No Free Lunch: the liquidity tradeoffs resulting from increased capital adequacy and deposit coverage

For reasons that are well understood, capital adequacy and deposit coverage regulations applied to banks and broker dealers were substantially increased in the wake of the global financial crisis. The benefits of these policies include less taxpayer and depositor risk during recessions, less pressure on the Federal Reserve to finance private sector positions with its balance sheet, and (possibly) additional private sector discipline regarding risk-taking financed by leverage.

However, there are tradeoffs involved within increased capitalization and deposit coverage, namely a reduction in the ability of banks and broker-dealers to provide financing and intermediate markets when recessions and other market shocks arise. The end result: much larger price movements can take place given reduced liquidity, resulting in larger losses for institutional and individual investors, greater capital markets volatility, systemically higher costs of capital and in the longer term, an erosion of the status the US currently holds as the world's deepest and most liquid capital market, a key pillar of the dollar as the world's reserve currency. The dislocations in Treasury markets during the early stages of COVID are an example of what we may expect more of in the years ahead if the tradeoff status quo remains unchanged.

For many banks, the increase in the Fed's balance sheet indirectly created binding constraints due to the Supplementary Leverage Ratio, since the increase in the Fed's balance sheet eventually makes its way onto bank balance sheets as well. This SLR test is designed to measure capital adequacy including both on balance sheet and off balance sheet positions. But since it does not risk-weight either asset category, the end result can be a highly constraining limitation, particular on holding and financing low risk liquid assets, during the kind of market corrections that may occur as monetary and fiscal stimulus is withdrawn.

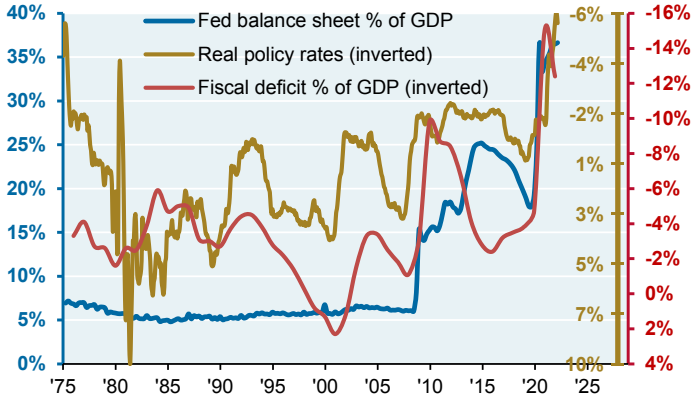
This paper contains the following sections:

1. The pending market shocks associated with the end of the largest stimulus experiment in history
2. The observed declines in liquidity and market depth in Treasuries, corporate bonds and equities
3. Preview of things to come: the 2020 COVID shock to Treasury markets
4. A pro forma approach to understanding capital vs liquidity tradeoffs
5. Why banks and broker dealers may sit on the sidelines in the next market correction
6. How might the SLR and bank specific GSIB Capital Surcharge change?
7. Supplementary liquidity and market depth exhibits
8. Time capsule: WWII and regulatory flexibility

[1] The pending market shocks associated with the end of the largest stimulus experiment in history

The combination of Fed balance sheet expansion, declining real policy rates, fiscal deficit expansion and money supply growth have no precedent in modern post-war financial markets. All of these stimulus pillars are now gradually being dismantled due to pressures from rising wage and price inflation. This sets in motion a market cycle that is likely to involve continued increases in risk free rates, credit spreads and other capital costs. It also is likely to be accompanied by substantial portfolio realignments by institutional and individual investors, some of whom are either highly leveraged and/or liquidity dependent.

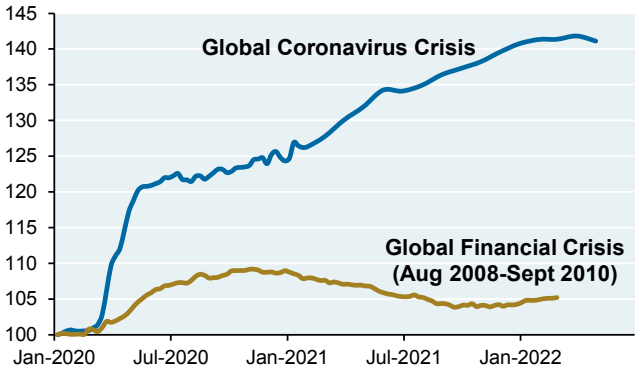
The end of the Gargantua era



Source: Fed Board, BEA, OMB, BLS, Shiller, JPMAM. May 2022

Faster growth in the US money supply this time around

M2 money supply + institutional money market fund balances, index



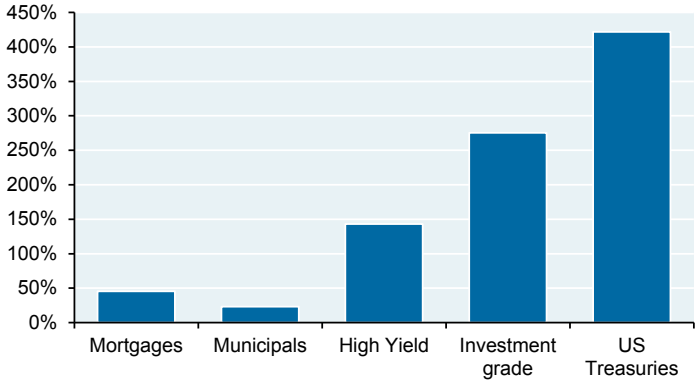
Source: St Louis Fed, ICI, J.P. Morgan Asset Management. Apr 2022.

[2] Observed declines in liquidity and market depth

The need for liquidity may be intense over the next 18-24 months given the increase in the size of fixed income markets and the decline in liquidity. The next two charts illustrate why: the public and private sector debt stock has expanded sharply since 2006 (in part a consequence of the Fed's monetary policies) while a simplified measure of liquidity (trading volumes as a % of the debt stock) have plummeted.

Debt stock expanding...

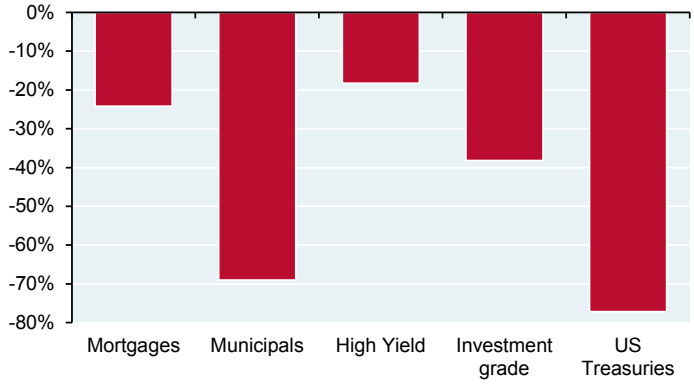
Change in market size 2006-2021 (debt stock)



Source: SIFMA, Finra Factbook, Bloomberg, JPMAM. 2022.

...while liquidity shrinks

Decline in turnover 2006-2021 (trading volume/debt stock)



Source: SIFMA, Finra Factbook, Bloomberg, JPMAM. 2022.

This simplified liquidity measure is just the tip of the iceberg. More detailed assessments of liquidity and market depth show erosion across all markets, and to an astonishing degree (see Supplementary exhibits for charts on each). Each of the following is at or close to all-time lows, and substantially below levels prevailing before the onset of new capital adequacy and deposit coverage ratios.

Treasury markets

- Share of Treasuries financed or held by dealers (Ex 1 and Ex 2)
- Treasury market depth, version 1 (price impact of a $100 mm trade on 10 year Treasury prices, Ex 4)
- Treasury market depth, version 2 (average of top 3 bid and ask sizes at top of order stack for 5, 10 and 30 year Treasuries, Ex 5 and Ex 6)
- Treasury futures market depth, (average of top 3 bid and ask sizes at top of order stack for 5, 10 and 20 year Treasury futures, Ex 7 and Ex 8)

Corporate bond markets

- Days required to trade entire market (Ex 9)
- Average trade size in high grade and high yield bonds (Ex 10)
- Investment grade bond turnover (Ex 11)
- Primary dealer positions held in high grade and high yield bonds (Ex 12)
- Share of corporate bonds held by dealers (Ex 13)
- Dealer capital in overnight corporate bond market [a measure of capital committed vs trading] (Ex 14)
- Outstanding amount of single-name credit default swap contracts (Ex 15)

Equity markets

- S&P 500 futures market depth, median bid-ask size (Ex 16)
- S&P 500 futures market depth, average number of contracts on bid-ask (Ex 17)
- Number of days per year with VIX increases of more than 5% (Ex 18)

The chart below shows percentiles for the liquidity and market depth measures described above.

Almost all liquidity and market depth measures in the bottom quintile vs history
Recent value as a percentile of historical data

Source: JP Morgan Asset Management. 2022.

[3] Preview of things to come: the 2020 COVID shock to Treasury markets

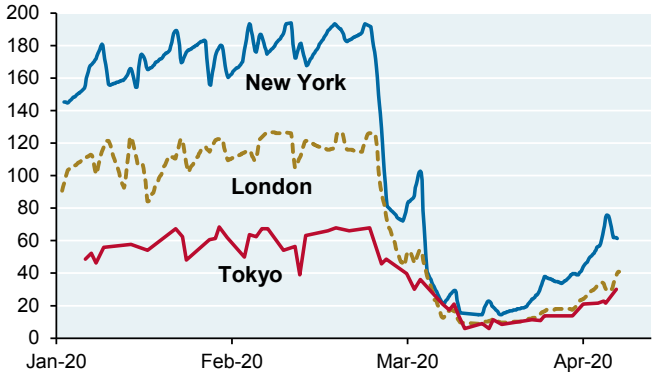
The shock to Treasury markets when COVID hit in 2020 may be a warning of things to come, and is in part an example of unintended consequences from bank regulations. The sequence of events can be laid out as follows:

- COVID created heightened investor demand for cash and increased liquidity
- The high frequency traders which had dominated Treasury market making disappeared (as they often do), leading to a collapse in market depth and greater reliance on traditional broker dealers. However, these broker dealers had to contend with capital, leverage and liquidity requirements that were all spiraling higher (see chart, top of page 6) which constrained their ability to provide all the support the market needed
- The cash-futures Treasury basis, an important measure of market efficiency and liquidity, widened out substantially (more on that on the following page)
- Rising volatility in the long bond futures market led to a large increase in CME margin requirements, putting further pressure on the system

High frequency trading share of Treasury market
Percent of market depth

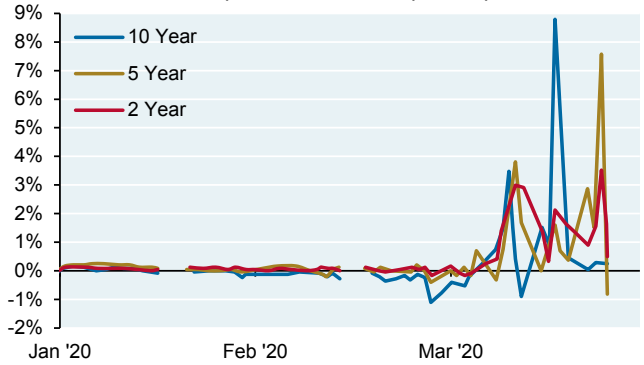
Source: BrokerTec, JP Morgan Fixed Income Strategy. June 9, 2022.

10 year Treasury market depth
Order book quantity, millions



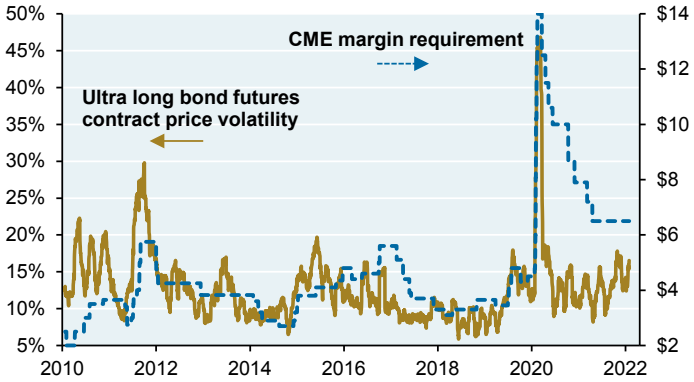
Source: *"Still the World's Safe Haven?"*, Duffie (Stanford). May 2020.

Cash-futures Treasury basis
Percent, one-month repo rate - futures implied repo rate



Source: *"Leverage and Marigin Spirals in Fixed Income Markets During the COVID-19 Crisis"*, Schrimpf (BIS). June 2022.

COVID spike in Treasury futures margin requirement
%, rolling 30 day annual volatility — Thousand US$ per contract



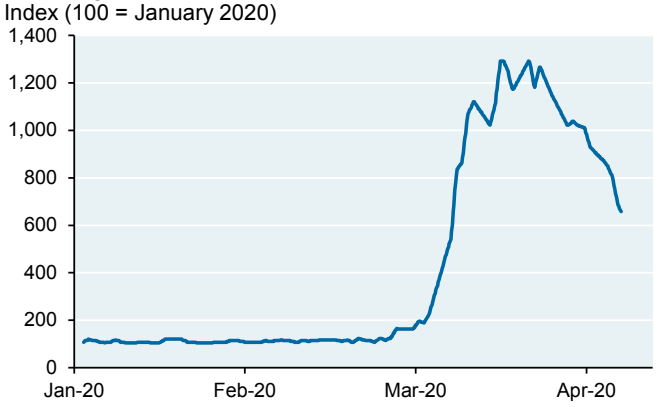
Source: CME, JPMAM. March 10, 2022.

- The net result for market participants: a surge in Treasury bid-offer spreads
- All of these liquidity and market depth measures did not normalize until the Fed intervened with a $1 trillion balance sheet expansion, and until the Fed temporarily relaxed constraints associated with the Supplementary Leverage Ratio

For the obvious reasons, the capacity of the Fed to intervene in markets may be reduced in the years ahead given wage/price pressures. Without Fed intervention and bank intermediation, these dislocations could be more frequent and longer-lasting, and spread to other asset classes. And to the extent that market participants now expect the Fed to intervene, dysfunction may be severe if the expected interventions are not forthcoming.

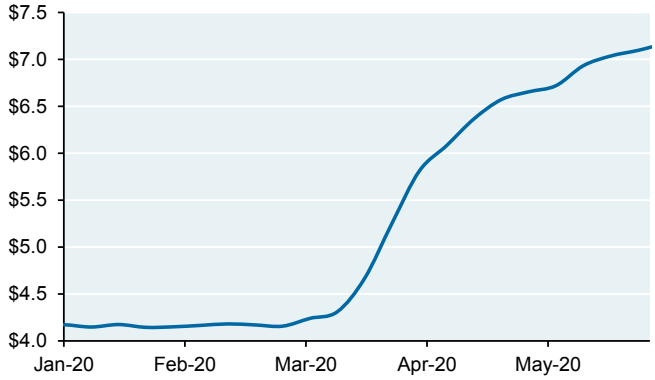
Another risk: fiscal and monetary withdrawal and tight liquidity conditions are **coinciding with an unrelated transition from Libor swaps to SOFR swaps**, a capital efficient customizable Treasury with minimal regulatory costs. Traditional cash Treasury securities might migrate even further to off balance sheet warehousing through levered channels and utilization of sponsored repo, which could exacerbate liquidity, market function and intermediation challenges during periods of stress.

Treasury bid offer spreads
Index (100 = January 2020)



Source: *"Still the World's Safe Haven?"*, Duffie (Stanford). May 2020.

Fed balance sheet
US$ trillions



Source: Federal Reserve Board. 2020.

The cash-futures Treasury basis: an example of unintended regulatory consequences

This episode is in part an example of how regulations can create unintended consequences. Since the SLR denominator does not risk-weight on and off balance sheets assets, banks have an incentive to reduce low-risk, balance-sheet-intensive activities that drive this ratio lower. In other words, providing liquidity to the Treasury market through market-making and repo financing is a low-risk, balance-sheet-intensive activity that may be unprofitable for many banks.

Furthermore: given scarce balance sheet capacity, some borrowers opted to secure capacity from banks during "good" times by putting on large positions in low-risk trades that could be unwound and converted into other borrowings at a later date. The Treasury cash-futures basis, which had historically exhibited extremely low volatility, seemed like a good option to many borrowers. Long-short positions on this basis reached almost $400 billion by late 2019.

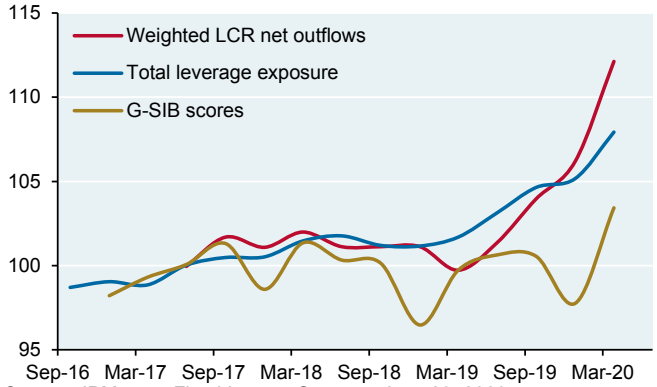
When the COVID crisis hit and liquidity declined, futures positions began to get more expensive relative to cash positions (since the latter have to be funded). The basis between the two widened, margin requirements increased and given the amounts involved that had to be unwound, Treasury market disruptions worsened and spread to short term credit markets as well until the Fed stepped in. You can read more about the whole episode here since it's highly technical[1]. **The bottom line is that it's an example of how regulations can create lender and borrower behaviors that create a new set of problems**.

[1] JP Morgan North America Fixed Income Strategy, Joshua Younger, June 29, 2020

One final look at the COVID Treasury shock: leverage, capital and liquidity constraints all tightened on Global Systemically Important Banks (GSIBs) during Q1 2020, limiting their ability to intermediate markets. To be clear, the 2020 problems in the Treasury markets were not the first sign of trouble; others preceded them which date back to regulatory implementation in 2013 (see box).

COVID impact on bank ratios

Index (100 = Q2 2017)



Source: JPMorgan Fixed Income Strategy. June 29, 2020.

Other Treasury/swap market mishaps since SLR/LCR regulatory implementation began in 2013

- June 2014: large Treasury repo fails
- October 2014: Treasury Market Flash Crash
- 2015: unprecedented Swap Spread inversion
- 2016/2017: year-end cross-currency dollar funding stress
- Sept 2019: Treasury repo spike (see below)
- February 2021: 7-year Treasury auction prices wide to curve ahead of SLR exemption expiry
- Q4 2021: hedge fund deleveraging 20-year Treasuries caused spike in volatility and bid ask spreads

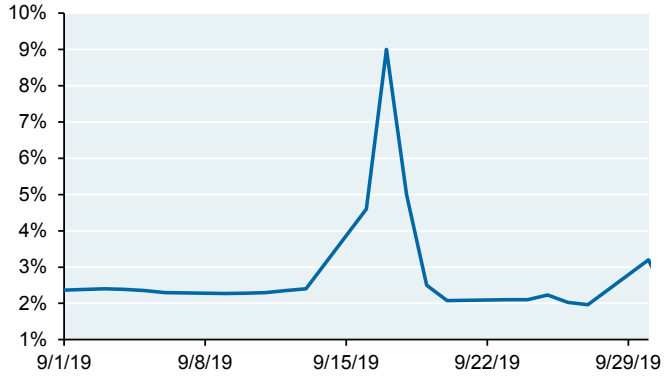
The 2019 Treasury repo event: an example of how regulations can adapt

Even before COVID, capital and deposit coverage rules were affecting market liquidity. In September 2019, the confluence of corporate tax payments and Treasury settlement resulted in a large shortfall in Treasury financing. Repo rates, which had been around 2%, shot up to 9%. At the time, banks had ~$800 billion in excess reserve balances held at the Fed but chose not to deploy them. The Fed acknowledged to Congress that regulatory issues may be involved, and a subsequent survey by the Bank Policy Institute[2] did as well. Respondents indicated that supervisory and regulatory issues were important factors in maintaining their reserve demand.

One topic that came up repeatedly: "Recovery and Resolution" planning, which refers to how banks comply with "living will" requirements in the event of failure. While many regulations treat reserves and Treasuries similarly, many banks believed that regulators prefer reserves since they might not be able to seamlessly liquidate large Treasury positions to keep critical functions operating during resolution without reliance on the Discount Window or Standing Repo Facility. The Fed has issued a clarification[3] noting that in a living will situation, both Fed sources could be used for a period of days if necessary, reducing the need for banks to prioritize reserves over other riskless securities. As a result, the risk of a spike in repo rates for the reasons that occurred in 2019 are more remote, and is an example of how rules can adapt for the benefit of market safety and liquidity.

2019 repo spike

%, overnight repo rate (end of day)



Source: Federal Reserve. 2022.

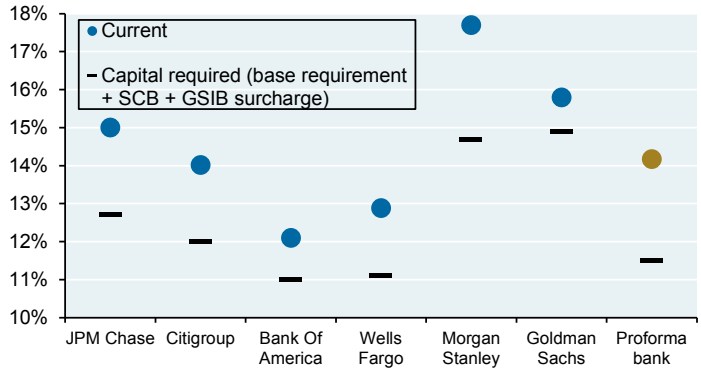
[2] "*Have banking regulations reduced market liquidity?*", Bank Policy Institute, June 9, 2020

[3] "*Living wills and resolution plans: Frequently Asked Questions*", Federal Reserve System, Feb 24, 2020

[4] A pro forma approach to understanding capital vs liquidity tradeoffs

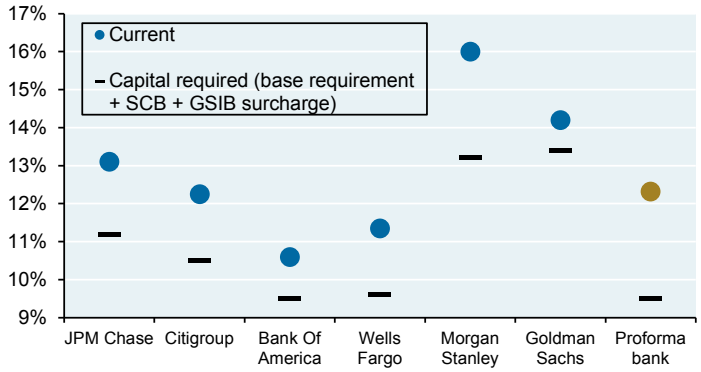
To illustrate the tradeoffs discussed above, we created a pro forma bank whose asset, liability, equity, risk, liquidity and leverage characteristics are similar to the industry. The first three charts show Tier 1 capital and common equity ratios, and the risk weighted share of total assets. The fourth and fifth charts show the Supplemental Leverage Ratio and the magnitude of off-balance sheet assets which affect the SLR's denominator.

Tier 1 Capital Ratio
%, Total equity / risk weighted assets



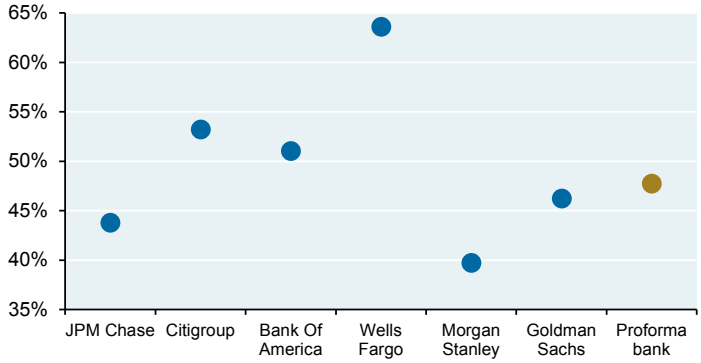
Source: Bloomberg, JPMAM. June 10, 2022.

Tier 1 Common Equity Ratio
%, Total common equity / risk weighted assets



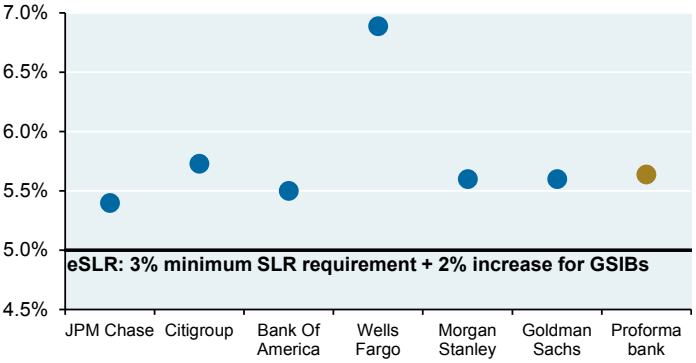
Source: Bloomberg, JPMAM. June 10, 2022.

Average assets risk weight
%, Risk weighted assets / total on balance sheet assets



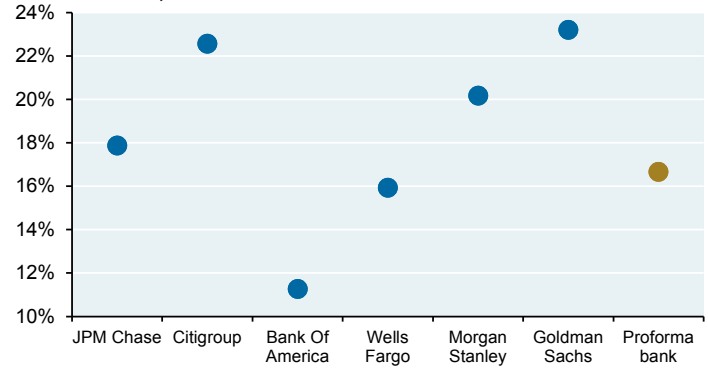
Source: Bloomberg, JPMAM. June 10, 2022.

Supplementary Leverage Ratio
%, Total equity / on and off balance sheet assets



Source: Bloomberg, JPMAM. June 10, 2022.

Off balance sheet assets as a share of on and off balance sheet assets, %

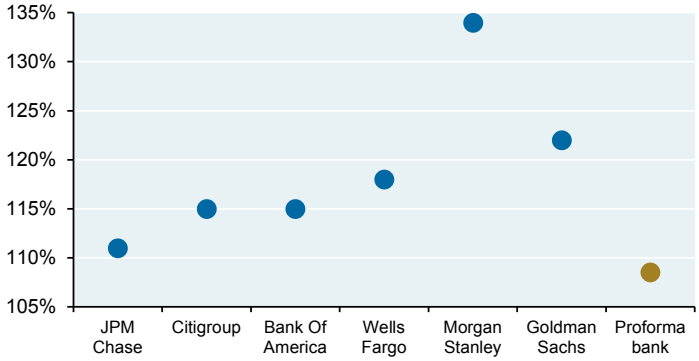


Source: Bloomberg, JPMAM. June 10, 2022.

The next two charts show the Liquidity Coverage Ratio, and each bank's deposit outflow coverage assumption which affects how the LCR is computed. The last two charts show the loan to deposit ratio and the ratio of high quality liquid assets as a % of total assets.

Liquidity Coverage Ratio

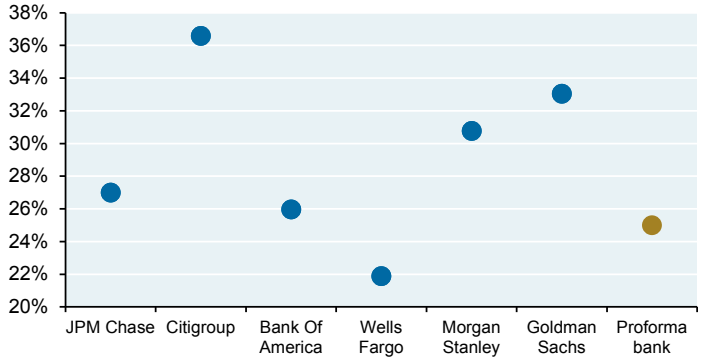
%, High Quality Liquid Assets / deposits times assumed outflows



Source: Bloomberg, JPMAM. June 10, 2022.

Assumed outflow as a percent of total deposits

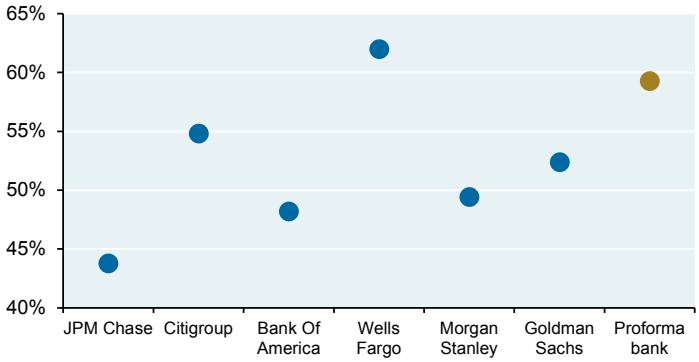
%



Source: Bloomberg, JPMAM. June 10, 2022.

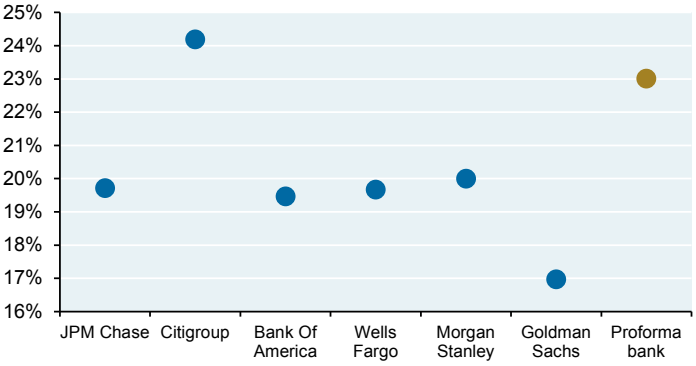
Loan to deposit ratio

%



Source: Bloomberg, JPMAM. June 10, 2022.

High Quality Liquid Assets share of on balance sheet assets, %



Source: Bloomberg, JPMAM. June 10, 2022.

Other assumptions used for the pro forma bank:

- Reverse repo risk weight: 5%
- Loan risk weight: 80%
- Non HQLA securities risk weight: 40%
- Agency risk weight: 20%
- Preferred stock as a share of total common equity: 15%
- Tier 1 Capital Ratio requirement: 6% base requirement + 2.5% stress capital buffer + 3% GSIB surcharge
- Tier 1 Common Equity Ratio requirement: 4.5% base requirement + 2.5% stress capital buffer + 3% GSIB surcharge

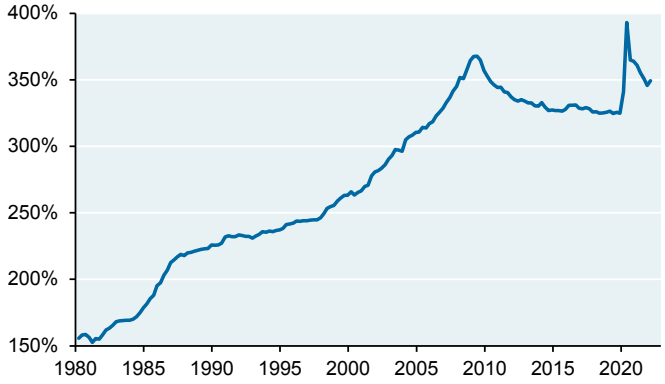
We will now examine how a market shock might affect our pro forma bank.

[5] Why banks and broker dealers may sit on the sidelines in the next market correction

Let's assume a market dislocation resulting from the following:

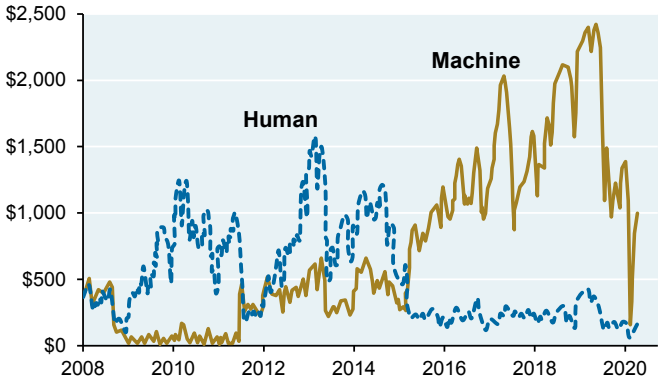
- withdrawal of historically large monetary and fiscal stimulus
- spike in long term Treasury yields, similar to the episode that took place from September 1993 to December 1994 when both policy rates and the 10 year Treasury rose by ~2.5%. Note that the stock of public and private sector debt relative to GDP is much higher today, creating greater risks
- High frequency traders evaporate, as they did in 2020
- Limited real money and commercial bank demand, most Treasury buyers are hedge funds relying on repo
- FX reserve managers seek to diversify out of the US$
- Contrary to expectations, inflation remains high and prompts the Fed to keep raising rates

Outstanding private and public debt to GDP



Source: Federal Reserve Board, JPMAM. Q1 2022.

Human vs high-frequency liquidity providers



Source: JPMorgan Fixed Income Strategy. May 12, 2022.

The assumed dislocation results in the following which affects the pro-forma bank:

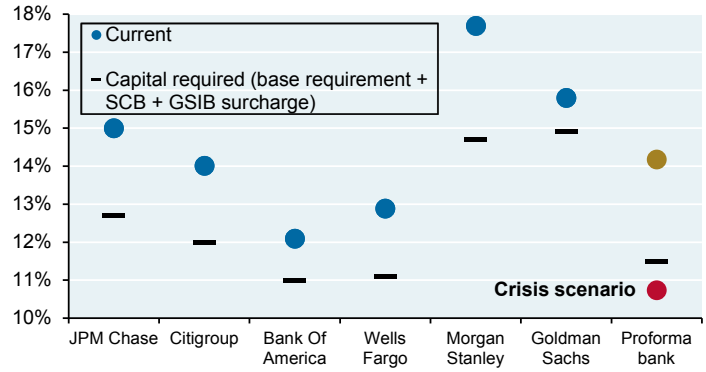
- The bank takes loan loss reserves against its loan portfolio, and recognizes mark to market losses on its HQLA and non-HQLA securities portfolios, both of which reduce capital
- Holders of long duration agencies and corporate bonds seek to exit and require liquidity, increasing the pro-forma banks non HQLA securities portfolio
- A "train wreck" someplace in the bond markets result in the kind of liquidity problems that hit in the Treasury market in March and April 2020. However, this time, the Fed is not available to respond via direct intervention. We assume a large increase in demand for reverse repo from the pro forma bank by leveraged buyers of Treasuries, Agencies and other high quality long duration paper
- The pro forma bank finances its increase in securities and reverse repo by drawing down on its cash, a modest 10% increase in deposits occurring at a time of stress and new financing supplied by the Federal Reserve (intentionally supplied to the market, transmitted by broker dealers)

In our scenario, the aggregate demand for the pro forma bank's balance sheet would increase its assets by 33%. To be clear, it is impossible to outline all potential market stress scenarios; this is just one of them. Others may differ with respect to changes in deposits, non-HQLA securities and liquidity needs, repo demand, etc.

The results:

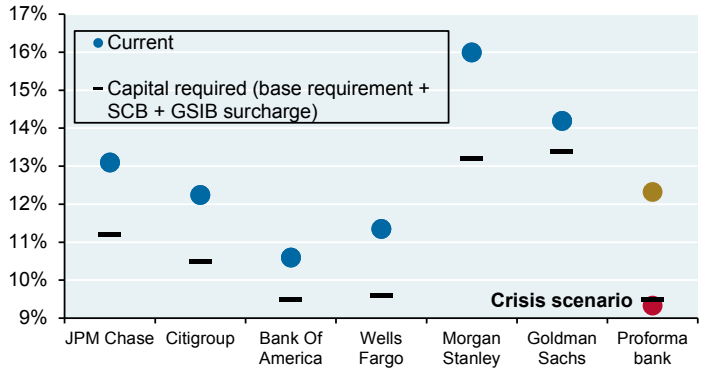
- *No problems with bank liquidity*. In our particular scenario, increased agency holdings provide enough assumed immediate liquidity to handle higher HQLA needs for larger deposit base
- *Significant drop in capital ratios*. The bank's non-HQLA securities purchases combined with writedowns on existing assets result in an erosion of its capital buffer vs the industry and below its Tier 1 Minimum, leaving it poorly positioned to handle any further increase in loan loss reserves and other demands for capital
- *Untenable decline in the Supplementary Leverage Ratio*. This is the most binding of constraints, since what was mostly a repo rescue operation by pro forma bank involving low risk collateralized lending ends up generating a substantial equity shortfall vs industry standards
- *Pullback in core market making activities*. The challenges posed by weakening capital and leverage ratios are likely to result in a pullback of capital committed by pro forma bank to market making, adding further pressure on liquidity, bid-ask spreads and market fragmentation. In other words, changing capital ratios are not just reporting items, they affect the day to day activities of GSIB banks with real world consequences

Tier 1 Capital Ratio
%, Total equity / risk weighted assets



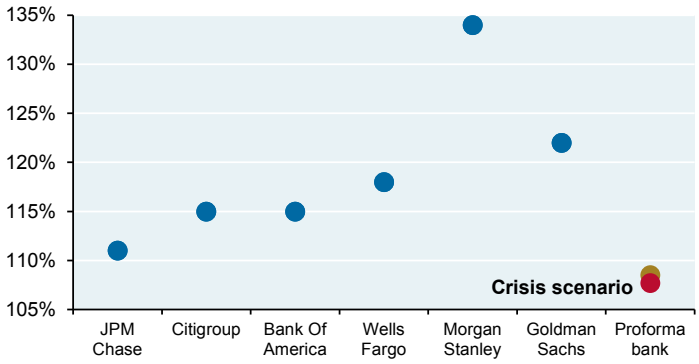
Source: Bloomberg, JPMAM. June 10, 2022.

Tier 1 Common Equity Ratio
%, Total common equity / risk weighted assets



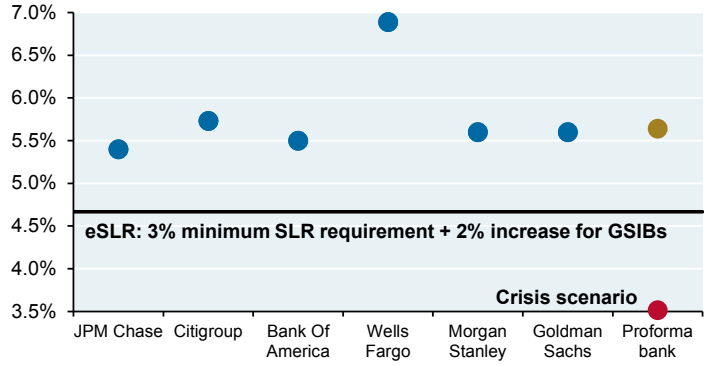
Source: Bloomberg, JPMAM. June 10, 2022.

Liquidity Coverage Ratio
%, High Quality Liquid Assets / deposits times assumed outflows



Source: Bloomberg, JPMAM. June 10, 2022.

Supplementary Leverage Ratio
%, Total equity / on and off balance sheet assets



Source: Bloomberg, JPMAM. June 10, 2022.

[6] How might the SLR and bank specific GSIB capital surcharge change?

#1: Permanently exclude reserve balances from the SLR denominator

This would mitigate the pro-cyclicality of the SLR since the Fed often increases reserves during recessions and other crisis episodes. If reserve balances for pro forma bank were similar to levels held by WFC/BAC/C, its crisis SLR would increase from 3.5% to 3.8%-4.2%, a modest increase that would still leave pro forma bank well below the 5% threshold. In less severe outcomes than our market stress scenario, exclusion of reserve assets could close more of the gap.

To be clear, exclusion of reserve balances from the SLR measure would not be Basel compliant unless the SLR threshold were raised in tandem, an approach which has been adopted in Europe. Exclusion of reserve balances on its own would free up capital for banks; the alternative approach is to remove reserve balances from the SLR in a crisis, but increase the required SLR at the same time so as to encourage allocation to lower risk assets without creating a capital windfall for the bank.

#2: Introduce counter-cyclicality into SLR calculations

Other countries have already replaced static capital buffers with counter-cyclical ones which reduce minimum requirements in the event of stress. Of 15 countries that activated counter-cyclical requirements before COVID, all but one wholly or partially activated it as market turmoil intensified. However, in Europe this approach only affects risk based capital ratios (Tier 1 common equity for example) and not leverage ratios like the SLR.

#3: Adjust SLR and bank-specific GSIB surcharge calculations to reflect critical nature of certain lending and investing functions

There is a large divide between the concept of risk weighting and no risk weighting. A compromise of sorts could be implemented in which certain critical lending functions such as reverse repo against Treasury and Agency collateral are treated differently so as to avoid discouraging banks from providing them, or excluded from these calculations altogether. In addition, unencumbered Treasury investments could also be excluded.

#4: Eliminate cliff effects of GSIB thresholds

Banks have an incentive to hold down their GSIB risk scores and associated capital surcharges. At the margin, these incentives are magnified when a bank approaches one of the thresholds at which a higher GSIB risk score lead to an increase in its capital surcharge, even if the bank crosses into the next category by a small amount. The methodology could be revised to allow for a gradual increase in capital requirements to avoid cliff effects.

[7] Supplementary liquidity and market depth charts

Treasury market liquidity, market depth and dealer positions

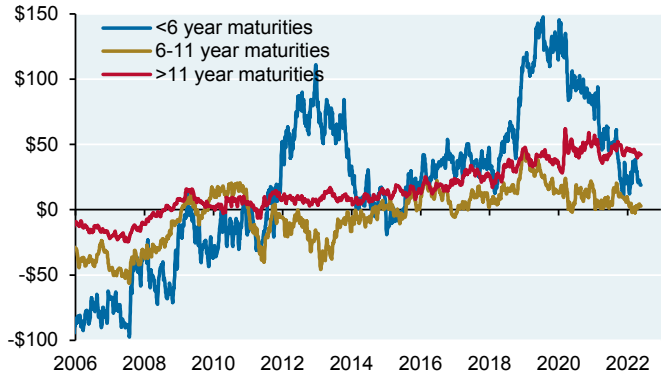
Exhibit 1
Share of marketable Treasuries financed by dealers
Percent

Source: *"Still the World's Safe Haven?"*, Duffie (Stanford). May 2020.

Exhibit 2
Share of Treasuries held by dealers
Percent

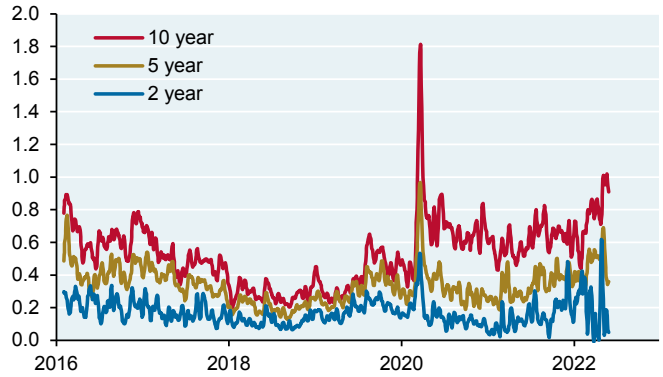
Source: *"Enhancing Liquidity of the US Treasury Market Under Stress"*, Liang (Brookings) and Parkinson (Bank Policy Institute). Dec 2020.

Exhibit 3
Dealer positions (not scaled by market size)
US$, billions



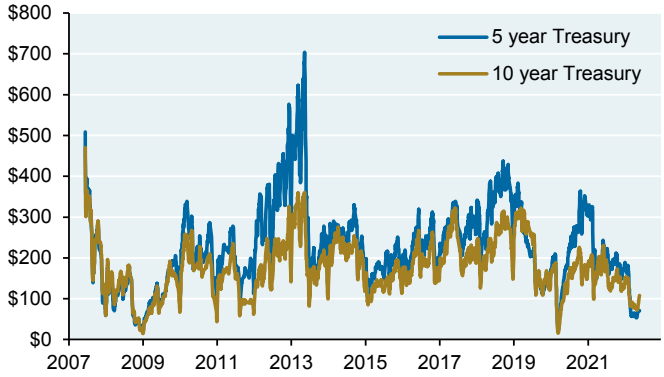
Source: JP Morgan Securities. June 1, 2022. 7 day average.

Exhibit 4
Treasury market depth
Price impact of $100 million trade, 32nds



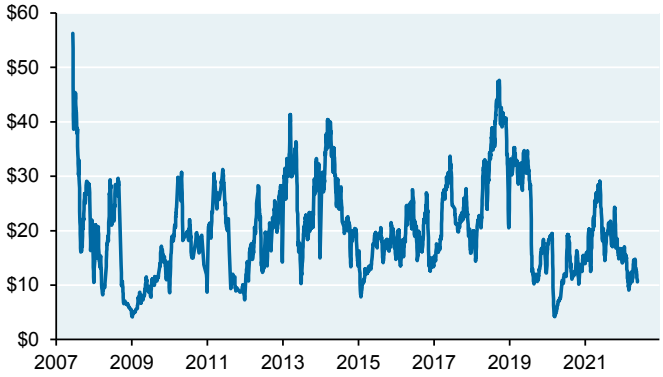
Source: JP Morgan Securities. May 31, 2022. 7 day average.

Exhibit 5
Treasury market depth: 5 year and 10 year Treasury
Million US$, average of top 3 bid and ask sizes at top of order stack



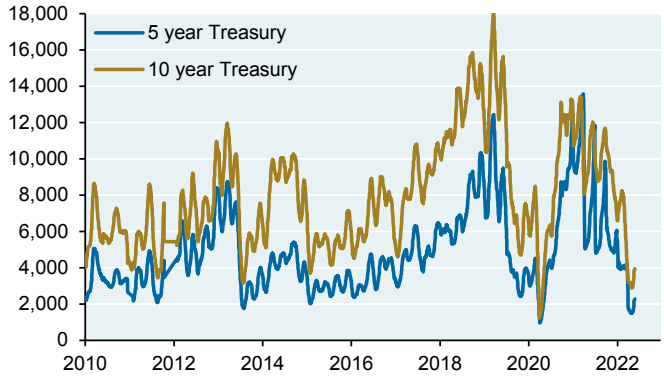
Source: JP Morgan Securities. June 1, 2022. 7 day average.

Exhibit 6
Treasury market depth: 30 year Treasury
Million US$, average of top 3 bid and ask sizes at top of order stack



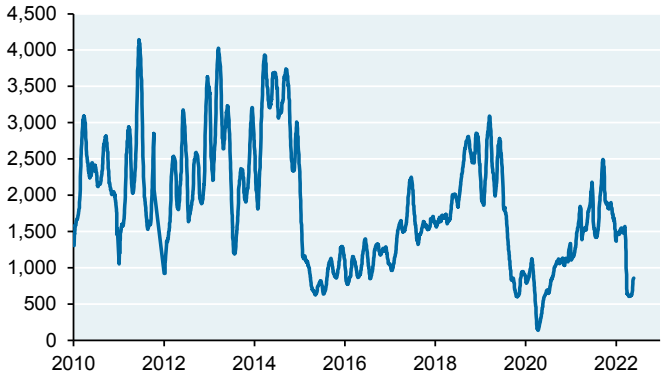
Source: JP Morgan Securities. June 1, 2022. 7 day average.

Exhibit 7
Treasury futures market depth: 5 year and 10 year
# of contracts, average of top 3 bid and ask sizes at top of order stack



Source: JP Morgan Securities. June 1, 2022. 30 day average.

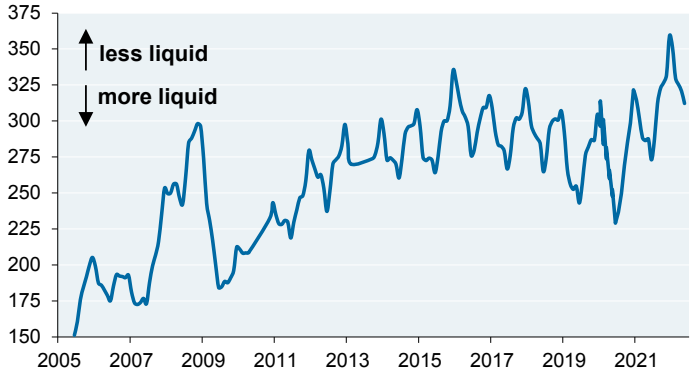
Exhibit 8
Treasury futures market depth: 20 year
# of contracts, average of top 3 bid and ask sizes at top of order stack



Source: JP Morgan Securities. June 1, 2022. 30 day average.

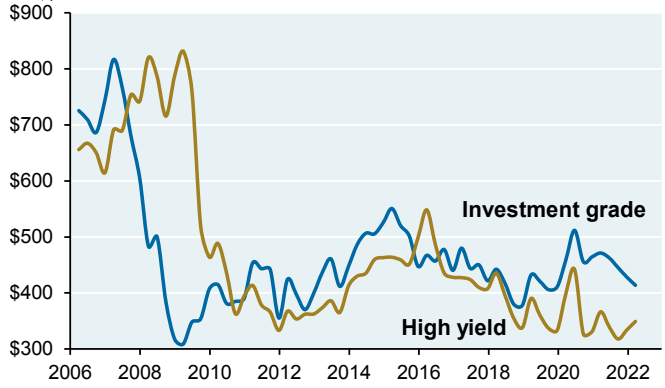
Corporate bond market liquidity

Exhibit 9
Days required to trade entire market
Days, 6 month average



Source: Bloomberg, JPMAM. May 31, 2022.

Exhibit 10
Average trade size in US corporate bond trading
US$, thousands

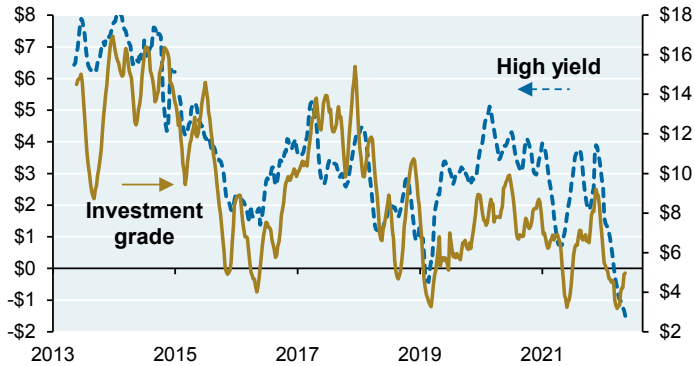


Source: FINRA, Bloomberg, JPMAM. Q1 2022.

Exhibit 11
Investment grade bond turnover
Percent, annual trading volume / total debt outstanding

Source: TRACE. June 2022.

Exhibit 12
Primary dealer positions in high yield & investment grade bonds, US$, billions, 8-week average (both axes)



Source: Federal Reserve Board of New York, JPMAM. May 18, 2022.

Exhibit 13

Share of corporate bonds held by dealers

Percent

Source: *"Enhancing Liquidity of the US Treasury Market Under Stress"*, Liang (Brookings) and Parkinson (Bank Policy Institute). Dec 2020.

Exhibit 14

Dealer capital in corporate bond market

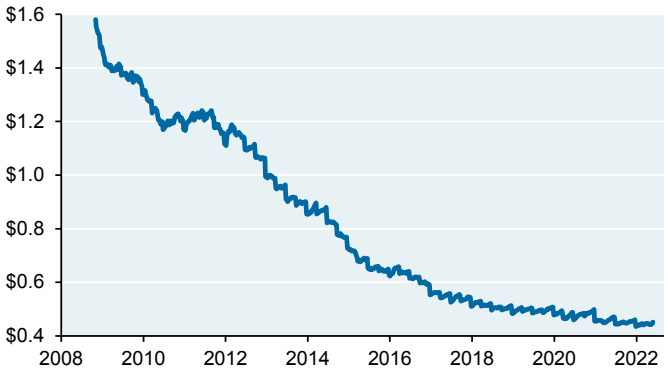
Percent, overnight dealer holdings / daily trading volume

Source: *"A Survey of the Microstructure of Fixed-Income Markets"*, Bessembinder (ASU). June 2022.

Exhibit 15

Net notional single-name CDS outstanding

US$, trillions



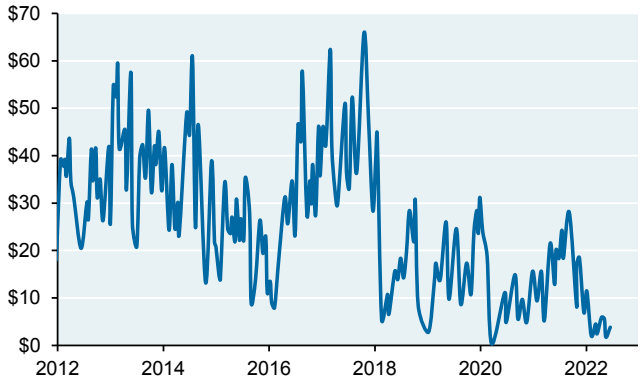
Source: J.P. Morgan Securities LLC. May 27, 2022.

Equity market liquidity

Exhibit 16

S&P 500 E-mini futures market depth

US$, Median bid-ask size, millions, 10 day average

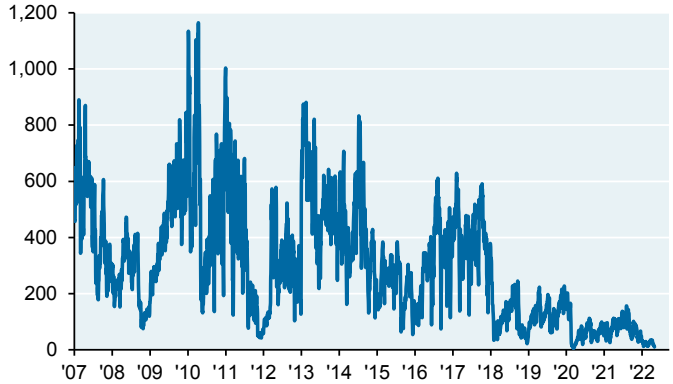


Source: GS. June 2022.

Exhibit 17

S&P 500 E-Mini futures market depth

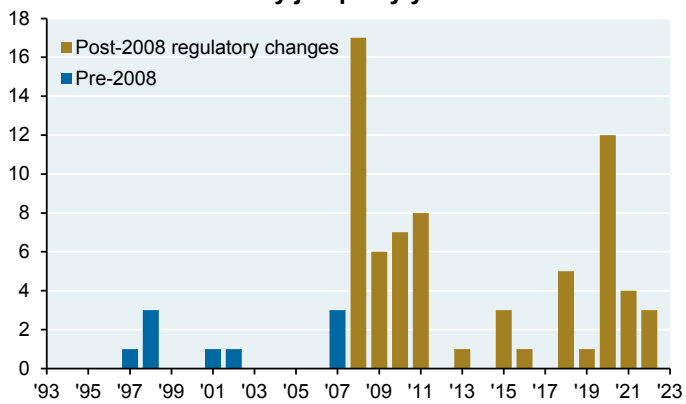
Average number of contracts on the bid-ask, 3-day moving average



Source: JPMorgan Global Markets Strategy. May 12, 2022.

Exhibit 18

VIX: Number of 5% daily jumps by year



Source: Bloomberg, JPMAM. June 8, 2022.

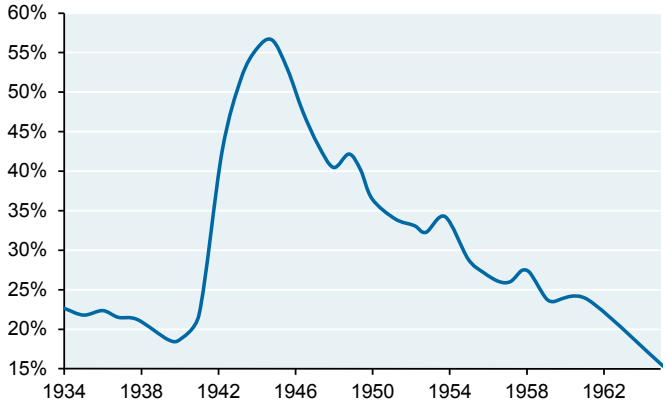
[8] Time capsule: WWII and regulatory flexibility

The regulatory approach to financing war expenditures during the 1940's is an interesting case study in regulatory flexibility[4]. Prior to the war, commercial banks held around 20% of the Federal debt. Financing needs surged, and while much is made of the Fed's intervention at the time, it only bought 10% - 15% of Treasury issuance at the time. The vast majority was purchased by the private sector and specifically commercial banks, which ended up owning more than 50% of the Federal debt by 1945. The assets of the commercial banks doubled in absolute terms during this time period.

This initially created a challenge for bank regulators: how to encourage banks to finance the war effort while their capital to asset ratios were plunging? The capital to asset ratios had just been instituted a decade earlier after the Great Depression, a period during which many banks failed. Any regulatory changes would need to be considered carefully given how recent the bank failure wave had been. To avoid a disorderly reduction in assets that could harm the war effort, the Federal Reserve revised its bank capital to asset requirements: a new ratio was created at a higher level of 20%, but which excluded cash and Treasuries.

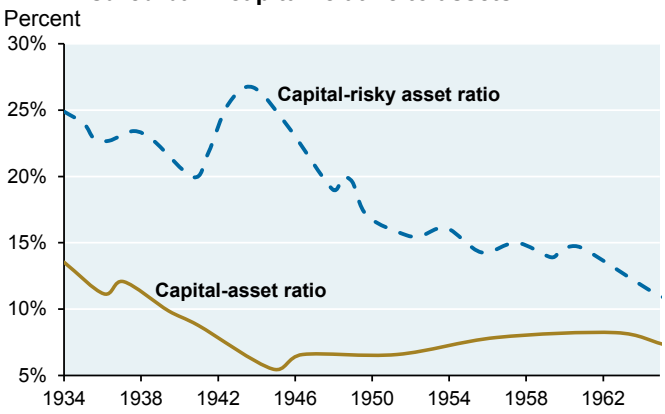
After the war, leverage ratios did not recover as quickly as debt-to-GDP since the economic recovery of the 1950s and 1960s increased demand for credit. The Federal Reserve responded by assigning capital requirements to specific assets on the basis of perceived risk, and added liquidity requirements that incorporated the liability side of the balance sheet. These rules were designed to maintain the stability of the banking system without restricting its ability to facilitate the recovery. Notably, they did not return to total leverage-based constraints on banks given the disincentives it creates for banks in a crisis.

Share of Treasury securities held by FDIC insured banks



Source: Yale, JP Morgan Fixed Income Strategy. 2020.

FDIC insured bank capital relative to assets



Source: Yale, JP Morgan Fixed Income Strategy. 2020.

[4] "*War finance and bank leverage: lessons from history*", Yale School of Management, Josh Younger and Antoine Martin, Sep 2020

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