How States Utilize Cryptocurrencies to Respond to Western Sanctions: A Case Study of the Russian Federation

Vogel, Michail

How States Utilize Cryptocurrencies to Respond to Western Sanctions:

A Case Study of the Russian Federation

Michail Vogel

s2227940

International Cooperation and The Design of Global Economic Instituions

Work group 15 (M. D. Sampson)

April 25, 2021

7970 words

Abstract

Today, the use of cryptocurrencies is an active strategy employed by various governments to counteract Western sanctions. This paper lists the five main strategies, namely, theft and mining of cryptocurrencies, issuance of commodity-based tokens, construction of a blockchain-based payment network and the fight of sanction-induced exchange rate volatility by stimulating the domestic adoption of cryptocurrencies. The author uses a hybrid methodology combining deductive theory-building with inductive hypotheses-testing in the case study of the Russian Federation. The testing phase includes blockchain-development data, rhetoric by Russian officials and relevant recent news reports. It is found that the Russian government does not actively engage in the theft of cryptocurrency but does take part to a certain degree in the other four strategies.

Keywords: cryptocurrency, blockchain, DLT, Bitcoin, CBDC, fintech, mining, tokens, sanctions, embargo, regulation, AML, Russia, Iran, North-Korea, Venezuela,

Table of contents

Introduction

Great powers have many options to resort to when their security is threatened, ranging from inaction to full-out war. Since the end of the cold war, it has become harder for the USA to justify military intervention, making such a move costly. Conversely, long-term inaction may leave a power vacuum, and a challenger may appear if the USA were to withdraw from the world arena. Sanctions are a step in between these extremes and are a very important foreign policy instrument in the hand of states. As a result of increasing global trade, the world has become very interconnected and interdependent. This has meant that while military intervention became more costly, the costs of a trade embargo for a targeted country have also increased (Selden, 1999).

Sanctions are becoming a more common diplomatic instrument, which has forced targeted states to respond, using new technologies. As of recently, a fresh development in the adoption of cryptocurrency has been reported by the media (Brett, 2020; Sexton, 2021; Business Insider, 2021), where countries that were excluded to some extent from the global financial system find ways to evade economic sanctions. Its pseudo-anonymous nature and the underlying distributed ledger technology that is fundamental to most cryptocurrencies make it possible for countries to continue international trade, seek foreign investment and curb the volatility of the home currency, despite facing obstacles from international financial regulators.

Fintech (financial technology), and, specifically, distributed ledger technologies are a rapidly evolving field. Since the development of the first cryptocurrency over a decade ago, and the increasing public and media attention during the recent years, states are still in the process of defining and finding the right place in the financial sector for these technologies. China, India, and Turkey have been looking into banning cryptocurrencies, as of 2021, but have also made

moves towards the adoption of them previously. On the contrary, Iran, which had previously declared cryptocurrency illegal, now is warming up to the new technology, seeing new benefits. These cases illustrate the current regulatory stance regarding cryptocurrency, where much uncertainty remains.

This thesis explores how states use this technology in response to sanctions, goes over the main five strategies, and focuses specifically on the case of Russia, looking at fintech benchmarks, the rhetoric of lawmakers and institutions, and the opinions of scholars. The author aims to add new knowledge of this dynamic field to the existing theory on the use of cryptocurrency for the evasion of sanctions. To provide more insight into the specific mechanisms, the following research question is constructed: How have states utilized cryptocurrencies as a response to Western sanctions?

This question will be answered by going over the existing literature on this topic, deriving specific hypotheses regarding the various strategies, and testing them against recent data in the case of Russia.

Concepts

Blockchain technology and cryptocurrency

Blockchain technology is an electronic distributed ledger technology (DLT), which carries a public database, that is managed in a decentralized manner. The database is shared over a network of multiple sites, where each site carries a copy of the ledger. The distributed nature of blockchain technologies allows for safe long-term data storage, as this enables each party to fully reconstruct the ledger from their copy in case of a shutdown. A new transaction within a blockchain network is represented by adding a 'block' of information to the ledger, thus creating a long chain of blocks, carrying information about the distribution of funds (Cozzi, 2020). Another feature of blockchain technologies is the pseudo-anonymous design of the system, where the identity of a participant is not revealed. While transactions to and from a specific wallet are visible to all on the blockchain, this wallet address does not carry an individual's name or other personal information. Each participant has a public and private key, allowing for safe access to the funds, which are protected by cryptographic hash functions. When A transacts with B, B may encrypt the data with A's public key, then A can decrypt the data using their private key, as these are mathematically related (Macfarlane, 2021).

The cryptographic nature of DLTs allows developers to use blockchain technology for personal property registers, intellectual property rights through NFTs, personal identification, and various solutions related to supply chains and smart contracts. However, the most influential development has been cryptocurrency. Cryptocurrency is like 'fiat currency' in the sense that it holds no inherent value, and the effective exchange value is determined by trust in the system. Most cryptocurrencies, however, are not offered by governments, but by algorithms, specifically designed to control their supply. This usually has the effect that the prices continue rising, as

demand for digital currency increases. Cryptocurrencies are also more open to manipulation, due to a lack of oversight (Vigna & Osipovich, 2018).

The pseudo-anonymous nature of cryptocurrencies has meant that they have also been used for illicit activities, such as terrorism, money laundering, weapon procurement, and drug deals. The transnational scope of many of these crimes makes it difficult to fight these activities on a national level, as is currently done. This makes it that the current international legal framework is underinclusive, as it allows criminals to operate in between various jurisdictions. This regulatory uncertainty keeps established investors out, while there is no clear institutional guidance (Macfarlane, 2021).

On the other hand, internet money can serve as a tool to bring financial inclusion to developing regions, as has happened in China, India, and various African countries, namely Nigeria (Vincent & Evans, 2019). Conditions, such as low banking penetration, absence of strong financial institutions and well-developed business infrastructure are a catalyst in the adoption of blockchain technology (International Finance Corporation, 2017). This means that cryptocurrency can be used to construct a financial system where the global financial system does not reach.

Bitcoin is the largest cryptocurrency, which runs on a Blockchain, which is a type of distributed ledger technology, which again is part of a larger umbrella term fintech (financial technologies). The use of cryptocurrencies is very related to the development of the fintech industry and the acceptance of DLTs like blockchain. The development of these technologies can be measured through the adoption of large cryptocurrencies like Bitcoin. These terms may be used somewhat interchangeably throughout this paper, but the author recognizes the vast distinctions between the terms.

Sanctions

Gordon et al. (2019) provide a historical overview of international sanction law, drawing on legislation by the UN as a major contributor, the EU as an autonomous source of trade sanctions, and the UK and USA as significant sources of broadly enforced sanctioning programs. They broadly define international sanctions as "*non-forcible … foreign policy measures adopted by international and regional organizations or unilaterally by single states and designed to influence other states or non-state entities or individuals to change their behavior or take a particular course of action*" (Cozzi, 2020).

The purpose of sanctions is to change the target's behavior by restricting economic and financial activity. Examples of economic tools are import/export restrictions, denial of economic aid and debt relief, and restriction of FDI into a targeted country. On the financial side, the instruments used are freezing assets and transactions, prohibiting access to capital markets, currency destabilization, and restricting access to assistance from international financial institutions (Jermano, 2018). The geopolitical context ultimately determines the nature of these sanctions (Konowisc, 2018).

According to Masters (2019), many scholars find that sanctions can be at least partly effective foreign policy measures. It should be considered, however, that their success depends on many factors, such as the scope of the sanctions. Additionally, it is observed that sanctions may change over time. A good sanctions policy should be complete and have a concrete purpose, should set realistic goals, be persuasive and leave a door open to build multilateral support.

Although Hufbauer and Schott (1985) are more critical about the effectiveness of sanctions, they observe that sanctions may still be successful under certain conditions. They argue that in some cases it is possible to induce enough economic pain to be able to influence the behavior of a

state, while not finding resistance from other major powers, and maintaining popular domestic support. However, they prescribe that leaders should very carefully consider all costs and benefits.

But even when scholars, such as Delevic (1998) highlight specific cases where sanctions may not have proved effective, or Elliott (2018), who mentions some significant costs to this approach and provides data that displays that sanctions are not very likely to be effective, sanctions can still not be disregarded. Sanctions remain one of the strongest soft-power instruments in the hands of large economic powers and are often employed as part of the foreign policy of the USA and the EU countries due to their low domestic costs compared to military intervention or developmental aid (EEAS, 2021).

The largest supranational contributor to international sanctions is the UN Security Council, which is capable of unilaterally implementing economic restrictions to restore peace and security. The main areas are conflict resolution, non-proliferation, counterterrorism, democratization, and the protection of civilians (UNSC, 2019). The UNSC can issue territory-wide sanctions against states, but also sanctions aimed at specific entities or individuals (Cozzi, 2020).

Similarly, the EU is an important issuer of sanctions, as part of the Common Foreign and Security Policy and Article 21(2) of the TEU (European Union, 2012). To the EU, sanctions carry little political costs and can be flexibly applied to minimize economic costs, while also being relatively easy to adopt compared to other approaches, given the Union's bureaucratic structure. Common methods are freezing of funds, trade and weapon embargoes, and financial restrictions. The EU uses sanctions as a method to fight terrorism and human rights violations.

The drawback is that sanctions are applied and enforced at the member state level, thus the EU lacks a central responsible authority (EEAS, 2021; Cozzi, 2020).

Since sanctions aim to change the decision calculus of a targeted country, by increasing its costs for economic activity, financial and trade relations are at the heart of sanction law. The US is a major player in international trade, but more importantly, the world's financial hub, hosting the New York Stock Exchange, being home to large banks and credit card companies, and being the issuer of the world's reserve currency (Siripurapu, 2020). This, combined with its large military force and active foreign policy makes the US a major contributor to sanction law, requiring its allies to adopt similar measures: *"Foreign banks and bankers have a choice: You can choose willfully to help Iran and other sanctioned nations evade U.S. law, or you can choose to be part of the international banking community transacting in U.S. dollars. But you can't do both"* (US Department of Justice, 2018).

Seeing that the US is the strongest issuer of extraterritorial sanctions (P.D.E.R. E.U.P., 2020), and observing that many countries adopt similar legislation, the remaining next section will delve into the legislation on capital controls, money businesses, and the enforcement of sanctions in the US.

Regulation of cryptocurrencies

In 1970 the Bank Secrecy Act was passed, strengthening identification requirements for individuals that transact more than $10,000, which could then be used to identify individuals violating sanctions law. Then, in 1992, the anti-Money Laundering Act was passed, requiring Suspicious Activity Reports by banks. Subsequently, two years later, the Money Laundering Suppression Act came into being prescribing AML regulations for Money Service Businesses (MSB), including currency exchanges, and requiring official registration of their beneficial owners. Lastly, the Money Laundering and Financial Crimes Strategy Act of 1998 prescribed an AML strategy to the Department of Treasury (Clautice, 2019).

Similarly, after the September 11 attacks, the USA Patriot Act and Intelligence Reforms & Terrorism Prevention Act strengthened the BSA customer identification requirements and included a section on cross-border electronic transfers, requiring the Treasury to treat them in the same way as wire transfers (Financial Crimes Enforcement Network, n.d.).

This overview is crucial to this research, as it formed the basis of the regulation of cryptocurrencies. The US Department of Treasury, specifically the FinCEN and OFAC are the main legislators in the enforcement of sanctions around cryptocurrency. FinCEN ensures compliance with the BSA, while the OFAC enforces sanction compliance based on US foreign policy (U.S. Department of the Treasury, 2021). These departments have made various statements regarding cryptocurrencies. In short, they require exchanges to follow the BSA rules and other AML regulations, such as the Patriot Act, as they fall under the definition of an MSB, according to FinCEN (Financial Crimes Enforcement Network, n.d.; Clautice, 2019).

Strategies to avoid sanction involving cryptocurrencies

According to Konowicz (2018), there are three main technological aspects of blockchain that make it possible for countries that have been sanctioned and thus excluded from the USD-backed financial system to evade these restrictions. Primarily, the underlying cryptographic technologies make it possible to make anonymous payments. Not only is the individual's identity hidden, but currency units, such as Bitcoins can be anonymized through so-called tumbler services, where the coins can be mixed with other coins, essentially wiping away the paper trail from the blockchain. Next, the decentralized nature of the system implies a lack of sovereign control over the financial system, which else could be influenced, coerced, or deterred. Doing so with a distributed ledger is practically impossible.

Finally, compared to establishing an independent financial system from scratch, utilizing the existing cryptocurrency market saves costs and has the benefit that the US and its allies allow cryptocurrency exchanges to freely thrive within their borders. Putting controls on this market would be against the free market principles, dominant in liberal democracies, making it harder for them to take a harsh stance against cryptocurrency. In short, cutting out intermediaries and switching to blockchain technologies not only reduces costs, increases transparency and trust, but also allows a party to transfer money out of the traditional financial system and circumvent policies set up by banks.

The position of the US Dollar in the global financial system gives the US Treasury the power to mandate international banks to exclude entities from this system. This means that the primacy of the US Dollar could be regarded as a determinant of the effectiveness of sanctions, as the decision calculus of companies is affected by the fear of financial repercussions when engaging with sanctioned entities (Cozzi, 2020). Though, it should be noted that each time the US dictates

such a ruling a country becomes more likely to seek new alternatives to the Dollar. Thus, the overuse of sanctions might eventually undermine their effectiveness (Blackwill & Harris, 2017; Konowicz, 2018).

Apart from the Renminbi, there has not been a currency that significantly challenged the role of the USD as an intermediary. Seeing that cryptocurrencies fulfill certain criteria required to be this challenger and recognizing that states might benefit from exploiting this feature of cryptocurrencies, the author will use the remainder of this section to explore the literature on strategies involving cryptocurrencies that have been applied by states to evade US sanctions. Combining the works of Konowicz (2018), Cozzi (2020), and Claustice (2019), five different strategies involving the use of cryptocurrencies are derived. Specifically, this includes theft through hacking, generating capital through mining, establishing a national commodity token, building a regional cryptocurrency system, and liberalizing cryptocurrency use to stabilize the domestic financial market.

Hacking

Mainly, the Democratic People's Republic of Korea is reported to have been part of elaborate cyber-attacks against financial institutions and cryptocurrency exchanges. The UN (2019) reports on at least 35 such cases. The cyberattacks against the Republic of Korea have taken a more financial nature during the past years, with a clear shift to targeting cryptocurrency exchanges, as seen during multiple strikes against Bithumb. The scope of these raids has increased as well, causing $7 million in losses per attack in 2017 and expanding to $31 and $20 million in 2018 and 2019 respectively. Other cases involve the exchanges Youbit and Upbit and exchanges in other countries. Moreover, Group-IB names the state-sponsored North Korean hacking group Lazarus as the culprit behind 5 substantial exchange attacks.

Moreover, the DPRK continues to access international financial systems through complicated schemes involving shell companies, offshore bank accounts, and cryptocurrency. The infamous WannaCry ransomware attacks targeted over 200,000 computers in nearly every corner of the globe. Essentially, the victims of the cyber-attack perform the conversion of hard currency into digital currency, wiping any paper trail back to the regular financial system (Konowicz, 2018). The Panel finds that these cyber activities are becoming more sophisticated and estimates that the country may have acquired up to 2 billion US Dollars through them. A Member State reports that stolen funds have been routed through 5000 one-time use wallets running through multiple countries before being converted to fiat currency. This makes it highly difficult to trace these transactions. Moreover, the use of highly anonymous cryptocurrencies, such as Monero only increases the difficulty of tracing these transfers.

Mining

Similarly, the UN Panel (2019) notes that the DPRK military is involved in large-scale mining of cryptocurrency. Mining is essentially lending computing power to solve complicated algorithms and verifying transactions on the ledger. The rewards are paid out in cryptocurrency making it an easy way of generating income for a sanctioned regime. North Korea can trade their electricity power for capital that can then be used to evade sanctions. Another form of generating cryptocurrencies is ‘cryptojacking’, where the mining of cryptocurrencies is outsourced to malware-infected computers. According to Yoshida (2019), the DPRK has amassed approximately $670 million in foreign and virtual cash, using DLT to launder the funds.

The DPRK breached EU and US trade restrictions by continuing the imports and exports of raw materials, metals, coal, and oil using unmarked ships and payments in cryptocurrency. It is

expected these crimes will become more frequent and more sophisticated in the future (Group IB, 2018; Cozzi, 2018).

Yet, cryptocurrency mining to generate cash for a sanctioned regime is not exclusive to North Korea. After a period of hostility towards crypto mining, because of power shortages, Iran came to realize the potential this industry may bring to the country (Ratna, 2020). Mining was recognized as a legitimate business practice and now Iranian startups are allowed to use subsidized low electricity costs to run Bitcoin mining farms to generate capital, on the condition that they restrict their use during peak moments of energy consumption (Motamedi, 2019). Though, the 'Wild East' of cryptocurrency mining is Russia (Matthews, 2019). Large energy supplies, high investments, and advanced ICT infrastructure have allowed for quick development of this sector in Russia. 70 bitcoin mining operations are reported to be discussing energy contracts with large Russian energy companies, offering low costs, making them able to generate higher marginal returns compared to private miners.

National cryptocurrencies and commodity tokens

Another way of generating capital with crypto is through utility tokens, which are blockchain-based assets. Venezuela is undergoing a currency crisis and is suffering from hyperinflation due to low oil prices. Since the home currency is rapidly losing its value, it is hard for the government to seek investments internally. This means that the state is forced to seek options outside its realms to find funding to fix the economy. However, this is very hard to realize since the government has been excluded from the global financial system and private entities can be penalized severely for engaging in transactions with the government. This makes it hard for the government to generate cash, as US banks cannot acquire their debt (Anchustegui & Hunter, 2018).

This has led to the development of a crypto token by the Venezuelan government, pegged to the value of its oil. The so-called Petro is a way for the Bolivar republic to capitalize on its natural reserves, despite the ongoing embargo. Konowicz (2018) calls this 'blockchain oil futures' and reports that $6 billion worth of Petros has been offered. The Petro has seen support from Russia (US Department of the Treasury, 2021) and Turkey (Staff, 2018), but this was quickly met with resistance from OFAC.

A similar approach has been employed by Iran. Four Iranian banks announced the creation of the Peyman coin, backed by gold and bank assets (Financial Tribune, 2019), which promised cooperation with Austria, Bosnia, France, Germany, and Russia. This happened following the removal of several Iranian banks from the SWIFT payment system after new sanctions were introduced by the Trump administration in 2018. Following the coin-offering, a trilateral agreement on blockchain cooperation with Russia and Armenia was signed by the Iranian government (Motamedi, 2019a).

Russia itself has also been involved with commodity-based tokens. Examples are the creation of the Neft coin, which is backed by oil (Abrosimova, 2019), and talks about a gold-backed coin offered by the Russian central bank (TASS, 2019). Abrosimova suggests that the Neft coin may help Russia escape US sanctions but adds that many experts predict a failure of the coin itself. Nevertheless, she adds, that this would raise the popularity of digital money in Russia.

Alternative blockchain-based payment system

Even though concrete evidence of a fully functioning alternative to the US dollar-based financial system cannot be named, several plans to create such a rivalrous system have been called for. Following the SWIFT ban, Iran not only sought the creation of the Peyman but also introduced wider regional ambitions regarding financial technology development. At a conference in

Malaysia, President Hassan Rouhani called for closer financial and trade cooperation between Muslim countries to fight US hegemony. He proposed a regional payment system, running on its Sharia-compliant blockchain (Ng, 2019).

A similar idea has been proposed by the BRICS countries, who advocated the creation of a BRICSCoin, which would be backed by a basket of local currencies and gold. Kirill Dmitriev, the head of RDIF and member of the BRICS Business Council, has been a major advocate, promoting this plan during a BRICS summit. This plan has not yet materialized, but the connection of the Yuan, Rupee, and Ruble through a common payment system could severely undermine the sanctioning potential of the US. The strategy is to effectively replace the role of reserve currency the USD has (RosBusinessConsulting, as reported by Cant, 2019).

Cryptocurrency adoption to stabilize the domestic financial market

Increased usage of cryptocurrencies prevails in embargoed economies. On one hand, this may be regarded as a coping mechanism, which citizens resort to, as they see their home currency fall under sanctions (Mahdavieh, 2019). On the other hand, sanctioned governments have also been promoting this adoption through policy. This brings risks to the home currency, but as the effects of sanctions on the home currency become stronger, the benefits begin to outweigh the costs, and a country is more likely to choose this strategy (Konowicz, 2019).

Articles, such as Reilly (2019) and Cuen (2020) show a clear picture of single-use cases, where Venezuelans resort to the use of cryptocurrencies since these are less volatile than their home currencies. The Bolivar has entered a spiral of hyperinflation because of falling oil prices and incorrect fiscal decisions (Pittaluga et al., 2020). Though, the digitalization of the Venezuelan economy is not limited to single cases. Analysis by Świerczyńska (2019) suggests that investors may consider Bitcoin a hedge against a falling exchange rate, along with investments such as

gold, even at ‘moderate’ periods. Moreover, the use of cryptocurrencies is so vast, that the Bitcoin trading data has been used as a substitute for a basket of goods in the PPP theory, and thus been utilized to estimate the exchange rate between the Bolivar and US dollar (Johnson, 2019).

Likewise, in Iran, cryptocurrency is seen as a *“theoretical hedge against local economic stagnation”* because of sanctions. Some surveys reveal that cryptocurrencies are not only used to generate capital through mining and trading but also for payments, proving that regular crypto usage is on the rise (Mogielnicki, 2019). Nevertheless, it should also be mentioned that Iran’s government has been slowly becoming hostile to foreign cryptocurrencies to promote their Peyman.

Finally, Russia has the most concrete plans concerning this strategy. According to a Russian economist, the country is making large investments to replace the dollar as a reserve currency with cryptocurrencies. Large-scale adoption of and investments in DLTs has been a key component to this. According to the economist’s analysis, sanctions may be seen as the reason for Russia’s ambition to implement financial technologies and the catalyst leading to the large investments of its reserves into Bitcoin (FBA Economics Today, 2018).

Table 1

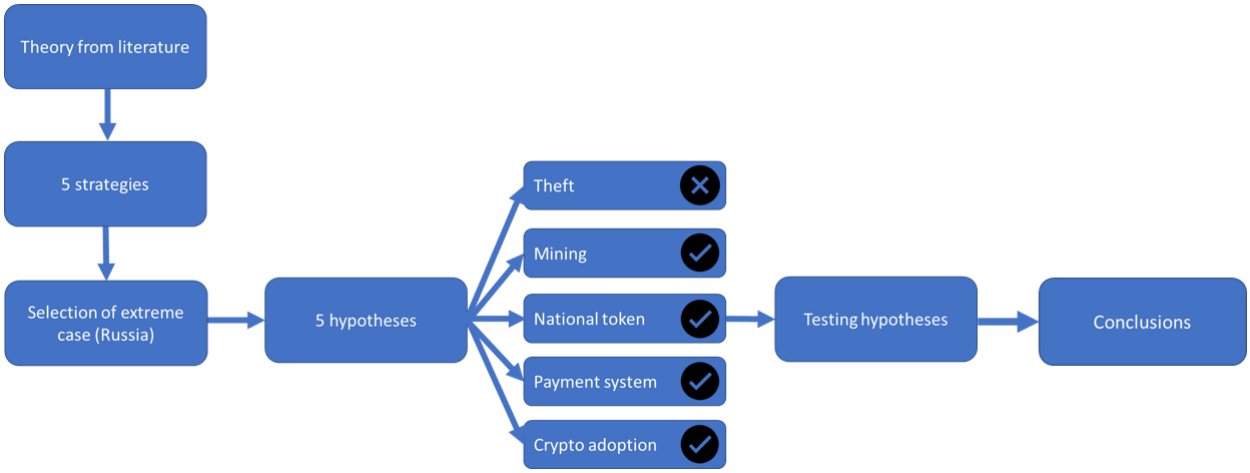
Type of strategy	Countries involved
Theft through hacking	North Korea
Mining for capital	Iran, Venezuela, Russia, North Korea
National commodity token	Venezuela, Iran, Russia
Establish a regional cryptocurrency system	Iran, Russia
Liberalize cryptocurrency use to stabilize the domestic financial market	Venezuela, Russia, Iran

To summarize this section, table 1 is constructed where the five strategies are listed together with the corresponding countries. It is observed that Russia (along with Iran) employs four out of the five strategies, as it follows from the literature. Moreover, it appears that the Russian economy is making a rapid transformation towards digitalization, scoring 6.8 in the World Bank's (2021) ICT Development Index and 55% of the population in 2017 receiving payments digitally (World Bank, 2018). This has led the Russian economy (alongside that of Ukraine) to become the leader in the cryptocurrency adoption ranking (Research and Markets, 2021). This appears to be a consequence of strategic governance, as the *"implementation of complementary services and innovative technologies, including blockchain technology"* is a strategic priority for the diversification of income for the Russian economy (National Settlement Depository, 2019).

Methodology

To investigate the actuality of these strategies, it is chosen to undergo a theory-driven research path is chosen. A single unit case study will be used to test hypotheses that are derived from the literature. The discussion of relevant academic research has been used to extract five strategies for the avoidance of sanctions, as seen in table 1. A set of hypotheses will be derived from this table, stating the expected prevalence of the strategies in the chosen case. This would allow for a thorough investigation, using verification through empirical data. Additionally, the author will employ the method of falsification, as he will actively look for data that is contradictory to these hypotheses.

Figure 1



The combination of inductive theory-building and deductive theory-testing would allow the research to fit into a broader academic context and ensure the claims made by the author are not merely correlation statements. At the same time, considering that the field of financial technologies is very dynamic, and countries often change their positions considering DLTs, the results of such research would advance the current academic debate by verifying previous

knowledge with new data. The case method of analysis would enhance the ability to perform a thorough investigation that includes blockchain statistics, recent news reports, and statements by government officials and institutions. Figure 1 shows a schematic overview of the research approach in this paper.

Seeing that the Russian Federation is one of the countries that employ four out of five of the strategies, noting the strategic importance of Blockchain technologies to the Russian government, and observing the rapid development of this sector, the author of this paper considers the case of Russia an extreme case. Furthermore, the capacity of Russia to materialize these ambitions, considering its diplomatic reach, large economy, developed financial system, and advanced cyber capabilities (Matthews, 2019), compared to the other listed countries, makes that case exceptional for this study.

The claims from table 1 are found in Konowicz (2018), and similar arguments are presented in the works by Cozzi (2020), Claustice (2019), and Macfarlane (2021). It is worth mentioning that Konowicz includes the Russian Federation in the discussion on the theft of cryptocurrencies by nation-states. The author of this paper did not find concrete examples of this in the reviewed publications, which sets the expectation that this does not occur at a large scale or is not actively promoted by the government. Therefore, the corresponding hypothesis is formulated in a way, where large-scale theft is not expected. However, this prediction is uncertain and will be studied carefully. Seeing that the other 4 strategies are confirmed by multiple sources that mention empirical examples, the author expects to find confirmatory evidence during the investigation of the claims.

In conclusion, the following hypotheses are derived from table 1:

H1 – Russia is not expected to engage in the large-scale theft or hacking of cryptocurrencies.

H2 – Russia is expected to be involved in the large-scale mining of cryptocurrencies.

H3 – Russia is expected to be committed to creating a national crypto token.

H4 – Russia is expected to be investing in a blockchain-based alternative to the USD-based international financial system.

H5 – Russia is expected to be promoting the large-scale adoption of cryptocurrencies as a means to stabilize the domestic financial market.

Russia's avoidance of Western sanctions through cryptocurrency

Theft and hacking of cryptocurrencies

The investigation of this claim begins by carefully studying page 7 from Konowicz (2018). Here the participation of the Russian Federation in the cyber hacking of cryptocurrencies is alleged. Konowicz mentions the capabilities of the 'Russians' to access the deepest part of the dark web, given their vast cyber capacities. Then a parallel is drawn with the North Korean government, which also has a well-developed cyberinfrastructure, that is used for the theft of cryptocurrencies (see WannaCry attacks). Investigating the primary source (Mathews, 2017) reveals that the implied link is the hacker group Shadow Brokers, related to the Russian Secret Service according to the report, stealing and distributing a series of hacking tools, containing the EternalBlue exploit, which then was used by North-Korean hackers to perform their operations.

Further investigation shows two Russian nationals being charged for stealing nearly $17 million (Cimpanu, 2020), and a hacker group that might be operating out of Russia or Eastern Europe stealing more than $200 million (Palli, 2020). As a response to growing cybercrime, the government has passed a new cryptocurrency law, similar to the AML, which seeks to improve the enforcement of crypto-related cybercrimes. However, the law is also regarded as a way to control the dark web and recruit domestic hackers to work for government-assisted hacking teams (Schwartz, 2021). Then again, there is no information that these hacker groups engage in the theft of cryptocurrencies.

Since the reports mention cases of crimes by individual persons and a concrete link between the Russian government and the theft of cryptocurrency remains to be found, it does not appear that this may be an active strategy pursued by Russia to diminish the effect of Western sanctions. Seeing that the government has also taken steps to curb related cybercrime, the author of this

paper did not find evidence to reject H1. This means that H1 holds, and state-sponsored theft or hacking of cryptocurrencies is not observed.

Mining

Similarly, the research on crypto mining begins with the argument presented in Konowicz (2018), where the principal goal of Russian bitcoin mining is to generate capital outside the global financial system, to diminish the dependence on the USD, as is currently the case with oil amounting to a large percentage of its exports. Since the mining of cryptocurrencies, such as Bitcoin is decentralized, a sanctions program would not be able to cut away this income source. In short, large mining operations would improve the country's ability to withstand sanctions.

The Cambridge Bitcoin Electricity Consumption Index shows the geographic distribution of the global Bitcoin hashrate, which is a tool to visualize the distribution of bitcoin mining facilities. China takes the lead globally, using 65% of the hashrate, but Russia in this index takes third place, just after the US (Cambridge Centre for Alternative Finance, n.d.). When looking at the number of Bitcoin Core downloads, a software used to mine Bitcoin, it is found that Russia ranks 4th (gavinandresen et al., 2008). Russia also ranks 7th in the number of bitcoin nodes, which are devices storing the blockchain's data, and usually function also as miners (Yeow, 2021).

The internet ombudsman Dmitry Marinichev has expressed the ambition for Russia to take up to 30% of the hash rate share in the future (Suberg, 2017). Marinichev is also the owner of the Russian Mining Company and has set up his business in a former RusAl aluminum plant, which was closed because of sanctions. The factory has a favorable location next to a hydroelectric powerplant, which was erected to support the aluminum plant.

Russia has a surplus of hydroelectric power from the Siberian region since the electricity is generated far away from the populous Western Russian cities. As this allows for very

competitive energy rates, the cities of Bratsk, Irkutsk, and Krasnoyarsk have become key mining locations (HASHR8, 2020). Mining centers are signing deals with large energy companies like Gazprom and EuroSibEnergo, for bulk energy rates (Suberg, 2017). Gazprom Neft has been involved in various crypto mining operations itself, as has the Russian institution of Rosatom (Szymczak, 2021).

The Digital Financial Assets Act was passed in August of 2020. It ruled that mining hardware must be owned by foreign nationals or owned by a Russian national and rented to an overseas individual. This setup, essentially, facilitates the exchange of excess Russian energy for foreign capital. Even though this might make business more complicated, it is regarded as a positive development, as this law sets out how a mining business should be run, clearing up any previous ambiguity. It also appears that Siberian officials have been supportive of this new industry since their regions stand to benefit from the increased demand for energy (HASHR8, 2020).

In summary, it may be said that Russia, indeed, is involved in the large-scale mining of cryptocurrency. A large share of global Bitcoin mining is observed in Russia, but more importantly, it is noted that national and local governments appear to be working together with energy giants, local entrepreneurs, private individuals, and foreign entities to shape a highly competitive cryptocurrency mining environment. Therefore, the author finds that H2 holds up to the analysis of available data and deems it confirmed.

National cryptocurrency and commodity tokens

Claustice (2017) writes that President Vladimir Putin announced the issuance of Russia's own "CryptoRuble' in 2017. Moreover, the president's advisor on regional economic integration, Sergey Glazyev, has stated that cryptocurrencies may be used to bypass sanctions against Russia. He argues that since banks are subject to sanctions, they cannot perform certain

transactions, but cryptocurrencies may be suitable to carry out international settlements in areas that are crucial to the state. He then adds that he supports the creation of a blockchain-based Ruble (Lenta.ru, 2017).

Similarly, the member of the National Banking Council of Russia's Central Bank and board member of the Russian Union of Industrialists and Entrepreneurs, Anatoly Aksakov, expressed that he would welcome a national cryptocurrency, especially if it would be offered by the Central Bank. Nevertheless, certain politicians are less optimistic. Elina Sidorenko, the head of the working group of the State Duma on risk assessment of cryptocurrency circulation, mentions limitations of current legislation, high costs for the Central Bank to realize such a project and makes a comparison with the failed attempt at creating the Venezuelan Petro (FBA Economics Today, 2018).

To this day, the Russian Central bank has not offered a cryptocurrency and stated plans to launch a CryptoRuble. Nonetheless, large Russian corporations have been experimenting with the launch of commodity tokens. For example, Gazprom Neft has launched a blockchain-based airplane refueling project, called Smart Fuel, which was deemed successful (Partz, 2021). Furthermore, the Bank of Russia announced a gold-backed cryptocurrency project, an attempt to return the world market to the gold standard and thus reduce the dependence on the USD (Pollock, 2019). Similarly, an Ethereum-based diamond token has been offered to make Russian diamond mining a liquid asset (Association NP RTS, n.d.). Lastly, the Russian Agricultural Bank has launched digitalized and tokenized grain stocks using blockchain technology (National Settlement Depository, 2019).

All these projects provide the Russian Government with cash flow outside of the regular financial system. In short, it can be said that Russia is committed to creating crypto tokens,

following the opinions of various government officials. The Central Bank is seriously considering this option, while various commodity tokens are already circulating the market. Therefore, the author concludes that enough evidence is found to support H3. However, it must be added that these ideas have been met with practical limitations and a government offered CryptoRuble is yet to materialize.

Blockchain-based alternative to the USD-based international financial system

The need for Russia to move away from the Swift payment system has been discussed in the Foreign Ministry, the Security Council, and the Kremlin. Starting in 2014, a so-called "Financial Messaging System" was launched by the central bank which included 400 partners, of which 20 banks. The system was meant to replace Swift for Russian cross-border transactions, but it ultimately did not find enough support from abroad, according to the director of the Institute for Strategic Analysis at FBK Grant Thornton. *"Inside (the country), without any problems, we can replace SWIFT with the Central Bank system or bilateral banking relations - respectively, we will cover 80%.",* writes another economist (Gusev, 2021).

Cozzi (2020) writes that Russia is using DLTs to enter financial operations outside of the traditional financial system. Specifically, Vladislav Ginko, an economist with ties to the Kremlin, stated that the country is investing in popular cryptocurrencies to replace its US dollar reserves, hoping to evade US sanctions: *"These sanctions and the will to adopt modern financial technologies lead Russia to the way of investing its reserves into Bitcoin."* (Chowdhury, 2019). The First Deputy Chairman of the Central Bank of the Russian Federation, Olga Skorobogatova, also sees a possibility for cryptocurrencies to be used for cross-border payments. Even more so, Yuri Pripachkin, chairman of the Russian Association of Cryptocurrency and Blockchain

(RACIB) claims that cryptocurrency may be used to evade sanctions and set up new payment networks (FBA Economics Today, 2018).

The Chief Executive Officer of Russian Direct Investment Fund Kirill Dmitriev has been a vocal advocate for the creation of a common payment system for the BRICS countries, as has been stated previously. According to him, this payment system would allow payments in national currencies and safeguard the investments between the countries (20% of global inflow of FDI). This initiative originated from Russia, after the introduction of sanctions in 2014. Dmitriev reports that, for Russia, the share of US dollars in cross-border transactions has fallen from 92% to 50%, while Ruble transactions rose from 3% to 14% (Reuters Staff, 2019).

Russia is also making more attempts at digitalizing the economy. In 2018, Russia pioneered its government bonds through the National Settlements Depository's blockchain-based smart contracts (National Settlement Depository, 2018).

Furthermore, Sberbank, a large Russian bank, has stated that it has joined the Enterprise Ethereum Alliance. The bank recognized that the adoption of decentralized blockchain technologies will have a big impact on its business configuration but expressed enthusiasm regarding the implementation of these technologies in Russia (Sberbank Europe AG, n.d.). Another large Bank, Alfa-Bank, has also been performing sandboxing trials involving cryptocurrency.

Russia is seen to be investing in a blockchain-based alternative to the USD-based international financial system. A process of de-dollarization of the world's financial system would be beneficial for Russia, as it would limit the scope of US sanctions. Cryptocurrencies seem like a viable alternative, that is thoroughly explored by various economists and lawmakers. Large financial institutions have already been experimenting with blockchain projects. Whether this

will be successful or not, remains to be seen. In short, it may be concluded that H4 holds and that an alternative payment system, at the very least, is seriously considered.

Domestic use

Finally, the last strategy used is when a sanctioned state promotes the unrestricted use of cryptocurrencies within its borders to achieve economic stability. This argument is sensible when considering the worsening effect sanctions may have on the exchange rate (Rasolyar et al., 2015) and seeing that cryptocurrencies like Bitcoin and Ethereum appreciate over time, and Stablecoins like Tether (USDT) maintain their value. The transfer of a certain part of the depreciating home currency into these coins might be a hedge against sanction-induced inflation for an investor (Hayes, 2020). Then, on a national scale, promoting the mass adoption of cryptocurrencies could thus be a viable strategy for counteracting the effects of sanctions, as it makes the population more prone to these. It should be noted that many cryptocurrencies, like Bitcoin and Ethereum, are very volatile in the short run, which might make them a less attractive alternative than foreign currencies reserves.

Russia's current policy towards cryptocurrencies is regulated through the law on Digital Financial Assets and Digital Currencies (Federal Law 259-FZ), where digital financial assets, such as utility tokens are considered securities (Art. 1). Furthermore, the law explicitly talks about cryptocurrencies as a digital means of payment and saving instrument (Art. 3). However, the law in Art. 14 also mentions that Russian citizens are not allowed to receive their income in the form of cryptocurrencies and firms cannot accept crypto as a form of payment. This means that cryptocurrencies cannot function as legal tender within the Russian Federation but remain a recognized investment tool. Finally, exchange operations are halted, unless they correspond with the provisions, as stated in Art. 14 (Fremer, 2021).

Additionally, bill 065710-7 Art. 38 calls for the taxation of cryptocurrencies as personal assets. This would obligate all tax liable entities to report the amount of possessed cryptocurrency or face a fine of 10% of the value of their possessions in Ruble. The bill also prescribes some other tax regulations, that are very similar to AML/KYC laws in the US (Fremer, 2021).

These regulations were introduced at the end of 2020 and were an attempt by the state to set up a legal framework for dealing with cryptocurrency after a few years of observing this market. The legislation is beneficial for the Russian cryptocurrency market, as it removes some of the uncertainty present in the former unregulated legal realm. The proposed tax requirements also provide a clear guide for investors and users of cryptocurrencies on how to report their holdings. However, the new legislation also presents certain restrictions for cryptocurrency users. Namely, the effective ban on income and revenue received in the form of cryptocurrency is regarded by the author as a way to protect the home currency and the role of the central bank. Decentralization, present in many cryptocurrencies, is troublesome for any central government, and Russia is no exception to this.

Looking at empirics, it becomes evident that the Russian population is welcoming towards cryptocurrencies. Research and Markets (2017) reports Ukraine and Russia as absolute leaders in cryptocurrency adoption. Chainanalysis (2020) confirmed these findings more recently, looking at on-chain and P2P indicators measuring the cryptocurrency trading volume. Here Russia ranks second, just after Ukraine. Russia takes 14th place in the number of Bitcoin ATMs (Bitcoin ATM Locations Worldwide, n.d.), hinting once again that cryptocurrency is prevalent. Moreover, looking at the distribution of ICO's (cryptocurrency equivalent of an IPO), it is found that Russia ranks between third and fourth place, after the US, the UK, and Singapore (TokensEconomy, n.d.; The ICO Watchlist, 2020), meaning that it is not only a popular country

for cryptocurrency usage but also for development. Moreover, looking at the top 100 Blockchain startups, according to the Manifest (2021), it is found that Russia hosts 4 of them, taking sixth place in the ranking. Looking at other benchmarks, such as the number of venture capital investment firms, it is observed that Russia hosts none of these (The We Use Coins Project, n.d.). Summarizing all these statistics, it could be said that, even though not universally, Russia takes a leading rank in the prevalence of cryptocurrency-related entrepreneurship.

Looking at polling data from 2018 done by Romir, a Russian private socio-economic research company, it is found that 56% of the respondents did not know what cryptocurrency is, while 31% had a rough idea, while only 13% knew and understood what cryptocurrencies are. Of the people that were familiar with the term, 87% did not intend to purchase it, 11% were willing to do so, and a mere 2% owned digital currencies. Crypto ownership was split between 76% as an investment, and 16% percent to purchase products. Even though this data may be dated, it provides a valuable insight into cryptocurrency usage inside Russia. It appears that a very small percentage of respondents actually used cryptocurrencies in 2018, and while this may have changed with the increasing popularity of the sector and the adoption of new laws in 2020, it does shape the picture that adoption by the masses is unlikely.

Concluding remarks

In conclusion, it is found that states employ five counterstrategies against Western sanctions. These strategies include hacking cryptocurrency exchanges and stealing funds, mining cryptocurrency to generate capital, issuing national cryptocurrencies and commodity tokens to continue seeking foreign investments, developing a blockchain-based international payment network, and promoting the adoption of cryptocurrency to stabilize the financial market.

From the academic literature, four countries are identified that are actively involved in the use of cryptocurrencies to evade sanctions: Russia, Iran, Venezuela, and North Korea. This paper tested the assumptions found in the literature for the case of Russia. It was found that Russia does not actively engage in the theft of cryptocurrency. However, research showed that the country is involved in large-scale mining of Bitcoin, exploiting its cheap energy sources. This is an effective way for Russia to turn these resources into capital outside of the prevailing financial system. Another strategy to continue generating income, despite sanctions, is the offering of utility tokens, pegged to Russia's natural resources. These blockchain-based futures are a way to reroute FDI, ignoring financial restrictions put out through SWIFT. Furthermore, Russia is found to be researching various other ways to minimize the role of the USD in international payments, such as a BRICS cryptocurrency, Central Bank-offered cryptocurrencies, and increasing digitalization of the financial sector. Finally, it is found that a clear regulatory stance and strategic governance have attributed to a booming fintech sector in Russia. Russian investors get the opportunity to curb the sanction-induced volatility of their home currency, by diversifying into crypto-assets.

The author believes that having used a hybrid approach, combining deductive theory-building with inductive hypothesis-testing, he managed to derive hypotheses from the current literature,

placing the research into a broader academic context. At the same time, the application of this theory in a more recent context has contributed to the further development of existing theory. The use of a case study has helped the researcher to perform a comprehensive study of legislation, official statements, and public data on the development of blockchain infrastructure in the Russian Federation.

The author recognizes that this research describes a rapidly moving industry, where the views of governments and the public are as unpredictable, as the crypto market itself. However, growing integration with existing financial infrastructure and a more concrete regulatory stance by the officials, are factors that will provide stability for the Russian cryptocurrency market.

How well these findings translate to other states like Iran, Venezuela, and the DPRK, is up for debate. Each case differs in many areas, such as infrastructure development, GDP, and even the types of strategies employed. However, this research does confirm many of the existing assumptions with fresh data, providing insight into a specific case. The author proposes the case of Iran, for a similar type of research, as it also employs many of the strategies and has significant regional capabilities. For the case of North Korea, the author would refer the reader to the research by Claustice (2019). For the comparison of cryptocurrencies and the Renminbi in the ability to challenge the role of the dollar in international payments, the researcher suggests the work by Taskinsoy (2020).

Bibliography

Abrosimova, T. (2019, February 25). Russia might have its own oil-backed cryptocurrency. *FXStreet*. https://www.fxstreet.com/cryptocurrencies/news/russia-might-have-its-own-oil-backed-cryptocurrency-201902250834

Anchustegui, I. H., & Hunter, T. (2018). Oil as Currency: Venezuela's Petro, a New 'Oil Pattern'? *SSRN Electronic Journal*. Published. https://doi.org/10.2139/ssrn.3291272

Association NP RTS. (n.d.). *Digital Platform Voskhod to list diamond-backed D1 coins by Diamundi (Singapore)*. Far East Arctic. Retrieved May 15, 2021, from https://www.fondvostok.ru/en/press/press_release/digital-platform-voskhod-to-list-diamond-backed-d1-coins-by-diamundi-singapore/

Bitcoin Magazine. (2021, April 16). *U.S. Imposes Sanctions On Russia-Linked Bitcoin Addresses*. Nasdaq. https://www.nasdaq.com/articles/u.s.-imposes-sanctions-on-russia-linked-bitcoin-addresses-2021-04-16

Blackwill, R. A. D., & Harris, J. M. (2017). *War by Other Means: Geoeconomics and Statecraft* (Reprint ed.). Belknap Press: An Imprint of Harvard University Press.

Brett, J. (2020, January 29). Trend Continues For Countries Looking To Evade U.S. Sanctions Using Crypto. *Forbes*. https://www.forbes.com/sites/jasonbrett/2020/01/29/trend-continues-for-countries-looking-to-evade-us-sanctions-using-crypto/

Business Insider. (2021, March 3). North Korea is the most isolated country on the planet, but it still finds ways to steal billions of dollars. *Business Insider*.

https://www.businessinsider.com/how-north-korea-uses-hacking-and-cryptocurrency-to-avoid-sanctions-2021-3?international=true&r=US&IR=T

Cambridge Centre for Alternative Finance. (n.d.). *Cambridge Bitcoin Electricity Consumption Index*. University of Cambridge Judge Business School. Retrieved May 15, 2021, from https://cbeci.org/mining_map

Cant, J. (2019, November 15). *BRICS Nations Discuss Creation of New Crypto For Unified Payment System*. Cointelegraph. https://cointelegraph.com/news/brics-nations-discuss-creation-of-new-crypto-for-unified-payment-system

Chowdhury, H. (2019, January 14). Russia plans to tackle US sanctions with Bitcoin investment, says Kremlin economist. *The Telegraph*. https://www.telegraph.co.uk/technology/2019/01/14/russia-plans-tackle-us-sanctions-bitcoin-investment-says-kremlin/

Cimpanu, C. (2020, September 16). US charges two Russians for stealing $16.8m via cryptocurrency phishing sites. *ZDNet*. https://www.zdnet.com/article/us-charges-two-russians-for-stealing-16-8m-via-cryptocurrency-phishing-sites/

Clautice, T. (2019). Nation State Involvement in Cryptocurrency and the Impact to Economic Sanctions. *Economic Crime Forensics Capstones*, *43*. https://digitalcommons.lasalle.edu/ecf_capstones/43

Cozzi, F. (2020). Will Blockchain Technologies Strengthen or Undermine the Effectiveness of Global Trade Control Regulations and Financial Sanctions? *Global Jurist*, *20*(2), 1–27. https://doi.org/10.1515/gj-2019-0047

Cuen, L. (2020, July 10). A Rare Glimpse Into How Crypto Is Really Used in Venezuela. *CoinDesk*. https://www.coindesk.com/airtm-airdrop-venezuela-crypto-donation-results

Delevic, M. (1998). Economic Sanctions as a Foreign Policy Tool: The Case of Yugoslavia. *International Journal of Peace Studies*, *3*(1), 1-end. https://www-jstor-org.ezproxy.leidenuniv.nl/stable/419135?seq=9#metadata_info_tab_contents

EEAS. (2021, March 17). *European Union sanctions*. EEAS - European External Action Service - European Commission. https://eeas.europa.eu/topics/sanctions-policy/423/european-union-sanctions_en

Elliott, K. A. (2018, December 24). Evidence on the Costs and Benefits of Economic Sanctions. *Peterson Institute for International Economics*. https://piie.com/commentary/testimonies/evidence-costs-and-benefits-economic-sanctions

European Union. (2012). *Consolidated Version of the Treaty on European Union*. Official Journal of the European Union. https://eur-lex.europa.eu/resource.html?uri=cellar:2bf140bf-a3f8-4ab2-b506-fd71826e6da6.0023.02/DOC_1&format=PDF

FBA Economics Today. (2018, November 14). "An excellent way to bypass sanctions ": the president of RACIB spoke about the prospects of cryptocurrencies and blockchain in Russia. *Rambler Finance*. https://translate.google.com/translate?sl=ru&tl=en&u=https://finance.rambler.ru/other/41267384-otlichnyy-sposob-dlya-obhoda-sanktsiy-prezident-rakib-rasskazal-o-perspektivah-kriptovalyut-i-blokcheyna-v-rossii/?utm_source%3Dheader%26utm_campaign%3Dself_promo%26utm_medium%3Dfinance%26utm_content%3Dto_default

Financial Tribune. (2019, January 30). Iran Unveils Gold-Backed Cryptocurrency. *Financial Tribune*. https://financialtribune.com/articles/business-and-markets/96476/iran-unveils-gold-backed-cryptocurrency

gavinandresen, jgarzik, & sipa. (2008, April 8). *Bitcoin Download Statistics by Country: All Files*. SourceForge. https://sourceforge.net/projects/bitcoin/files/stats/map?dates=2008-11-09+to+2021-04-08

Gordon, R., Smyth, M., & Cornell, T. (2019). *Sanctions Law*. Bloomsbury Academic.

Group IB. (2018). *Hi-Tech Crime Trends 2018*. https://www.group-ib.com/resources/threat-research/2018-report.html

Gusev, S. (2021, May 4). The authorities are betting on blockchain: How disconnecting from SWIFT could affect the Russian financial system. *Kommersant*. https://translate.google.com/translate?hl=&sl=ru&tl=en&u=https%3A%2F%2Fwww.kommersant.ru%2Fdoc%2F4760960

HASHR8. (2020, November). *The State of Bitcoin Mining in Russia*. Bitcoin Mining Index. https://compassmining.io/education/content/images/attachments/the_state_of_bitcoin_mining_in_russia_hashr8.pdf

Hayes, A. (2020, June 30). *Stablecoin*. Investopedia. https://www.investopedia.com/terms/s/stablecoin.asp

Hufbauer, G. C., & Schott, J. J. (1985). Economic Sanctions and U. S. Foreign Policy. *American Political Science Association*, *18*(4), 727–735. https://www.jstor.org/stable/419135

International Finance Corporation. (2017). Blockchain in Financial Services in Emerging Markets Part I: Current Trends. *EMCompass*, *43*, 1–8. https://www.ifc.org/wps/wcm/connect/a3559b7c-19b7-4f8d-94be-30d1cf7e172b/EMCompass+Note+43+FINAL+8-21.pdf?MOD=AJPERES&CVID=lU51Cxz

Jermano, J. (2018). Economic and Financial Sanctions in U.S. National Security Strategy. *PRISM*, *7*(4), 1. https://cco.ndu.edu/News/Article/1680801/economic-and-financial-sanctions-in-us-national-security-strategy/

Johnson, J. (2019). Bitcoin and Venezuela's Unofficial Exchange Rate. *Ledger*, *4*. https://doi.org/10.5195/ledger.2019.170

Konowicz, D. R. (2018, February). *The New Game: Cryptocurrency Challenges US Economic Sanctions* (No. AD1062142). Naval War College Newport United States. https://apps.dtic.mil/sti/citations/AD1062142

Lenta.ru. (2017, December 12). Putin's adviser mentions the circumvention of sanctions with the help of Bitcoin. *Lenta*. https://translate.google.com/translate?hl=en&sl=ru&u=https://lenta.ru/news/2017/12/12/kriptovaluty_i_glaziev/&prev=search&pto=aue

Macfarlane, E. (2021). Strengthening Sanctions: Solutions to Curtail the Evasion of International Economic Sanctions Through the Use of Cryptocurrency. *Michigan Journal of International Law, 42.1,* 199. https://doi.org/10.36642/mjil.42.1.strengthening

Mahdavieh, R. (2019). Governments' Adoption of Native Cryptocurrency: A Case Study of Iran, Russia, and Venezuela. *Honors Undergraduate Theses, 502*. https://stars.library.ucf.edu/honorstheses/502

Masters, J. (2019, August 12). *What Are Economic Sanctions?* Council on Foreign Relations. https://www.cfr.org/backgrounder/what-are-economic-sanctions

Matthews, O. (2017, September 21). Bitcoin and Blockchain: A Russian Money Laundering Bonanza? *Newsweek*. https://www.newsweek.com/russia-finally-embracing-virtual-currencies-666794

Mogielnicki, R. (2019, October 21). *Iran May Pay To Play in Crypto Amid Sanctions, Financial Tensions*. Arab Gulf States Institute in Washington. https://agsiw.org/iran-may-pay-to-play-in-crypto-amid-sanctions-financial-tensions/

Motamedi, M. (2019a, January 27). Iran inches closer to unveiling state-backed cryptocurrency. *Business and Economy | Al Jazeera*.

https://www.aljazeera.com/economy/2019/01/27/iran-inches-closer-to-unveiling-state-backed-cryptocurrency/

Motamedi, M. (2019b, August 5). Iran's government recognises cryptocurrency mining with caveat. *Business and Economy | Al Jazeera*. https://www.aljazeera.com/economy/2019/08/05/irans-government-recognises-cryptocurrency-mining-with-caveat/

National Settlement Depository. (2018). *Annual report*. https://report2018.moex.com/en/30/30/20

National Settlement Depository. (2019). *NSD Annual Report* (No. 1). Moscow Exchange Group. https://www.nsd.ru/en/about/otchetnost-i-statistika/godovye-formy-nrd/

Ng, E. (2019, December 19). Iran leader urges deeper Muslim links to fight US "hegemony." *AP NEWS*. https://apnews.com/article/religion-asia-pacific-kuala-lumpur-middle-east-malaysia-b8bab8c75cff1580d28e03c7536a25f8

Palli, I. C. (2020, June 25). Hacker Group Stole $200 Million From Cryptocurrency Exchanges. *Bank Info Security*. https://www.bankinfosecurity.com/hacker-group-stole-200-million-from-cryptocurrency-exchanges-a-14506

Partz, H. (2021, March 1). *Gazprom Neft uses blockchain tech to streamline aircraft refueling*. Cointelegraph. https://cointelegraph.com/news/gazprom-neft-uses-blockchain-tech-to-streamline-aircraft-refueling

Pittaluga, G. B., Seghezza, E., & Morelli, P. (2020). The political economy of hyperinflation in Venezuela. *Public Choice*, *186*(3–4), 337–350. https://doi.org/10.1007/s11127-019-00766-5

Policy Department for External Relations of the EU Parliament. (2020, November). *Extraterritorial sanctions on trade and investments and European responses*. Directorate General for External Policies of the Union. https://europarl.europa.eu/RegData/etudes/STUD/2020/653618/EXPO_STU(2020)653618_EN.pdf

Pollock, D. (2019, June 16). Russian Gold-Backed Crypto Slams the Global US Dollar Standard. *CNN*. https://www.ccn.com/russian-gold-backed-crypto-slams-the-global-us-dollar-standard/

Rasolyar, M. S., Babaei, J., & Yavari, S. (2015). The Effect of Sanctions on Exchange Rates through GMM Method (A Cross Country Comparison). *International Journal of Review in Life Sciences*, *5*(3). https://www.freit.org/WorkingPapers/Papers/TradePatterns/FREIT1133.pdf

Ratna, T. (2020, January 24). Iran Has a Bitcoin Strategy to Beat Trump's Maximum Pressure. *Foreign Policy*. https://foreignpolicy.com/2020/01/24/iran-bitcoin-strategy-cryptocurrency-blockchain-sanctions/

Reeves, S. (2021, May 6). Turkey, India and China Look to Ban Crypto, U.S., Germany and Iran Move to Use It. *Newsweek*. https://www.newsweek.com/turkey-india-china-look-ban-crypto-us-germany-iran-move-use-it-1589338

Reilly, C. (2019, December 13). Venezuelans use cryptocurrency to bypass corruption, inflation. *Roll Call*. https://www.rollcall.com/2019/09/10/venezuelans-use-cryptocurrency-to-bypass-corruption-inflation/

Research and Markets. (2021, March). *Global Blockchain and Cryptocurrency Market Report 2021: Ukraine and Russia are Leading the Ranking of Cryptocurrency Adoption*. Business Wire. https://www.businesswire.com/news/home/20210331005682/en/Global-Blockchain-and-Cryptocurrency-Market-Report-2021-Ukraine-and-Russia-are-Leading-the-Ranking-of-Cryptocurrency-Adoption---ResearchAndMarkets.com

Reuters Staff. (2018, February 17). Venezuela cryptocurrency to draw investment from Turkey, Qatar-official. *Reuters*. https://www.reuters.com/article/us-crypto-currency-venezuela/venezuela-cryptocurrency-to-draw-investment-from-turkey-qatar-official-idUSKCN1G025S

Reuters Staff. (2019, November 14). Russia says BRICS nations favour idea of common payment system. *U.S.* https://www.reuters.com/article/uk-brics-summit-russia-fx-idUSKBN1XO1KQ

Romir. (2018, July 8). *Less than half of Russians know what cryptocurrencies are*. Romir.Ru. https://translate.google.com/translate?sl=ru&tl=en&u=https://romir.ru/studies/chto-takoe-kriptovalyuty-znayut-menee-poloviny-rossiyan

Sberbank Europe AG. (n.d.). *Herman Gref speaks about advanced technologies of the future*. Sberbank. Retrieved May 15, 2021, from https://www.sberbank.at/press-releases/herman-gref-speaks-about-advanced-technologies-future

Schwartz, M. J. (2021, February 11). Will Russian Cryptocurrency Law Drive Hacker Recruitment? *Bank Info Security*. https://www.bankinfosecurity.com/blogs/will-russian-cryptocurrency-law-drive-hacker-recruitment-p-2995

Selden, Z. (1999). *Economic Sanctions as Instruments of American Foreign Policy* (first ed.). Praeger Publishers.

Sexton, M. (2021, January 22). Bitcoin: A dirty solution to Iran's economic troubles? *Middle East Institute*. https://www.mei.edu/publications/bitcoin-dirty-solution-irans-economic-troubles#:%7E:text=In%20early%202019%2C%20Iran%20legalized,currency's%20public%20ledger%20of%20transactions%2C

Siripurapu, A. (2020, September 28). *The Dollar: The World's Currency*. Council on Foreign Relations. https://www.cfr.org/backgrounder/dollar-worlds-currency#:%7E:text=The%20dollar%20has%20been%20the,used%20currency%20for%20international%20trade.

Suberg, W. (2017, August 29). Bitcoin Miners in Russia 'In Talks' To Get Spare Energy From Energy Firms. *Cointelegraph*. https://cointelegraph.com/news/bitcoin-miners-in-russia-in-talks-to-get-spare-energy-from-energy-firms

Suberg, W. (2018, June 18). *Two Major Russian Banks to Offer Crypto-Based Fund for Retail Investors*. Cointelegraph. https://cointelegraph.com/news/two-major-russian-banks-to-offer-crypto-based-fund-for-retail-investors

Świerczyńska, K. A. (2019). Bitcoin as a Panacea for the Venezuelan Crisis. *Proceedings of the 16th International Scientific Conference, Brno: Masaryk University*, 271–281. https://www.researchgate.net/publication/337113481_Bitcoin_as_a_Panacea_for_the_Venezuelan_Crisis

Szymczak, P. D. (2021, February 3). Gazprom Neft Mines Bitcoin as an Alternative to Flaring Unwanted Gas. *Journal of Petrolium Technology*. https://jpt.spe.org/gazprom-neft-mines-bitcoin-as-an-alternative-to-flaring-unwanted-gas

Taskinsoy, J. (2020, August). *Diminishing American Power: The US - China Trade War, Sanctions, and Coronavirus*. SSRN. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3677841

TASS. (2019, May 23). Bank of Russia may consider gold-backed cryptocurrency. *TASS*. https://tass.com/economy/1059727

United Nations Security Council. (2019). *Subsidiary Organs of the United Nations Security Council*. DPPA. pp. 40–41. https://www.un.org/securitycouncil/sites/www.un.org.securitycouncil/files/subsidiary_organs_factsheets.pdf

US Department of Justice. (2018, January 3). *Turkish Banker Convicted Of Conspiring To Evade U.S. Sanctions* [Press release]. https://www.justice.gov/usao-sdny/pr/turkish-banker-convicted-conspiring-evade-us-sanctions-against-iran-and-other-offenses

US Department of the Treasury. (2021, April 21). *Treasury Sanctions Russia-based Bank Attempting to Circumvent U.S. Sanctions on Venezuela*. United States Government. https://home.treasury.gov/news/press-releases/sm622

Vigna, P., & Osipovich, A. (2018, October 2). Bots Are Manipulating Price of Bitcoin in 'Wild West of Crypto.' *WSJ*. https://www.wsj.com/articles/the-bots-manipulating-bitcoins-price-1538481600

Vincent, O., & Evans, O. (2019). Can cryptocurrency, mobile phones, and internet herald sustainable financial sector development in emerging markets? *Journal of Transnational Management, 24*(3), 259–279. https://doi.org/10.1080/15475778.2019.1633170

World Bank. (2018, October 15). *Global Financial Inclusion (Global Findex) Database (Global Findex)* | *Data Catalog* [Dataset]. https://datacatalog.worldbank.org/dataset/global-financial-inclusion-global-findex-database

World Bank. (2021). *TCdata360: Country rank and value in the ITU ICT Development Index* [Dataset]. https://tcdata360.worldbank.org/indicators/h2e1ddd20?country=BRA&indicator=24719&viz=bar_chart&years=2015#table-link%20{low(0)=1-3,%20mid(1)=3-6,high(2)=6+

Yeow, A. (2021, May 19). *Global Bitcoin nodes distribution*. Bitnodes. https://bitnodes.io/

Yoshida, K. (2019, March 8). North Korea stole cryptocurrency via hacking: UN panel. *Nikkei Asia*. https://asia.nikkei.com/Spotlight/N-Korea-at-crossroads/North-Korea-stole-cryptocurrency-via-hacking-UN-panel