, recent advances in cryptographic technology, Layer 2 scaling solutions, connection systems between blockchains, and innovative financial approaches all offer promising solutions. This section tackles the technical challenges that must be overcome to tap into the $40tn international transaction market.

5.1. Operational & User Concerns: Privacy, Transaction Finality/Refunds

5.1.1. Privacy

The transparency of public blockchains creates privacy challenges for stablecoin adoption. Since every transaction permanently records wallet addresses, amounts, and timestamps on distributed ledgers, sensitive financial patterns risk being exposed. When users deposit or withdraw stablecoins from CEXs, these platforms often collect KYC information as previously discussed, linking a user's identity to their on-chain addresses. If transaction data can be linked to a CEX user's activity, deanonymization becomes possible.[60] A study found that 80% of Bitcoin volume in an average week can be traced to an exchange.[61] There are also specialized companies (e.g., TRM Labs) that employ techniques to analyze blockchain data, looking for patterns, connections between addresses, and links to known entities (like labeled exchange addresses).[62] This visibility conflicts with corporate treasury management norms and consumer privacy expectations under regulations such as the General Data Protection Regulation (GDPR), which mandates "data minimization" principles.[63] Additionally, for confidential financial transactions like employee payroll that require privacy under federal, state, and company laws, this transparency presents significant challenges, as corporations traditionally maintain strict confidentiality for the aforementioned transaction details.

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[60] https://www.chainalysis.com/blog/introduction-to-cryptocurrency-exchange-compliance-crypto-businesses-2024/
[61] http://dx.doi.org/10.2139/ssrn.3942181
[62] https://www.trmlabs.com/glossary/blockchain-analytics
[63] https://gdpr-info.eu/

A potential solution to this privacy challenge comes through zero-knowledge proof systems, specifically ZK-SNARKs (Zero-Knowledge Succinct Non-Interactive Arguments of Knowledge). These are cryptographic tools that let one party prove something is true without revealing the underlying information, similar to proving you know a password without actually sharing the password itself.[64] Google could implement this technology through zkSync, a L2 blockchain solution built on Ethereum.[65] Simultaneously, these systems can be designed to allow authorized entities like regulators and tax authorities to access specific transaction details when legally required.[66] For a visual of this process, see Appendix 5. ZKsync's recently announced 2025 roadmap focuses heavily on privacy features to maintain transaction privacy while preserving necessary transparency for compliance. The platform aims to achieve 10,000 transactions per second with minimal fees by the end of 2025, making it increasingly viable for enterprise adoption.[67]

Through this technology, Google would be able to verify an employee receiving the correct payment without showing the exact salary amount on the public blockchain. The system would simply confirm "this payment meets all requirements" without exposing sensitive details. There is also the potential to prevent the blockchain analysis firms mentioned above from tracking financial patterns and linking them to specific business activities. Furthermore, ZK-SNARKs would enable Google to comply with data minimization requirements under GDPR while still leveraging blockchain's benefits, as the underlying transaction data would remain private while only the verification of transaction validity would be shared on the public ledger. So, payment privacy does not have to come at the expense of regulatory compliance, and security does not have to be sacrificed for confidentiality.

5.1.2. Refunds (Transaction Finality)

Another concern with stablecoins lies in the blockchain's immutability. Traditional payment systems protect consumers through dispute resolution methods that allow problematic transactions to be reversed, particularly in cases of fraud, unauthorized transactions, and processing errors. Most credit card networks finalize transactions within 1-3 days, and allow

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[64] https://ont.io/news/1075/Understanding-zkProofs-The-Backbone-of-Privacy-in-Blockchain-Technology#:~:text=By%20maintaining%20the%20confidentiality%20of,keeping%20the%20underlying%20data%20private

[65] https://docs.zksync.io/zksync-protocol/rollup

[66] https://aleo.org/post/how-aleo-works-building-aleo-network-together/

[67] https://www.binance.com/en/square/post/17499897946010

120-day chargeback windows.[68] On the other hand, stablecoin transactions can be finalized anywhere from milliseconds to less than an hour (depending on the blockchain) without any chargeback windows.[69] This could create significant challenges for Google in handling cases where users experience unauthorized charges, double-billing errors, or fraudulent transactions across its services. Currently, for example, there is a 48-hour window for Google Play apps, games, and in-app purchases.[70] Without a mechanism to handle refunds, Google would struggle to maintain consumer-friendly policies such as this when using stablecoins.

To address this, Stanford University researchers have proposed a solution: dispute resolution systems through smart contracts. Smart contracts are essentially automated digital agreements with the terms directly written into code that can be activated without intermediaries. These contracts create a time window (specified by company policy) where transactions could be reversed through a governed verification process specifically for cases involving fraud, unauthorized use, and processing errors.[71] This approach mirrors how credit card companies hold funds for a period before finalizing payments, allowing time to address disputes. For a visual representation of this concept, see Appendix 6. With this framework, Google could maintain consumer protections across its platforms while preserving the blockchain's benefits. It is important to note that this concept is still a theory and has not been implemented, however, creating a smart contract for this purpose with well-versed coders should not take more than a few months to develop, test, audit, and deploy.[72]

5.2. Technical Considerations: Scalability, Interoperability

5.2.1. Scalability

Many public blockchains typically struggle with scalability challenges. Ethereum, for example, can only process about 15-30 transactions per second, while Solana achieves 2,000-4,500 TPS in practice (with a theoretical maximum of 65,000 TPS). However, even Solana's improved performance falls short when compared to traditional payment systems like Visa, which can handle over 24,000 transactions per second.[73] Ethereum's limitations create traffic jams on the

[68] https://www.chargebackgurus.com/blog/dont-run-out-the-clock-understanding-chargeback-time-limits
[69] https://docs.chain.link/ccip/concepts/ccip-execution-latency
[70] https://support.google.com/googleplay/answer/15574908
[71] https://arxiv.org/pdf/2208.00543
[72] https://hedera.com/learning/smart-contracts/how-to-create-a-smart-contract#:~:text=How%20long%20does%20it%20take,seconds%20to%20minutes%20to%20complete.
[73] https://crypto.com/en/university/blockchain-scalability

blockchain, leading to high "gas fees," payments users make to process their transactions. These fees go up when many people are using the network at once, with Ethereum's fees spiking up to $50 per transaction in 2024.[74] While Solana offers significantly lower fees (averaging about $0.00025 per transaction), both blockchains still face fundamental scalability challenges. For a clearer comparison of these systems, see Appendix 7.

Essentially, current blockchains are too slow and expensive for businesses to use at scale, making it impossible to handle even a small portion of global transaction volumes without better solutions. This creates a major problem for businesses wanting to use blockchain technology. Big companies like Google, which plans to spend around $75bn on infrastructure in 2025, need systems that can process millions of transactions daily. The main blockchain networks (Layer 1) simply cannot handle this without help.

We found that Layer 2 (L2) scaling solutions offer a promising approach. L2 solutions work separately from L1 to process transactions and then settle them in batches back on L1. Think of L1 as a highway that's becoming congested. Rather than widening the entire highway (expensive and disruptive), L2 solutions act as express lanes that handle most traffic more efficiently before merging back with the main road.

Two notable L2 solutions are Optimistic Rollups and ZK Rollups. Optimistic Rollups are the simpler version of the two and assume transactions are valid by default and only verify them if someone challenges their legitimacy within a set time period (typically 7 days). This is efficient because it eliminates the need to verify every transaction immediately, thus improving transaction processing speed by 10-100 times more than L1. They are also easier to implement due to there being less computational requirements, so they could be instated faster than ZK Rollups. However, users must wait through the challenge period before moving funds back to the main network, which could create liquidity issues.[75]

ZK Rollups take a more mathematical approach. They use complex calculations to generate cryptographic proofs that verify batches of transactions. Unlike Optimistic Rollups, ZK Rollups prove transactions are valid upfront, eliminating the need for a waiting period. This allows for immediate transaction finality and lets users withdraw funds almost instantly. Major use cases

[74] https://swissmoney.com/cryptocurrency-transaction-fees
[75] https://ethereum.org/en/developers/docs/scaling/optimistic-rollups/

like zkSync[76] and StarkNet[77] are already processing thousands of transactions per second (2,000-20,000 TPS) while reducing fees by 10-100 times. However, ZK Rollups are more complicated to implement because of their complex nature, and developers have struggled to make them fully compatible with Ethereum.[78] To compare the two solutions side-by-side, see Appendix 8.

When evaluating these options, the choice between Optimistic and ZK Rollups truly depends on specific business objectives and use cases. Optimistic Rollups might be preferable if Google were to prioritize ease of implementation, compatibility with existing systems, and lower development costs. For Google's extensive payment ecosystem, ZK Rollups likely offer the best combination of features despite their current implementation challenges, as Google most likely prioritizes its features more. The ability to process transactions without withdrawal delays would be significant for YouTube creators needing immediate access to their earnings or for business partners requiring real-time settlement. These ZK-based solutions could allow stablecoin payment systems to scale to billions of users while also maintaining reliable operation. This scalability could also be essential for treasury management applications where programmable liquidity pools would require high transaction throughput to optimize Google's cash flow across regions that together generate over $179bn in annual revenue. The initial implementation complexity of ZK Rollups seems to be a worthwhile investment given Google's technical resources and the long-term benefits of a more efficient and trustworthy system.

5.2.2. Interoperability

Interoperability shows another key concern for stablecoin integration. Since stablecoins can operate on many different blockchain systems that do not naturally work together, an issue arises similar to having bank accounts in different countries each with its own rules, fees, and processing times. Users might need to use multiple wallet applications, pay additional fees for cross-chain transfers, and wait longer for transactions to complete.[79] Transaction history also becomes scattered across different networks, making it difficult to maintain clear financial

[76] https://cointelegraph.com/news/zksync-2025-roadmap-scalable-blockchain-privacy-tech
[77] https://www.starknet.io/blog/understanding-l2-fees/
[78] https://ethereum.org/en/developers/docs/scaling/zk-rollups/
[79] https://www.bis.org/publ/bisbull56.pdf

records.[80] This becomes an issue for Google if it attempts to build a unified payment system that utilizes the full potential of blockchain cost savings.

There are two paths to resolve the complications. One is to use existing solutions. Google could use platforms like ChainLink that work as bridges between different blockchains. Think of different blockchains like separate stock exchanges (NYSE, NASDAQ, etc.). Traditionally, transferring assets between these exchanges requires brokers, clearinghouses, currency conversions, and settlement delays– all with added fees and risks. ChainLink acts as an electronic trading system that connects these exchanges directly, creating secure pathways for information to travel between otherwise separate networks, allowing for nearly instant transfers with lower fees and better security.[81]

To further illustrate this, consider a YouTuber in Switzerland who is paid by Google through Google Pay. The YouTuber prefers receiving USDC on Solana, as it has lower transaction fees, but Google prefers Ethereum because it has more stablecoin holdings. Without interoperability solutions, this would require a manual transfer that would incur the very costs we are trying to eliminate. This challenge is particularly relevant for the YouTube creator payouts discussed in Section 4, where 90% of YouTube's 63.8mn creators are located outside the US. The issue is especially acute for high-growth markets like India, which hosts four of the top ten YouTube channels and represents approximately $946mn in payouts to Indian creators over the last two years.

With an interoperability protocol in place, the payment process is as follows:

1. Google initiates payment in USDC on Ethereum
2. The interoperability protocol detects that the recipient prefers Solana
3. The protocol locks the USDC on Ethereum and mints an equivalent amount on Solana
4. The YouTuber receives the USDC on their preferred network
5. Both parties receive confirmation of the completed transaction

However, they are not free and act similar to the current legacy payment system where each member of the transaction process needs a piece of the pie. In some cases the fees may be marginal and unlock spend for some customers who would not want to obtain stablecoins on a

[80] https://www.sanctionscanner.com/blog/challenges-and-techniques-in-cryptocurrency-transaction-monitoring-735
[81] https://blog.chain.link/ccip-mainnet-early-access/

new network, making the services worth it, especially considering that costs will be saved in comparison to traditional payment systems. While these can be valuable integrations for unique, uncommon or unconventional networks, there is another solution for Google.

Much like how Google can accept Visa, Mastercard and Discover, Google can set up systems to transact on the dominant networks. For example, Google can accept Ethereum, Solana, and BNB Smart Chain. As of today, Etheruem dominates about 55%, Solana covers 9% and BNB Smart chain has 7%.[82] These three networks are already inclusive of over 70% of crypto currencies. Diving more specifically into Stablecoins, namely USDC, there is an even tighter distribution. 60% of USDC's market share is on the Ethereum network, and 16% of it on the Solana network.[83] While this statistic does tell us that the significant majority of USDC is on Ethereum, it is also important to note that Solana has increased from 3% to 16% of USDC transaction market share in just the past year.[84] The remaining 24% is distributed across other, smaller networks such as Tron, Base and Artbitrum.

6. Conclusion

Stablecoins hold substantial potential to revolutionize elements of Google's extensive payment ecosystem. By offering the combination of blockchain's efficiency and the stability of traditional currencies, stablecoins address many of the inefficiencies inherent in legacy payment infrastructures. These inefficiencies, which Google confronts daily, range from the sluggishness and high costs of cross-border transactions to the complexities of managing diverse international payment flows.

The strategic integration of stablecoins could yield significant advantages for Google. Specifically, stablecoins can streamline creator and developer payouts, expedite and reduce the costs of B2B transactions, and enhance the functionality of Google Pay/Wallet. By adopting stablecoins for international payments, Google can bypass costly intermediaries, accelerate settlement times, and reduce currency conversion fees—benefits that are particularly critical

[82] https://www.coingecko.com/en/chains
[83] https://crypto.com/en/market-updates/crypto-market-pulse-weekly-31-03-2025
[84] https://cryptoslate.com/insights/usdc-supply-surpasses-50-billion-as-users-increasingly-prefer-solana-blockchain/

given the company's extensive global operations. Similarly, enabling stablecoin payouts for YouTube creators and Google Play developers could provide faster access to earnings while reducing administrative overhead. Integration with Google Pay could further bolster financial inclusion and offer consumers and merchants a cost-effective alternative to traditional payment methods.

The adoption of stablecoins is not without challenges. Regulatory uncertainty, technical scalability issues, interoperability concerns, and user education barriers must be carefully addressed to ensure successful implementation. The fragmented global regulatory landscape requires proactive compliance strategies to mitigate operational risks. Technical solutions such as Layer 2 scaling mechanisms and interoperability protocols are essential for overcoming blockchain limitations and ensuring seamless cross-chain transactions. Additionally, robust privacy measures like zero-knowledge proofs can help balance transparency with confidentiality in sensitive financial operations.

Google stands to gain a great deal by proactively exploring and piloting stablecoin applications. By doing so, Google can not only optimize its payment processes but also position itself at the forefront of the next wave of financial innovation. By embracing this transformative technology, Google can drive significant cost savings, enhance user experiences, and solidify its role as a pioneer in shaping the future of payments. The path forward requires careful planning and execution, but the rewards promise to be substantial – both for Google and for the broader ecosystem it serves.

Appendix

Appendix 1: Regulations by Country

Region	Legislative/Regulatory Framework	Status	Supervising Agency	Favorable for corporate Use?
Australia	Consultation on "Token Mapping" (2023) proposes regulating stablecoins under existing financial laws. Australian Securities and Investment Commission strategic plan	Proposed with consultation period closed - still waiting for draft legislation Timeline set from 2024 - 2028	ASIC, and Reserve Bank of Australia (RBA)	Unclear - optimistic direction but still no laws have been enacted
Canada	CSA Staff Notice 21-333 - Expectation for stablecoin issuers (transparency, liquidity, custody)	Interim provisions (guidance only, no formal rules)	Provincial Securities Regulators	Not yet - no full regulatory clarity, corporations unlikely to commit
European Union	E-money Directive 2 for FBSC's referenced under MiCA - full prudential, reserve, and redemption rules for ARTs/EMTs.	Implemented (June 30, 2024)	European Securities and Markets Authority (ESMA) and European Banking Authority (EBA)	Yes - clear framework which supports corporate usage of compliant stablecoins
Hong Kong	Stablecoins Bill introduced but not enacted yet - mandates licensing, reserve backing, and audits	Not enacted into law yet, introduced in December 2024	Hong Kong Monetary Authority, Financial Services & Treasury	Not yet - corporate clarity will come with enactment in 2025
India	Crypto and Stablecoin regulation bill (2025) - regulate stablecoins under the Payment and Settlement Systems Act	Introduced and now under parliamentary review	Reserve Bank of India (RBI) Securities and Exchange Board of India (SEBI)	Likely - favorable direction for settlement and compliance
Japan	Payment Services Act - limits stablecoin issuance to banks/trusts. AML safeguards enforced	Implemented	Financial Services Agency	Yes - corporate use through regulated institutions is clear and secure
Singapore	Payment Services Act - Licensing for issuers,	Implemented	Monetary Authority of Singapore	Yes - strong regulatory environment

	capital requirements, AML/CFT compliance. MAS guidelines for risk management		(MAS)	encourages corporate adoption
Switzerland	Regulated by the Banking Act FINMA guidance explaining stablecoin risk, default guarantees, and customer adoption	Effective Guidance	Financial Market Supervisory Authority (FINMA)	Yes - corporate friendly jurisdiction
Nigeria	Central Bank of Nigeria (CBN) guidelines allow banks to facilitate crypto transactions. SEC classifies stablecoins as securities	Implemented partially with a full framework pending	CBN, SEC Nigeria	Not yet - promise for the future but corporate are waiting
United Arab Emirates	Payment Token Services Regulation - licensing, reserve backing, and disclosure rules. Focus on DLT-based tokens	Implementation planned for June 2025	UAE Central Bank	Favorable direction - once fully implemented likely to support corporations
United Kingdom	Systemic Stablecoins, Financial Markets Services Act, Payment Services Regulations	Proposed	Bank of England for Systemic Stablecoins, Financial Conduct Authority, Payment System Regulators	Not yet - high potential but corporates are waiting for clearer guidance
United States	GENIUS Act and STABLE Act State level legislation	Bills proposed in congress - awaiting vote State Rules implemented	Office of Comptroller and Currency Federal Reserve	Not yet - lack of cohesive regulatory framework
Turkey	March 2025 regulations - comprehensive regulations governing crypto asset service providers, including exchanges and wallet services	Implemented	Central Bank of the Republic of Turkey (CBRT) - payments oversight Capital Markets Board (CMB) - licensing	Yes - comprehensive rules allow for corporate use

Appendix 2: How to Buy USDC on Binance

*Trading fees are tiered based on your 30-day trading volume and BNB (Binance Coin) holdings

Step 1: Create a Binance Account

1. Visit the Binance website (www.binance.com) or download the Binance mobile application from your device's app store
2. Click on the "Register" or "Create Account" button and follow the prompts to set up your account
3. Complete the required identity verification procedures (KYC) by providing personal information and uploading identification documents to unlock full trading capabilities
4. Once verified, your account will be ready to purchase USDC and other other cryptocurrencies

Step 2: Buy USDC on Binance[85]

1. Log in to your Binance account using your credentials
2. Navigate to the "Buy Crypto" section or use the search function to find USDC
3. Select your preferred payment method. Binance supports various options including:
    a. Credit/debit cards
    b. Bank transfers
    c. Third-party payment processors (Apple Pay, Google Pay)
    d. P2P trading (peer-to-peer)
4. [86]Enter the amount of USDC you wish to purchase or the fiat amount you want to spend
5. Review the transaction details, including any applicable fees and the exchange rate
6. Confirm the purchase and complete any additional security verification steps if prompted

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[85] https://www.binance.com/en/how-to-buy/usd-coin

[86] https://www.binance.com/en/how-to-buy/usd-coin-bridged-usdc-e

7. The USDC will be deposited into your Binance wallet, generally within minutes of transaction completion

Step 3: USDC via Binance Wallet and Binance Pay

USDC can be used for payments through Binance Pay with zero gas fee[87]s:

1. Go to the “Pay” section via the homepage or app menu
2. To send USDC to another user (Binance Wallet):
    a. Click “Send”
    b. Enter the recipient’s email, phone number, or Pay ID
    c. Select USDC as your payment currency (default for new users)
    d. Enter the amount and confirm the transfer

    To spend USDC at merchants (Binance Pay):
    a. Shop at supported Binance Pay merchants (over 32,000 worldwide)
    b. Select “Binance Pay” as the payment method at checkout
    c. Choose USDC as your payment currency
    d. Scan the merchant’s QR code and confirm the payment in the app
3. Tracking USDC Transactions[88]
    a. Go to “Wallet” → “Overview” → “Transaction History”
    b. Filter for USDC transactions if needed
    c. Click on any transaction to view details
    d. For blockchain verification, click the transaction ID (TxID) to view the transaction on the respective blockchain explorer

[87] https://www.binance.com/en/blog/payments/how-to-send-and-spend-usdc-with-binance-pay-2025-guide-5468235863407397079
[88] https://www.binance.com/en/support/faq/detail/a6f58adc6f5640f8af08aa70a55760f7

Appendix 3: How to Buy USDC on Coinbase

*Coinbase offers rewards for holding USDC, currently at a 4.1% rate. USDC is available on ten different blockchains, including Ethereum, Solana, Avalanche, TRON, Algorand, Stellar, Flow, Hedera, Base, and Optimism. Unlike many cryptocurrencies, Coinbase does not charge fees for USDC purchases, though network fees may still apply.[89]

Step 1: Create a Coinbase Account

1. Visit the Coinbase website (www.coinbase.com) or download the Coinbase mobile app from your device's app store
2. Click on "Sign up" and enter your email address and create a password
3. Verify your email address by clicking the link sent to your inbox
4. Complete identity verification by providing personal information and uploading government-issued ID documents. Verification may take several minutes to complete depending on your location.
5. Set up two-factor authentication for enhanced security

Step 2: Buy USDC on Coinbase[90]

1. Select "Buy & Sell" on the Coinbase website or tap the "+" icon on the mobile app's home screen
2. Add a payment method if you haven't already done so:
    a. Bank account (ACH)
    b. Debit card
    c. Wire transfer
    d. PayPal (U.S. customers only)

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[89] https://www.coinbase.com/usdc

[90] https://www.coinbase.com/how-to-buy/usdc

    e. Digital gift cards (U.S. only, excluding Hawaii)
3. In the search field, type “USDC” and select it from the results
4. Enter the amount of USDC you wish to buy, either in your local currency or in USDC units
5. Review your purchase details by clicking “Preview buy”
6. Confirm the transaction by selecting “Buy now”
7. Upon successful processing, the USDC will appear in your Coinbase wallet

Step 3: USDC in Coinbase Wallet[91]

For users preserving self-custody, Coinbase also offers the option to buy USDC directly through Coinbase Wallet:

1. Open your Coinbase Wallet application
2. Select “Buy” from the main interface
3. Choose “USDC on Base network” and enter your desired purchase amount
4. Select your preferred payment method (options vary by country)
5. Complete any required authentication steps for the selected payment method
6. Confirm and place your transaction

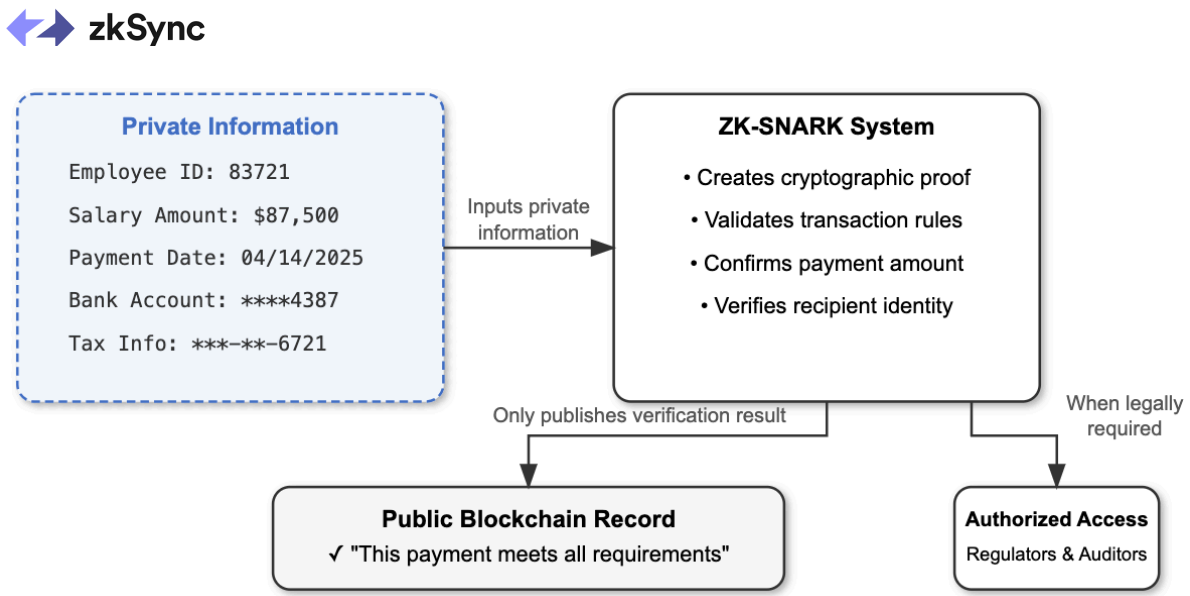
Then, the user would have to deposit local currency via a bank transfer to their exchange account. For instance, using Coinbase, the fees would range from free using an ACH transfer, $10 for a wire transfer, €0.15 for a Single Euro Payments Area (SEPA) transfer, or free using SWIFT for the GBP.[92] After this, the user would have to convert fiat to USD-pegged stablecoins like USDC or USDT through exchange interfaces. Sticking with Coinbase as our example, their platform would charge a 0.6% taker fee for up to $10k and a 0.4% maker fee within this same tier.[93]

[91] https://help.coinbase.com/en/wallet/managing-account/usdc-coinbase-wallet
[92] https://help.coinbase.com/en/exchange/trading-and-funding/exchange-fees
[93] From Coinbase: “When you place an order that gets partially matched immediately, you pay a taker fee for that portion. The remainder of the order is placed on the order book and, when matched, is considered a maker order. You pay a maker fee for this remaining portion of the total order.”

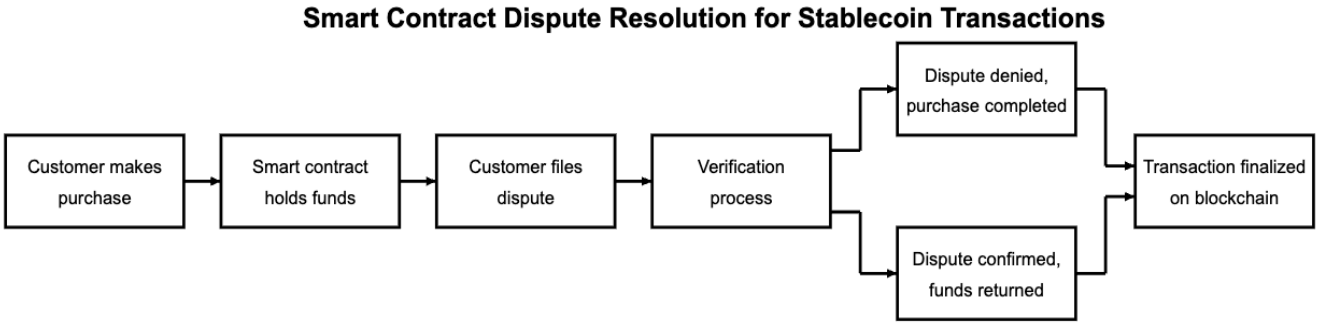
Appendix 4: Blockchain Network Comparisons

	Solana	Ethereum	Ripple	BNB Chain
Transaction Fees	Very low (fractions of a cent)	High (due to gas fees, can exceed $10)	Low (fractions of a cent)	Low to moderate (usually <$0.10)
Speed	Fast	Moderate	Fast	Fast
Ease of Use	User-friendly with wallets like Phantom	Complex due to gas fees and ETH balance	Easy with XRP Ledger-native wallets	Simple with Binance ecosystem wallets
Network Costs	Minimal	High due to network congestion	Minimal	Low if using BNB for fees (~25% discount)
Volatility	High	Moderate	Moderate	High

Appendix 5: Zero-Knowledge Proof System



Appendix 6: Processing Refunds



Appendix 7: Traditional vs. Blockchain Transaction Processing Speeds

Payment System	Transactions Per Second	Finalization Time	Refund Mechanism	Fee Structure
Visa	24,000	1-3 days	120-day chargeback window	Fixed percentage fee
Ethereum	15-30	Minutes	No built-in mechanism	Variable gas fees (up to $50 per transaction)
Solana	2,000-4,500	12.8 seconds	No built-in mechanism	~$0.00025 per transaction

Appendix 8: Optimistic vs. ZK Rollups

Feature	**Optimistic Rollups**	**ZK Rollups**
Validation Model	Transactions presumed valid, only challenged if alerted of fraud	Transactions are mathematically proven valid upfront
Implementation Difficulty	Easy	Difficult
Dispute Period	7 day challenge period	Near immediate
Main Advantage	**Quick scaling/implementation**	**More privacy and security**

Biographies

Alec Dron is a senior at Lehigh University majoring in Business Information Systems with a minor in FinTech. After he graduates this May, he will be joining the Products and Automation team in the Tech Consulting division at Crowe LLP, out of the New York office. Alec is the President of the Business Information Systems and Analytics club, works as the Chief of staff at Hillel, and has interests in AI, Finance, and technology integration.

Brian Fullenbaum is a junior at Lehigh University double majoring in Finance and Business Analytics, with a minor in Data Science. This summer he will be interning at JPMorgan as a corporate analyst. Brian is the captain of the club squash team, and has a deep interest in data analytics.

Skyler Goldin is a senior at Lehigh University majoring in Finance and minoring in Creative Writing. After graduating in May 2025, she will be working as a Controllers Analyst at Goldman Sachs in New York City. At Lehigh, Skyler co-founded GirlBoss, a club dedicated to promoting financial literacy and empowering women in finance. She also served as Vice President of Coffee Club and Vice President of Events for The Women's Network.

Haley Jones is a senior at Lehigh University majoring in Finance and minoring in Financial Technology. She will be joining Morgan Stanley in Los Angeles with an Investment Management role after graduating in May. Currently, she holds a position as a Collegiate Advisor for XDAO to promote no-code DAO building for a more accessible Web-3 community.

Mason Schick is a senior at Lehigh University majoring in Finance, with minors in Financial Technology and Entrepreneurship. After he graduates this Spring, he will be joining Bank of America in Chicago, working in Global Quantitative Analytics Risk Management. Mason has deep interest in the financial markets and data science.