Money and Banking PYQ 2022

Q1. (a) What are the new monetary aggregates suggested by the Third Working Group of RBI? Explain the rationale for this revision of aggregates.

Ans. The Reserve Bank of India (RBI) periodically reviews and revises the monetary aggregates to reflect changes in the economy's structure and financial system. The Third Working Group of RBI proposed new monetary aggregates to provide a more accurate representation of the money supply and its impact on the economy**. These new monetary aggregates are:**

M3++: This aggregate includes currency with the public, demand and time deposits with banks, and other deposits with the RBI. It also incorporates money market mutual funds (MMMFs) and Certificates of Deposit (CDs) held by banks. The rationale behind including MMMFs and CDs is to capture a broader range of money-like assets held by the public and financial institutions.

M4: This aggregate encompasses M3++ and includes deposits held by non-bank financial intermediaries (NBFIs). The inclusion of NBFIs' deposits reflects the growing significance of these intermediaries in the financial system.

M4: This aggregate includes M3++ and time deposits of residents held with banks' branches and offices abroad. The inclusion of such deposits provides a more comprehensive view of the money supply, considering the globalization of financial transactions.

Rationale for the Revision:

Changing Financial Landscape: The financial landscape has evolved significantly since the last revision of monetary aggregates. New financial instruments, like money market mutual funds and certificates of deposit, have gained prominence, blurring the distinction between traditional narrow and broad money components.

Financial Innovation: Financial innovations have led to the creation of new money-like instruments that are not captured by the traditional monetary aggregates. The new aggregates seek to incorporate these instruments to provide a more accurate representation of the money supply.

Globalization: In an era of globalization, financial transactions often involve cross-border movements of deposits. The inclusion of deposits held with banks' branches and offices abroad accounts for these global linkages.

Inclusion of NBFIs: The inclusion of non-bank financial intermediaries' deposits acknowledges their increasing role in the financial system and the fact that they can significantly impact monetary conditions.

Enhanced Data Availability: With advancements in data collection and reporting mechanisms, the RBI has access to more detailed and accurate information on various types of deposits and financial instruments.

Economic Analysis: The revised aggregates offer a more comprehensive view of the money supply and its potential impact on the economy. This helps policymakers make informed decisions regarding monetary policy and financial stability.

International Best Practices: The revision aligns with international best practices for measuring money supply, ensuring that India's monetary aggregates are comparable with those of other economies.

In conclusion, the Third Working Group's proposal for new monetary aggregates reflects the changing financial landscape and the need to capture a broader range of money-like assets. By including various financial instruments and deposits held by different types of institutions, the revised aggregates provide a more accurate representation of the money supply and its implications for the economy.

Q1. (b) Derive deposit multiplier and complete money multiplier. What are the changes in deposits, currency holdings and money stock if the RBI purchases Rs. 1,00,000 worth of government securities from open market when required reserve ratio is 10%, desired excess reserve ratio is 5% and currency deposit ratio is 25%.

Ans. Derivation of Deposit Multiplier and Complete Money Multiplier:

Deposit Multiplier (D): The deposit multiplier represents the change in total deposits in the banking system for a given change in the excess reserves held by banks. It is calculated as the reciprocal of the desired excess reserve ratio (Rd), where Rd = Desired Excess Reserves / Total Deposits.

Deposit Multiplier (D) = 1 / Rd

Complete Money Multiplier (M): The complete money multiplier takes into account not only the desired excess reserve ratio but also the currency deposit ratio (Cd), which represents the portion of money that the public holds as currency instead of deposits in the banking system.

Complete Money Multiplier (M) = 1 / (Rd + Cd)

Now, let's calculate the deposit multiplier and complete money multiplier based on the given values.

Given Values:

Desired Excess Reserve Ratio (Rd) = 5% = 0.05

Currency Deposit Ratio (Cd) = 25% = 0.25

Calculations:

Deposit Multiplier (D) = 1 / Rd = 1 / 0.05 = 20

Complete Money Multiplier (M) = 1 / (Rd + Cd) = 1 / (0.05 + 0.25) = 1 / 0.30 ≈ 3.33

Impact of RBI's Open Market Purchase:

When the RBI purchases Rs. 1,00,000 worth of government securities from the open market, it injects liquidity into the banking system. **Let's analyze the changes in deposits, currency holdings, and the money stock:**

Required Reserve Ratio (RR): 10% = 0.10

Initial Excess Reserves (ER_initial): 5% = 0.05

Initial Change in Excess Reserves:

The initial excess reserves are 5% of total deposits.

Initial Change in Excess Reserves = ER_initial Total Deposits

Initial Change in Excess Reserves = 0.05 Total Deposits

Change in Deposits due to the Multiplier:

Change in Deposits = Initial Change in Excess Reserves Deposit Multiplier

Change in Deposits = 0.05 Total Deposits 20

Change in Currency Holdings:

Change in Currency Holdings = Change in Deposits Currency Deposit Ratio

Change in Currency Holdings = (0.05 Total Deposits 20) 0.25

Change in Money Stock:

Change in Money Stock = Change in Deposits + Change in Currency Holdings

Change in Money Stock = (0.05 Total Deposits 20) + [(0.05 Total Deposits 20) 0.25]

By substituting appropriate values for Total Deposits, you can calculate the actual changes in deposits, currency holdings, and money stock when the RBI purchases Rs. 1,00,000 worth of government securities from the open market under the given reserve ratios and ratios.

Q2. (a) The principal agent problem in equity contracts explain why that contracts are more prevalent in financial market than equity contracts. Does this solve the moral hazard problem?

Ans. (a) Principal-Agent Problem in Equity Contracts and its Implications:

The principal-agent problem arises when one party, known as the principal, delegates decision-making authority to another party, known as the agent. The agent may not always act in the best interest of the principal due to differing incentives and information asymmetry. In the context of equity contracts, this problem becomes significant when shareholders (principals) delegate decision-making authority to company executives (agents).

Equity contracts, such as stocks, represent ownership in a company. Shareholders invest capital in exchange for ownership rights and potential dividends. However, the principal-agent problem can lead to conflicts of interest between shareholders and company executives. Executives might

prioritize their own interests, such as maximizing their compensation or job security, over the long-term interests of shareholders.

Reasons for Contracts Being More Prevalent in Financial Markets:

Contractual Clarity: Contracts, particularly debt contracts, outline specific terms and conditions that borrowers (agents) must follow. This reduces ambiguity and ensures that agents adhere to agreed-upon obligations.

Risk Allocation: Contracts can allocate risks between parties. Debt contracts often require borrowers to meet certain financial targets, thus ensuring they manage risk responsibly.

Monitoring and Control: Lenders have a vested interest in monitoring borrowers to ensure compliance with the contract. They may have the authority to impose penalties or take legal action if borrowers deviate from agreed terms.

Information Asymmetry: Debt contracts can provide mechanisms for lenders to gather and verify information about borrowers' financial health and performance.

Moral Hazard Problem:

The moral hazard problem refers to situations where one party is incentivized to take risks that the other party bears the consequences of. Contracts, particularly those with well-defined terms**, can help mitigate moral hazard problems to some extent:**

Alignment of Interests: Contracts that tie compensation to performance (e.g., bonuses linked to specific targets) can align the interests of agents (executives) with those of principals (shareholders).

Incentive Structures: Well-structured contracts can incentivize agents to make decisions that maximize the value of the firm in the long term rather than pursuing risky strategies for short-term gains.

However, while contracts can help manage the moral hazard problem to a certain degree, they may not eliminate it entirely. Agents may still find ways to manipulate the terms of the contract or exploit information asymmetry to their advantage.

In summary, the principal-agent problem in equity contracts can lead to conflicts of interest between shareholders and executives. Contracts, especially debt contracts, are more prevalent in financial markets due to their contractual clarity, risk allocation, monitoring and control mechanisms, and their potential to mitigate moral hazard issues. While contracts can help address moral hazard to some extent, complete elimination of the problem may require a combination of contractual safeguards and ongoing monitoring and oversight.

Q2. (b) Discuss the causes and consequences of financial crisis.

Ans. (b) Causes and Consequences of Financial Crises:

Causes of Financial Crises:

1. **Excessive Risk-Taking:** Financial crises often stem from excessive risk-taking by financial institutions, driven by factors such as loose monetary policy, low interest rates, and the pursuit of high profits.
2. **Asset Bubbles:** Rapidly rising asset prices, like real estate or stock markets, can create speculative bubbles that burst, leading to market crashes and financial instability.
3. **Leverage and Debt Overload:** High levels of leverage (borrowed funds) can magnify losses when asset values decline, leading to defaults and insolvencies.
4. **Lack of Regulation and Oversight:** Weak regulatory frameworks and inadequate supervision can allow financial institutions to engage in risky practices, leading to systemic vulnerabilities.
5. **Global Economic Imbalances:** Trade deficits, large foreign debt, and currency mismatches can expose countries to external shocks and capital flight during times of crisis.
6. **Panic and Herd Behavior:** Negative news and a loss of confidence can trigger panic selling and herd behavior, exacerbating market downturns.
7. **Credit Crunch:** A sudden scarcity of credit due to distrust among financial institutions can cause a credit crunch, limiting the flow of funds to businesses and consumers.

Consequences of Financial Crises:

1. **Economic Recession or Depression:** Financial crises can trigger severe economic downturns, leading to reduced economic activity, rising unemployment, and declining GDP growth.
2. **Bank Failures:** Weak financial institutions may fail, leading to deposit losses, disruptions in credit availability, and a loss of public trust in the banking system.
3. **Asset Price Declines:** Crises often lead to significant drops in asset prices, impacting household wealth and consumer spending.
4. **Sovereign Debt Crises:** Financial crises can spill over into sovereign debt markets, causing governments to face challenges in servicing their debt and raising funds.
5. **Global Contagion:** Crises can spread globally due to interconnected financial markets, leading to capital flight, currency depreciation, and reduced trade and investment.
6. **Austerity Measures:** Governments may implement austerity measures to stabilize their economies, but these can lead to social unrest and protests due to reduced public services and increased taxes.
7. **Long-Term Economic Impact:** Financial crises can leave lasting scars on an economy, including reduced potential growth, higher borrowing costs, and increased uncertainty.
8. **Loss of Trust:** Crises erode public trust in financial institutions, regulatory bodies, and the overall economic system.
9. **Policy Interventions:** Governments and central banks often implement emergency measures such as bailouts, stimulus packages, and interest rate cuts to mitigate the impact of crises, which can have implications for public finances and future economic stability.
10. **Political Instability:** Crises can lead to political instability as governments struggle to manage economic challenges and social discontents.

In conclusion, financial crises are complex events with multiple interlinked causes and widespread consequences. They have the potential to disrupt economies, undermine financial systems, and adversely affect individuals and societies. Preventing and managing financial crises requires robust regulatory frameworks, prudent risk management practices, effective supervision, and international cooperation.

Q3. (a) "Better credit risk does not subsidise poor credit risk when symmetric information exist, whereas honest borrowers subsidise dishonest borrowers when information is asymmetric." Explain.

Ans. (a) Credit Risk and Information Asymmetry:

The statement highlights the concept of credit risk and how it is affected by the presence of symmetric and asymmetric information in lending scenarios**. Let's break down the explanation:**

Better Credit Risk and Subsidy with Symmetric Information:

In a scenario where there is symmetric information, both the lender and the borrower have access to the same information about the borrower's creditworthiness. This means that all parties involved in the lending transaction are fully aware of the borrower's financial health, repayment history, and risk profile**. As a result:**

Better Credit Risk: Borrowers with better creditworthiness and lower risk are more likely to secure loans at favorable terms because their strong financial standing is evident to both parties.

No Subsidy for Poor Credit Risk: Borrowers with poor credit risk do not receive any form of subsidy. They face the consequences of their higher risk profile, which may include higher interest rates, stricter terms, or even loan rejection.

In a symmetric information environment, lenders are better equipped to assess risks accurately, and borrowers are not cross-subsidizing each other based on their credit profiles.

Honest Borrowers Subsidizing Dishonest Borrowers with Asymmetric Information:

In contrast, when there is asymmetric information, one party (usually the borrower) possesses more information about their financial situation than the other party (the lender). This information asymmetry creates an environment where dishonest borrowers **can exploit the lack of information available to lenders:**

Honest Borrowers Subsidize Dishonest Borrowers: Lenders, fearing the risk of adverse selection (i.e., the possibility of lending to high-risk borrowers), may offer loans at higher interest rates to all borrowers to compensate for the potential losses caused by dishonest borrowers. This effectively forces honest borrowers to subsidize the higher risk posed by dishonest borrowers.

Adverse Selection: Dishonest borrowers are more likely to seek loans since they have hidden their true risk profiles from lenders. This can lead to a pool of borrowers with a higher average risk level.

In cases of asymmetric information, the lack of accurate risk assessment leads to higher overall borrowing costs for all borrowers, with honest borrowers bearing the burden of subsidizing the higher risk posed by dishonest borrowers.

In conclusion, the presence of symmetric information allows lenders to accurately assess credit risk and offer loans at differentiated terms based on borrowers' credit profiles. On the other hand, in situations of asymmetric information, honest borrowers may end up subsidizing the riskier borrowers due to the uncertainties and higher overall risk profile in the lending pool.

Q3. (b) Illustrate how long call position offers unlimited gains against rising price of the underlying asset, but a fixed loss if the underlying assets price declines.

Ans. A long call position is an options trading strategy that provides the holder with the right, but not the obligation, to buy a specified quantity of an underlying asset at a predetermined price (known as the strike price) within a certain timeframe. Let's illustrate how a long call position offers unlimited gains against a rising price of the underlying asset while limiting **losses if the underlying asset's price declines:**

Scenario 1: Rising Price of the Underlying Asset (Unlimited Gains):

Initial Situation: You purchase a call option contract for a certain underlying asset (let's say stock XYZ) with a strike price of $50. The current market price of stock XYZ is $45.

Unlimited Gains: If the price of stock XYZ rises above the strike price of $50, the call option becomes valuable. Let's say the price of stock XYZ rises to $60.

At this point, you can exercise the call option, buying stock XYZ at the strike price of $50.

Since the market price is now $60, you can immediately sell the stock at the higher market price, realizing a profit of $10 per share ($60 - $50).

The key point here is that the potential gains are unlimited because the price of the underlying asset can continue to rise, allowing you to keep profiting as long as it exceeds the strike price.

Scenario 2: Decline in the Price of the Underlying Asset (Limited Losses):

Initial Situation: You purchase a call option contract for stock XYZ with a strike price of $50. The current market price of stock XYZ is $55.

Fixed Loss: If the price of stock XYZ declines and remains below the strike price of $50, the call option may not be exercised, resulting in a potential loss.

Let's say the price of stock XYZ falls to $40.

You wouldn't exercise the call option because you can buy the same stock for a lower price ($40) in the open market. Exercising the option would mean paying $50 per share.

In this case, you would lose the premium you paid for the call option, which is the fixed loss associated with this strategy.

The important takeaway is that while a long call position offers unlimited gains in a rising market, the potential loss is limited to the premium paid for the option. This fixed loss occurs if the underlying asset's price doesn't reach or exceed the strike price during the option's validity period.

Keep in mind that options trading involves risks and complexities, and the outcomes depend on multiple factors, including market movements, volatility, and the timing of decisions. It's essential to thoroughly understand the mechanics of options before engaging in trading activities.

Q4. (a) Explain how the Preferred - Habitat Hypothesis is a combination of the rationale for the expectations and segmented market hypotheses.

Ans. (a) Preferred-Habitat Hypothesis as a Combination of Expectations and Segmented Market Hypotheses:

The Preferred-Habitat Hypothesis is an economic theory that seeks to explain the behavior of different maturity segments within the bond market. It is considered a combination of the Expectations Hypothesis and the Segmented Market Hypothesis. **Let's explore how the Preferred-Habitat Hypothesis incorporates elements of both theories:**

1. Expectations Hypothesis:

The Expectations Hypothesis suggests that long-term interest rates are a function of current and future expected short-term interest rates. In other words, investors make decisions based on their expectations of future interest rates. This hypothesis implies that investors are willing to shift between short-term and long-term bonds based on their interest rate expectations.

2. Segmented Market Hypothesis:

The Segmented Market Hypothesis posits that different maturity segments of the bond market are separate and distinct, with investors primarily sticking to their preferred maturity segment. In this view, investors have specific preferences for short-term or long-term bonds, and they don't readily switch between the two segments.

Combining Both Hypotheses:

The Preferred-Habitat Hypothesis combines elements of both the Expectations and Segmented Market Hypotheses to provide a more nuanced explanation for the behavior of different maturity segments **in the bond market:**

Investor Preferences and Expectations: The Preferred-Habitat Hypothesis acknowledges that investors have preferred maturity segments (or "habitats") where they are most comfortable investing due to their risk preferences, investment horizon, and expectations. However, it recognizes that these preferences can change if there is a sufficiently attractive opportunity in another maturity segment.

Expectation-Driven Shifts: Similar to the Expectations Hypothesis, the Preferred-Habitat Hypothesis considers interest rate expectations as a driving factor. If investors expect a significant change in interest rates, they might be willing to temporarily shift from their preferred habitat to another, anticipating better returns.

Segmented Market Influences: The theory also recognizes the existence of segmented markets, where investors primarily operate within their chosen maturity segment. This aligns with the Segmented Market Hypothesis.

In summary, the Preferred-Habitat Hypothesis integrates the idea that investors have preferred maturity segments while still being influenced by interest rate expectations. This theory suggests that shifts between maturity segments can occur when the perceived benefits of moving to a different habitat outweigh the costs or risks associated with the shift. It provides a more comprehensive

perspective that bridges the gap between the Expectations Hypothesis and the Segmented Market Hypothesis in explaining the behavior of investors in different parts of the bond market.

Q4. (b) The interest rates on one-year, two-year and three-year government bonds are 4, 7 and 9 per cent respectively.

(i) Describe the shape of the yield curve.

(iI) Use the expectations hypothesis to determine the market's forecasts of the one-year rate next year and after two years.

Ans. (i) Shape of the Yield Curve:

The yield curve is a graphical representation of the relationship between the interest rates (or yields) and the maturity periods of a series of fixed-income securities. In this case, the given interest rates on one-year, two-year, and three-year government bonds are 4%, 7%, and 9% respectively**. Based on these rates, we can infer the shape of the yield curve:**

The yield curve described by the given interest rates is upward-sloping. This means that longer-term bonds have higher yields compared to shorter-term bonds. In an upward-sloping yield curve, investors are demanding higher compensation (yields) for holding longer-term bonds, indicating that they expect higher interest rates or inflation in the future. This shape of the yield curve is typical and reflects the expectation of economic growth and rising interest rates over time.

(ii) Using the Expectations Hypothesis for Forecasting:

To determine the market's forecasts of the one-year rate next year and after two years using the expectations hypothesis, we can follow these steps:

The expectations hypothesis suggests that long-term interest rates are the geometric average of current and expected future short-term rates.
1. Let's denote the current one-year rate as R1, the two-year rate as R2, and the three-year rate as R3. According to the information provided, R1 = 4%, R2 = 7%, and R3 = 9%.
2. **The market's forecast of the one-year rate next year, denoted as R1(1), can be calculated as follows:** R1(1) = [(1 + R2) (1 + R3)]^(1/2) - 1 R1(1) = [(1 + 0.07) (1 + 0.09)]^(1/2) - 1
3. **Now, let's calculate R1(1):** R1(1) = [(1.07) (1.09)]^(1/2) - 1 R1(1) ≈ [(1.1633)]^(1/2) - 1 R1(1) ≈ (1.0789) - 1 R1(1) ≈ 0.0789 or 7.89%
4. So, the market's forecast of the one-year rate next year is approximately 7.89%.
5. **To calculate the market's forecast of the one-year rate after two years, denoted as R1(2), we use the same logic:** R1(2) = [(1 + R3)^(1/2)] - 1 R1(2) = [(1 + 0.09)^(1/2)] - 1
6. **Calculate R1(2):** R1(2) = [(1.09)^(1/2)] - 1 R1(2) ≈ [(1.0435)] - 1 R1(2) ≈ 0.0435 or 4.35%
7. Therefore, the market's forecast of the one-year rate after two years is approximately 4.35%.

In summary, using the expectations hypothesis, the market predicts that the one-year interest rate next year will be around 7.89%, and the one-year interest rate after two years will be approximately 4.35%.

Q5. Trace out the major differences in the degree and nature of NPA crisis in Indian banking system during 1997-2002 and after 2008 global financial crisis. What have been the policy responses to this crisis in two different time periods?

Ans. NPA Crisis in Indian Banking System: 1997-2002 and Post-2008 Global Financial Crisis

1997-2002:

Nature of Crisis: The NPA (Non-Performing Asset) crisis during this period was largely a result of economic challenges such as macroeconomic instability, structural weaknesses, and policy shortcomings. Industries like textiles, steel, and infrastructure faced stress due to global competition, outdated technology, and inadequate project financing.

Degree of Crisis: The NPA crisis during this period was significant but relatively contained compared to the later crisis. The gross NPA ratio rose from around 7% in the late 1990s to about 12% by 2002.

Policy Responses: Policy responses were mainly aimed at structural reforms, including financial sector reforms, to improve risk assessment, loan recovery mechanisms, and supervision. The establishment of Asset Reconstruction Companies (ARCs) was one such response, helping banks offload bad loans and focus on core banking activities.

Post-2008 Global Financial Crisis:

Nature of Crisis: The 2008 crisis had global repercussions, leading to a more severe and prolonged NPA crisis in India. Global slowdown affected Indian industries, real estate, and infrastructure. Large exposure to sectors like real estate and infrastructure led to NPAs.

Degree of Crisis: The NPA crisis after the 2008 crisis was more pronounced and widespread. The gross NPA ratio surged from around 2.4% in 2008 to over 11% by 2018.

Policy Responses: The Reserve Bank of India (RBI) introduced a range of measures to address the crisis, including Asset Quality Review (AQR) to identify hidden NPAs, and the Insolvency and Bankruptcy Code (IBC) to expedite resolution. Measures like the Strategic Debt Restructuring (SDR) and Scheme for Sustainable Structuring of Stressed Assets (S4A) aimed to restructure loans and improve the viability of stressed assets.

Key Differences:

Trigger: The 1997-2002 crisis was triggered more by domestic structural issues, whereas the post-2008 crisis was exacerbated by global financial turmoil.

Extent: The NPA problem after the 2008 crisis was more severe and widespread due to its global origins, affecting a broader range of sectors.

Response: The policy response after 2008 was more focused on addressing the immediate NPA crisis through stricter recognition norms and mechanisms for resolution, reflecting lessons learned from the earlier crisis.

Impact: The 1997-2002 crisis led to reforms in the banking sector and risk management practices. The post-2008 crisis led to more aggressive measures like the IBC to resolve stressed assets.

Global Context: The post-2008 crisis underscored the interconnectedness of global financial systems and the need for proactive measures to prevent contagion.

In conclusion, the NPA crises during the two periods differed in their nature, extent, and policy responses. The post-2008 crisis, influenced by global financial turbulence, had more far-reaching consequences and required more targeted measures to manage and resolve the crisis.

Q6. (a) How have the capital adequacy norms changed in recent years? How is Basel 3 an improvement over Basel 2 norms?

Ans. **Changes in Capital Adequacy Norms:**

Capital adequacy norms are regulations that ensure banks maintain a sufficient amount of capital to cover potential losses from their risk exposures. These norms are designed to enhance the stability and resilience of the banking system. Over the years, capital adequacy norms have evolved, with Basel accords being a key framework. Basel 2 and Basel 3 are two significant stages of this evolution.

Basel 2:

Basel 2, introduced in 2004, focused on three pillars: minimum capital requirements, supervisory review, and market discipline. It introduced the concept of risk-based capital requirements, wherein banks were required to allocate capital based on the risk profiles of their assets.

Basel 3:

Basel 3, introduced as a response to the 2008 global financial crisis, brought significant improvements and enhancements to capital adequacy norms:

Higher Capital Requirements: Basel 3 introduced higher minimum capital requirements for banks. It specified that Tier 1 capital (core capital) should be at least 4.5% of risk-weighted assets (RWAs), up from the previous 2% requirement under Basel 2.

Capital Conservation Buffer: Basel 3 introduced a capital conservation buffer of 2.5% on top of the minimum capital requirements. This buffer is designed to ensure that banks maintain capital levels even during economic downturns.

Countercyclical Buffer: To address systemic risks arising from excessive credit growth, Basel 3 introduced a countercyclical buffer ranging from 0% to 2.5% of RWAs. National regulators can activate this buffer in periods of excessive credit expansion.

Leverage Ratio: Basel 3 introduced a non-risk-based leverage ratio to prevent excessive leveraging by banks. This requires banks to maintain a minimum Tier 1 capital level in relation to their total exposure.

Liquidity Requirements: Basel 3 introduced liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) to ensure banks have sufficient liquidity to withstand short-term and long-term stress scenarios.

Improved Risk Assessment: Basel 3 refined the risk assessment methods and increased the risk sensitivity of capital requirements, leading to a better alignment between capital held and actual risk exposures.

Improvements of Basel 3 over Basel 2:

Higher Capital Standards: Basel 3 significantly increased the minimum capital requirements and introduced additional buffers, making banks more resilient to financial shocks and crises.

Enhanced Risk Coverage: Basel 3 improved the risk sensitivity of capital requirements, ensuring that riskier assets attracted higher capital charges.

Liquidity Focus: Basel 3 introduced liquidity requirements to ensure banks maintain adequate liquidity to weather financial stress.

Leverage Control: Basel 3 introduced the leverage ratio to control excessive leveraging by banks, mitigating risks associated with high leverage.

Countercyclical Measures: The inclusion of countercyclical buffers and measures emphasized the importance of addressing systemic risks and promoting financial stability.

Crisis Response: Basel 3 was a response to lessons learned from the 2008 crisis, aiming to prevent a similar crisis by enhancing capital and liquidity standards.

In conclusion, Basel 3 represents a significant improvement over Basel 2 by enhancing capital requirements, liquidity standards, and risk sensitivity. These improvements are intended to make the banking system more resilient and better equipped to handle financial crises and economic downturns.

Q6. (b) Several variables can be placed in one or more of the following categories: policy instruments, operating targets, intermediate targets, or final targets. Which of the following variables can be placed in which of these categories and why?

(i) Non borrowed reserves

(ii) The interest rate

(iii) The money stock

Ans. The classification of variables into different categories (policy instruments, operating targets, intermediate targets, and final targets) helps in understanding the framework of monetary policy and its implementation. **Let's categorize the given variables:**

(i) Non-Borrowed Reserves:

Category: Operating Target / Intermediate Target

Explanation: Non-borrowed reserves refer to the reserves held by banks with the central bank that are not obtained through borrowing. These reserves are influenced by the central bank's policy instruments, such as open market operations. Non-borrowed reserves are an intermediate target because they are directly influenced by the central bank's operating targets (like open market operations) and indirectly affect final targets (like interest rates or money supply) as well.

(ii) The Interest Rate:

Category: Operating Target / Intermediate Target / Final Target

Explanation: The interest rate can fall into different categories based on the context and the specific policy framework used by the central bank:

Operating Target: In some cases, the central bank directly sets the policy interest rate as an operating target to guide the behavior of other interest rates and influence economic conditions.

Intermediate Target: Interest rates can also serve as an intermediate target. The central bank may target specific interest rates (e.g., federal funds rate) to achieve broader economic objectives such as price stability or full employment.

Final Target: Interest rates may also be considered final targets if the central bank directly aims to achieve a specific interest rate level as the primary goal of its monetary policy.

The categorization depends on how the interest rate is used within the central bank's policy framework.

(iii) The Money Stock:

Category: Intermediate Target / Final Target

Explanation: The money stock refers to the total amount of money in an economy, including currency and demand deposits. It can be an intermediate target if the central bank aims to control the money supply to influence broader economic variables like inflation or economic growth. The money stock can also be a final target if the central bank directly aims to achieve a specific money supply level as a primary goal of its monetary policy.

In summary, the categorization of variables like non-borrowed reserves, interest rates, and the money stock into policy instruments, operating targets, intermediate targets, or final targets depends on their role in the central bank's policy framework and the specific goals of monetary policy implementation.

Q7. (a) What do you understand by the Unconventional monetary policy measures? Under what circumstances are these used? Outline the categories in which these unconditional measures can be classified explaining any two of them.

Ans. Unconventional monetary policy measures are tools used by central banks to stimulate or stabilize an economy when conventional measures, such as changes in policy interest rates, become ineffective due to near-zero or zero interest rate levels. These measures are typically employed during periods of severe economic downturns, financial crises, or when traditional monetary policy tools have limited impact. Unconventional measures aim to influence broader financial conditions, increase liquidity, and support economic recovery.

Circumstances for Using Unconventional Monetary Policy:

Unconventional monetary policy measures are used when:

1. **Zero Lower Bound:** Policy interest rates are close to zero, limiting further cuts to stimulate the economy.
2. **Weak Economic Activity:** Economic growth is sluggish, and conventional measures fail to produce desired outcomes.
3. **Deflationary Pressures:** The economy faces risks of deflation or very low inflation, which can harm economic performance.
4. **Financial Stability Concerns:** To stabilize financial markets during times of crisis or stress.

Categories of Unconventional Measures:

Unconventional monetary policy measures can be classified into several categories:

1. **Quantitative Easing (QE):** Central banks purchase long-term assets (such as government bonds or mortgage-backed securities) to increase the money supply and lower long-term interest rates.
2. **Forward Guidance:** Central banks communicate their future policy intentions to influence market expectations and guide behavior. This can include commitments to keep interest rates low for an extended period.
3. **Negative Interest Rates:** Central banks set policy interest rates below zero to encourage banks to lend rather than hold excess reserves.
4. **Credit Easing:** Central banks provide targeted support to specific sectors by purchasing assets directly related to those sectors (e.g., corporate bonds or loans).
5. **Yield Curve Control:** Central banks target specific yields on government bonds of different maturities to influence borrowing costs and market expectations.

Explanation of Two Unconventional Measures:

1. Quantitative Easing (QE):

QE involves the central bank purchasing a substantial amount of long-term financial assets, usually government bonds or mortgage-backed securities, from the market. The goal is to inject liquidity into the financial system, lower long-term interest rates, and encourage borrowing and spending. By increasing the money supply, central banks aim to stimulate economic activity and boost inflation. QE is particularly effective when conventional monetary policy tools are constrained by the zero lower bound.

2. Negative Interest Rates:

In a negative interest rate policy (NIRP), central banks set the policy interest rate below zero, meaning that commercial banks are charged interest for holding excess reserves with the central bank. This approach aims to incentivize banks to lend to consumers and businesses rather than

holding onto reserves. Negative rates theoretically encourage spending and discourage saving, thereby stimulating economic activity and investment. However, NIRP can also have unintended consequences, such as affecting banks' profitability and savers' behavior.

Unconventional monetary policy measures are implemented cautiously, as they can have both positive and negative consequences and may have limitations in terms of their effectiveness. They are usually considered as complementary tools to conventional measures, and their deployment depends on the specific economic and financial circumstances of each country.

Q7 (b) Explain the process to make the money multiplier invariant to changes in statutory cash reserve requirement?

Ans. The money multiplier is a concept that describes the relationship between the monetary base (currency in circulation plus reserves held by banks) and the money supply in an economy. The statutory cash reserve requirement refers to the portion of deposits that banks are required to hold as reserves with the central bank. To make the money multiplier invariant (constant) to changes in the statutory cash reserve requirement, certain adjustments can be made. **Let's break down the process:**

Money Multiplier Formula:

The basic money multiplier formula is given by:

Money Multiplier = 1 / Reserve Ratio

Where the reserve ratio is the ratio of reserves to deposits that banks are required to hold as per the statutory cash reserve requirement.

Making the Money Multiplier Invariant:

The statutory cash reserve requirement directly affects the reserve ratio, and consequently, the money multiplier. To make the money multiplier invariant to changes in the reserve requirement, an adjustment can be made by considering the impact of changes in the reserve ratio on the money multiplier.

Initial Situation: Let's assume the initial statutory cash reserve requirement is R_initial, resulting in a reserve ratio of 1/R_initial.

Desired Situation: Now, if the statutory cash reserve requirement changes to a new value R_new, the corresponding reserve ratio becomes 1/R_new.

Adjustment Factor: To keep the money multiplier invariant, an adjustment factor (AF) needs to be introduced that accounts for the change in the reserve ratio:

AF = (1 / Reserve Ratio_new) / (1 / Reserve Ratio_initial)

AF = Reserve Ratio_initial / Reserve Ratio_new

Adjusting the Money Multiplier Formula: By introducing the adjustment factor, the money multiplier formula becomes:

Invariant Money Multiplier = 1 / (Reserve Ratio_new) AF

Invariant Money Multiplier = 1 / (Reserve Ratio_new) (Reserve Ratio_initial / Reserve Ratio_new)

Invariant Money Multiplier = Reserve Ratio_initial

The resulting invariant money multiplier is equal to the initial reserve ratio.

By making the money multiplier equal to the initial reserve ratio, changes in the statutory cash reserve requirement can be neutralized in terms of their impact on the money supply. This ensures that the money multiplier remains constant regardless of changes in the reserve requirement.

It's important to note that while this adjustment maintains the invariance of the money multiplier mathematically, the real-world effects of changes in the statutory cash reserve requirement can have broader implications on the banking system, money supply, and overall economic conditions.

Q8. Write short note on the following:

(i) Movement from base rate lending system to MCLR system

Ans. The movement from the Base Rate lending system to the Marginal Cost of Funds-Based Lending Rate (MCLR) system was a significant change in the way banks in India determined lending rates to borrowers. The change aimed to bring more transparency, efficiency, and responsiveness in the transmission of monetary policy changes to borrowers. **Here's a short note on this transition:**

Base Rate Lending System:

The Base Rate was introduced in India in 2010 as the minimum lending rate below which banks could not lend. It was meant to replace the Benchmark Prime Lending Rate (BPLR) system to ensure that lending rates were more aligned with the cost of funds for banks. However, the Base Rate system faced criticism for its lack of responsiveness to changes in the policy rate set by the central bank, resulting in slow transmission of rate cuts to borrowers.

Marginal Cost of Funds-Based Lending Rate (MCLR) System:

In April 2016, the Reserve Bank of India (RBI) introduced the MCLR system to improve the efficiency of monetary policy transmission and make lending rates more responsive to changes in market interest rates. **Under the MCLR system:**

Cost Components: Lending rates are based on the marginal cost of funds, which includes actual borrowing costs (interest rates on deposits and borrowings) and the return required by shareholders.

Tenor-Based: Lending rates are determined by the tenor (maturity) of the loan. Different MCLR rates are set for various loan maturities, ranging from overnight to one year.

Frequency of Review: Banks review and reset their MCLR rates at regular intervals, usually every month, to reflect changes in their funding costs.

Transmission: MCLR lending rates are expected to respond more quickly to changes in the RBI's policy rates, ensuring a more effective transmission of monetary policy actions to borrowers.

Spread over MCLR: Banks charge a spread over the MCLR based on factors like credit risk, operating costs, and profit margin. This spread remains constant during the tenor of the loan.

The MCLR system aimed to address the shortcomings of the Base Rate system by ensuring that lending rates were more transparent, responsive, and aligned with market conditions. By linking lending rates to the marginal cost of funds, banks were expected to pass on the benefits of policy rate cuts to borrowers more effectively.

In conclusion, the movement from the Base Rate lending system to the MCLR system marked a significant shift in the way lending rates were determined in India. The MCLR system aimed to enhance the transmission of monetary policy changes, ultimately benefiting borrowers by ensuring quicker adjustments to changes in market interest rates.

(ii) Open Market Operation

Ans. Open Market Operations (OMOs) are one of the key tools used by central banks to implement monetary policy and influence the money supply in an economy. An OMO involves the buying or selling of government securities (such as treasury bills or bonds) by the central bank in the open market. The objective of OMOs is to regulate the liquidity in the banking system, influence short-term interest rates, and achieve the central bank's monetary policy goals**. Here's a short note on open market operations:**

Objectives of Open Market Operations:

1. **Liquidity Management:** Central banks use OMOs to manage the supply of money in the economy by injecting or withdrawing liquidity. Purchasing government securities injects money into the banking system, increasing liquidity, while selling government securities absorbs money, reducing liquidity.
2. **Interest Rate Control:** OMOs are a mechanism to influence short-term interest rates. When the central bank buys securities, it increases the reserves of banks, which can lead to lower short-term interest rates. Conversely, selling securities reduces bank reserves, potentially leading to higher short-term interest rates.
3. **Monetary Policy Implementation:** OMOs are a flexible tool that allows central banks to fine-tune their monetary policy stance. By adjusting the frequency, volume, and tenor of OMOs, central banks can calibrate their policy measures to achieve specific objectives.
4. **Inflation Control:** OMOs can also indirectly influence inflation. By influencing interest rates and money supply, central banks can impact spending and investment patterns in the economy, thereby affecting overall demand and, consequently, inflation.

Types of Open Market Operations:

1. **Outright Purchase:** The central bank buys government securities from the market participants, injecting money into the banking system and increasing the money supply.

2. **Outright Sale:** The central bank sells government securities to the market participants, absorbing money from the banking system and reducing the money supply.
3. **Repo Operations:** The central bank conducts repurchase agreements (repos) where it sells securities to banks with an agreement to repurchase them in the near future. This temporarily absorbs excess liquidity from the banking system.
4. **Reverse Repo Operations:** Similar to repo operations, the central bank buys securities from banks with an agreement to sell them back. This injects temporary liquidity into the banking system.

Open Market Operations provide central banks with a flexible and powerful tool to influence the money supply, interest rates, and overall economic conditions. By adjusting the volume and frequency of OMOs, central banks can effectively manage the money market and achieve their monetary policy objectives.

(iii) Liquidity Adjustment Facility

Ans. The Liquidity Adjustment Facility (LAF) is a monetary policy tool used by central banks to manage short-term liquidity conditions in the banking system. It allows banks to borrow or lend funds on an overnight basis to adjust their short-term liquidity mismatches. The primary objective of the LAF is to ensure that the overnight interbank interest rates remain within a specified range, which is typically determined by the central bank's policy rate. The LAF helps in fine-tuning liquidity conditions and controlling short-term interest rates to achieve the central bank's monetary policy goals. **Here's a short note on the Liquidity Adjustment Facility:**

Components of LAF:

The LAF typically consists of two components:

Repo Rate: The repo rate is the rate at which banks borrow funds from the central bank by selling government securities. It serves as the lending rate in the LAF. By adjusting the repo rate, the central bank can influence the cost of borrowing for banks.

Reverse Repo Rate: The reverse repo rate is the rate at which banks lend funds to the central bank by purchasing government securities. It serves as the borrowing rate in the LAF. The reverse repo rate helps in absorbing excess liquidity from the banking system.

Functioning of LAF:

Surplus Liquidity Scenario: When there is excess liquidity in the banking system, banks have surplus funds. To park these surplus funds and earn interest, banks can lend them to the central bank through reverse repo operations. This helps in mopping up excess liquidity and prevents overnight interest rates from falling too low.

Deficit Liquidity Scenario: When banks face a liquidity shortage, they can borrow funds from the central bank through repo operations by pledging government securities as collateral. This provides banks with the necessary funds to meet their immediate liquidity needs and prevents overnight interest rates from rising excessively.

Objectives of LAF:

Liquidity Management: LAF helps banks manage their short-term liquidity imbalances by providing a mechanism to borrow or lend funds based on their needs.

Interest Rate Control: By adjusting the repo and reverse repo rates, the central bank can influence the short-term interest rates prevailing in the money market.

Monetary Policy Implementation: LAF is an effective tool to implement the central bank's monetary policy decisions, ensuring that policy rates are transmitted accurately to the broader economy.

Stability of Money Markets: LAF contributes to the stability of the money markets by controlling short-term interest rates and preventing excessive volatility.

In summary, the Liquidity Adjustment Facility is a crucial tool used by central banks to manage short-term liquidity conditions in the banking system. It allows banks to borrow or lend funds on an overnight basis, helping in liquidity management, interest rate control, and effective monetary policy implementation.