GROUP WORK PROJECT # _2_
GROUP NUMBER: _5547_

MScFE 600: FINANCIAL DATA

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Statement of integrity: By typing the names of all group members in the text boxes below, you confirm that the assignment submitted is original work produced by the group (excluding any non-contributing members identified with an "X" above).	
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Use the box below to explain any attempts to reach out to a non-contributing member. Type (N/A) if all members contributed. **Note:** You may be required to provide proof of your outreach to non-contributing members upon request.

This GWP is a submission by group 5547 including all members: Zahara Miriam, Pragati Thakur and Krishna Vamsi.

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We have jointly responded to each requirement within this assignment.

Step 1: Magnifying Risks

Scenario	Leverage Challenges	Non-linearities Challenges
Money at a fixed rate for an unsecured purchase (e.g. credit card) for an individual	**Lack of collateral**: Credit card loans, being unsecured, lack collateral, which intensifies the potential risk of loss to the lender. **Credit risk amplification**: Amplified credit risk emerges from the fact that unsecured loans carry a heightened default risk, further exacerbated when customers take on excessive debt relative to their assets. **Fixed interest rate risks**: If market rates decline, a fixed interest rate can turn disadvantageous, potentially elevating the default risk as borrowers may seek more affordable credit alternatives.	**Credit Utilization Impact on Credit Score**: Utilizing a substantial amount of available credit can lead to a disproportionate decrease in an individual's credit score, which in turn, could impact the cost of future borrowing. **Minimum Payment Trap**: Making only the minimum payments can result in the outstanding balance escalating in a non-linear fashion because of the effects of compounding interest.
Money at a floating rate for a secured purchase (e.g. home or automobile) for an individual	**Interest Rate Risk**: Should interest rates surge, the variable nature of a floating rate can adversely affect the borrower by precipitating an unforeseen increase in their payment amounts. **Equity Position Volatility**: In volatile markets, shifts in market conditions can swiftly alter an individual's equity standing, which, in turn, influences the leverage ratio. **Loan-to-Value Ratio:** A decline in collateral value leads to a higher loan-to-value ratio, potentially necessitating further stipulations such as the procurement of mortgage insurance or the imposition of elevated interest rates.	**Variable Rate Mortgage as an Option**: Comparing a mortgage to an equity option on a house reveals non-linear properties, as fluctuations in the home's value (the underlying asset) affect the financial dynamics. **Prepayment Risk**: Allowing borrowers to prepay their mortgage without penalties introduces non-linear financial implications for the lender.
Money at a fixed rate for a business for a construction loan	**Debt-to-Equity Ratio:** By taking out a construction loan, a business can increase its debt level and therefore, the debt-to-equity ratio will also increase. A greater percentage of financing for this firm is from debt since the higher leverage ratio refers to less equity in it that may heighten financial risks.	**Project Delays and Cost Overruns:** Different uncertainties including material shortages, labor disputes and climatic conditions can lead to project delays and cost overruns in construction projects. These non-linearities distort significantly the project timeline and budgeting estimates that impact on the capability of firms' refunding loans as planned.

	Collateral Requirements: Usually, construction loans need to be backed up by collateral like assets owned by the business or property being constructed. The value and quality of the collateral may affect the ability of businesses to get such loans or require more securities	**Regulatory Compliance:** Changing regulations or unanticipated legal issues during construction introduce non-linear challenges. Meeting zoning ordinances, building codes, or environmental requirements could result in expensive alterations to project scopes or designs causing changes both in timeline and budgetary process.
Publicly traded Equity	**Leverage through Margin Trading:** People who trade on margin increase their potential exposure to stocks, which means buying these securities using borrowed money. Even though one stand a chance of getting higher returns due to magnification of possible profits by trading on margin; this technique is also susceptible to great losses if the investor makes wrong predictions. **Financial Leverage through Options Trading:** Options trading, lets an investor take control over larger volume of stocks without substantial initial investments, therefore it helps to leverage capital. This approach also adds some complications and risks associated with option contracts since they can cause investors to lose substantial amount of money very quickly.	**Non-linear Price Movements**: In many cases stock prices tend to be non-linear with various factors coming into play such as market mood, economic indicators and company specific news. This way even slight shifts in these factors might lead to considerable alterations in stock prices thereby suggesting that equity investment are inherently non-linear. **Volatility Risk:** Volatility refers to how much the price of a stock or other security moves up and down over time. With increased volatility comes increased chances for big price swings which make an investor's task in risk management and making investment decisions more difficult.
Publicly traded bond(Municipal Bond)	**Risk Factor:** Municipal bond trading leverage involves borrowing funds to invest, with high leverage amplifying gains and losses in bond prices. **Volatility, sensitivity, risk management:** -When investors use leverage to invest in municipal bonds, they amplify their exposure to market movements. This means that any fluctuations in interest rates, credit quality, or other market factors can have a magnified impact on the returns of leveraged municipal bond investments.	**Risk factor:** -Municipal bond trading can exhibit non-linear behaviour, where changes in market conditions or issuer-specific factors do not result in proportional price changes. -Bond prices and interest rates have a non-linear relationship, where even a small change in interest rates can result in a significant change in bond prices, particularly noticeable in longer-maturity bonds -Non-linearity in Municipal Bond Prices: • Introduces unpredictability into price movements.

	-Municipal bonds are known to be sensitive to changes in interest rates. Typically, when interest rates rise, the prices of existing bonds tend to fall, and conversely, when interest rates fall, bond prices tend to increase. This relationship is important for investors to understand as it directly affects the value of their bond holdings. -Effective risk management strategies for leverage in municipal bond trading involve setting limits, maintaining liquidity, diversifying investments, and conducting thorough credit analysis to mitigate risks and enhance the overall stability of the investment portfolio.	• Sudden market shifts trigger non-linear responses. • Sharp price swings and increased volatility. • Investors struggle to predict market conditions' reactions. - To manage non-linearity in municipal bond trading, stress testing, scenario analysis, and incorporating risk factors into risk models are essential, along with option strategies and market updates.
An illiquid security- Blackstone Group	**Debt Obligations Impact:** Leverage can amplify losses if the value of illiquid assets falls, affecting financial resources and the ability to meet obligations. Blackstone's debt obligations may strain its financial capacity and limit its ability to repay lenders due to leverage. **Forced Sales Consequences:** Leverage can compel quick sales of illiquid assets, potentially resulting in significant losses and fire sales, especially in unfavourable market conditions. **Missed Opportunities Due to Leverage**: Managing leverage exposure from illiquid assets might restrict Blackstone's capacity to invest in new high-return opportunities	**Valuation Sensitivity:** Non-linear Impact: Illiquid assets behave differently. Even a slight shift in investor mood can cause a significant change in their perceived value. This is because there are few buyers and sellers, making prices more volatile. **Exit Strategy Challenges:** -Selling Illiquid Assets: These assets, like private equity holdings or real estate, don't have a readily available market. Finding a buyer takes time and effort, and Blackstone might have to accept a lower price. -If Blackstone used borrowed money to buy these illiquid assets (leverage), it becomes even more critical to sell them quickly if the market turns sour. However, the lack of buyers makes a fast exit difficult, potentially trapping Blackstone in a bad investment.

Step 2: Frictional Related Challenges

Scenario	Liquidity Challenges	Regulation Challenges
Money at a fixed rate for an unsecured purchase (e.g. credit card) for an individual	**Credit Line Availability:** The liquidity accessible through credit cards for individuals may be constrained, varying with their creditworthiness and prevailing market conditions. **Market Conditions Impact**: During economic downturns, lenders might restrict credit availability, consequently diminishing liquidity for consumers. **Asset Sell-off Difficulty**: Lacking collateral, the lender is left without immediate assets to liquidate in the event of a default.	**Interest Rate Caps**: Regulatory constraints on the interest rates that lenders can charge may impact their profitability. **Consumer Protection Laws**: Regulatory requirements for clear term disclosure could limit lenders' flexibility to modify terms, affecting the manner in which credit is provided. **Lending Practices**: Regulatory oversight aims to curb predatory lending and prevent individuals from becoming excessively indebted through unsecured lending practices.
Money at a floating rate for a secured purchase (e.g. home or automobile) for an individual	**Collateral Value Fluctuation**: The liquidity available is linked to the fluctuating value of the collateral, such as homes, which can vary significantly. **Refinancing Frequency**: Frequent refinancing may result from floating rates, potentially straining liquidity if not carefully managed. **Secondary Market Activity**: Broader economic trends can influence the market for selling debt secured by homes or automobiles, thereby affecting liquidity.	**Loan-to-Value Requirements**: Strict loan-to-value ratio regulations for secured lending can determine the amount of money that can be borrowed. **Interest Rate Adjustment Rules:** Regulations may impose limits on the frequency and magnitude of interest rate changes, which protect consumers while also restricting lender flexibility. **Foreclosure Processes**: Strict regulations on the foreclosure process can delay the ability to reclaim and liquidate assets.
Money at a fixed rate for a business for a construction loan	**Funding Disbursement Timing:** Typically, construction loans are disbursed in a number of stages as the project progresses. Nevertheless, the release of funds may not coincide with completion of milestones resulting in liquidity constraints on the business. It affects cash flow management and the ability to cater for ongoing project expenses. **Contingency Funding:** Construction projects often incur unexpected costs or unforeseen events that require additional funds above what was taken as a loan at first instance. Availability of contingency funding to	**Compliance with Building Codes and Regulations:** Various building codes, zoning regulations and environmental standards stipulated by local, state and federal governments must be complied with by construction projects. Adhering to these rules makes it complicated to manage the development process thus additional resources might need to be pumped into it together with having experts on board. Violation can lead to fines, delays or even stoppage of work leading to financial instability and loss of goodwill for this enterprise. **Permitting and Approval Processes:** The process of obtaining required legal permissions

	cater for these uncertainties is crucial in order to ensure liquidity and project completion. However, it might be difficult accessing more money which will cause liquidity challenges for the company.	and consents from governmental agencies is tedious and bureaucratic, resulting in delays in projects as well as increased costs. Liquidity and project profitability can be affected if the construction timeline is disrupted by delay in permit issuance or shifts in regulatory requirements.
Publicly traded Equity	**Market Liquidity:** liquidity can be variable depending on a variety of factors including trading volume, market conditions and the size of investment in contrast to other asset classes. This may mean that illiquid stocks are likely to have bigger bid-ask spreads and higher transaction costs than liquid stocks hence this might influence purchasing or selling prices for shareholders. **Trading Restrictions:** Some publicly traded equities can have trading restrictions like lock-up periods for newly issued shares and restrictions during certain market conditions. Such restrictions inhibit investors from accessing their funds or conducting trades thus affecting portfolio management and liquidity.	**Securities Regulations:** Entities such as the SEC enforce stringent regulations on publicly traded stocks. To protect investors and market integrity, compliance necessitates fulfilling disclosure requirements, reporting commitments, and dealing with provisions. Failure to adhere to these rules may result in a negative impact on a firm’s reputation and legal consequences. **Insider Trading Restrictions:** Insider trading laws prohibit individuals with access to non-public information from trading based on that information. Adhering to these laws is crucial for market fairness and investor confidence. However, navigating these restrictions can be complex, requiring careful adherence to avoid legal liabilities and regulatory scrutiny.
Publicly traded bond	**Tricky Reselling: Secondary Market Depth:** Municipal bonds, on the other hand, are issued by local governments and can be less popular, especially for smaller, lesser-known issuers. This means the garage sale for these bonds might be less crowded. If you want to sell your municipal bond quickly, it might be harder to find a buyer willing to pay exactly what you think it's worth. You might have to wait or accept a slightly lower price. **Trading Costs Eating our Returns:** Transaction costs are like the fees you pay at the garage sale to sell your stuff. When you buy or sell a municipal bond, you might have to pay commissions to a broker or fees to the exchange where the	**Disclosure Burden:** Municipal bond issuers face regulations requiring detailed disclosures about their finances. This transparency protects investors but can be time-consuming and delay bond issuance. **Tax Code Complexity:** The tax implications of municipal bond interest vary based on the investor's tax bracket and residency. This complexity can make it challenging to evaluate these investments. **Call Risk:** Certain municipal bonds are callable, meaning the issuer can redeem the bond early. This disrupts investor strategies, especially if interest rates have fallen since purchase, potentially leading to capital losses.

	trading happens. These costs can be a bigger deal for smaller trades of municipal bonds because the return you earn on the bond itself might not be much. It's like paying a high fee to sell a used book at a garage sale. **Guessing the True Price: Price Discovery Challenges** For some municipal bonds, especially those with lower liquidity (not actively traded), it can be difficult to pinpoint the exact market value. There might not be enough recent trades of that specific bond to get a clear idea of what a fair price would be. This can lead to situations where bonds might be priced incorrectly, either too high or too low.	
An illiquid security	**Finding a Buyer Can Be Tough:**(illiquid asset). There aren't many people out there looking to buy one (limited investor pool). So, if you suddenly need cash and want to sell, it might take a while to find a buyer, especially if the market is shaky (market stress). **Guessing Game Valuations:** Since this rare isn't traded daily (illiquid), it's hard to know exactly what it's worth (valuation opacity). This makes it tough for Blackstone to know if they're getting a good deal or overpaying, potentially leading to losses. **Fees Eating into Profits:** Buying and selling might involve fees for negotiating the price, structuring the deal, and maybe even an extra charge because it's hard to sell quickly (transaction costs). All these fees can eat into Blackstone's profits from the investment.	**Reporting and Compliance:** Blackstone has a team dedicated to constantly collecting data, analyzing market trends, and making judgment calls to arrive at fair valuations for their assets. Then, they need to translate those valuations into reports that comply with various regulations. It's a constant battle to stay on top of everything, and any errors could lead to penalties or even legal trouble. **Regulatory Scrutiny:** Blackstone often uses leverage, borrowing money to amplify their investment returns. This strategy can be lucrative, but it also raises red flags for regulators. They worry that if asset values fall, Blackstone's debt burden could become too heavy and lead to financial instability. Weak risk management around illiquid assets can further heighten scrutiny. Since these assets are less transparent and more volatile than stocks, robust risk controls are crucial. **Limited Regulatory Guidance:** Blackstone's success hinges on their ability to find that sweet spot: maximizing returns through complex investments while staying compliant in a constantly evolving and demanding regulatory environment.

Step 3. Identifying Additional Data

	Data Type: Asset, Accounting, Economic, Ratings, Factor	**Data Processing:** Raw prices / yields; Levels / Categories; Returns; Implied Volatilities,	**Data Frequency:** High-Frequency, Intraday, Daily, Weekly, Quarterly, Annually,	**Data Class:** Equity, FX, Crypto, Fixed Income, Credit, Commodity, Derivatives, Real Estate,	**Data Source:** Exchanges, OTC, Brokers, Dealers, Audited Financials, Vendors, Analytics Companies	**Data Variety:** Trade Data vs Quote Data; Actual Data vs Estimated Data; Observed Data vs Modeled Data; Adjusted Data vs Unadjusted; Absolute Data vs Relative Data,
UNSECURED FIXED RATE DATA, (i.e credit card)						
Large Bank Consumer Credit Card Balances: Utilization: Active Accounts Only: 50th Percentile (RCCCBACTIVEUTILPCT50) https://fred.stlouisfed.org/series/RCCCBACTIVEUTILPCT50	Accounting	Raw prices	Quarterly, End of Quarter	Credit	Federal Reserve Bank of Philadelphia	Credit utilization rate
Large Bank Consumer Credit Card Balances: Current Credit Score: 50th Percentile (RCCCBSCOREPCT50) https://fred.stlouisfed.org/series/RCCCBSCOREPCT50	Accounting	Raw prices	Quarterly, End of Quarter	Credit	Federal Reserve Bank of Philadelphia	Adjusted Data
Assets: Liquidity and Credit Facilities: Loans: Week Average (RESPPALDXAWNWW) https://fred.stlouisfed.org/series/RESPPALDXAWNWW	Accounting	Raw prices	Weekly, Ending Wednesday	Credit	Board of Governors of the Federal Reserve System (US)	Quote Data
Federal Funds Effective Rate (FEDFUNDS)	Economic	Raw prices	Monthly	Credit	Board of Governors of the Federal Reserve System	Quote Data

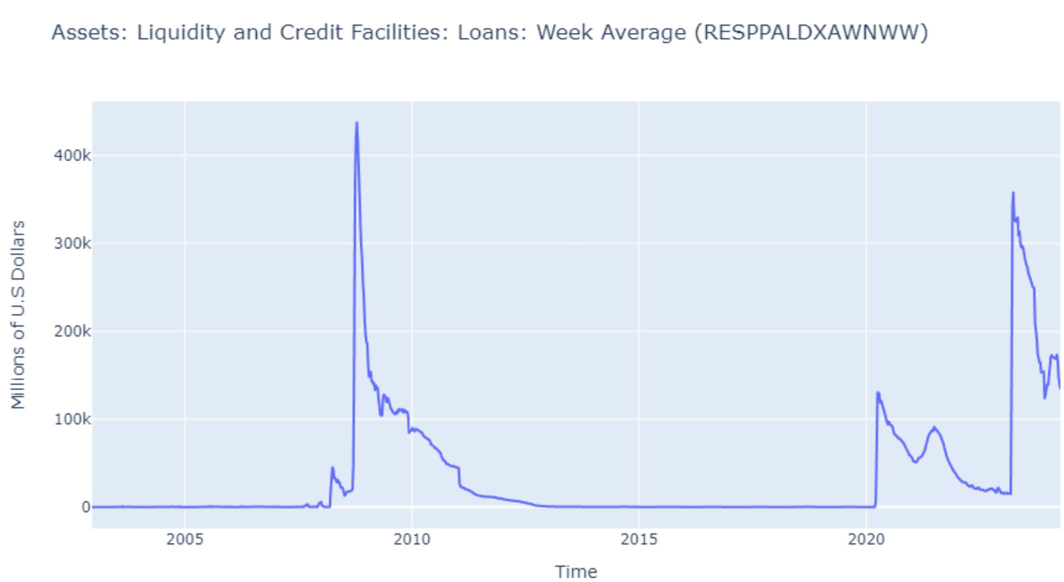
https://fred.stlouisfed.org/series/FEDFUNDS					(US)	
FLOATING RATE FOR SECURED PURCHASE (i.e mortgage)						
30-Year Fixed Rate Conforming Mortgage Index: Loan-to-Value Less Than or Equal to 80, FICO Score Greater Than 740 (OBMMIC30YFLVLE80FGE740) https://fred.stlouisfed.org/series/OBMMIC30YFLVLE80FGE740	Ratings	Raw prices	Daily	Real Estate	U.S. Census Bureau	Quote Data
Average Sales Price of New Manufactured Homes: Single Homes in the United States (SPSNSAUS) https://fred.stlouisfed.org/series/SPSNSAUS	Economic	Raw prices	Monthly	Real Estate	U.S. Census Bureau	Not Seasonally Adjusted
30-Year Fixed Rate Mortgage Average in the United States (MORTGAGE30US) https://fred.stlouisfed.org/series/MORTGAGE30US	Economic	Raw prices	Weekly, Ending Thursday	Real Estate	Freddie Mac	Quote Data
Existing Home Sales: Months Supply (HOSSUPUSM673N) https://fred.stlouisfed.org/series/HOSSUPUSM673N	Economic		Monthly	Real Estate	National Association of Realtors	
Money at a fixed rate for a business for a construction loan						
Construction Cost Index	Economic	Index	Quarterly	Real Estate	FRED - Construction Cost Index (NRCOSTI)	Actual Data
Commercial Real Estate	Economic	Percentage	Quarterly	Real Estate	FRED - Commercial	Actual Data

Vacancy Rates					[Real Estate Vacancy Rates (RRVRUSQ156N)](#)	
Publicly traded Equity (e.g. common stock)						
Stock Price Data	Asset	Raw prices	Daily	Equity	Yahoo Finance	Trade Data
PUBLICLY TRADED BONDS (MUNICIPAL BONDS)						
Exchange-Traded Funds Total Financial Assets in Municipal Bond Funds, Level(BOGZ1FL564091203Q) https://fred.stlouisfed.org/series/BOGZ1FL564091203Q	Accounting	Raw Prices	Quarterly	Finance Accounts	Board of Governors of the Federal Reserve System (US)	Seasonally Adjusted
ILLIQUID SECURITY (BLACKSTONE GROUP)						
Blackstone group Stocks data on Yahoo Finance https://finance.yahoo.com/quote/BX/history?period1=1555433690&period2=1713286486	Stock Prices	Index	Daily	Equity	Yahoo Finance	Stock data

Step 5 and Step 6:

Analysis Outcome:

3-credit-card. Liquidity Explanations



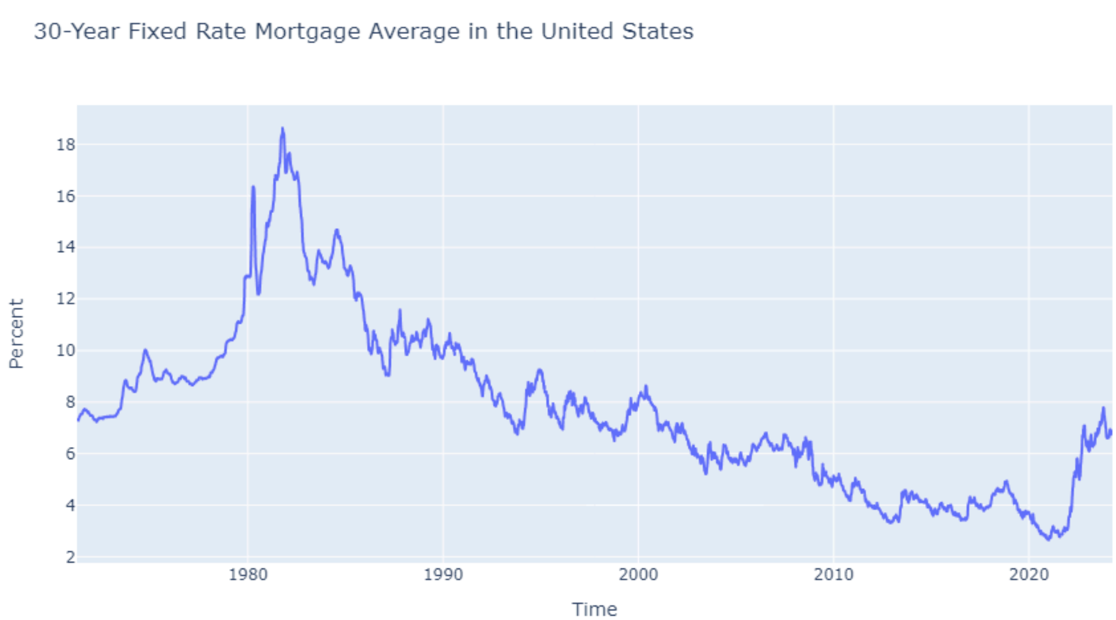
The graph illustrates the weekly average of loans from liquidity and credit facilities over time. Such data can be used to analyze liquidity in the financial system, particularly how it impacts the availability of credit, including for unsecured purchases like those made with credit cards.

Here's how this graph addresses liquidity for a fixed-rate, unsecured purchase:

1. **Credit Availability:** The volume of loans made available by these facilities can indicate how much liquidity is in the financial system. More liquidity means more availability of credit, which can lead to an increase in unsecured lending like credit card loans.
2. **Credit Market Conditions:** Sharp increases or decreases in the loans provided can reflect changes in credit market conditions. For example, a spike might indicate a response to tightened credit conditions, where central banks or other institutions step in to provide liquidity.
3. **Financial Stability:** The stability of liquidity sources is crucial for credit card issuers. If liquidity facilities are heavily utilized, it may signal stress in the financial system, potentially impacting the terms and availability of credit for consumers.
4. **Lender Confidence:** If banks and other lenders are willing to extend more unsecured credit, it's often a sign of confidence in the market. This can be influenced by the liquidity provided through credit facilities.
5. **Policy Implications:** The use of credit facilities often changes in response to monetary policy. For example, during a financial crisis, central banks may increase such facilities to ensure that liquidity remains available for all types of lending, including fixed-rate, unsecured credit cards.

In summary, this graph can be used to infer the general state of liquidity in the financial system and the potential availability of credit for consumers seeking unsecured credit card loans at a fixed rate. It indirectly addresses liquidity by indicating the health and responsiveness of financial institutions to provide unsecured credit based on the broader economic and financial environment.

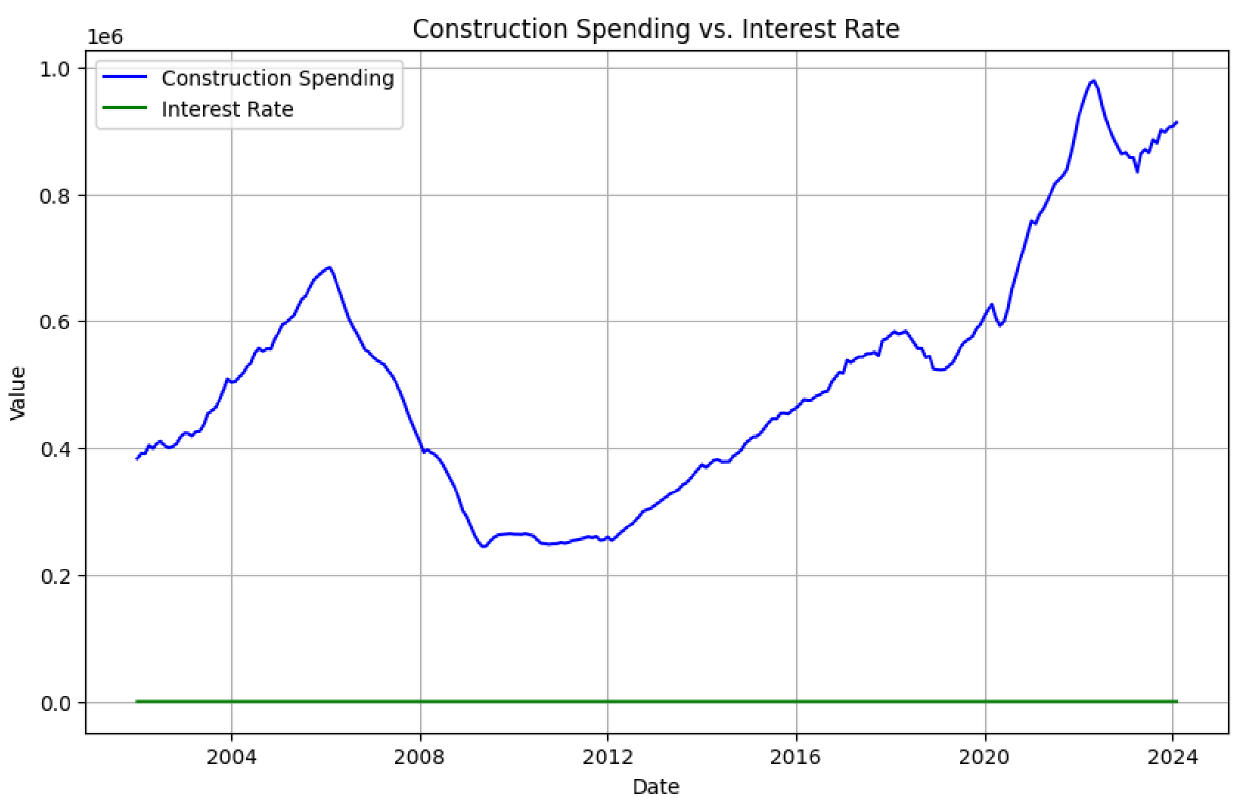
3-mortgage. Liquidity Explanations



The chart depicting the 30-year Fixed Rate Mortgage Average in the United States over an extended period is instrumental in understanding the liquidity challenges related to the housing market and, by extension, secured home purchases. Here's how this data addresses those challenges:

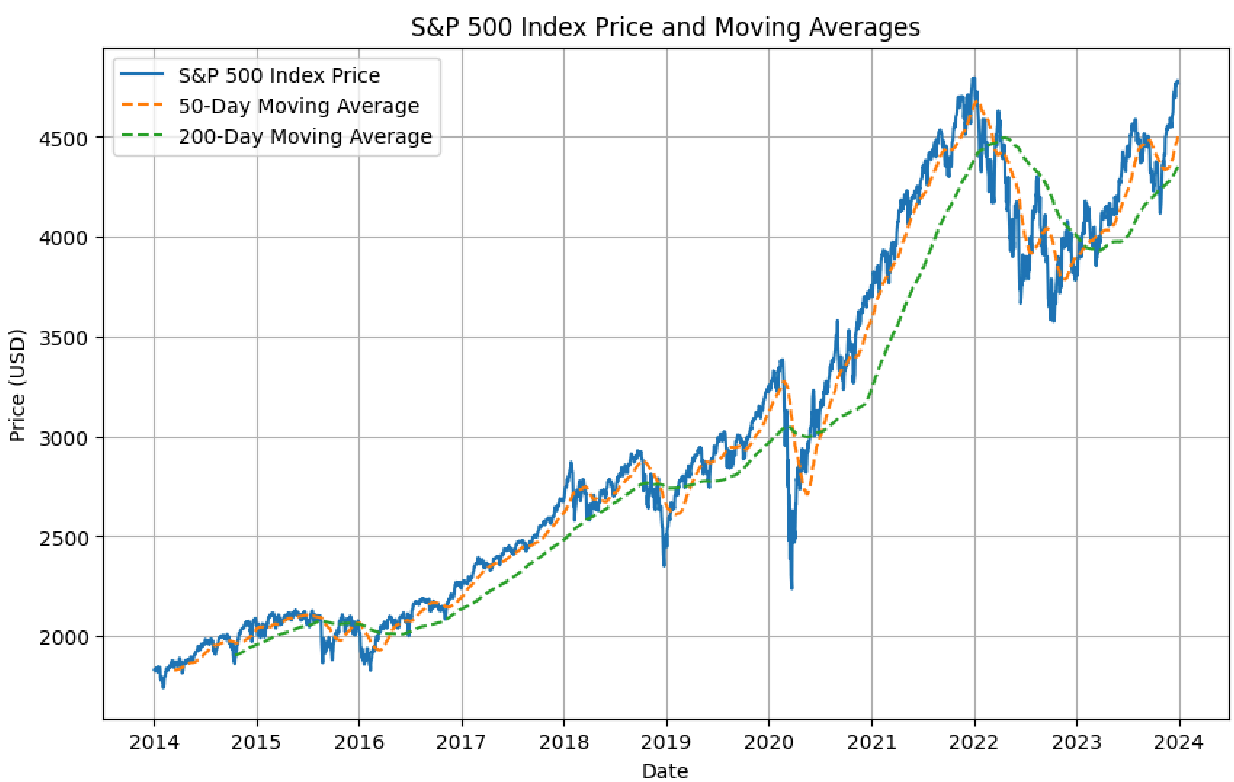
1. **Mortgage Rate Trends and Demand:** The interest rate on a mortgage directly influences the affordability of housing. Lower rates generally increase demand for mortgages, as more people can afford to buy homes. This, in turn, affects liquidity in the housing market, as more transactions take place.
2. **Refinancing Volume:** When mortgage rates decline, existing homeowners may opt to refinance their mortgages to take advantage of lower rates, which boosts liquidity in the financial markets as lenders process new loans.
3. **Housing Market Activity:** Changes in mortgage rates can signal shifts in the housing market's liquidity. For example, rising rates tend to dampen buying activity, leading to lower turnover in the housing stock, which can reduce liquidity.
4. **Lender's Liquidity:** For lenders, the average mortgage rate impacts the volume of lending they can support. Higher rates might reduce the number of qualified borrowers, potentially leading to less lending activity and thus impacting the liquidity available in the market.
5. **Investor Appetite:** The average mortgage rate also influences investors' interest in mortgage-backed securities. Favourable rates can attract investors, thereby providing more capital for lenders to offer mortgages, enhancing liquidity.
6. **Construction and Development:** The liquidity challenge is also about the availability of funding for new construction and development. Lower mortgage rates can increase home purchases, encouraging developers to build more, which requires liquidity.

Money at a fixed rate for a business for a construction loan



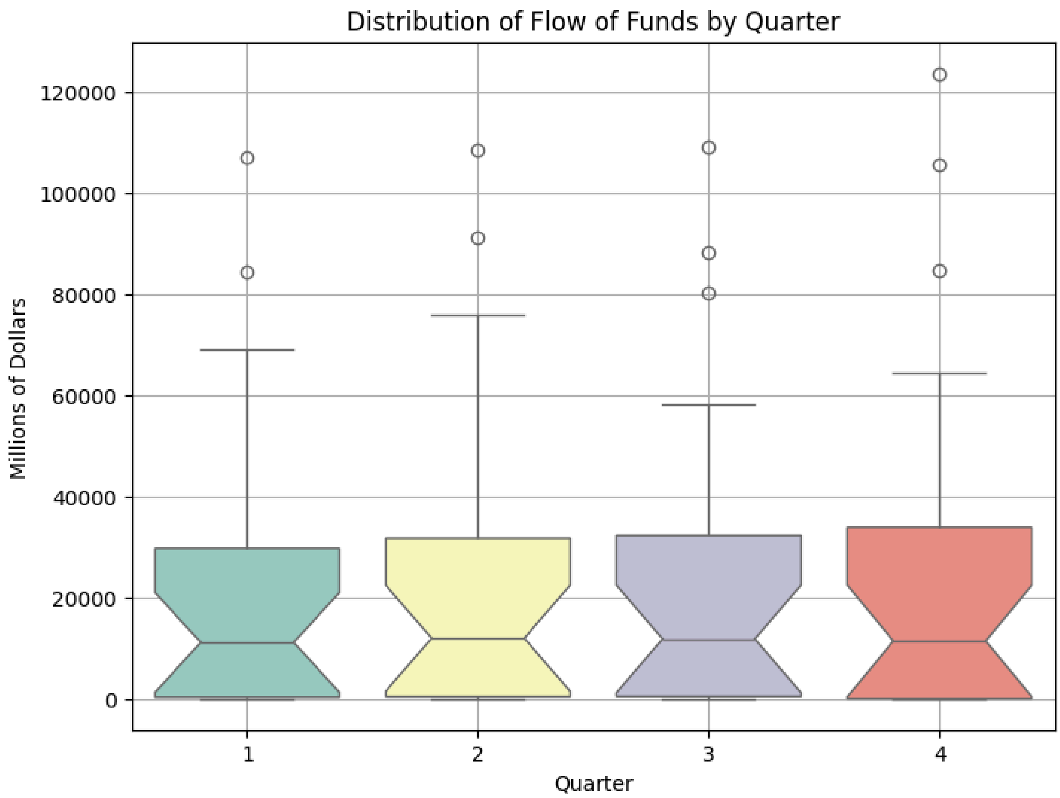
1. **Construction Cost Index:**
   Insight: The Construction Cost Index measures the changes in the cost of construction over time. This index allows stakeholders in the construction industry to discern trends in costs which may influence project budgets and investment decisions. A growing index indicates an increase in construction costs while a falling index shows a decrease in costs.
2. **Commercial Real Estate Vacancy Rates:**
   Insight: The Commercial Real Estate Vacancy Rates measure the proportion of empty commercial properties over time. Policymakers and investors often use this information to determine how well the commercial real estate market is doing. Increase in Vacancies could mean there are more properties than demand or the economy is deteriorating while a fall in vacancies denotes strong demand for commercial spaces.
3. **Business Confidence Index:**
   Insight: Another indicator of business confidence in current and future economic conditions is Business Confidence Index (BCI). A BCI higher than 50 represents optimism among businesses that can lead to increased investment, recruitment and general economic activity. Conversely, an index less than 50 may signal apprehension on possible downturns or uncertainty about the economy.
4. **Credit Availability Index:**
   Insight: This Credit Availability Index shows how easy it is for businesses to secure credit from lenders. In other words, higher value of the index signifies greater credit availability that can stimulate business investment as well as expansion.

Publicly traded Equity (e.g. common stock)



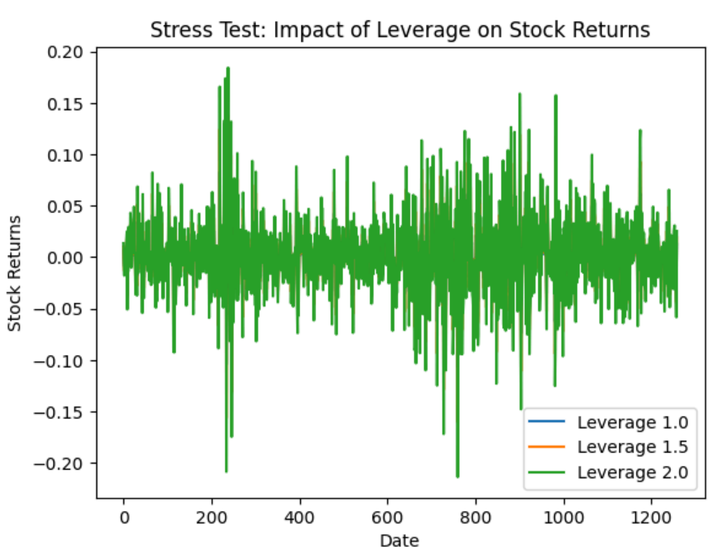
The last plot shows the S&P 500 index's price along with its 50-day and 200-day moving averages, helping to identify potential trends and momentum in the index's price movements.

Publicly traded bond(Municipal Bond):



These visualizations explore seasonality in the data. Subplots show the flow of funds for each quarter (Q1, Q2, Q3, Q4) separately. This allows you to visually compare the patterns across quarters. Boxplots reveal how the distribution of the flow of funds is spread out across different quarters. They can indicate if there are quarters with consistently higher or lower flow values compared to others.

Illiquid Security- Blackstone Group



One way is to look at the company's debt level compared to its own money. This is called the debt-to-equity ratio. A high ratio means the company owes a lot of money, which can be risky. You can also try to imagine how the stock might perform in different situations, like if the company borrows more or less money.

It's wise to plan for different scenarios, like what might happen if it becomes even harder to buy or sell these stocks in the future. To manage this risk, we should also spread our investments out across different types of assets, not just these hard-to-trade stocks.

References:

[1]S.C. Myers et al., Corporate financing and investment decisions when firms have information that investors do not have ; **Journal of Financial Economics(1984).**

[2] The determinants and implications of corporate cash holdings Journal of Financial Economics(1999).