World Financial Networks

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I. How many financial networks are there in the world? (SWIFT, RTP, ACH, etc)

A financial network is a chain of banks, traders, organizations, and financial exchanges to undergo financial transactions. There are millions of financial networks running in this world who are working for the betterment of people [1]. Most common financial network are as follow.

A. SWIFT

SWIFT stands for "Society for Worldwide Interbank Financial Telecommunication". The purpose of SWIFT is to make global financial transactions easier. The code is universal and is governed by ISO 9362 standards. Created in 1973, the institution connects at least 11,000 financial institutions in 200 countries and territories.

SWIFT is a system whose main function allows the exchange of banking information and financial transfers between financial institutions. The World Society for Interbank Financial Telecommunications is a cooperative body between financial institutions. Therefore, SWIFT is a type of service often used for transfers between institutions in two or more different countries or even for those who operate investments abroad [2].

B. The importance of SWIFT in the global financial system

Since 1973, when it was created, the institution has worked as a platform for financial communication. That is, it allows financial information to be exchanged. In other words, the institution does not act in the transfer of money, as banks and brokers, but in the transfer of data.

It is based in Belgium, Brussels, at the same time Amsterdam, the Netherlands, and New York, the United States, set up exchange centers respectively, and set up National Concentration centers for participating countries to provide fast, accurate, and excellent services for international financial business.

In 1977, SWIFT had more than 150 member countries and more than 5,000 member banks in the world. The SWIFT system handled 3 million SWIFT telecommunications transactions daily, with a peak of 3.3 million transactions. As of June 2007, SWIFT's services have spread to 207 countries and more than 8,100 financial institutions have been connected. The only one in Taiwan with business strategy and service provider qualifications is Ares.

SWIFT Code (Bank International Code) is generally used for power transmission, letter of credit telegram, every bank has it, and is used to quickly process inter-bank telegrams. Large banks like Industrial and Commercial Bank of China and China Construction Bank also assign different Swift codes to their internal branches.

239 banks from 15 countries in the United States, Canada, and Europe announced the formal establishment SWIFT, headquartered in Brussels, Belgium, is a non-profit organization established to solve the problem that financial communications in various countries cannot adapt to the rapid growth of international payment and settlement. It is responsible for the design, establishment, and management of the SWIFT international network to communicate among its members. Carry out the transmission and routing of international financial information. International Interbank Communication Association Swift was established in 1977 by commercial banks in Europe and the United States for cross-border money transactions.

More than 11,000 financial institutions in over 200 countries pay money and pay for trade through the Swift network every day. It is a necessary service for international financial transactions in payments in dollars and euros. It is a system that transacts funds through special encrypted financial messages. A representative example of the international community's use of this Swift for sanctions was in 2012. The United States and the EU have forced Iran's central bank and more than 30 financial institutions and businesses out of Swift due to economic sanctions against Iran. The organization, which started as 239 banks in 15 countries in 1973, has 9,000 financial institutions from 209 countries as of September 2010, and 15 million Interbank messages are exchanged a day through SWIFT's network.

SWIFT has data centers in the United States and the Netherlands and opened its third data center in Switzerland in 2009. In the event of a problem in any of the three regions, the remaining centers will be able to process interbank messages.

Meanwhile, most of the existing financial-related systems can process information messages written in the SWIFT standard after receiving them regardless of whether they are via the SWIFT network. Business identifier codes established by SWIFT have been designated as international standards (ISO 9362) since 1994 and are generally called SWIFT codes. The code has a total of 11 or 8 digits and consists of institutional/bank code, country code, area code, and branch code. The branch code is optional, and the head office is marked with XXXX' in place of the area code or not at all.

C. Automated Clearing House (ACH)

It is an electronic clearing system between American financial institutions and the most stable and efficient batch exchange center in the United States. It provides interbank payment, electronic payment, and clearing services to participate in depository institutions.

ACH is highly practical and can meet high-efficiency requirements. ACH transaction settlement generally only takes 1 working day, which can effectively meet the general timeliness requirements. Also, ACH charges are low, compared to other payment methods such as wire transfers. For example, the handling fee of a wire transfer is usually $10-$25 per transaction, while ACH is usually only $1-$2.

Due to the simple processing process, the service providers in each link of the value chain charge low fees and are economical. It simplifies processing, improves efficiency, and makes the entire payment network simple and fast. Therefore, for inter-bank payments in the United States, the preferred method is ACH payment.

Bank of America has strict requirements for the management of ACH. Because it is a batch operation, the "recipient financial institution" does not need to check the deduction balance in real-time and then return it to the "initiator financial institution". Under this model, banks need to bear risks such as insufficient customer balances. The U.S. banking industry has extremely strict compliance requirements and technical specifications for partners, especially for financial technology companies (Fintech) that only accept the top and best partners.

At present, all wealth management products that are connected through Maxim Financial already support the ACH payment method, that is, if your customer has a U.S. bank account, the customer can choose to use ACH payment when paying for investment orders. Although checks are widely used in daily life, as a paper payment method, in this era of popular mobile/electronic payment, it is still not very convenient. This article mainly introduces the ACH (Automated Clearing House) transfer method in the United States, which is an electronic payment method for transferring funds between banks and the mainstream payment method currently used by everyone. In 2018, the ACH payment network processed 23 billion transfers, including direct deposit to pay various wages and government benefits, direct payment to pay various bills, person-to-person (P2P) payment, business-to-business (B2B) Paid. In 18 years, the transaction value of ACH online payment exceeded $51.2 trillion. At present, the transaction volume of the ACH network continues to grow. Nacha (National Automated Clearing House Association) announced that the payment volume in the fourth quarter of 2019 increased by 8.1% year-on-year.

D. The history of ACH

The history of ACH starts with the use of checks. In the 19th century, banks received a large number of checks from other banks every day. Banks need to sort these checks, send a postman, and go to other banks to exchange the checks for cash. This method is very inefficient. Both banks have to send personnel to withdraw cash from each other. With the increase in the number of banks, this transaction method requires more time to complete.

Based on this situation, Clearing House was established to process checks between various banks. Banks hand over the checks to Clearing House for unified processing, and exchange checks from other banks for their bank checks. This method greatly improves the efficiency of processing and makes American people use checks more and more frequently. Around the 1950s, Americans paid more than 28 million checks every day. This means that one in six Americans uses a check every day. With the surge in the use of checks, processing efficiency is once again facing the test. Although there is a clearinghouse, the sorting and cashing of checks are still done manually. The efficiency of manual processing can no longer meet the surge in the number of checks, and electronic payment needs to be introduced to solve the problem.

In this business, the collecting bank will deduct the money from the recipient's bank account to the sender, and the sender or the paying bank will transfer the sender's money to the recipient's bank account. All transactions are in the sender's and recipient's bank accounts. Transfer money is convenient, safe, fast, and reliable.

E. Real-time Payment (RTP)

In 2017, 25 large banks in the United States started to use the real-time payment system (RTP) launched by the financial market utility company TCH (The Clearing House), which changed the outdated financial infrastructure in the United States. It is understood that TCH has been operating payment infrastructure in the United States since the Civil War. This shows that American banks and other financial institutions have begun to pay attention to the importance of real-time payment systems. Compared with other countries, the United Kingdom has launched the RTP system as early as 2008, and China has completed the national promotion of real-time payment systems as early as 2005. The use of TCH's RTP system by major US banks is also a key step for the US to catch up with the development of RTP systems in other countries.

When small banks in the U.S. face the real-time launch of direct competitors The payment system has refused to join and expects the Federal Reserve to launch similar services. Last year, the Federal Reserve (Federal Reserve) announced that it was considering providing its real-time payment network system and began to solicit public opinions, which also brought the TCH RTP promotion to a standstill. In the summer of this year, the Federal Reserve confirmed that it will begin to establish the FedNow real-time payment settlement network.

The biggest problem after the Fed's entry into the market is that the Fed's FedNow and the RTP system jointly promoted by 25 large banks cannot interoperate. This means that the system run by the Fed will produce a branch payment system, which may allow individuals and businesses, individuals and Individuals, enterprises and enterprises cannot complete instant payments in time.

II. WHO STARTED THOSE NETWORKS AND WHO MAINTAINS THEM?

Swift works under Belgian law, and it is governed by the stakeholders that include 3500 organizations in the world. It is maintained by a team of 25 directors.

ACH is governed by NACHA, Automate Clearing House, which is an independent institution.

RTP is established by the Clearing House (TCH) and other 25 banks and it is managed by the collaboration of its founders.

III. WHAT ARE THE TRANSACTION FORMATTING RULES (ISO STANDARDS)?

ISO 20022 "Financial Services Financial Industry General Message Program" is a sequential international standard developed and released by the International Organization for Standardization since 2004. It aims to realize the straight-through processing (STP) of financial messages and improve Market efficiency reduces transaction costs. This standard has greatly improved the

interoperability, openness, and scalability of financial industry messages. It is an advanced general message scheme developed by using the network and extensible mark-up language (XML) technology.

The standard splits the message into two parts: business elements and technical representations, that is, a unified modeling method (UML) independent of grammar is used to extract, analyze and describe business fields, business processes, business transactions, message processes, etc., and finally The XML language describes the message definition. The above methods provide a prerequisite for maintaining the relative stability of messages, improving cross-domain sharing of messages, promoting information integration, and using other more advanced grammatical forms to describe message definitions in the future.

As an organic whole, the ISO 20022 standard is composed of 6 parts. The main content includes an overview of the contents of the ISO 20022 library and input and output methods, the role and responsibilities of the registration and maintenance organization, service levels and processes, modeling guidelines for building business models and message sets that conform to the ISO 20022 standard, and converting the model to XML grammar representation Design rules, conversion from existing standards to conform to ISO 20022 standard message rules, and selection of message transmission characteristic parameters.

The ISO 20022 standard is one of the widely used international standards. According to the information provided by the TC68 annual conferences and ISO 20022 registration and maintenance organizations, many countries, regions, and standardization organizations have adopted or are planning to adopt the standard. For example, TC68 SC7 (Bank Core Business Sub-Technical Committee) has planned to unify financial transaction card-related transaction messages under the ISO 20022 standard, and unify the contents of the ISO 8583 and ISO 20022 libraries; SWIFT has formulated a plan to standardize its MT message Gradually transition to ISO 20022, its newly developed standards have all been based on ISO 20022 standards; SEPA in Europe and MEPS+ systems in Singapore have adopted ISO 20022 standards; Fedwire in the United States, Zengin in Japan, and HKMA in Hong Kong have also adopted the real-time settlement system ISO 20022 standard. The People's Bank of China organized the adoption of this standard in 2005 and submitted it to the National Standards Committee for approval in June 2009. The securities industry has formulated two standards under the framework of this standard, and the bond registration and settlement field are also using this standard for system message development. The second-generation payment system of the People's Bank of China and the RMB cross-border receipt and payment information management system will adopt the ISO 20022 message standard and use this as an opportunity to realize the standardization of interconnected messages in the People's Bank of China system in a gradual expansion method.

A. Prospects for the application of ISO 20022 standard

The ISO 20022 "Financial Services and Financial Industry General Messaging Scheme" standard is an advanced universal message scheme formulated by using the Internet and XML technology for the information exchange problem of the financial industry. At present, the message specification conforming to the ISO 20022 standard has been widely used worldwide. ISO attaches great importance to the promotion and use of standards. It has specially established the ISO 20022 standard newspaper library for free use by the global financial community and established the ISO 20022 registration management organization (RMG), standard evaluation organization (SEG), and registration organization (RA) to be responsible for this Maintenance and management of the library. At present, following the ISO 20022 "Common Messaging Scheme for Financial Services and Financial Industry" standards, four types of message standards have been developed internationally. They are Payment, Foreign Exchange and Derivatives (FX), Securities, and Trade Services. (Trade services), a total of 265, these mature message standards have been reviewed granted ISO 20022 Registry of standards, the ISO 20022 into the library, as the global financial business message standards. In many countries, the ISO 20022 standardized development method has also been gradually applied to the development process of some important financial industry information systems, including the Central Bank Accounting Data Centralized System (ACS), the second generation payment system of the People's Bank of China, and the online payment interbank of the People's Bank of China Clearing System (EBPS), Electronic Commercial Draft System of the People's Bank of China (ECDS) and RMB cross-border receipt and payment information management system (RCPMIS), etc. In the next step, the People's Bank of China will use the practical application of the ISO 20022 standard as an opportunity to gradually establish the "People's Bank of China System Interconnection News Library", build the People's Bank of China infrastructure, and promote the standardization of information system interconnection.

The gradual implementation of the ISO 20022 standardization development method in the financial industry will bring new ideas and vitality to the development of general information systems in the country's financial industry and lay a good foundation for information interaction and standard unification between information systems in the future.

IV. HOW DO THEY OPERATE? (BANK TO BANK/ BANK TO THE GOVERNMENT)

A. SWIFT

Swift sends money rather than transferring funds by using the Swift codes. SWIFT (The Society for Work Interbank Financial Telecommunication) is a Belgian System created to be a tool for the transmission of secure messages on international financial transactions, through this system interbank transactions are exchanged (orders of payment, remittances, documentary credits, messages in free format). It is a System that facilitates interbank transfers Provides an encrypted messaging service to enable international fund transfers.

B. How does SWIFT work?

This is carried out when a client makes an international transfer in favor of another, the issuing bank issues a code that indicates how it will send the funds to the client, indicating dates, currencies, and expenses. It can also be used in all operations abroad, with all countries in the world, and

is mainly used to identify the bank account in international payments.

C. SWIFT system security focuses on four main objectives:

1) Confidentiality: The information is only disclosed to authorized persons.

2) Integrity: Information can be trusted to be complete, accurate, and valid.

3) Availability: Information and associated services can be accessed when needed.

4) Trust: Every individual authorized to use the system is trustworthy.

D. Benefits

As a result, it has the following benefits:

- Standardization of processes
- Speed in the transmission of information
- Elimination of errors due to interpretations
- Increase in security levels (encrypted messages and authentication keys.

E. ACH

The ACH collection and payment service are to process large inter-bank transfer transactions in a timed, batch, and net clearing manner. First, the financial institution transmits the transfer content to the Exchange via the Internet for classification and settlement according to the initiator's application. Then the relevant bank transfers the account. The ACH collection and payment operations of this Exchange are handled regularly every day, that is, the system starts every morning and accepts the ACH collection and payment materials submitted by the proposing banks [43].

F. RTP

The establishment of the new network RTP allows users to view and immediately use the payments received, or to obtain credits for payments received. The RTP network established by TCH now covers more than 50% of the users of U.S. deposit accounts and is expected to achieve coverage of almost every account before the end of 2020.

V. How do bank chartering works, how much does it cost, how many are issued in the USA?

Given the particularity of the banking industry's high risks, the overall nature of the crisis, and the importance of its functions, all countries have implemented franchise systems for them. Licensed operators have the right to carry out banking business, and can not only obtain competition restrictions, interest rate control, Financial control policies such as government implicit guarantees create operating conditions for them and can rely on the industrial attributes and functional characteristics of the banking industry to form operating advantages in economies of scale, information resources, and market reputation [3].

A bank charter is an official document permitting a banking company to commence business as a bank. It authorizes banking operations. A bank charter includes the articles of incorporation and the certificate of incorporation. The charter specifies the rights of a banking institution. The cost of a bank charter varies from different aspects like size, monetary value, and other conditions. About 5177 charters have been issued in the US till 2019.

VI. How are these networks monitoring transactions, what tools, and what methods?

Bank chartering is a set of laws and limitations implemented on the bank. The banks are monitored through the implementation of the rules mentioned in the charter. On the other hand, the national charter provides leniency to the banks.

VII. Who are the Financial Watchdogs and how do they enforce suspect transactions?

Anti-Money Laundering (AML), Asian Pacific Group on Money Laundering (APG), Caribbean Financial Action Task Force (CFAT), Countering the Finances of Terrorism (CFT), etc. these are some of the well-known global financial watchdogs. Financial Action Task Force which is also known as FATF is considered the most important money laundering and terrorist financing watchdog. The main purpose of this organization is to help prevent the illegal transfer of money which may be used for unlawful purposes. The 9/11 attacks followed by attacks in Pakistan, Turkey, Saudi Arabia, etc. which were carried out by the Al Qaida network, these events brought into focus the changing nature of terrorism. The world is relying on FATF since 2001. United Nations Security Council passed resolution number 1617 which appreciated the role of FATF in curbing the evil of illegal money transfer.

FATF was established in July 1989 after the Summit in Paris. Group G-7 countries decided to establish this organization so that they can track and trace the illegal financial transfer taking place in different countries. In the first year of its formation, FATF gave forty recommendations. Its recommendations were approved late on after the event of 9/11. It is a 39 members organization having 37 jurisdictions and two regional organizations including the GCC and European Commission. All the members share a common goal of diminishing illegal transfers [4].

A. Strategies to suspect and combat illegal money transfer:

The forty recommendations given by FATF turned out to a cornerstone in the fight against illicit money transfer. The policy adopted by FATF was '' Know your customer''. Under the policy guideline, it was recommended to omit all the anonymous bank accounts, proper identification of all customers should be made compulsory and all the records should be maintained for 5 years further addition was made in the pact by allowing all the legal organizations to check the details of customers if they are suspect. FATF also recommended the governments to track and trace all the laundered money because it was believed that the black money acquired through illegal sources was used in drug trafficking and other illicit means. If the states comply with the FATF recommendations, then it would be quite helpful for each country. For that, the state must give authorities a free hand in tracking and tracing them. Another most important point was the sharing of money laundering details between the countries [5].

Financial institutions are under obligation to report dubious transactions to the government's Financial Intelligence Units (FIUs). The main purpose of Suspicious Transaction Reporting (STR) is in line with the Anti Money Laundering (AML) and Countering the Finances of Terrorism (CFT). AML was enacted to pinpoint the money launderers and their supporters. It was believed that this would help the world to get rid of the menace of money laundering. FATF recommendations from R.13-16 are about suspicious transactions reporting. More precisely R.13 states that if a financial institution suspects some sort of irregularity or malicious attempt, it must report promptly to Financial Intelligence Units (FIU). The financial institution can cater the case in two categories referred to as subjective case and objective case. All the countries are required to criminalize money laundering following the Vienna Convention and Palermo Convention. R.13 clearly states that financial institutions have the authority to report a suspected transaction in the following mentioned cases which include environmental crimes, drug trafficking, extortion, or forgery. Once the complaint is filed by a financial institution then criminal investigation proceeds, but all this is kept confidentially from the customer as well as a third party. For more efficient working of STR, it was suggested under R.15 to develop AML and CFT programs for financial institutions [6].So in this way transactions are processed, and suspects are put under investigation for a criminal offense.

VIII. Where does the central bank fit into the picture?

Suspected transactions are an important globalized phenomenon in recent financial society. The country's financial controls are sabotaged, and dirty money is transferred from one area to another. It is also an important case study for tax evasion. Most of the money launderers try to transfer money to avoid taxation and in doing so they save millions of dollars. No doubt it is a global phenomenon, but it is the major obstacle for the efficient working of global financial institutions. The suspected transactions which after investigation turn out to be illicit, have a direct impact on central banks because it halts the efficient working of national economies, and drives the country towards pathetic economic policies. It has a direct impact on global financial institutions by eroding public trust in institutions. The launderers avoid attention by using specific techniques like smurfing (by conducting transactions in the minimum amount possible), invoicing, or through shell companies, etc. These activities are conducted to mainstreaming their cash into the financial system. It is also known as whitening black money. 500 billion to 1 trillion dollars are laundered each year through banking channels. A range of research has shown that more the suspected transaction in a country more will be de stability in that region. It threatens the integrity of a country. Criminal underworlds are present in every country. The conversion of illegal funds into legal can be stopped by adopting certain standard operating procedures. Commercial banks are preferable in case of money transfer because they offer a variety of new ways in which money can be transferred. foreign exchange services, bank drafts, etc are used. The commercial banking sector has branches throughout the world and they never hesitate to transfer small amounts which are quite difficult to trace. Under the new restrictions imposed by FATF customers of Commercial as well as Central banks are quite dissatisfied under close supervision. Governments have enacted new laws throughout the world, and they have also taken help from technology. The process of documentation is being introduced in banks. For every transaction worth greater than 10 thousand dollars, it is traced, and the customer is asked to provide the source. In recent times the United States of America has formulated strict laws to control the flow of illegal money (Musonda, 2011).

The central bank of Ireland has put forward a proposal that banks need to administer programs that follow the recommendations of FATF so that a fast and efficient method of curbing suspected transactions could be reached. [7] This can be achieved by keeping records of the transaction and boosting the internal system of banks. If a suspected transaction has been made, then the specific bank should use all the necessary means to get to know customers' source of income. Cooperation between the banks and the transfer of information must also be maintained. Off and on-site surveillance of financial institutions must be carried out. Issues faced by financial institutions should also be addressed. Capacity building process in all the institutions should be the top priority. The central bank is that platform that provides necessary guidelines and SOPs to all the financial institutions, it is the responsibility of financial institutions to devise their policy according to the Central bank. It will help formulate centralized policy throughout a region. FATF gave a policy statement regarding central banks. The central bank must verify the details of the customers. In case someone is trying to create a new account, it should be made compulsory that all his credentials are thoroughly verified and checked by the manager of that concerned bank. After verification of personal details, the customer should be asked to provide his source of income certificate. His place of employment and his address should be cross-checked [8].

IX. How does the World Bank fit in this picture

World Bank is playing a pivotal role in assisting developing countries to meet their fiscal demand. World Bank provides financial assistance to those countries which are facing extreme poverty. World Bank is also contributing to stopping the transfer of illicit money by launching the Stolen Asset Recovery unit (StAR) and Financial Market Integrity teams (FMI). The drainage of money from developing countries to developed countries has impoverished the former. It has crippled the economy of developing countries. It has been estimated that 20billion dollars to 40 billion dollars are stolen from developing countries each year. Due to the enormous drainage of money, it undermines economic growth and halts the public services to those in need. The World Bank has taken one step further in the war against corruption by helping countries to establish a robust system that will trace and track the information related to the suspected transaction and it will also trace the ultimate beneficiary of illicit flows. G8 leaders in 2011 came out in support of the Asset Recover plan of the World Bank. Repatriation of money is also in process. In 2013, 37 cases were solved on a priority basis. The StAR initiative is a collaboration between the World Bank and the United Nations Office on drug control. This group works trans-nationally by providing all the necessary help needed to fellow countries by providing training and infrastructural support [9].

In 2001, another organization was established under the heading of the Financial Market Integrity Unit which is linked closely with the World Bank. It helps to provide transparency and a systematic approach in going after corrupt money.

A. Challenge

Financial criminals are always in search of new ways to evade justice. It is not easy to comprehend financial irregularity. Anti-Money Laundering organizations are always in search of money trails. Aiding and abetting criminals is a crime therefore these watchdogs target those specific criminals who have a certain record, or they have done some illicit money transfer. These efforts have been more synchronized with the advent of an intergovernmental organization named FATF or Financial Action Task Force. World Bank has also issued guidelines which are completely in line with the forty recommendation of FATF.

B. Solution

World Bank launched its Anti Money Laundering and Combating the Finance of Terrorism in 2001. This initiative demonstrates that WB believes in combating corruption and money laundering through creating an environment of trust between countries so that they can share information. The StAR and FMI along with WB's anti-money laundering agenda have turned out to be a successful strategy to root out corruption prevailing in the society. Those governments who are willing to end these corrupt practices have joined hands with the World Banks' reform agenda in which proper funds and infrastructure is provided by the organization to bring out structural changes in the legislature of a country. Technical assistance is provided to the recipient country. It has proven to be a very effective program because it not only inhibits money drain but also provides capacity building features to broaden the tax base [10].

Many countries have taken advantage of these capacity-building features. In the case of Bolivia StAR has helped this country to establish its asset-recovery unit. Many developing countries are now demanding that the developed countries should formulate laws that will halt the cash drain. In the case of Pakistan, Its premier has demanded that the money drainage should be brought back and WB and IMF should help speed up the process. These efforts made by WB will have positive results in near future because with the help of technology further transparency can be achieved [11].

X. Council on Foreign Relations – what is it, what does it do, who runs it?

Council on Foreign Relations is a think tank organization and works independently. It is a non-profit organization formed in 1992 whose task is to critically analyze the current geopolitical atmosphere especially U.S foreign relations and also about International affairs. It is headquartered in New York City. It comprises five thousand plus members including senior politicians, journalists, students, lawyers, etc. CFR conducts meetings regarding the current issues prevailing in the world and offers a clear and transparent understanding of issues. Since 1922 it has been publishing a bi-monthly magazine named Foreign Policy which is highly reputed throughout the world. They influence the foreign policy of the United States by offering recommendations. The members of this Council interact with diplomats and government officials.

When Germany got defeated after WWI, President Woodrow Wilson was briefed by a group of 150 scholars named ‘’The Inquiry’’. They met to strategize the postwar world. The whole world knew that America is going to expand its horizons. This team worked efficiently to formulate almost 2000 documents that were related to political, economic, and social changes after the War. Woodrow’s famous 14 points on strategy for peace were the outcome of these research scholars. In 1919 they decided to form an organization under the banner of ‘’ The Institute of International Affairs’’. Edwin F. Gay in 1922 decided to publish the magazine on foreign relations for the first time. He collected money from the wealthy people of America. The CFR has been influencing Americans since 1922 practically. In WWII, the American foreign office adopted the recommendation given by CFR.

CFR has two forms of membership; term membership lasts for 5 years only while life membership is lifelong. It is for those citizens having age between 30-36. Only US citizens or those residing there and who have applied for its members can apply. It also offers internship programs and fellowships. once this fellowship is completed you can apply for membership. Currently, Richard Hass is the president of this organization. The council on foreign relations has expanded itself now. It has become a global platform that studies changes taking place throughout the world. It is not limited to USA international affairs only rather it has broadened its horizon to the East. It gives recommendations related to health, economy, any form of pandemics like Covid-19. Last year this organization gathered a fund of almost a 76million dollars. It is not involved in some form of lobbying or political maneuvering rather it is a think tank organization involved in suggesting things. It is not a part of the US government. It is a non-governmental organization [12].

The critics of CFR believe that this organization is eating into the vitals of American democratic society. The main issue related to CFR is that they are highly influential people, but they are unelected so most of the American citizens believe that unelected members should not interfere in state affairs. It is often termed as a school of a statesman. Those who are moderate in their views are also not in favor of CFR's role in politics. When Hitler invaded Poland, CFR devised a foreign policy which turned out to be a miracle and America won the War. These events further prove that CFR is ingrained in US foreign policy although it is not a proper part of the government it is somehow believed to be. It has also worked a lot on forming a soft image of America through the power of the press and the social media platforms [13].

XI. What is Monetary policy?

Monetary Policy can be defined as those actions taken by a country’s central bank to achieve sustainable economic goals through controlling the money supply chain. Monetary policies can be two types of expansionary or contractionary monetary policies. The central bank controls directly or indirectly the flow and quantity of money coming in and out of the country so by drafting, announcing, and implementing the new set of laws come under the jurisdiction of a state bank. To meet macroeconomic goals interest rates are

adjusted and money supply is influenced. When there is a meeting of monetary policy decision-makers, then the investor's stockbrokers wait eagerly for the decisions being made because it directly affects their businesses. Monetary policy aims to reduce poverty by adopting socioeconomic goals like reducing the interest rate, selling of bonds, etc. The policy formulation is not an easy task because inputs from various departments are collected beforehand so that a comprehensive policy should be adopted. Gross Domestic Product and poverty index is also under consideration before finalizing the policy. Business-friendly policy renders more cash inflow and which in turn proves to be a cause of the reduction in the poverty index. The authorities are given free hand to formulate such a policy in which the rate of unemployment is reduced further. the foreign exchange rate is also maintained. It can also be formulated following fiscal policy in which the government collects taxes and manages to borrow and selling to control economic indicators. For example, the Federal Reserve Bank oversees the monetary policies of America. It has a dual task to keep poverty at minimum and employment at maximum. So, it becomes the Fed's responsibility to attain sustainability goals while keeping poverty at a minimum level [14].

Expansionary policies are brought up in a time of catastrophes like Covid-19 when the whole world’s global markets are in a recession so in these hard times this policy is adopted. Interest rates are lowered down. This lowering of interest rate favors spending and diminishes savings. Due to the increase in spending it makes cash flow in markets and boost in the industrial sector appear. A good example of expansionary policy is that after the global financial crisis of 2008 many countries are maintaining zero to low-interest rates to catalyze spending [15].

When the money supply chain is exceeding the targets, it raises the cost of living and the cost of business. Here contractionary monetary policy comes into play by increasing the interest rates so that the cash drainage can be controlled which in turn brings down the level of inflation. But it has one serious disadvantage that it can slow down economic growth which will have a direct impact on employment. In the USA in 1980 when the inflation level peaked at 15%, the Feds decided to increase the interest rate to almost 20% which contributed to the recession in the economy. But this policy brought down inflation to a rate of 3-4% in just a few months [16].

There are certain tools used by central banks to control the market and cash flow. One of the tools is known as open market operation in which bonds are bought and sold to keep the level of cash under control. Another tool used by the central bank is that it causes fluctuations in its rates so that cash remains at the prescribed level. Reserve requirement is another tool successfully used by the central banks. Apart from contractionary and expansionary policies, unconventional policies have also taken place and have proved to be very functional to achieve a sustainable growth rate. These monetary policies are used as an indicator to predict GDP, employment, poverty of a country.

XII. What is the central bank and what does it do for you?

The central bank is also known as the reserve bank or monetary authority. It has the authority to regulate the exchange rates of a country as well as the interest rate. It also manages the currency. It acts as a watchdog over all the commercial banks in that area. It has a contrasting feature as compared to commercial banks because it can increase and decrease the monetary base, so it has an innate monopoly. The central bank in addition to this is also given a supervisory role in which maintains check and balance on its member commercial banks to keep them in the loop. In developed countries, central banks are given full autonomy and there exists no political intervention.

The task of the central bank is to formulate an official interest rate keeping in view the poverty index as well as the level of unemployment. It manages inflation and exchange rate at the same time. It has a monopoly on currency flow, so it controls the money supply. It acts as a government bank, manages country foreign exchange reserves, and tries to keep a balance between fiscal and monetary policy. It also manages the means of payment.

FATF has also developed certain standard operating procedures which all banks of the world have to follow. In case of noncompliance, countries and their banks are blacklisted, and they cannot carry out any further transactions.

One of the major works carried out by the Central bank is that of currency issuance. The major role of the central bank is to keep the currency of a country stable because stability in the currency, as well as the political and economic sphere, brings money and economic growth. Inflation happens if the currency is devalued or prices of eatables have gone high as compared to currency. All the central banks have an inflation target of around 2% but it can vary considerably.

The goal of economic stability can be achieved with the help of a large investment. If the central bank lowers the rate of interest, then the companies take out money from banks and they start megaprojects with that money. So spending is favored as compared to savings. The opposite happens if interest rates are increased. But one thing is kept in mind while changing the interest rate that it should remain for some time so that stability is reached. Central banks are also moving towards environmentally-friendly goals. A European bank has announced that it will take into consideration the environmental aspect before giving out the monetary policy. They have under control open market operations as well as credit policy. Through open markets when it buys securities it is in effect trying to control currency. Its role is to increase the money supply to the open market. The open market operates differently by buying or selling securities or by adjusting foreign exchange reserves to control currency.

All banks should have some of their assets as capital. To affect the money supply, central banks should exchange foreign reserves in their currency. Some countries use Central banks as a supervisor for other commercial banks while in other countries there is a separate supervisory council that acts as a watchdog. It is generally believed that governments have some sort of influence over the central bank but in principle, this should not happen. Central banks should be separated from political interference so that it can work independently to bring about changes in monetary policy which will have a positive effect on the people of that region.

XIII. What is the global role of the US Dollar?

The recent report published by IMF states that almost 62% of the global reserves are present in form of dollars. No doubt the US dollar has been one of the most renowned currency for many decades now. In the past when America was developing economically, it prompted world investors to use dollars as their currency. But now the situation has turned out to be more complicated. Due to trade imbalance, dollars have been accumulated overseas. After world war II, the currencies of war-torn countries were so deeply affected that the dollar came in limelight. The dollar's role in the global economy benefitted the US economy too which in turn became the reason why the US became a superpower lately.

Due to trade imbalance, it causes developing countries' currency to move upward which will make their exports more expensive. To save their money, they reinvest in dollar-dominated markets which in turn boosts dollar stability. Globalization turned out to be a prime factor for the rise of the dollar centered economy around the globe. Emerging markets are turning out to be the best consumers of dollars. It is the dominant invoicing currency. Because it is used worldwide it means changes in the currency would have a deep impact throughout the world. The major use of this currency occurs in form of reserves. It is used excessively as an invoicing as well as a funding currency [17].

A. Impact on the global economy

When the value of the dollar fluctuates so does the export and imports change worldwide. If the rate of dollar increases, then the price of the US exported article also goes up which is not good for those countries which have imported those items. This in turn decreases demand in the local market because it does not cost-efficient nor economic. This also affects the invoicing sector and funding currency. The use of US dollars as the reserved currency has also a significant impact worldwide. Non-US savers use the dollar as a reserve currency, the non-US borrower uses it as a funding currency, non-US countries use invoicing for transactions between them. Due to which fluctuation in the rate of dollars has a worldwide impact. empirical data suggests that if the value of the dollar appreciates then all the developing countries will have below the average growth rate and it will have a direct impact on the GDP of these countries. This in turn is against global sustainable economic goals. If the rate of dollar increases continuously then strain occurs on global banks and institutions. If a country is battering an economic crisis accompanied by political instability, in this case, if the rate of the dollar goes up, then it will devalue the currency of that unstable country. As a result of currency devaluation, Inflation will rise, and people will have to purchase materials at a considerable high price which will also trigger unemployment. The system might also get damaged, with public trust in its representatives eroding it will further add fuel to fire. The strength of the US dollar conversion scale is frequently seen as a proportion of the strength of the US economy, in any event on a relative premise. Nonetheless, the US dollar assumes an exceptional part in the worldwide economy that reflects key qualities of the US economy and political framework. These qualities are for the freest of the monetary cycle, homegrown legislative issues, and the high points and low points of trade rates — even though the United States is not safe to worry about the drawn-out supportability of its public accounts and the condition of its homegrown governmental issues [17].

The US dollar commonly fortifies on worldwide monetary and political pressure, featuring the general strength of US political and financial establishments. This remaining part the case, even as President Trump has released a tumultuous exchange battle against the remainder of the world. While there is some proof that homegrown political partisanship subverts the place of refuge allure of the US dollar,52 the US dollar's worldwide job is probably not going to be altogether lessened by the Trump organization and could be strengthened, regardless of whether for unreasonable reasons. The strategy vulnerability related to President Trump's exchange war has prompted a 12 percent thankfulness in the US dollar in genuine terms, worsening exchange strains [18].

XIV. Understanding Currency and Exchange rates

A. Exchange rates and Currency

Also known as "foreign exchange market or exchange rate." The ratio of one country's currency to another country's currency is the price of one currency in another currency. Due to the different names and values of currencies in different countries in the world, a country’s currency must be exchanged against the currencies of other countries, that is, the exchange rate. Exchange rate refers to the exchange rate between two different currencies. If foreign exchange is also regarded as a commodity, then the exchange rate is the price at which one currency is used to purchase another currency in the foreign exchange market. For example, 1 US dollar = 110 yen, which means that 1 US dollar can be exchanged for 110 yen. Exchange rate expression methods include the direct price method and indirect price method.

B. Pricing method

1) Direct pricing: The direct pricing method refers to a pricing method that uses a certain unit of foreign currency as a benchmark and converts it into a certain amount of domestic currency. At present, most countries use this pricing method. Ri dollars, Swiss francs, Canadian dollars, Hong Kong dollars, Singapore dollars are using a direct quotation, such as 25 yen to $ 1 = 115; USD 1 = 1.47 Canadian dollars, and so on.

2) Indirect pricing: The indirect pricing method refers to a method of pricing a certain unit of currency into a certain amount of foreign currency. Euro, British pound, and Australian dollar use the indirect pricing method, such as 1 pound = 1.6025 US dollars; 1 Euro = 1.5680 Canadian dollars; 1 Euro = 1.0562 US dollars; 1 Australian dollar = 0.5922 US dollars, etc. For example, 1 US dollar = 105 yen, that is, 1 US dollar can be exchanged for 105 yen.

C. Classification

Selling exchange rate. Also known as the selling price, that is, the exchange rate used by banks when selling foreign exchange to peers or customers. When the direct pricing method is adopted, the exchange rate at which the foreign currency is converted into the domestic currency is the selling price, while the indirect pricing method is the opposite.

There is a price difference between buying and selling, this difference is the income of the bank's foreign exchange

trading, generally 1% to 5%. The buying and selling exchange rates used when buying and selling foreign exchange between banks are also called interbank buying and selling rates, which are the buying and selling prices in the foreign exchange market.

Intermediate exchange rate. It is the average of the buying price and selling price. Western publications often use the intermediate exchange rate when reporting exchange rate news, and the calculated exchange rate is also calculated using the intermediate exchange rate of the relevant currency.

1) Currency exchange rate: Generally, countries stipulate that foreign currencies are not allowed to circulate in their own countries. Only when foreign currencies are exchanged for national currencies can they purchase domestic goods and services. Therefore, the exchange rate for buying and selling foreign currency, that is, the currency exchange rate, is created. It is reasonable that the currency exchange rate should be the same as the foreign exchange rate, but because foreign currency notes need to be shipped to the issuing countries because the transportation of foreign currency notes costs a certain amount of freight and insurance, the exchange rate of the bank when receiving foreign currency notes Usually lower than the foreign exchange buying rate. The foreign exchange rate is the exchange rate of a country's currency to a foreign currency. It depends on the balance of payments between the two countries, or the purchasing power of the currencies of the two countries. Inexperience, the foreign exchange rate is determined by the long-term economic factors between the two countries. The expected performance of investors.

2) Foreign exchange market: In a broad sense, the foreign exchange market refers to foreign exchange trading venues, including personal foreign exchange trading venues, foreign currency futures exchanges, etc.; in a narrow sense, it refers to foreign exchange professional banks, foreign exchange brokers, central banks, etc. Modern communication means such as transmission and trading machines realize the trading market; the foreign exchange market is both a tangible market and an invisible market. Tangible means that the foreign exchange market has its geographic location, such as the Tokyo foreign exchange market and the New York foreign exchange market; and Intangible means that the market does not have a specific scope. Currency conversion between individuals, institutions, and banks can also form a foreign exchange market invisibly. The main international foreign exchange markets are Sydney, Tokyo, Singapore, Hong Kong, Frankfurt, Zurich, London, and New York. Since the above cities span multiple time zones, working hours are basically from 9 a.m. to 4 p.m. local time. So basically, it can cover 24 hours a day. Base currency refers to the currency written in the front of a currency pair; non-base currency refers to the currency written in the back of a currency pair. For example, in USD/JPY, the US dollar is the base currency, and the Japanese yen is a non-base currency; in EUR/GBP, the euro is the base currency, and the British pound is the non-base currency. ICBC's basic and non-basic currency performance methods follow international common methods.

3) Buying price (BID) and selling price (OFFER or ASK): In the international market, the meaning of buying price and selling price refers to the buying (bid) price and selling (OFFER) price that the bank is prepared to obtain from the counterparty (usually referred to as the customer). The buying price (BID) is on the left. The selling price (OFFER) price is on the right. The explanation for the actual application of the buying price and selling price: the buying price marked by the bank is the buying price for the base currency, and the selling price marked by the bank is the selling for the base currency price. For example, ICBC's buying and selling prices for USD/JPY are 109.30/109.60 respectively; it means that ICBC buys USD and sells Japanese yen from the customer at the quoted price of 109.30, then the customer sells USD to buy Japanese yen the list price of 109.30 will be used, and vice versa. The selling price of the bank is higher than the buying price of the bank, that is, when the customer is trading with the bank, the buying price of the customer is higher than the selling price of the customer; there are two reasons: (1) The customer whenever Both can conduct transactions with banks, and banks must buy or sell unconditionally, which requires banks to use such spreads to guarantee their interests. (2) For investors, profit is only possible when the market changes. If there is no change in the market, investors will lose money if they buy and sell when the exchange rate is static. The purpose of investors' investment is to make a profit. The element of profit is to require us to see the direction of exchange rate trends. Only when the foreign exchange market changes, will there be profitability. The exchange rate of the foreign exchange market is static, and customers will not be able to make a profit.

4) Major currencies and symbols in the international foreign exchange market:

- U.S. Dollar: USD, British Pound: GBP, Euro: EUR, Japanese Yen: JPY
- Australian Dollar: AUD, Hong Kong Dollar: HKD, Canadian Dollar: CAD, Swiss Franc: CHF, Swedish Krona: SEK
- Singapore Dollar: SGD, Norwegian Krone: NOK, Danish Krone: DKK.

At each moment there is an exchange rate that is determined by the supply and demand of each currency, that is, through the foreign exchange market. However, as we will see below, in some exchange rate systems, the central banks of a country intervene in the market to establish an exchange rate that favors its economy.

The currency converter is used to calculate the value of one currency concerning another. The market where the exchange rate is traded in the foreign exchange market or FOREX (Foreign Exchange) one of the most popular among investors

Fixed exchange rate. Within the fixed exchange rates several exchange regimes are depending on the actions of the central bank. The regimes are as follows, ordered from the strictest to the most flexible:

Convertibility regime or currency board: It is the strictest category of the fixed exchange rate; an exchange rate is established by law. Its rules work the same way as the gold standard, the central bank is obliged to immediately convert the currency linked whenever a citizen this cash. To do this, it must have 100% of its monetary mass backed by dollars stored in its reserves.

Conventional fixed-rate regime: A country fixes its currency with margins of +/- 1% over another currency or basket of currencies. You can use direct intervention policies (buying or selling the currency), or indirect intervention policies (lowering or raising interest rates, for example). Exchange rate within horizontal bands: The allowed fluctuations of the currency are somewhat more flexible, for example, +/- 2%. also known as a target zone exchange rate.

Moving exchange rate: the exchange rate is adjusted periodically, usually adjusting for higher inflation relative to the pegged currency. It can be done passively or actively, announced in advance, and implementing the announced settings.

The exchange rate with moving bands: It is like the exchange rate with horizontal bands, but the width of the bands increases little by little. It is usually used as an intermediate step to a floating exchange rate.

D. Floating exchange rate

The exchange rate is determined by the supply and demand for foreign exchange in the market. There are two floating exchange rates, one completely free and the other somewhat intervened:

1) Clean floating: That situation in which the currencies are found whose exchange rate is the one obtained from the game of supply and demand, without the central bank intervening at any time. Also known as independent float type.

2) Dirty float: That situation in which currencies are found whose exchange rate is the one obtained from the game of supply and demand, but in this case, the central bank is forced to intervene by buying or selling to stabilize the currency and achieve financial objectives. It is also known as a managed floating exchange rate, as it has a directed float but is not previously announced.

XV. The Global Consequences of Financial Contagion

Financial Contagion can be defined as the disturbance of markets around the globe with fluctuations in stock markets, exchange rates, and capital flows. Monetary contagion/infection can be an expected danger for nations who are attempting to coordinate their monetary framework with worldwide monetary business sectors and establishments [19]. It clarifies a financial emergency stretching out across neighboring nations or even districts. Monetary infection occurs at both the global level and the homegrown level. At the domestic level, ordinarily, the disappointment of a domestic bank or monetary middle person triggers transmission when it defaults on interbank liabilities and sells resources in a fire deal, accordingly subverting trust in comparable banks. An illustration of this marvel is the ensuing unrest in the United States monetary business sectors. Worldwide monetary virus, which occurs in both progressed economies and creating economies, is the transmission of monetary emergency across monetary business sectors for immediate or roundabout economies. Be that as it may, under the present monetary framework, with the enormous volume of income, for example, speculative stock investments and cross-territorial activity of huge banks, monetary infection normally happens at the same time both among homegrown foundations and across nations. The reason for monetary disease ordinarily is past the clarification of a genuine economy, for example, the two-sided exchange volume. [20]. The four specialists that impact monetary globalization are governments, monetary establishments, speculators, and borrowers. The monetary disturbance that hit numerous East Asian nations in 1997 and afterward spread to different pieces of the world proceeded unabated in 1998. Russia defaulted on its obligation as trust in worldwide monetary business sectors debilitated. The disturbance annoyed capital business sectors in modern nations, significantly adjusting the (relative) evaluating of numerous monetary instruments and gushed out over into theoretical speculative stock investments wagers, leaving Long term Capital Management, an enormous U.S. flexible investment, looking close to insolvency. The emergency hence hit Brazil, making vulnerability about the nation's capacity to roll over its public area obligation, and spread to other developing business sectors in Latin America [21].

Financial contagion is best characterized as a huge expansion in cross-market linkages after a crisis to an individual nation (or gathering of nations), as estimated by the degree to which resource costs or monetary streams move together across business sectors comparative with this movement in peaceful occasions. At the point when one nation is hit by a crisis, liquidity limitations can compel speculators to pull out assets from different nations. Since numerous monetary exchanges are led by specialists instead of by directors, impetus issues likewise assume a part in setting off unpredictability. A choice to pull assets from a few nations can likewise reflect coordination issues among speculators and deficient systems at the global level for managing nations' liquidity issues. Recognizing among these different types of financial specialist conduct is exceptionally troublesome in practice [22].

Financial analysts do not know accurately what variables make nations powerless against contagion or the specific components through which it is communicated at any given—regardless of whether hypothetical or observational—on the job of worldwide monetary specialists and the global monetary framework may shed light on these perspectives. Such exploration could help recognize attributes that make nations defenseless against disease and could add to the improvement of explicit arrangement solutions to decrease the dangers of infection, deal with its effect, and assist economies with recuperating effectively as could be expected under the circumstances. Meanwhile, it will be troublesome to decide if any measures past fortifying the worldwide monetary engineering can diminish the dangers of contagion explicitly.

XVI. Loose Fiscal Policy and Tight Monetary Policy

When inflation and economic depression coexist, tax cuts and other expansionary fiscal policy measures are used to stimulate demand and increase supply; tighten monetary policy to control inflation.

All investments are subject to risks, including a possible loss of the investment amount. The value of investments can go down as well as up and investors may not get back the full amount invested. In the case of bonds, prices and interest rates generally move in opposite directions. Since the prices of the bonds held in an investment portfolio are adjusted when interest rates rise, the value of the portfolio can fall. Share prices fluctuate fundamentally, sometimes quickly and violently. This can be due to factors that affect individual companies, specific industries or sectors, or general market conditions. Such investments can be subject to significant price volatility each year.

Foreign securities are associated with special risks such as exchange rate fluctuations and economic and political uncertainty. Investing in emerging markets, of which frontier markets are a subset, involves increased risks due to the same factors, as well as risks related to a smaller size, lower liquidity, and the lack of established legal, political, economic, and social systems to support the securities markets. Because these systems tend to be weaker in frontier markets and due to various factors, such as the increased potential for extreme price volatility, illiquidity, trade barriers, and exchange controls, the risks associated with emerging markets are much greater in frontier markets [23].

The low-interest rates we see in many markets around the world are now putting normal deposit customers of banks and retirees at a disadvantage, while stockholders have generally benefited as the surviving banks have grown - now perhaps even systemically important. In the longer term, however, savers suffering from low-interest rates could face new hardships from high inflation. Although inflation has generally remained low in the markets on which central banks have eased monetary policy, many, including myself, expect it to rise once banks regain confidence enough to aggressively lend. This is of course a double-edged sword. Countries struggling with deflationary pressures, such as Japan and the eurozone, would welcome inflation.

The financial industry is facing enormous change. Many of the changes are intentional and positive. But far from all. To be able to better understand the individual aspects and their interrelationships, I am going into more detail today about the causes of our monetary policy measures and their effects. The policy of the European Central Bank (ECB) is often cited as the cause of the current problems in the banking and financial sector. It quickly becomes clear that such a conclusion falls short. Getting to the root of our actions will make it easier to understand how we can return to the normalization of monetary policy.

A. Effects of Monetary Policy and Currencies

The growth trend in many developed economies has been declining not just since the crisis, but for several decades. There are many reasons for this, which I do not want to go into in detail here. The fact is slower growth has led to lower long-term interest rates.

In this environment, there is a risk of a self-reinforcing downward spiral. Because of course these developments do not go unnoticed by the economic players; their expectations are clouding over. When a company expects less demand, it will be less willing to make large investments [24].

Also, aging societies, as we find them in numerous developed economies, not only have to make do with a reduced labor supply but also increasingly save. In the meantime, this has meant that we have excess savings and the need for safe investment opportunities is becoming scarce. So less is invested and more savings are made. This investment strike is intensified if the public sector - where there is room for maneuverer and demand - invests less than is necessary to maintain the economy.

This dynamic has led to a decline in the natural interest rate - that is, the real interest rate at which saving and investing are in balance, in a normally busy economy in which there is no upward or downward pressure on inflation. The natural interest rate plays an important role in our monetary policy. If the key interest rate is below the natural interest rate, monetary policy has a stimulating effect on the economy by creating an incentive for consumption and investment. Conversely, if the key interest rate is higher than the natural rate, demand is dampened, and thus the price increase as well [25].

In the current environment, the ECB has brought the market interest rate below the level of the natural interest rate. Accordingly, the key interest rate has been zero since March this year, and the interest rate for the deposit facility at -0.4%. Had we not done this, constant nominal interest rates would have led to higher real interest rates as inflation rates fell and further weakened the growth. This would have increased the risk of deflation. However, we cannot lower our interest rates indefinitely. At a certain level, for example, it becomes more attractive for market participants to hold cash - despite the associated costs - than to pay negative interest.

While we have not yet reached this point, we should keep in mind that further rate cuts in the negative territory may not be linear. The reactions of people in extreme situations cannot be planned on the drawing board.

But we can also influence market rates in other ways. With our securities purchases, for example, we shifted the yield curve downwards. And by offering long-term loans on favorable terms that reward additional lending, we have succeeded in allowing banks to lower their lending rates, which has led to greater lending [26].

All our measures in recent years have contributed to the economic recovery in the euro area making headway - albeit more slowly than expected and desired. As mentioned earlier, lending is increasing, as is demand. The unemployment rate in the euro area fell to 10.0% in the third quarter and the risks of deflation have decreased significantly. We expect the inflation rate to reach 1.6% in 2018, which is already very close to our target level. However, to bring about a sustainable recovery, additional political support is required through structural reforms in various areas. Only in this way can we reverse the growth trend in the long term and increase the growth potential.

Some institutes have failed since the financial and economic crisis. In Europe, we reacted to this, including a comprehensive assessment of the banks for which the ECB took over supervision in 2014. The directive on the restructuring and resolution of credit institutions (BRRD) creates a uniform approach to failed banks in the EU, in which the owners and creditors must primarily bear the losses - and not the taxpayers.

Banks that are in liquidation no longer benefit the real economy, they no longer grant new loans, no longer accept deposits, and are only active to a limited extent in the money market. These institutions can no longer pass our monetary policy impulses on to companies and households.

ASSSIGNMENT 2

I. HOW THE BLOCKCHAIN AFFECTS CROSS BORDER PAYMENTS

Blockchain, a new technology, has brought a revolution in the field of cross-border payments. It is ready to disturb the way organizations and people undergo financial transactions on a worldwide scale. Although it's inexorably regular for organizations to sell products and enterprises universally, the cross-border installment framework hasn't changed in many years. It is a fast and reliable alternative to the current system prevailing. It has been estimated that by the year 2025 that the business of blockchain will expand up to $170 billion as predicted by various sources [27].

The transfer of money internationally through a proper banking channel is quite an arduous task because it comprises various multi-step processes and is quite time-consuming. If company A headquartered in China wants to transfer money and funds to Company X which is headquartered in Turkey. Company A will request the Central Bank of China to do this transaction. This bank will contact the associated bank in Turkey and will send money overseas to that respective bank which receives money and will transfer it to Company X. All these steps are time-consuming and require a huge sum of money too. These practices are a significant hurdle for businesses as they are overpriced measures. It has been reported, according to the World Bank, that 7% of payments are sent through banking channels worldwide.

All these problems about the use of banking channels have been solved by the BlockChain method because it involves no middleman and is also quite a fast and accurate method. There appears no delay once the transaction has entered the chain. Security protocols are exemplary as once the transaction has been made it cannot be reversed [28].

Consumers and businesses are using the blockchain method for cross-border payments because of their several advantages. This method is secure and causes an immediate transfer of money. One of the major advantages of using the blockchain method for cross-border payment is that it decreases the overpricing which happens if the transaction is made through proper banking channels. Business to business transactions reduces the cost by 40-80%. It is so the fact that it only takes a few seconds to finalize the process of the transaction while in case of banking channels it takes two to three days. By paying a nominal amount the organization can save a lot of money. The organization does not need to pay huge sums of money to multiple fronts. Therefore, it is a cost-effective method.

These payments through blockchain are so immediate that it helps companies to start projects at a rapid rate because the issue of funds is resolved. Within few seconds transfer is completed. It helps businesses to become more agile and responsive to customers.

The problem of keeping track of previous transactions is resolved using a blockchain method. Transparency is ensured because a record of transactions is made available which can be viewed by all authorized customers. A decentralized ledger is maintained which is verifiable. There appears no central institution which holds the record. A database is kept the same. Company A in China and Company X in Turkey will have access to the respective database [29].

The process of Blockchain is secure because in the case of using some bank it will be prone to interference. Further, if the bank is offline or hacked then the data will be compromised. With the help of blockchain payments, cryptography is used to secure all the records of transactions. The process is nearly impermeable. On a global scale, government banks are testing the blockchain method. There is no doubt that the blockchain method is the future of cross-border payments and it will disrupt the entire status quo.

Public keys and private keys are used more exclusively during the process of making transactions. Public key stands for account numbers while private key for signatures. No paperwork is needed during the process of the transaction. Cryptographic procedures are followed to check the authenticity of the source. These transactions are circulated through a complex network of public and private keys. Network members perform the task to insert the transaction in a blockchain system. Transaction history is verified as well as circulation of the transaction is made possible by adopting an insurance mechanism in which the puzzle is solved which is related to the previous history of transactions. This process provides security that was not present before in the system. The creation of fake identities is practically impossible [30].

Blockchain, at first, was an algorithm for online communication to trade bitcoin. The idea of digital money was not a new one, but it took time to establish its presence. The formulation and execution of bitcoin turned out to be the birth ground for blockchain. The worldwide acceptability of this process is because it involves a decentralized digital system in which procedures are controlled by algorithms.

A division exists depending upon the different application scenarios and user's demand in which there are three major types, public blockchain, private blockchain, consortium blockchain. It has been reported that in the future alliance blockchain should be used because it will eliminate all the discrepancies present in private and public blockchain domains.

Blockchain technology gives us a new way to gather statistics related to credits therefore it is responsible for reconstructing the credit system. The basic advantage of using blockchain is that it is based on an independent algorithm that is entirely independent, and it collects all the credit statistics on its own without any interference. The entire system is agile. Identity cannot be faked. The process of tracking the transaction is quite efficient. The real information obtained about customers is not only helpful for personal data record but also it helps to estimate future developments and trends in the credit system. It has attributes of a wide array, comprehensive data, reliable content, minimal cost, and guaranteed process.

As of now, blockchain development is in its earliest stages. Even though there are a few constraints but

blockchain has a very bright future in terms of cross border payments. For the current specialized issues of a blockchain, market members from varying backgrounds require to investigate and tackle them together. Simultaneously, global trades should be reinforced to investigate and advance the progression of blockchain innovation, yet in addition to envision blockchain hazards and improve the security of cross-border installments.

A. Blockchain and inter-banking payment Systems

Blockchain technology can be applied in different industries and business scenarios. To allow customers to understand the blockchain from a business perspective, the base platform has launched several blockchain solutions based on specific business scenarios. The following is a schematic diagram of tbaas's business structure to solve user problems: Application scenario example Shared ledger business scenario Inter-bank clearing and settlement, cross-border clearing and settlement audit, fast underwriting, insurance, and direct claims to solve business pain points, slow inter-bank clearing, and settlement [31].

B. What is a blockchain acceptance payment system?

Blockchain payment is currently a new payment channel tool. Blockchain digital assets are used as payment methods to solve the problem of deposits and withdrawals in various industries, which can be docked across the industry. Blockchain digital asset payment has functions such as decentralization, checkable records, large-value transfers, and cross-border transactions.

C. What is the role of blockchain payment?

The purpose of the blockchain payment system is to solve the problem of large payments; the second is to solve the problems of cross-border payment, high handling fees, and slow arrival; the third is to provide payment for some "special industries" Function to solve the problems of difficult to apply for channel and easy to seal card number.

D. What kind of currency does the blockchain payment system generally use?

Blockchain currency payments generally use "stable coins" (such as usdt 1:1 anchored to the US dollar, with high recognition) as the payment method. This is a currency that is constant and not volatile with the US dollar or other currencies, or if investors have their circle, they can build it by themselves. It is generally not recommended to make payments in such currencies as BTC and ETH, as the fluctuation range is too large [32].

E. What is an acceptor?

Acceptor: A team enterprise or individual that holds coins or assets. It mainly plays the role of the acceptor in the blockchain acceptance payment platform, that is, the receiver resolves the deposit and withdrawal of funds, which is the core role of the entire payment platform. Of course, many platforms also act as platform acceptors themselves.

Blockchain technology can effectively solve the security problem of mobile payment. Transactions supported by blockchain technology are based on a blockchain technology ledger, and it is very difficult to break into user accounts. Therefore, many mobile phone deceptions, such as deception, repeated payments, and price hikes, will not occur after using blockchain technology.

Customers do not need to operate on other platforms and have open API interfaces to access the deposit pages of major platforms. The blockchain payment system can be connected to any industry website system without restrictions.

II. HOW TO DOUSE THE BLOCKCHAIN PAYMENT SYSTEM FOR INTER-BANKING SYSTEMS

Blockchain subverts the six dimensions of the banking industry: payment, clearing, and settlement, financing, securities, loans and credit investigation, trade financing. Blockchain is changing everything from payment transactions to raising funds in the private equity market. Blockchain technology has received a lot of attention in the past few years, beyond the scope of Bitcoin fanatics, and has become the main topic of discussion among banking experts and investment institutions. JPMorgan Chase CEO Jamie Dimon slammed Bitcoin: “It’s worse than the tulip bubble. It won’t have a good ending. Some people will be unlucky because of it. "The head of Goldman Sachs, Lloyd Blankfein, responded to this statement, saying, "Something that fluctuates 20% overnight is not like a currency. It is a fraud." Despite doubts, it remains to be seen whether blockchain and decentralized edge technology (DLT) will replace or revolutionize the banking system [33].

A. The role of blockchain in the banking industry

Blockchain technology provides a way for untrusted parties to agree on the state of the database without the presence of an intermediary. By providing an unmanaged ledger, blockchain can provide specific financial services such as payment or securitization-without going through intermediaries like banks. Also, blockchain allows the use of tools such as "smart contracts," which can potentially automate manual processes, from compliance and claims processing to distribution of will content. For some applications, a higher degree of decentralization is not required-but it can benefit from better coordination-this is an additional benefit brought by the blockchain, "Distributed Ledger Technology (DLT)" can help companies Establish better governance and standards for sharing and collaboration. As the global banking industry is currently an industry with a scale of 134 trillion U.S. dollars, blockchain technology, and DLT can disintermediate certain key services provided by banks, including:

1) Payment: By establishing a decentralized payment ledger (such as Bitcoin), blockchain technology can facilitate faster payments at lower fees than banks.

2) Clearing and settlement system: Distributed ledger can reduce operating costs and promote closer real-time transactions between financial institutions.

Financing: Initial Token Offering (ICO) is testing a new financing model that can be a traditional financing model. Continue to explore in-depth how blockchain technology can realize new business models through technology, thereby changing the development direction of the traditional banking industry.

Blockchain technology provides high-security, low-cost payment methods, reduces the need for third-party verification, and saves the processing time of traditional bank

transfers. 90% of the members of the European Payments Council believe that blockchain technology will fundamentally change the industry by 2025. Today, trillions of dollars are transferred around the world through an obsolete and time-consuming payment system, while paying a lot of fees. If you work in San Francisco and want to return part of your salary to your family in London, you may have to pay a fixed fee of $25 to receive wire transfers, with an additional fee of up to 7%. Your bank charges a fee, the receiving bank charges a fee, and you need to pay the exchange fee. Your family's bank account may not even receive the transaction until a week later [34].

Facilitating payments is very profitable for banks, leaving them with no incentive to reduce fees. During 2016, cross-border transactions from payment to the letter of credit generated 40% of global payment transaction revenue. Cryptocurrencies like Bitcoin and Ethereum are built on public Blockchain, and anyone can use them to send and receive funds. In this way, public Blockchain reduces the need for trusted third parties to verify transactions and enable people all over the world to obtain fast, cheap, and cross-border payments.

Bitcoin transactions can take 30 minutes or up to 16 hours-in extreme cases-to complete settlement. This is still not perfect, but it is a big improvement compared to the average bank transfer time of 3 days. Due to its distributed and complex nature, transactions based on encrypted digital currencies make it difficult for governments and regulatory agencies to monitor. In other words, they cannot close these almost instant transactions [35].

B. Examples of improving payments through the blockchain

Although there is still a long way to go for encrypted digital currencies to completely replace legal currencies (such as the U.S. dollar) in terms of payment, the transaction volume of encrypted digital currencies such as Bitcoin and Ethereum has seen substantial growth in the past few years. An important reason behind these disruptive changes in the payment industry is that the infrastructure that supports the payment business is also prone to be a disrupted-the field of clearing and settlement.

C. Cleaning and settlement system

Distributed ledger technology can directly settle transactions and can track transactions better than existing protocols (such as SWIFT). Companies such as Ripple and R3 are working with traditional banks to bring greater efficiency to the industry. As mentioned above, the average bank transfer takes 3 days to resolve, which has a lot to do with our financial infrastructure construction method. Moving funds around the world is a nightmare for banks. Today, simple bank transfers from one account to another-must bypass a complex intermediary system, from correspondent banks to custodial services, to reach any destination. The balances of these two banks must be coordinated in the global financial system, which is composed of a wide range of traders, funds, and asset managers. If you want to send money from your UnicaCredit Banca account in Italy to a Wells Fargo account in the United States, the transfer will be performed through the Association for Global Interbank Financial Communications (SWIFT), which sends 24 million emails to 10,000 financial institutions every day [36].

The Center of the SWIFT agreement does not send money, it just sends a single payment. Then the actual funds are processed through the intermediary system. Each intermediary will increase the additional cost of the transaction and present potential problems-60% of B2B payments require manual intervention, which takes 15-20 minutes each time. Also, blockchain technology allows "atomic" transactions or transactions that are cleared and settled at the time of payment. This is in stark contrast to the current banking system, which clears and settles transactions a few days after payment.

This may help alleviate the high cost of maintaining a global correspondent banking network. Banks estimate that blockchain innovation can cut costs for the financial sector by at least $20 billion by providing better infrastructure for clearing and settlement.

III. BLOCKCHAIN IN FINANCIAL NETWORKS

The most considerable blockchain innovations are associated with SWIFT:

SWIFT was established in the 1970s. At the beginning of its establishment, the vision was to create a global financial messaging service and a common language for international financial messaging. After the messaging service was launched in 1997, SWIFT replaced the Telex technology that was widely used at that time. The original services provided mainly included messaging platforms and computer systems for verifying and routing messages. At the same time, the establishment of message standards enables people to understand the data across languages and system boundaries together and enables the communication between users to be seamlessly and automatically transmitted, received, and processed.

In the thirty years since its establishment, SWIFT has been widely accepted internationally. At present, including the four state-owned banks of China Bank, Industrial and Commercial Bank, Construction Bank, and Agricultural Bank of China, most banks in the world have already used the SWIFT system. Judging from the data disclosed on its official website, in the 30 years from 1979 to 2009, the number of international members joining SWIFT has increased from 15 to 209, and the number of bank members has increased from 239 to 9281.

As a revolutionary technology, blockchain is beginning to be more and more sought after. why? Because the blockchain is the underlying technology of many encrypted digital currencies, such as Bitcoin (BTC), Ethereum (ETH), and Litecoin (LTC). This tutorial will cover all blockchain-related knowledge and will also teach you how to build a Swift blockchain [37].

A. How the blockchain works

As the name implies, a blockchain is a chain composed of different blocks connected. Each block contains three pieces of information: data, hash, and the hash of the preceding block.

- Data -Due to different application scenarios, the data stored in the block is determined by the type of blockchain. For example, in the Bitcoin blockchain, the stored data is transaction information: the

transfer amount and the information of both parties to the transaction.

- Hash -You can think of a hash as a digital fingerprint to uniquely identify a block and its data. The important thing about a hash is that it is a unique alphanumeric code, usually 64 characters. When a block is created, the hash is also created. When a block is modified, the hash is also modified. Therefore, when you want to see any changes made on a block, the hash is very important.
- The hash of the preceding block -by storing the hash of the preceding block, you can restore the process of connecting each block to a blockchain! This makes the blockchain particularly safe.

On July 19, SWIFT announced the global test results of integrating SWIFT GPI Instant (cross-border instant payment service) in Singapore's domestic instant payment service FAST. Among them, it takes the shortest time to pay from Australia to Singapore, only 13 seconds. But even if it reaches 13 seconds, in the eyes of many blockchain practitioners and bankers who are determined to reform, SWIFT's interbank settlement system will eventually be replaced by a blockchain platform. Since the emergence of blockchain technology, its distributed, decentralized, point-to-point, non-tamper able and other characteristics can provide instant, safe, and transparent services for cross-border payments, which greatly impacts the existing cross-border payment system.

This is the first sentence written by "Bank Intermediary" SWIFT in the latest white paper of GPI (Global Payment Innovation Service). At the end of 2016, the first phase of the SWIFT GPI project was completed; in April 2017, DLTP(Distributed Ledger Technology Verification) was officially launched as a component of GPI, and SWIFT GPI launched blockchain technology; after that, SWIFT continued to update the GPI system and DLT. PoC technology integrates blockchain technology into cross-border payment services. The instant test has achieved a seamless connection between cross-border payments and Singaporean domestic payments, and at the same time confirmed the scalability of GPI services, laying the foundation for the ultimate realization of global cross-border instant payments. Judging from SWIFT's actions and speeches.

The use of blockchain technology to increase the speed and establish global cross-border instantaneous payments is regarded as the advancement of SWIFT services and the new vitality of SWIFT. However, in recent years, due to the emergence of blockchain technology and the turbulence of the international trade situation, the momentum of SWIFT's steady development has been hindered. At the same time, SWIFT's long time to account has also been criticized. Forbes analyst Joseph.

Young said in December 2018: The SWIFT system has a history of 45 years and its efficiency is already very low. It takes 3-5 working days for international wire transfers to be settled, and if there is no receipt, it is impossible to send Large remittances, but Bitcoin can handle large amounts of transactions more efficiently. On July 18, Reuters quoted anonymous sources as saying that the Japanese government is trying to establish an international cryptocurrency payment network similar to SWIFT, with the motivation to effectively combat money laundering. On May 23, 2018,

Dakak, the main shareholder of Banco Masventas Bank in Argentina, stated that the bank will withdraw from SWIFT and begin to use Bitcoin blockchain technology to solve international payment problems. In June 2018, the Russian Enterprise Treasury Association announced that it will trial run the government-run Masterchain blockchain platform with the central bank of the country to try to replace SWIFT. Also, even Europe where SWIFT is located intends to break away from SWIFT's existing system [38].

Maas stated clearly and publicly on August 21, 2018, that the European Union must establish a European payment channel independent of the US SWIFT. At the opening ceremony of the 2018 EU Foreign Ministers' Meeting in Berlin, Maas revealed that he has started research on the proposal to establish an independent European settlement system. In this situation, SWIFT launched GPI. The GPI white paper points out that the primary goal of adopting GPI is to ensure that the international payment process meets the requirements of the entire industry for speed, transparency, and better end-user experience. The correspondent banking ecosystem will also rebuild itself through GPI, and finally promote the community to establish a frictionless intermediary model that provides efficiency and added value.

Since the first phase of the GPI project was announced at the end of 2016, SWIFT's GPI and blockchain applications will enter a new phase every year. In 2017, SWIFT launched the new system and officially launched the DLT PoC to complete the infrastructure construction. In 2018, the SWIFT GPI project entered the technical preparation stage.

On January 22, 2018, Swift signed a memorandum of agreement with seven central securities depository institutions to study how blockchain can be applied to post-transaction processes, such as proxy voting. On November 13, 2018, the SWIFT Association) and Smart.

B. Worldwide Financial

Technology (SWFT Blockchain) signed a coexistence agreement. In November 2018, it was reported that SWIFT India has partnered with the financial technology company MonetaGo to pilot a distributed ledger technology (DLT) network to improve the efficiency and security of financial products. In 2019, SWIFT GPI entered the landing stage.

On January 30, 2019, SWIFT officially announced the Proof of Concept (POC) plan for cooperation with R3. After that, GPI was launched on six Spanish banks in March; GPI business was expanded to the European market in May; in June, a report was released stating that following the successful proof of concept of the R3Corda platform, it will “soon be launched on a trading platform based on distributed ledger technology. GPI payment is enabled on the Internet”; In July, it cooperated with Singapore FAST to realize instant cross-border payment, as long as 13 seconds

At the same time, SWIFT has accumulated strong banking resources over the past 40 years, which is unmatched by any other platform. As SWIFT said: “The 11,000 banks currently connected to the SWIFT network can easily integrate GPI into their current infrastructure, unlike other cross-border payment models that require extensive integration with existing banking infrastructure". Not only is

facing severe external competition, but there are also huge problems with the blockchain technology used within SWIFT.

Previously, Cai Weide, a columnist of Interlink Pulse and a special professor of the National "Thousand Talents Program", once pointed out that in the old financial market represented by SWIFT, the blockchain uses new technology and puts new wine in old bottles, which may cause the old and new technologies to be incompatible. In the SWIFT project, to protect privacy and scalability, the PoC adopts a channel solution, but the actual result is contrary to the vision. Because each bank does not want to share data with other banks, each bank forms a channel with another bank and SWIFT. If the original SWIFT system is online, 100,000 channels are required. This design is actually "soft isolation", and compared with hard isolation, privacy is worse. At the same time, this design also means that the system has a big center-SWIFT, that is, SWIFT has all the data of all other banks, which violates the design concept of decentralization, and the reliability of the centralized system may be a problem.

IV. Central Banks & BlockChain

Blockchain is a trusted technology that originated from Bitcoin but surpassed Bitcoin. Blockchain technology innovation has not only spawned various private digital currencies but also aroused widespread interest and exploration by central banks in various countries. It can be said that the current Central Bank Digital Currency (CBDC) experiments in most countries are based on blockchain technology. But to this day, whether CBDC uses blockchain technology is still controversial. A typical view is that the decentralization of blockchain conflicts with the centralized management of the central bank. Therefore, CBDC is not recommended to adopt this technology. The author believes that blockchain technology is developing at an unprecedented speed and is deeply integrated with various mainstream technologies. Therefore, whether from a technical point of view or a business point of view, the actual application of the blockchain is consistent with the understanding of "fundamentalism". The difference. How to use blockchain technology to better serve distributed operations under centralized management may be the current focus of CBDC. This article uses three typical scenarios as examples to discuss possible applications and solutions of blockchain in CBDC. It points out that although the technical characteristics of blockchain are not dependent on central institutions, it does not mean that they cannot be incorporated into existing central institutions. In the system, as long as through reasonable design, the central bank can use the blockchain to effectively integrate distributed operations and better realize the centralized control of CBDC. There is no inevitable conflict between the two [39].

A. Scenario 1: Wholesale payment settlement

CBDC experiments currently being carried out in various countries are mainly aimed at wholesale end scenarios, and most of them are based on blockchain technology. For example, the Jasper project in Canada is testing a large-value payment system based on blockchain technology; the Ubin project in Singapore is evaluating the effect of payment settlement in the form of digital SGD tokens on distributed ledgers; the European Central Bank and the Bank of Japan The Stella project aims to study the application of distributed ledger technology (DLT) in financial market infrastructure, and to evaluate whether the specific functions of the existing payment system can operate safely and efficiently in the DLT environment. There is also the LionRock project in Hong Kong, China, and the Inthanon project in Thailand, which are all experimenting with CBDC based on blockchain technology. The application of these blockchain technologies is carried out under the centralized management and strict control of the central bank.

Take the Ubin project in Singapore as an example, which uses the same Digital Deposit Receipt (DDR) model as the Jasper project in Canada. To support the issuance of DDR in distributed ledgers, the existing Singapore Electronic Payment System (MEPS+), which is Singapore's RTGS system, has established a DDR fund mortgage account. At the beginning of each day, participating banks request the central bank to transfer their RTGS account The funds in the DDR are transferred to the DDR fund mortgage account as a mortgage. The distributed ledger creates a corresponding equivalent DDR and sends it to the DDR wallet of each bank so that the participating banks can carry out transfers and payments based on the distributed ledger. At the end of the day, the distributed ledger system will send a network settlement document to MEPS+, and MEPS+ will adjust the balance of the DDR fund mortgage account accordingly to match the participant's DDR balance in the DLT network.

It can be seen that the decentralized distributed ledger and the existing mature central-led financial infrastructure are not exclusive, and can be integrated and supplemented with each other. On the one hand, the blockchain-based DDR payment system provides a new payment method that does not rely on traditional accounts for the existing RTGS system and effectively supplements the existing payment and settlement system. On the other hand, DDR, as an extension of the digital form of electronic legal currency in RTGS, can eventually be converted back to RTGS account value and settled externally through the RTGS system. That is to say, the RTGS system solves the problem of blockchain DDR to traditional account funds. The issue of settlement finality also shows that the settlement finality of the blockchain can be organically integrated into the existing settlement system. Also, because DDR is generated through a 100% fund mortgage, it does not affect the money supply, so the distributed ledger will not affect the central bank's total currency control.

Obviously, in terms of technical logic, a new blockchain-based payment system led by the central bank is completely feasible. In a sense, referring to the digital depository receipt model of the Ubin project, there is no need to resort to intermediate channels like the online payment platform. Various payment institutions and commercial banks can build peer-to-peer networks in the financial private network. A unified blockchain network is connected to carry out payment and settlement. Considering that the transaction performance of blockchain technology is still evolving, the above-mentioned clearing business should be carried out at the wholesale level.

It should be said that the decentralization of the blockchain refers to disintermediation, but no supervision. In the environment of the alliance chain, the central bank and other regulatory agencies can not only centrally control the

business and risks carried by the blockchain, but also achieve penetrating off-site supervision.

B. Scenario 2: Digitalization of cash

It seems that there is no essential difference between the digitization of cash and the digitization of reserves (i.e., the aforementioned digital depository receipts), except that the former is for the public, while the latter is limited to inter-bank circulation, but the public is facing a problem. If Allowing the public to open accounts at the central bank will put the central bank under great service pressure and may trigger deposits to move, leading to narrow banks [40].

One solution is the 100% reserve fund, model. The agency operating agency deposits 100% of the reserve fund with the central bank and then issues a corresponding amount of digital currency on its books, which can be regarded as the central bank's digital currency. IMF economists call it the synthetic central bank digital currency (SCBD). According to this, after my country's third-party payment institutions deposit 100% of the reserve funds with the central bank, the funds in their virtual accounts are the central bank's digital currency. If so, China has long been the world's first big country to realize the digitalization of legal currency.

But after careful consideration, this idea has flaws: First, technically, 100% reserve deposit means that the entire life cycle of the issuance, circulation, and withdrawal of digital currency must be attached to the traditional account system, especially the cross-agency CBDC. Circulation, in addition to the CBDC account book update, also has to deal with the clearing and settlement between the corresponding reserve accounts, which can only sacrifice system flexibility and limit the way to deal with it, and also needs to set up a special clearing agency to provide interconnection services. This not only increases the pressure and complexity of the central bank's central system, that is to say, it still does not solve the service pressure of the central bank, and it is difficult to achieve the requirement of "loose account coupling"; second, in terms of management, the central bank and operating institutions are The issuance and circulation process is tightly bound, and the central bank still bears centralization pressure. How to ensure that the agency operating agency does not have over-issued currency after 100% of the reserve, especially when the payment network operated by the agency operating agency is not under centralized control, it is more difficult for the central bank to control the currency issuance of the operating agency. To a certain extent, it also constitutes some reasons against the application of blockchain technology to CBDC [41].

The perspective determines thinking. If you look at it from another angle, you will get a completely different and better solution. Now when it comes to CBDC, many people understand the technical logic of CBDC from a top-down perspective, from central bank issuance to commercial bank, and from commercial bank issuance to personal perspective, so there is always a worry of messy invoices. Physical currency is subject to the link of banknote printing and coinage, and it has to be so, but the "banknote printing and coinage" of digital currency can be completed in an instant without this restriction, and this is its advantage. If you look at it from a bottom-up perspective, you can be surprised to find that the end-user of digital currency does not have the concept of "issuance", but the concept of "exchange", which is how much cash and deposits they have to exchange for CBDC. So from this perspective, the problem of chaotic invoices is not so prominent. The CBDC exchanged by the agency operating agency is not the currency issuance quota given by the central bank, but the result of the user's actual exchange of real gold and silver. The central bank only counts relevant information from a global perspective and supervises it. Whether it is private stable tokens or CBDCs developed by various countries, they are based on the idea of on-demand exchange, rather than expanding the issuance. This is a very critical point. This is of great significance to monetary policy, indicating that there is no fundamental change; for the technical route, it means that the issuance process of physical currency can be disregarded, and the design of the system can be more concise, thus greatly improving the situation.

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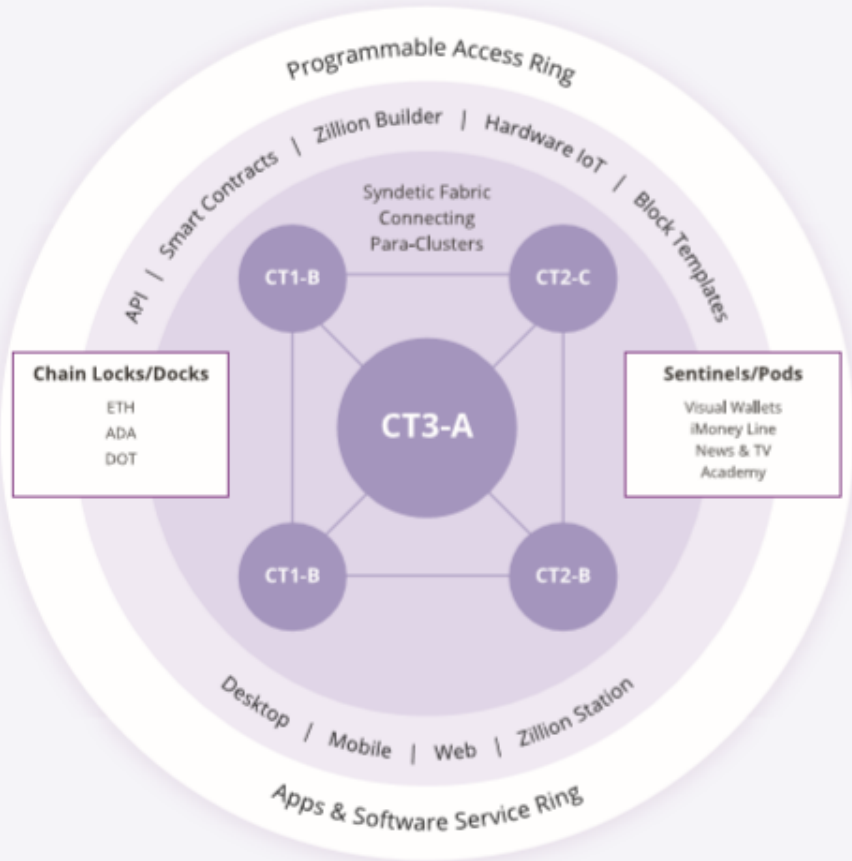

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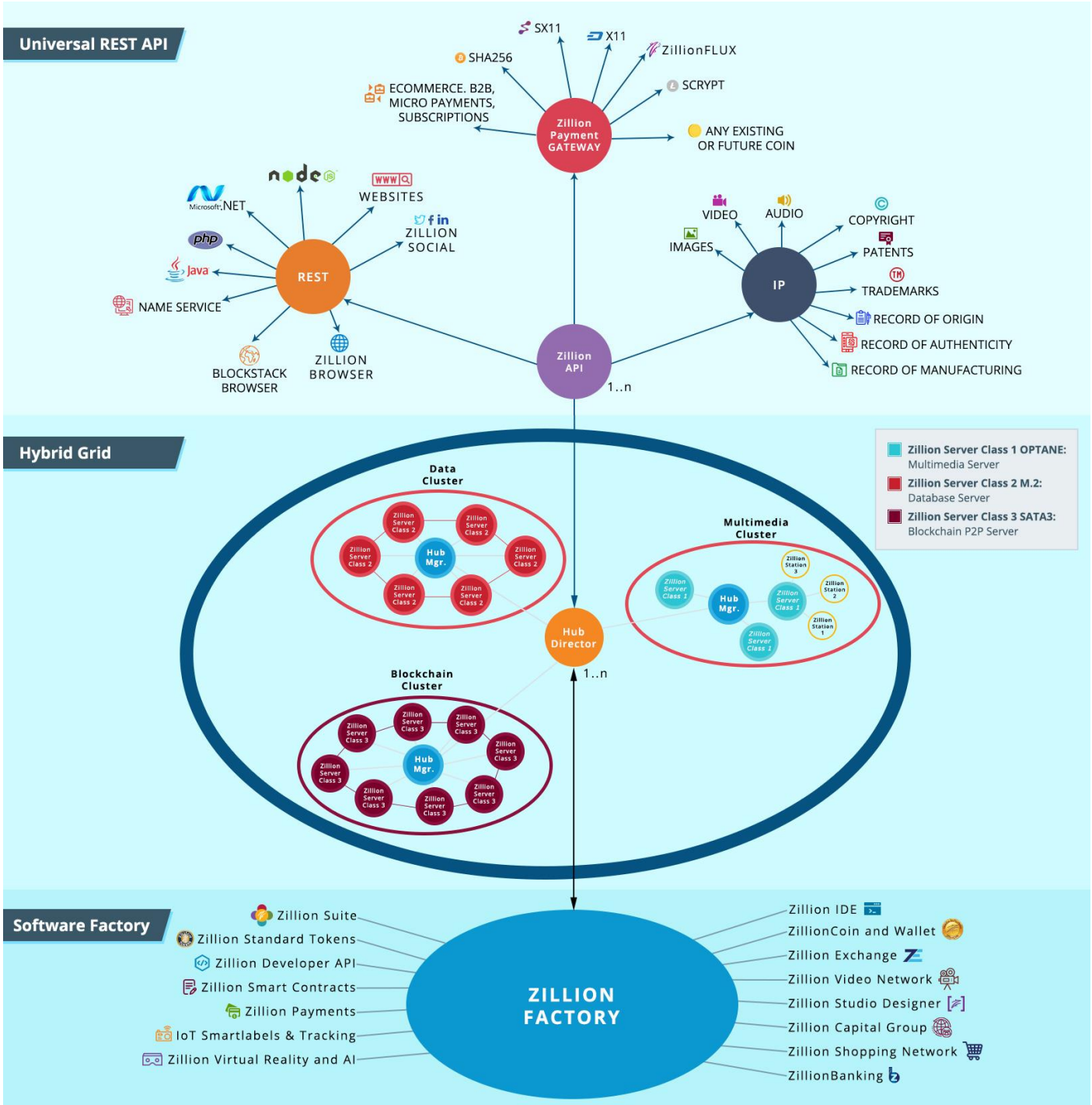

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