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An Early Look into Digital-Assets Regulatory Data

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Per CSBS, reporting standards for the NMLS MSB Call Report are still under development and reporting is also still being reviewed through the supervisory process. Accordingly, CSBS has advised that the 2021 MSB Call Report data can be used on a limited basis to estimate the: (i) total volume for MSB companies in the United States; and (ii) number of companies reporting in each MSB activity. Disclaimers have been made where appropriate to identify the limits of the NMLS MSB Call Report and its focus on money transmission.

Digital-asset platforms and other intermediaries play important roles in the cryptocurrency ecosystem. They facilitate trading between buyers and sellers, engage in large volumes of daily transactions, and have recently expanded to provide more complex financial services. However, the extent of their activities and the potential risks they pose to financial stability are still largely opaque to regulators. Using Nationwide Multistate Licensing System & Registry (NMLS) Money Services Businesses (MSB) Call Report data, this brief provides an early look into the activities of these intermediaries, such as information on the size and volume of digital-asset transactions as well as aggregate balance sheet details. We find a high degree of market concentration, with major intermediaries not only accounting for the majority of transaction volumes but also holding the largest amounts of customers' digital assets. Finally, we identify significant data gaps that remain with respect to the oversight of these digital-asset intermediaries and the financial-stability risks that may emerge from them.

1. Introduction: Regulating Digital-Asset Intermediaries

Digital assets[i] have emerged as a new and rapidly growing asset class for investors, with total market value jumping from roughly $100 billion just three years ago to a peak of $2 trillion this year. Despite this rapid growth, the regulatory framework governing the oversight of entities in this space has not evolved. As more institutional investors have entered the digital-asset space, policymakers have increasingly focused on how to regulate such entities.

During the past year, federal authorities began to take significant steps toward developing a regulatory framework for digital assets. In March 2022, President Biden issued an Executive Order on Ensuring Responsible Development of Digital Assets, which explicitly tasked the Financial Stability Oversight Council (Council) with identifying specific financial-stability risks posed by digital assets. Prior to this, the OFR and the Council identified digital assets as a notable emerging risk to financial stability.[2]

One aspect of debate is how to handle the regulatory oversight of digital-asset intermediaries, such as platform service providers, who play several crucial roles in these markets. Digital intermediaries may:

1. Facilitate the exchange of digital assets between buyers and sellers,
2. Convert digital assets to fiat money and vice versa,
3. Engage in proprietary trading on their own books, and
4. Hold these assets on behalf of customers.

As a result of these activities, digital-asset intermediaries potentially face several risks, such as cybersecurity, bankruptcy, financial fraud, and payment settlement risks.

Large-scale use of digital assets coupled with greater interconnectedness with other parts of the financial sector could pose additional financial-stability risks. Digital-asset markets share many vulnerabilities with traditional financial markets, including leverage, liquidity and maturity mismatch, and operational and contagion risks. As outlined in a report by the Financial Stability Board, these vulnerabilities can have implications for financial stability through several channels: financial sector exposures, wealth effects, confidence effects, and risks stemming from the use of digital assets as a means of payment and settlement.[3] In addition to these risks, a recent report by the Federal Reserve Board of Governors identified several emerging vulnerabilities in the digital-asset ecosystem in the event of future growth and stronger interlinkages with traditional finance. Run risk in stablecoins, valuation pressures, fragilities of decentralized platforms, and a general lack of regulation all could present risks to overall financial stability.[4] Understanding the full extent of the financial-stability risks posed by digital-asset intermediaries is therefore a priority for policymakers.

This brief presents the first analysis of some key features of platforms and other intermediaries in digital-asset markets. Our data comes from the Nationwide Multistate Licensing System & Registry (NMLS) Money Services Business (MSB) Call Report,[ii] which, to our knowledge, is the most comprehensive regulatory data collected on these actors regarding their digital-asset activities. Section II details the current regulatory framework governing the oversight of these cryptocurrency intermediaries and provides background on the MSB Call Report. Section III presents stylized facts gleaned from the MSB Call Report about digital-asset activities and the financial health of these intermediaries. Section IV highlights data gaps that impede regulators from making a full assessment of financial-stability risks stemming from these institutions. Section V concludes the brief.

i For the purposes of this brief, the terms virtual currency, cryptocurrency, and digital assets all refer to the same concept. We will be focusing solely on "crypto-assets" and will omit "central bank digital currencies" entirely. A crypto-asset is a type of private-sector digital asset that depends primarily on cryptography and distributed-ledger or similar technology. For the purposes of this brief, the term crypto-assets encompasses many assets that are commonly referred to as "coins," "stablecoins," or "tokens." This brief will use the term virtual currency when referring to specific data items in the MSB Call Report, given that this is the terminology used in the dataset. We will use the term digital assets when referring to crypto-assets in general. More on this topic in Section III. Stylized Facts.

ii For public information on the field definitions, sample forms, report sections, and FAQs, see https://nationwidelicensingsystem.org/slr/common/Pages/MoneyServicesBusinessesCallReport.aspx.

OFR notes that money transmission and the activity covered by the MSB Call Report is a very limited portion of the crypto-asset market, but nonetheless, this data provides significant insight into the U.S. market. Disclaimers have been made where appropriate to identify the limits of the MSB Call Report and its focus on money transmission.

2. Regulatory Framework

In the United States, cryptocurrencies and digital assets are considered convertible virtual currency (CVC) under the U.S. Department of the Treasury's Financial Crimes Enforcement Network (FinCEN) regulations. Under this regulatory framework, all crypto intermediaries that offer trading of CVCs must register with FinCEN as money services businesses (MSBs). Federal MSB registration regulations focus on requiring these companies to comply with anti–money laundering/countering the financing of terrorism (AML/CFT) regulations.

Because these federal regulations are concerned with reducing fraud and illicit-financing risks, gaps remain with respect to the federal oversight of other risks that may emerge from the activities of these financial intermediaries. As many of these platforms are not subject to direct oversight by the Securities and Exchange Commission (SEC), the Commodity Futures Trading Commission (CFTC), or other federal agencies, this limited oversight coupled with the explosive growth of digital assets has prompted concerns about regulatory gaps.

Currently, the MSB Call Report is, to our knowledge, the only comprehensive source of regulatory data on key intermediaries in the digital-asset ecosystem. Instituted by the Nationwide Multistate Licensing System & Registry (NMLS) and collected from 37 state regulators, the MSB Call Report provides standardized national and state-specific information on the activities of the money services businesses market in the United States. More broadly, MSBs include a diverse range of businesses, such as:

1. Money transmitters (e.g., remittance providers),
2. Providers and sellers of prepaid services (e.g., mobile wallets or prepaid cards), and
3. Sellers of payment instruments (e.g., money orders or traveler's checks).

Traditionally, MSBs serve three general functions:

1. Sending and receiving money on behalf of customers, domestically and internationally.
2. Providing products that can be purchased by customers with the sole intent of money transmission.
3. Foreign currency exchange.[5]

Banks and credit unions can also provide some of these services, but MSBs do not accept U.S. dollar deposits or issue loans and thus do not fall under federal banking regulations. Regulation of MSBs is instead conducted at the state level, with the MSB Call Report providing detailed information concerning the financial activities of MSB licensees.[iii]

When digital assets are used to perform the above-listed activities, state regulators may consider such activities to be money transmission and thus subject to licensure. Critically, the license is typically limited to the activity—digital-asset transmission—not other activities like brokering, dealing, or lending. Also, the licensed entity may be separate from parent companies, international affiliates, or other related entities that remain unsupervised. Accordingly, the MSB Call Report provides only a limited view into the financials of these firms.

Available on a quarterly and annual basis, the MSB Call Report is comprised of four sections detailing in-formation on each licensed company:

1. Financial information.
2. Transactional activity.
3. Permissible investments.
4. Transaction destination countries.

Our data sample covers the period from 2017 to 2021 and includes information such as:

- total dollar amount of virtual-currency transactions;

iii Currently, 37 state regulators require reporting of financial information with various degrees of detail. While not all states require their licensees to file an MSB report, licensees who are required to do so must report their financial activities conducted from any states.

- total number of virtual-currency transactions;
- permissible investments in cash on hand, deposits, U.S. Treasury securities, and virtual currency balance held on behalf of customers; and
- virtual currency assets and liabilities.

Because the dataset also includes businesses whose activities are unrelated to digital assets, we restrict our sample to 79 companies that reported any virtual-currency activities during the sample period. In addition, since the dataset is limited to licensed activities at licensed entities, it does not provide insight into activities occurring at unlicensed affiliates, such as digital-asset transactions by international affiliates.

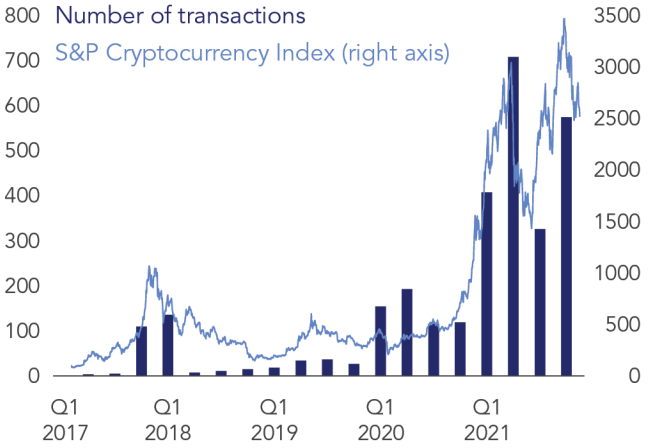
3. Stylized Facts

Broadly, financial intermediation in digital-asset markets is performed mainly by entities involved in:

- transmitting digital assets for or on behalf of clients,
- holding digital assets for clients,
- buying and selling digital assets using fiat, and
- exchanging services in the conversion or exchange of fiat currency or other value.[6]

Within our dataset, the types of entities range from large platforms with operations geared toward institutional traders to those that offer simpler services with limited buying and selling capabilities for retail investors. Note that the language of the MSB Call Report refers to "virtual currency," which, though not defined, is commonly accepted to be defined under FinCEN guidance[7] as a medium of exchange that can operate like currency but does not have all the attributes of "real" currency,[8] including legal-tender status. Under this guidance, any particular type of virtual currency (such as cryptocurrency, digital assets, or stablecoin) falls under this regulatory treatment. Furthermore, this regulatory treatment applies regardless of whether the virtual currency is represented by a physical or digital token or whether the type of ledger used to record the transaction is centralized or distributed. This regulatory treatment also applies regardless of the type of technology utilized for the transmission of value. For the purposes of this brief, the term digital asset will be used generally, while virtual currency will mainly be used in reference to specific fields in the MSB Call Report.

Figure 1. Total Virtual-Currency Activities (number of transactions in millions, index)



Note: The S&P Cryptocurrency LargeCap Index reflects the largest and most liquid cryptocurrencies in one index that is weighted by the equivalent of market capitalization for crypto-currencies (coin supply × coin price). The index equals 100 at February 28, 2017.

Sources: MSB Call Report, S&P Cryptocurrency Index Series, Office of Financial Research

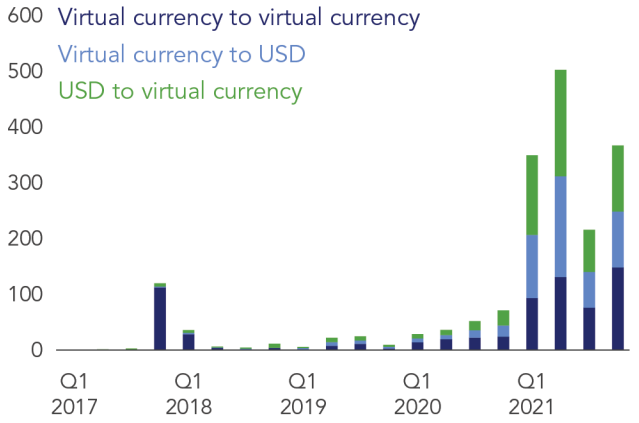
In this section, using aggregates generated from the data, we present several stylized facts about the growth and market concentration of these digital-asset intermediaries:[iv]

1. Digital assets experienced rapid growth in recent years.
2. Digital-asset transactions are typically dominated by trading among digital assets.
3. Our regulatory dataset only captures a fraction of global digital-asset trading activities.
4. Digital-asset trading exhibits a high degree of concentration among top intermediaries.
5. Digital assets held on behalf of customers are highly concentrated among top companies.

Digital-asset activities experienced rapid growth in 2021. The growth in the aggregate number of virtual-currency transactions conducted by companies

iv For detailed descriptions of data fields in the MSB Call Report, we refer to https://mortgage.nationwidelicensingsystem.org/licensees/resources/LicenseeResources/MSB%20Call%20Report%20Field%20Definitions.pdf.

Figure 2. Virtual-Currency Activities by Transaction Type ($ billions)



Note: Virtual-currency-to-virtual-currency transactions include those in which the company is either the buyer or the seller, as well as those in which the company is neither the buyer nor the seller but merely provides order matching to facilitate the exchange.

Sources: MSB Call Report, Office of Financial Research

Figure 3. Number of Companies and Share of Global Trading Volume (Percent, number of companies)

Note: Share of global trading volume is calculated as the total dollar amount of virtual currency transactions as a percentage of total global trading volume for each quarter.

Sources: MSB Call Report, CoinMarketCap.com, Office of Financial Research

in our data sample tracks closely with the rise in cryptocurrency prices (see **Figure 1**). In 2021, virtual-currency companies reported a total of $1.4 trillion in virtual-currency activities conducted over 2 billion transactions, up from $193 billion in activities over 586 million transactions in 2020. Looking at Q4 2021 in particular, the total dollar amount of virtual-currency transactions was $367 billion, with the mean company reporting an amount of $4.7 billion in transactions. Some of this growth, however, can be explained by the dramatic increase in the price of digital assets like Bitcoin and new companies entering the dataset. Several companies started operations during this timeframe.

Digital-asset transactions are typically dominated by trading among different digital assets, rather than exchanging digital assets for or converting them into or from U.S. dollars. We present the total dollar amount of virtual-currency trading by transaction type (see **Figure 2**):

1. Virtual currency to virtual currency.
2. Virtual currency to U.S. dollars.
3. U.S. dollars to virtual currency.

On average, virtual-currency-to-virtual-currency transactions account for about 48% of all transactions, followed by U.S.-dollar-to-virtual-currency transactions, which account for 32%. Virtual-currency-to-U.S.-dollar transactions account for the rest.

Furthermore, MSB Call Report data only captures a fraction of global crypto transactions. The share of transaction volume captured in our data sample peaked in late 2017 as Bitcoin climbed to an all-time high, accounting for roughly 9% of the global transaction volume (see **Figure 3**). However, while the number of digital-asset intermediaries captured in our dataset has grown since 2017, their share of transaction volume declined to less than 1% from 2018 to 2020, before rising modestly to roughly 4% at the end of 2021. These trends in part reflect the rapid growth of decentralized finance: the share of on-chain transactions conducted on decentralized platforms grew from less than 10% in 2020 to 55% at the end of 2021.[9] An additional factor to consider is that many intermediaries may have offshore operations, be based internationally, or file in one of the states that don't collect the MSB Call Report. All such intermediaries would not be captured in our dataset.

In addition, we find that digital-asset transactions exhibit a high degree of concentration among the top few intermediaries. We divide the 79 companies into quartiles, based on the total dollar amount of virtual-currency activities conducted each quarter, and we report their total virtual-currency transaction volume

Figure 4. Virtual-Currency (VC) Transaction Volume and Assets by Quartiles ($ millions)

	VC Transaction Volume				VC Assets			
	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile	1st Quartile	2nd Quartile	3rd Quartile	4th Quartile
Q4 2018	-	2.56	242.96	12,410.51	0.01	0.38	97.71	287.36
Q1 2019	-	13.21	116.95	7,011.34	-	1.16	21.03	311.46
Q2 2019	-	27.69	480.11	22,766.03	1.46	9.35	7.14	461.10
Q3 2019	0.26	62.64	648.07	25,140.84	0.49	11.30	120.74	317.73
Q4 2019	0.02	17.86	244.09	10,568.33	2.39	1.55	103.27	341.22
Q1 2020	0.04	27.99	457.75	29,659.06	1.06	4.05	126.37	252.30
Q2 2020	0.06	45.00	830.79	36,573.55	24.52	6.57	202.08	441.25
Q3 2020	0.08	66.98	1,470.28	51,833.56	4.66	23.36	419.82	468.09
Q4 2020	0.79	192.90	3,626.69	68,372.86	4.99	35.34	452.78	1,483.37
Q1 2021	2.22	480.96	8,387.59	340,576.54	6.38	76.75	2,135.63	6,888.40
Q2 2021	1.48	446.53	6,913.95	494,997.56	20.29	69.25	3,446.42	4,431.50
Q3 2021	0.91	320.73	6,558.76	209,466.42	61.53	71.56	2,525.24	6,274.01
Q4 2021	0.85	242.58	11,316.86	355,552.18	74.57	48.53	2,720.68	11,267.51

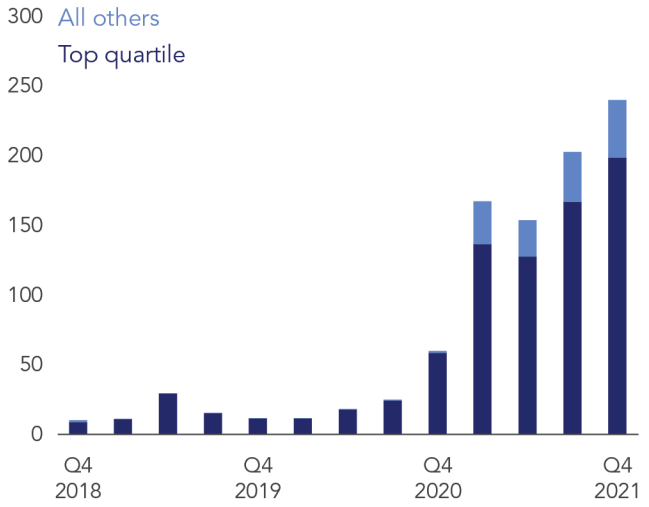
Note: Quartiles are determined each quarter by the total dollar amount of virtual-currency activities reported.
Sources: MSB Call Report, Office of Financial Research

and assets (see **Figure 4**). Due to data-reporting restrictions, the table only shows data from Q4 2018 to ensure there are a minimum of five companies per quartile.

Companies in the fourth quartile consistently accounted for the majority of virtual-currency activities across every quarter in our data, with over $356 billion in transactions accounting for more than 97% of all activity reported in Q4 2021. Those companies also held the majority of digital assets, with over $11 billion reported in Q4 2021, or roughly 65% of total digital assets across all reporting companies. These results are in line with the Financial Stability Board Report on crypto-assets previously mentioned in this brief, as well as the literature that presents evidence of cryptocurrency being a top-heavy market. For instance, Makarov and Schoar (2021) show that since 2015, 75% of real Bitcoin volume has been linked to platforms or exchange-like entities such as online wallets, OTC desks, and large institutional traders.[10]

We also find that digital assets held on behalf of customers are highly concentrated among the top quartile. Buying or selling through a digital-asset platform typically entails transferring digital assets into a wallet provided by the platform. These platforms typically have access to their customers' private keys, allowing the platforms to manage their users' digital assets.[11] To manage daily transfers and withdrawal requests, they typically operate out of a much smaller pot of funds while parking the excess in safe storage. Assessing the magnitude of these assets is often difficult because these companies tend to hold digital assets on behalf of customers off-balance sheet, but the MSB Call Report provides aggregated data on their custody-like activities.[12]

Figure 5. Virtual Currency Held On Behalf of Customers ($ billions)



Note: Quartiles are determined each quarter by the total dollar amount of virtual-currency activities reported.
Sources: MSB Call Report, Office of Financial Research

We further find that virtual currency held on behalf of customers increased rapidly in 2021, jumping to $240 billion during Q4 2021 from $60 billion in Q4 2020 (see **Figure 5**). Of that $240 billion, $198 billion was held by intermediaries in the top quartile, again illustrating a high degree of concentration within this market. However, while the majority of our sample shows that the largest companies account for nearly all virtual currency held on behalf of customers, smaller firms have begun to hold significant amounts since 2021.

Risk Profile

One significant source of risk with respect to the custody-like services provided by digital-asset intermediaries is the lack of asset segregation rules like those for all entities in traditional financial markets. Financial firms such as futures platforms are required to segregate customers' funds from their own corporate funds, but few rules, regulations, or protections are in place in digital-asset markets to restrict the comingling of clients' assets with those of intermediaries.[13] This lack of clear custody rules in turn raises important questions regarding potential fraud and liquidity risks. For instance, in 2019, the New York Attorney General sued the Bitfinex platform for covering up the apparent loss of $850 million of commingled client and corporate funds and also misleading clients about their liquidity issues.[14] Guidance, via the SEC's Staff Accounting Bulletin 121 (released in March 2022),[15] does currently exist for certain entities that engage in activities in which they have an obligation to safeguard customers' digital assets. This bulletin requires a reporting entity that performs digital-asset custody-like activities to record a liability with a corresponding asset. Because this guidance applies to existing SEC registrants, it does not cover all the companies in our sample.

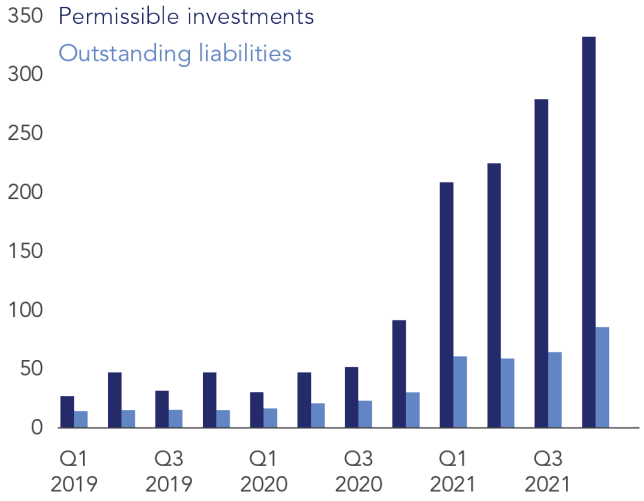
While the MSB Call Report does not provide visibility into these companies' management frameworks for assets held on behalf of customers, the report does include some measures of their quarterly liabilities and liquid assets that can be used to meet customers' obligations. Specifically, the MSB report includes data on permissible investments made by these companies. This is the state equivalent of funds safeguarding. Generally, money transmission licensees must hold an equivalent amount of cash or cash-like instruments for total outstanding customer transmission liability. These assets are deemed held in trust for the benefit of customers if an institution is unable to meet its commitments or fails.[v] In addition, the report provides data on outstanding liabilities in cash and virtual currencies owed to the customers in each quarter. According to MSB regulations,[vi] "a licensee, at all times, shall possess permissible investments having an aggregate market value . . . of not less than the aggregate amount of all outstanding payment obligations."[16]

We next present the outstanding liabilities and investments for all companies for each quarter from 2019 to 2021, thus providing a snapshot of companies' available funds in cases of customer redemptions (see **Figure 6**). Like the other series in our brief,

v Permissible investments in the MSB Call Report include (1) cash, time deposits, savings deposits, demand deposits, certificates of deposit, and senior debt obligations of accounts at federally insured financial institutions in the United States and in foreign banks; (2) investments in A-rated or above securities; (3) investments in BBB-rated or lower or nonrated securities; (4) investments in U.S. Treasury securities; and (5) other investments. In addition, virtual currency held by the companies is understood to be a permissible investment when unencumbered.

vi Other states, such as Washington, require a minimum in which the level of permissible investments must be at least equal to the total daily average of outstanding liabilities. See Washington Rev. Stat. RCW 19.230.200.

Figure 6. Total Liabilities and Investments ($ billions)



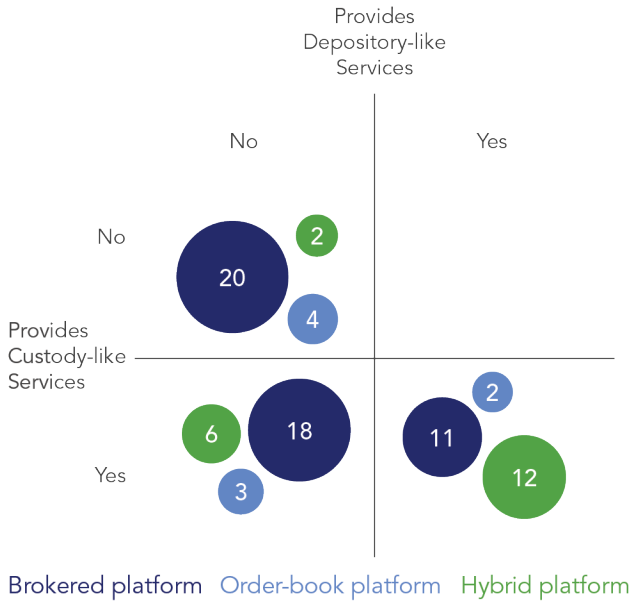
Sources: MSB Call Report, Office of Financial Research

investments and liabilities both saw notable increases in 2021. However, it is important to note that these numbers are aggregated across companies and thus do not provide a comprehensive picture of the riskiness of any individual firm.

One limitation of our metrics measured above is the different regulatory approaches by state MSB regulators when it comes to safeguarding customer assets. For example, the state of New York requires cryptocurrency platforms to "hold Virtual Currency of the same type and amount as that which is owed or obligated" to customers. Depending on where intermediaries operate, our metrics may capture the upper range of the funds held by these entities.

An additional source of uncertainty arises from the fact that the corporate structure of these digital-asset intermediaries and the scope of their activities are not well understood. Some may be engaging in broker-dealer-like activities, trading on behalf of clients and themselves. Others may be operating similarly to order-book exchanges, providing only the platform to facilitate trades. Some offer custodian-like services, while a few others have begun expanding into depository-like activities, accepting digital assets to be held on behalf of customers while engaging in banking-like activities such as lending. Some may be hybrid models performing a combination of these activities (see **Figure 7**). The diversity of business models, many of which are not money transmission

Figure 7. Number of Companies by Services Provided



Note: We categorize companies by services provided, based on each company's website and terms of use. This figure reflects their activities as of June 1, 2022.

Sources: MSB Call Report, Office of Financial Research

and not reported as such, limits the extent to which the MSB Call Report can be relied upon to gauge the safety and soundness of the industry at large.

This distinction is important to regulators because each type of institution, and consequently the regulatory framework it is subject to, is characterized by risks specific to the types of services it provides. For example, where platforms may be acting as broker-dealers, inadequate capital requirements along with significant proprietary holdings of risky assets may lead some to become insolvent during a severe downturn, resulting in customer losses. Where platforms are engaging in depository-like activities, the lack of public disclosure on their reserve asset management may give rise to the misuse of customer assets and other risks similar to those faced by traditional banking institutions. Therefore, understanding the types of activities these businesses are conducting is the first step to informing policy choices on their oversight. For the purposes of this brief, this question is important because it drives our assessment of data gaps. Without a clear framework for how these companies should or could be regulated, assessing data gaps in our report becomes difficult. Thus, in the next section, we will

Figure 8. Permissible and Virtual-Currency Investments by Quartile in Q4 2021

	Digital-Asset Companies: All		Digital-Asset Companies: Top Quartile		Traditional MSBs: All		Traditional MSBs: Top Quartile	
	% Total	Average $ millions	% Total	Average $ millions	% Total	Average $ millions	% Total	Average $ millions
Permissible Investments								
Total Cash on Hand	71.85	802.50	86.66	2,858.40	65.66	60.08	69.96	266.37
Investments (A)	18.11	202.25	10.91	359.71	23.36	21.37	20.23	77.03
Investments (BBB)	0.00	-	0.00	-	1.37	1.25	0.83	3.17
Investments (U.S Treasuries)	9.94	111.03	2.34	77.27	6.34	5.80	5.35	20.38
Other Investments	0.10	1.11	0.09	3.02	0.16	0.15	0.18	0.68
Virtual Currency								
Virtual Currency Held On Behalf of Customers	98.14	3,079.82	98.86	10,470.75	0.00	-	0.00	-
Virtual Currency Not Held On Behalf of Customers	1.78	55.84	1.13	120.17	0.00	-	0.00	-
Other Virtual-Currency Investments	0.08	2.37	0.00	0.09	0.00	-	0.00	-

Note: For digital-asset companies, the top quartile is determined by the total dollar amount of virtual-currency activities reported. For traditional MSBs, the top quartile is determined by the total dollar amount of money transmission activities reported. Data is as of Q4 2021 and subject to the CSBS Technical Note.
Sources: MSB Call Report, Office of Financial Research

address data gaps that would arise if we assumed these companies would be treated like traditional financial entities.

4. Data Gaps

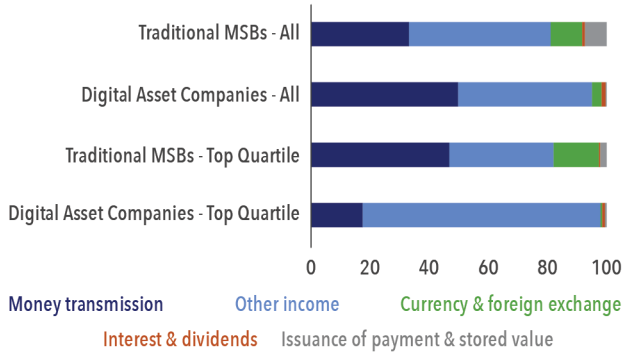
In this section, we describe the framework traditionally employed to regulate different types of financial institutions, how digital-asset intermediaries may fit into these frameworks, and the data gaps that need to be filled to properly regulate these entities under different frameworks.

Money Service Businesses

The companies in our dataset provide services that are quite different from those provided by traditional money servicers, and this fact is also reflected in the data submitted by these entities. A quick glance at the data shows that digital-asset intermediaries have a different investment structure than traditional money service businesses (see **Figure 8**).[vii] Digital-asset companies, particularly those in the top quartile of transaction volumes, tend to hold more cash as a percentage of their permissible investments and in total dollar amounts. They also hold significant levels of digital assets, both on behalf of customers and on their own accounts. On the other hand, traditional MSBs typically hold more permissible investments in the form of Treasuries and A-rated securities, though the average amount of these investments for traditional MSBs is roughly an order of magnitude smaller than that of digital-asset companies. These investments are required by state regulators in order to protect consumers from loss of uninsured funds, since MSBs are not bank or thrift institutions and are not

vii We define traditional money service businesses (MSBs) as companies who reported no virtual-currency activities. Additional data cleaning was applied to omit notable outliers.

Figure 9. Sources of Revenue in Q4 2021 (percent)



Note: For digital-asset companies, the top quartile is determined by the total dollar amount of virtual-currency activities reported. For traditional MSBs, the top quartile is determined by the total dollar amount of money transmission activities reported. Data as of Q4 2021.

Sources: MSB Call Report, Office of Financial Research

insured by the FDIC. Generally, states require these companies to maintain a minimum net worth and a balance sheet with enough assets that can be triggered to pay consumers in the event of adverse shocks (e.g., foreign exchange risk, fraud, cybersecurity failures). Traditional MSBs in our dataset do not typically report digital assets, and those that do mainly hold them on their own books rather than on behalf of customers.

In addition, we can compare the sources of income of digital-asset companies to those of traditional MSBs. The top quartile of digital-asset companies earned most of their income from activities other than money transmission, with over 80% of their income being reported as "Other Income" (see **Figure 9**). By contrast, traditional MSBs earned almost 40% of their income from traditional activities such as money transmission, currency and foreign exchange gains or losses, and issuance of payment cards. Activity coming from "Other Income" accounts for around 57% of income for these types of companies.

For traditional money transmitters, the large proportion of revenue coming from "Other Income" may reflect the wide scope of companies that qualify as money service businesses. For example, this dataset contains data submitted by paycheck processors, fintech companies, bank affiliates, and other types of businesses such as retail and grocery stores that engage in money transmission as secondary services. These companies' "Other Income" likely captures revenues earned from their primary business service beyond money transmission. On the other hand, it is currently unclear how digital-asset companies generate "Other Income." More granular data on the income sources of these companies are needed in order to understand their operating structures.

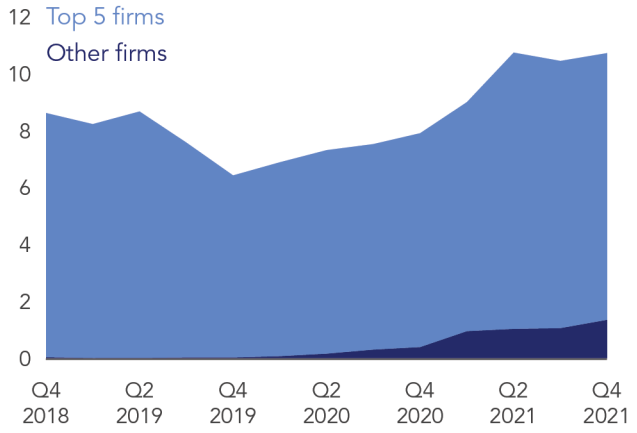
Institutions Holding Assets on Behalf of Customers

Across digital-asset intermediaries, there is no uniform practice for holding client assets. In traditional finance, asset custody is broadly defined as the holding and servicing of assets on behalf of others.[17] While some platforms follow rules for client digital assets similar to those followed by traditional financial companies, holding digital assets on behalf of customers is different from traditional financial-asset custody in that the exchange maintains control over the customers' private key. This enables the exchange to transfer customers' digital assets to and store them in the customers' own wallets. While these types of arrangements may be attractive to customers in that the exchanges can help prevent the loss of private keys, it creates significant risks in the case of cyberattacks or insolvency of digital-asset platforms. In 2021, the Carnegie Endowment for International Peace's Timeline of Cyber Incidents Involving Financial Institutions reported about a dozen cyberattacks on cryptocurrency and decentralized-finance platforms. Total losses amounted to $1.34 billion.[18]

In addition, companies using pooled arrangements for digital assets held on behalf of customers may be exposing their customers to traditional banking risks stemming from reuse, hypothecation, or employing comingled assets in investment or lending activities. The lack of public disclosure and audits for some firms generates further uncertainty as to how these digital-asset intermediaries are safeguarding customers' assets.

Some of these risks have materialized in the previous collapse of a few digital-asset platforms.[19] For example, courts refused revendication claims during the demise of MtGox on the basis that Bitcoin cannot be the object of ownership. In a similar case, courts refused revendication claims during the failure of BitGrail due to commingling of digital assets held on behalf of customers. In addition, certain platforms, such as Coinbase, have stated that assets held on behalf of

Figure 10. Market Share of Digital Assets Held On Behalf of Customers (percent)



Note: The Top 5 Firms are defined as the top 5 companies that reported the largest amount in virtual currency held on behalf of customers. Remaining Firms are all others firms that hold virtual currency on behalf of customers. Market share is calculated as total virtual currency held on behalf of customers as a percentage of virtual-currency market capitalization.

Sources: MSB Call Report, CoinMarketCap.com, Office of Financial Research

customers could be subject to bankruptcy proceedings, further raising concerns of what could happen in the event of a run or bankruptcy if customers are considered unsecured creditors.[20] The collapse of FTX in the fall of 2022 resulted in severe customer losses.[21]

We now examine the virtual currency held on behalf of customers by the Top 5 versus remaining firms, as a percent of total digital-asset market capitalization (see **Figure 10**). We define the Top 5 as the 5 companies that reported the most digital assets held on behalf of customers each quarter. Remaining Firms include all others that hold assets on behalf of customers. Again, we observe a high degree of market concentration because the Top 5 continue to hold the majority of digital assets held on behalf of customers, to the tune of $208 billion USD in Q4 2021, or 9.4% of the total crypto market capitalization, compared to $32 billion for Remaining Firms.

Broker-Dealer Activities

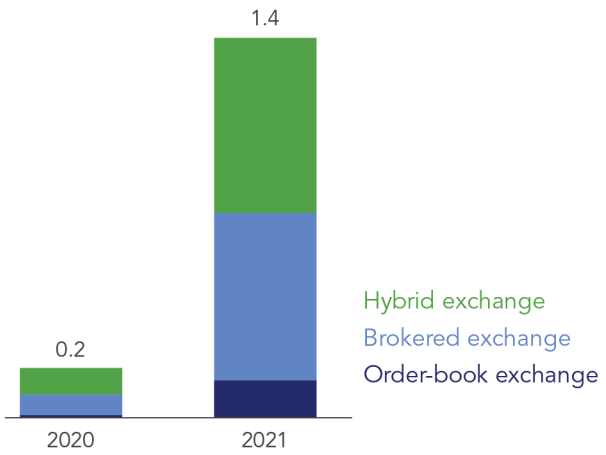
Some virtual-currency intermediaries functionally behave much like broker-dealers for cryptocurrencies: they may engage in proprietary trading while maintaining their own inventory, from which they execute trades on behalf of customers at predetermined prices. Considering this, not only is there a question of whether digital assets should become subject to commodities or securities regulation, but also whether these intermediaries should be subject to broker-dealer regulations under the Securities Exchange Act of 1934. To be considered a broker under the Act, an entity must "engage in the business of effecting transactions in securities for the account of others."[22] However, it is unclear whether digital assets are considered "securities." The platforms themselves tend to deny the assertion that these are securities, while the SEC, in a report published in July 2017, endorsed a case-by-case determination of whether digital assets are securities.[23] [24] Given this case-by-case approach, the regulatory landscape is uncertain as to which digital assets are securities and which are not.

The Great Financial Crisis saw dramatic runs on securities broker-dealers, including some that were part of larger independent investment banks. Unlike institutions that finance their holdings with long-term borrowing, the funding structure of these broker-dealers depends on uninsured short-term credit markets. A crisis of confidence in broker-dealers can lead to a drying up of their short-term funding, which in turn may impair their ability to act as intermediaries between market participants buying and selling securities.

Other risks arise from digital-asset platforms' unique "hybrid" model as both the broker and the exchange. In traditional financial markets, brokers handle trade orders by forwarding them to registered exchanges, which function as matchmakers by finding a seller, buyer, or registered market maker. The assets are held by the broker in distinct accounts on behalf of the customer. In the case of digital-asset platforms, many act as both the broker and the exchange, enabling them to hold the assets (in either segregated or pooled accounts) and act as market makers for the transaction of the security. Taking the other side of the trade in these transactions could cause digital-asset platforms to generate new risks from potential conflicts of interest, such as information asymmetry, market abuse, unfair pricing, and lack of transparency to customers.

Because the MSB Call Report is for money transmission and not broker-dealer activities, there is limited data to assess how digital-asset platforms fund their broker-dealer operations and whether their funding model

Figure 11. Digital-Asset Activities by Platform Type ($ trillions)



Sources: MSB Call Report, Office of Financial Research

relies on uninsured short-term credit markets or other forms of funding. We can, however, see snapshots of some of their activities and liquidity positions. For instance, we can observe that hybrid digital-asset platforms, which may offer both brokerage services and order-book matching services, accounted for 46% (or roughly $653 billion) of the total dollar volume of digital asset transactions in 2021 (see **Figure 11**). Meanwhile, brokered-only platforms accounted for 44% (or $625 billion) of total digital-asset transaction volume.

Banking-like Activities

Key features of traditional banking are deposit taking and the absence of asset segregation, which allow banks to use customer deposits for their own accounts. In the case of digital assets, whether a platform is performing bank-like activities can be a difficult question to answer, due to the nature of cryptocurrencies. Among the most commonly debated topics with respect to digital assets are the general concept of moneyness, whether digital assets are indeed money, and whether customer holdings of digital assets at these institutions are or should be used for investment or lending activities.

A quick glance through some of these companies' user agreements would reveal that they don't see themselves as banks or depository institutions when it comes to digital assets. These user agreements often state that U.S. dollars are held in custodial accounts at FDIC-insured banks or invested in liquid assets in accordance with state money transmitter regulations, with all interest and other earnings going to the platforms. With respect to digital-asset funds held on behalf of customers, the terms of use vary widely across companies, with some platforms maintaining that they reserve the right to "pledge, repledge, hypothecate, rehypothecate, sell, lend, [and] stake" such digital-asset funds. This suggests that the digital-asset funds are not received for transmission. In addition, very few of these companies have either a national or state banking charter.[25]

Some crypto intermediaries have begun to engage in activities that look like bank lending by allowing customers to stake digital assets (e.g., stablecoins) while issuing loans via use of such digital assets.[26] For example, BlockFi was recently fined by the SEC for allowing investors to purchase its "BlockFi Interest Accounts" (BIA) by staking certain eligible cryptocurrencies into accounts. BlockFi then pooled these cryptocurrencies together to fund its lending operations and proprietary trading.[27] In exchange for investing in the BIAs, investors were promised an attractive interest rate that was paid monthly in cryptocurrency.

These activities may expose digital-asset intermediaries to traditional risks that banks face without any banking regulatory requirements, examination, and protection. Through their lending activities, these businesses face credit risk if borrowers or counterparties fail to meet contractual obligations. In addition, these businesses could face market risk if they engage in capital markets or digital-asset markets using customer deposits. They would also face liquidity risk, particularly if the business that is allowing digital-asset staking and issuing loans in stablecoin is the main issuer of that stablecoin. These businesses, like traditional banks, need to be able to access cash to meet some of their funding obligations. Delays in taking out staked digital assets, redemption of these assets for USD, or large institutional withdrawals can accelerate into a run if confidence in either the digital asset or the intermediary falters.

The most extreme manifestation of this risk occurred in May 2022, during the "death spiral" of the stablecoin TerraUSD, which generated billions in investor losses

and prompted Treasury Secretary Janet Yellen to call for stablecoin regulations.[28] The catalyst for this event was likely a series of large withdrawals from Anchor Protocol, a digital-asset banking operation in which investors could deposit their TerraUSD in exchange for lofty returns of nearly 20%. The stablecoin would in turn be lent out to borrowers engaging in cryptocurrency trading or staking. Volatility in TerraUSD in early May created what has essentially been dubbed a bank run, in which sufficient instability prompted investors to withdraw from Anchor and sell the stablecoin, leading to a larger sell-off that culminated with the price of the stablecoin collapsing to near zero. Deposits of TerraUSD (which were supposed to be pegged to the U.S. Dollar) and Luna (a coin that assisted in the algorithmic dollar peg) were wiped out in the process—despite Terraform Labs, the parent company, holding over $3 billion in Bitcoin and other digital assets as reserves.[29] The sell-off of these reserves contributed to sharp drops in digital-asset prices while this episode played out.

Another issue could arise if these companies mismanage asset-liability duration by holding more short-term liabilities than short-term assets on their balance sheets. Proper liquidity needs to be ensured so these companies stay solvent, even without inflow of funds. At the time of writing, none of these companies are subject to bank-like capital requirements that would limit their exposures to market, operational, or liquidity risks.

Data Gaps

While the MSB Call Report offers an informative look into the activities of intermediaries in digital-asset markets, there are still significant data gaps to be addressed in order to develop a comprehensive framework for financial-stability monitoring.

First, the MSB Call Report collects data related to MSB activities, which is only a subset of digital-asset transactions. Additionally, these activities are limited to the licensee; a company may have separate affiliates, including offshore operations or international affiliates performing additional operations. Accordingly, the MSB Call Report data does not include the entire market of digital-asset intermediaries. It represents less than 5% of total transaction volumes in digital-asset markets, with the rest presumably falling outside of MSB activities or conducted by companies with cross-border operations. Given the borderless nature of digital assets, an adequate regulatory framework would need to ensure that regulators have visibility into all parts of the market. Additionally, the MSB Call Report data on digital assets are aggregated and reported in total dollar amounts, thus limiting insights into the different types of digital assets being traded and held by the entity. (At the time of this writing, there are over 20,000 tokens listed across various platforms.[30]) Companies are also only required to file an end-of-quarter snapshot; thus, there may be incentives for window dressing to improve the appearance of their financial statements. More granular and more frequent data on the various types of crypto-assets traded and held would allow regulators to assess financial-stability risks that may emerge from their activities.

Second, digital-asset intermediaries providing custody or depository services should have detailed and precise information about the use of digital-asset deposits, particularly in cases where the digital asset may be treated as a fund lent to the intermediary when it is at risk of becoming subject to insolvency proceedings. As of Q4 2021, $240 billion of digital assets are held on behalf of customers across all businesses. Given that the MSB Call Report focuses on money transmission and not lending or investment, this data cannot answer these questions. To determine whether these companies should be regulated as traditional custodians, one would need more data on the nature of their customer arrangements and the extent to which they invest customer funds.

Third, to better assess and regulate credit risk, one would need more data on loans, collateral, lending standards, internal credit risk models, capital, and exposures of companies that are issuing loans in digital assets. Current data in the MSB Call Report suggests that these companies generate substantial revenues from "Other Income." Presumably, some of this income is from lending or other bank-like activities, given that these companies publicly advertise these services. In particular, when stablecoins are used as funds that back loan issuance, it would be imperative to know whether these companies are backing each deposit with reserves or whether they are engaging in a form of fractional reserve lending.

Fourth, institutional investment in virtual currencies may pose systemic financial-stability risks, especially if traditional financial institutions (such as hedge funds or pension funds) are using leverage to increase their exposure to highly volatile digital assets.[31] Current reporting requirements provide little visibility into financial-institutional exposure to digital assets, leaving regulators and investors alike to rely largely on self-reported, ad-hoc disclosures. Without sufficient data, financial institutions may be able to build up significant exposures without the appropriate risk management or liquidity measures. In turn, in the event of a rapid price decline of certain digital assets, such as the "crypto winter" experienced in 2022, one or more institutions may face some combination of margin calls, run risk, fire-sale risk, and cybersecurity risk that could spread to counterparties, both in digital-asset markets and in traditional markets such as funding markets.

Fifth, the MSB Call Report data coverage is currently insufficient to capture the entire market of digital-asset intermediaries. The MSB Call Report captures less than 4% of total transaction volume in digital-asset markets, with the rest presumably conducted as nonmoney transmission activities and by companies with offshore operations or international subsidiaries. Given the borderless nature of virtual currencies, an adequate regulatory framework would need to ensure regulators have visibility into all parts of the market via significant international cooperation.

Finally, it is important to note that data on decentralized platforms is limited by design. While we have laid out gaps in the data needed to accurately assess financial-stability risks related to centralized platforms, the existence of intermediaries is contrary to the very essence of decentralized finance, and it is often difficult to identify which parties are involved in trading and lending activities. It may also be the case that any existing regulatory frameworks may not be suitable to regulate these entities.

5. Conclusion

This brief has highlighted the rapidly growing and complex landscape of digital-asset platforms and other intermediaries. These entities play an important role in providing investors access to virtual currencies, show a strong tendency toward market concentration, and share common features with traditional financial intermediation. Because regulations applicable to the money service business portions of digital-asset platforms cover only a fraction of such platforms' activities, platform services that may resemble those of broker-dealers, custodians, and even deposit-taking institutions raise the question of whether such platforms' activities are appropriately ring-fenced and their risks are adequately managed.

Given the lack of a comprehensive regulatory framework, significant data gaps make it difficult to assess the risks digital-asset intermediaries may pose to financial stability. Vulnerabilities may stem from the degree and nature of leverage enabled by the least-regulated entities, asset valuation pressures resulting from fraud and market manipulation, and weaknesses in the financial strength of these entities that have significant interconnections with traditional financial markets. In the absence of more comprehensive oversight, these vulnerabilities will continue to grow in tandem with the increasing size and scope of digital-asset markets. As more investors begin to trade and hold digital assets through these platforms, policymakers must begin to address the regulatory framework governing such platforms' oversight. Left unaddressed, these intermediaries may pose significant risks.

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