

The Potential of Cryptocurrencies in Funding the Weapons of Mass Destruction Proliferation

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Abstract

Cryptocurrencies have grown rapidly and are used in various cross-border transactions. The negative impact of cryptocurrencies includes the misuse of crimes, especially in funding the weapons of mass destruction (WMD) proliferation. This article examines how *cryptocurrency* can be utilized in WMD proliferation funding and the challenges faced in overcoming this problem. The method used is a normative research method with a conceptual approach. The research found that cryptocurrency characteristics such as high anonymity and cross-border transactions make it easier for WMD proliferation funding perpetrators to hide funding traces. The lack of transparency in the blockchain adds to the difficulty in tracking WMD proliferation funds. The suggestion from this research is that there is a need for stronger international cooperation and a financial system that can detect and prevent the spread of nuclear material.

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Introduction

Cryptocurrency or cryptocurrency is a term consisting of 2 (two) syllables, namely "crypto" and "currency." "Crypto" is a word derived from "cryptography," which means the science of reading a password, while the word "currency" itself can be interpreted as currency.¹ According to Satoshi Nakamoto, bitcoin represents the purest form of peer-to-peer (P2P) payments, an online payment mechanism that facilitates direct transfers between individuals without the involvement of a third-party financial institution.² Users of this P2P system can remain anonymous; although it ensures that the circulation of Bitcoin can be easily traced, the confidentiality of the user's identity is still guaranteed. This is because user addresses comprise

¹ Translated by Content Engine LLC, "Keys to Understanding Cryptocurrencies: What Are They and When Were They Born?," *ProQuest* (blog), November 10, 2022, <https://www.proquest.com/wire-feeds/keys-understanding-cryptocurrencies-what-are-they/docview/2735489248/se-2>. Accessed on 20 May 2024.

² Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System," 2008, <https://bitcoin.org/bitcoin.pdf>:1.

a long series of randomly generated encryptions, and users are free to create as many addresses as they like.³

Cryptocurrencies have four different properties, namely:⁴ 1) Traceable and immutable: all Bitcoin transactions are traceable and irreversible once completed. In addition, all transactions are recorded on the blockchain for as long as possible. 2) Decentralization and anonymity: all cryptocurrency systems have no third-party organizations, and all actions are anonymous; the parties involved in a transaction do not know the specifics of the transaction. 3) It is secure and does not require permission because the public key and blockchain technology guarantee the security of cryptocurrencies, so the use of cryptocurrencies does not require permission. 4) Fast and Global (Cross-Country): Transactions can be done in just a few minutes using the cryptocurrency is open, so anyone in the world can access and use it.

Nowadays, the development of cryptocurrencies can have a negative impact, including the use of cryptocurrencies as a means of money laundering, terrorism financing, fraud, and terrorism trading to finance the proliferation of weapons of mass destruction. According to Vassiliki, proliferation is the spread of weapons of mass destruction or high lethality.⁵ The deployment of weapons of mass destruction needs to be watched out for because it can cause great damage and even destruction. The spread of weapons of mass destruction can occur between countries, non-state actors, and non-state groups. This deployment refers not only to the weapons of mass destruction that have been made but also to the technology intended to produce them, the materials needed, and the intellectual expertise that facilitates the development of these weapons. Therefore, efforts to prevent and handle the spread of weapons of mass destruction must be carried out seriously and planned.⁶

The nuclear non-proliferation regime encompasses a broad framework of treaties, international agreements, and international organizations that seek to prevent the spread of nuclear weapons and contribute to the advancement of arms control and disarmament.⁷ The regime has several key components that serve to create legally binding non-proliferation obligations, strengthen international norms to counter the proliferation of nuclear weapons, control access to materials and technologies related to weapons of mass destruction, and enforce existing treaties while building trust between countries.⁸ To date, the non-proliferation regime has managed to achieve its objectives; it is evident that only 9 (nine) countries have nuclear weapons, and the global stockpile of nuclear weapons has been reduced from 64,449 at the peak of the Cold War to about 17,300 nuclear warheads today. Any country has used no nuclear weapons since the initial use by the United States against Japan in 1945.⁹

In order to prevent the spread of weapons of mass destruction, strictly enforced international instruments have now been established to regulate the spread of biological,

³ Willy Wong, *Bitcoin: A Practical Guide to Understanding, Mining, and Displaying Bitcoin* (Indonesian: *Bitcoin: Panduan Praktis Memahami, Menambang, Dan Menampilkan Bitcoin*), Cetakan 1 (Semarang: Indraprasta, 2014). pp. 16-17.

⁴ Xiaoq Li et al., "A Survey on the Security of Blockchain Systems," *Future Generation Computer Systems* 107 (2020): 841–53.

⁵ Vassiliki Aroniadou Anderjaska et al., "Acetylcholinesterase Inhibitors (Nerve Agenst) as Weapons of Mass Destruction: History, Mechanisms of Action, and Medical Countermeasures," *Neuropharmacology* 181 (2020), <https://doi.org/10.1016/j.neuropharm.2020.108298>.

⁶ Funlade Sunmola and Patrick Burgess, "Transparency by Design for Blockchain-Based Supply Chains," *4th International Conference on Industry 4.0 and Smart Manufacturing* 217 (January 1, 2023): 1256–65, <https://doi.org/10.1016/j.procs.2022.12.324>.

⁷ Nuclear Threat Initiative Experts, "Tutorial on the Nonproliferation Regime," *Nuclear Threat Initiative* (blog), accessed May 28, 2024, <https://tutorials.nti.org/nonproliferation-regime-tutorial/nti-nuclear-nonproliferation-regime-treaties-by-country/>. Accessed on 29 May 2024.

⁸ *Ibid.*

⁹ Hans Kristensen and Robert Norris, "World Nuclear Stockpile Report," *Ploughshares* (blog), 2023, <https://ploughshares.org/world-nuclear-stockpile-report>. Accessed on 29 May 2024.

chemical, and nuclear weapons. In addition, proliferation contract agreements have also been put in place to control exports and prevent the illicit trade in weapons of mass destruction, such as UN Security Council Resolution 1540 and other international agreements.¹⁰ The data of the 2021 Annual Report on Indonesia's Risk Assessment on Terrorism Financing and Weapons of Mass Destruction (WMD) Proliferation Financing has changed in recent years. Criminals use financial institutions as a channel for laundering, weapons of mass destruction funding, and media funding.¹¹ Actors have switched from conventional cash fundraising to virtual means of payment that can be accessed through online networks worldwide.¹²

Non-proliferation regimes, in many ways, rely on financial systems and controls that detect and prevent the spread of nuclear and radioactive materials. Proliferation financing is defined by the Financial Action Task Force (FATF) as the act of providing funds or financial services that are used, in whole or in part, for the manufacture, acquisition, possession, development, export, transshipment, brokerage, transportation, transfer, stockpiling or use of nuclear, chemical or biological weapons and their means of delivery and related materials that are contrary to national law or where applicable international obligations.¹³

Controlling the proliferation of nuclear weapons is one of the main challenges facing the global community. The threat posed by the proliferation of nuclear weapons has three main aspects:¹⁴ 1) the development of the ability to produce or acquire nuclear weapons by states that do not currently possess nuclear weapons, 2) the increase in the stockpile of weapons by states that currently possess nuclear weapons, the increase in the technical sophistication or reliability of such weapons, and the development of new weapons such as "mini-nuclear" or nuclear warheads on the battlefield, 3) the acquisition of nuclear weapons or their materials and knowledge by non-state individuals or entities, who are often called "terrorists" to produce nuclear weapons.

Cryptocurrencies have several characteristics that can make them potentially dangerous in the context of WMD proliferation funding. Reasons why cryptocurrencies can be a risk are as follows:¹⁵

- 1) High Anonymity: Blockchain technology carries out cryptocurrency transactions anonymously. User identities are not always linked to crypto addresses; of course, this makes it easier for WMD proliferation perpetrators to hide their funding footprints and avoid detection.
- 2) Cross-Border Transactions: cryptocurrencies allow cross-border transactions without geographical constraints. This facilitates funding involving various countries. WMD

¹⁰ Robert J. Hughes, "Noncompliance and Punishment: Lessons from Multilateral Chemical, Biological, and Nuclear Arms Control," *The Nonproliferation Review* 28, no. 4-6 (November 1, 2021): 337-59, <https://doi.org/10.1080/10736700.2022.2128579>.

¹¹ Andrii Fomenko et al., "International Regime of Counteraction to Laundering of Proceeds of Crime and Financing of Terrorism: Two Vectors of Evolution," *Economic Annals-XXI* 181 (February 10, 2020): 28-43, <https://doi.org/10.21003/ea.V181-03>.

¹² Mohammad Hashemi Joo, Yuka Nishikawa, and Krishnan Dandapani, "Cryptocurrency, a Successful Application of Blockchain Technology," *Managerial Finance* 46, no. 6 (January 1, 2020): 715-33, <https://doi.org/10.1108/MF-09-2018-0451>.

¹³ Financial Action Task Force, "Combating Proliferation Financing: A Status Report on Policy Development and Consultation," FATF (France: Financial Action Task Force, 2010), <https://www.fatf-gafi.org/content/dam/fatf-gafi/reports/Status-report-proliferation-financing.pdf>. Diakses 29 Mei 2024.

¹⁴ Victor W. Sidel and Barry S. Levy, "Proliferation of Nuclear Weapons: Opportunities for Control and Abolition.," *American Journal of Public Health* 97, no. 9 (September 2007): 1589-94, <https://doi.org/10.2105/AJPH.2006.100602>.

¹⁵ Otoritas Jasa Keuangan, "Guidelines for the Implementation of the Risk-Based Weapons of Mass Destruction Proliferation Financing Prevention Program (Indonesian: *Panduan Penerapan Program Pencegahan Pendanaan Proliferasi Senjata Pemusnah Massal Berbasis Risiko*)" (Jakarta: Otoritas Jasa Keuangan, 2023).

proliferation actors can take advantage of this to avoid regulations and flow funds to various regions of the country.

- 3) Non-transparency: blockchain, the technology behind cryptocurrencies, is not always transparent. Transactions can be hidden by using a crypto address that is not linked to a real identity, which makes tracking WMD proliferation funding more difficult.

The international community enacted a non-proliferation regime because of its agreement that the deliberate use of biological, chemical, radiological, and nuclear weapons is extremely dangerous and that the spread of such materials must be controlled.¹⁶ This includes the existence of a robust financial mechanism to track proliferation funding through transfers, trade finance products, cash, checks, and credit cards.¹⁷ Nuclear non-proliferation research to date has not involved any issued virtual currencies, and non-proliferation regimes are now faced with new vulnerabilities that have largely been unexplored.¹⁸

Articles that discuss the financing of the proliferation of weapons of mass destruction throughout the search that has been carried out have not been discussed. This study discusses the threat of funding the proliferation of weapons of mass destruction and the challenges it poses as the working mechanism of cryptocurrencies so that they can be used in the funding of WMD proliferation.

Methods

This research is normative research, which uses legal sources in the form of laws and regulations, court decisions, contracts or agreements, legal theories, and opinions of scholars.¹⁹ This research is normative legal research because this research is only conducted or aimed at written regulations or legal materials. The approach used in this study was conceptual.²⁰ The Conceptual Approach begins with the views and doctrines that develop in legal science. The opinions and doctrines studied would find ideas that give birth to legal understandings, legal concepts, and legal principles relevant to the problem being studied, such as the concept and theory of cryptocurrencies and the proliferation of weapons of mass destruction.

The Threats and Challenges of the Proliferation of Weapons of Mass Destruction Funding

Several countries in the world are currently working to develop and produce weapons of mass destruction. Weapons of mass destruction can kill or eliminate many people in a short period of time.²¹ The types are nuclear weapons (atomic weapons, radiation weapons), chemical weapons (toxic gases), and biological weapons (toxins and natural pathogens such as anthrax bacteria). These countries usually also develop or try to acquire means to deliver these weapons, such as ballistic missiles, cruise missiles, and unmanned aerial vehicles.²²

The threat of the use of weapons of mass destruction by states and non-state actors has emerged as a significant security issue in the last two decades, so the UN Security Council

¹⁶ Center for Strategic and International Studies, "Weapons of Mass Destruction Proliferation," 2018, <https://www.csis.org/topics/nuclear-issues>. Accessed on 29 May 2024.

¹⁷ Ibid.

¹⁸ Ibid.

¹⁹ Muhaimin, *Legal Research Methods (Indonesian: Metode Penelitian Hukum)* (Mataram: Mataram University Press, 2020). pp. 45

²⁰ Peter Mahmud Marzuki, *Law Research (Indonesian: Penelitian Hukum (Edisi Revisi))* (Jakarta: Kencana, 2014). pp. 133-135.

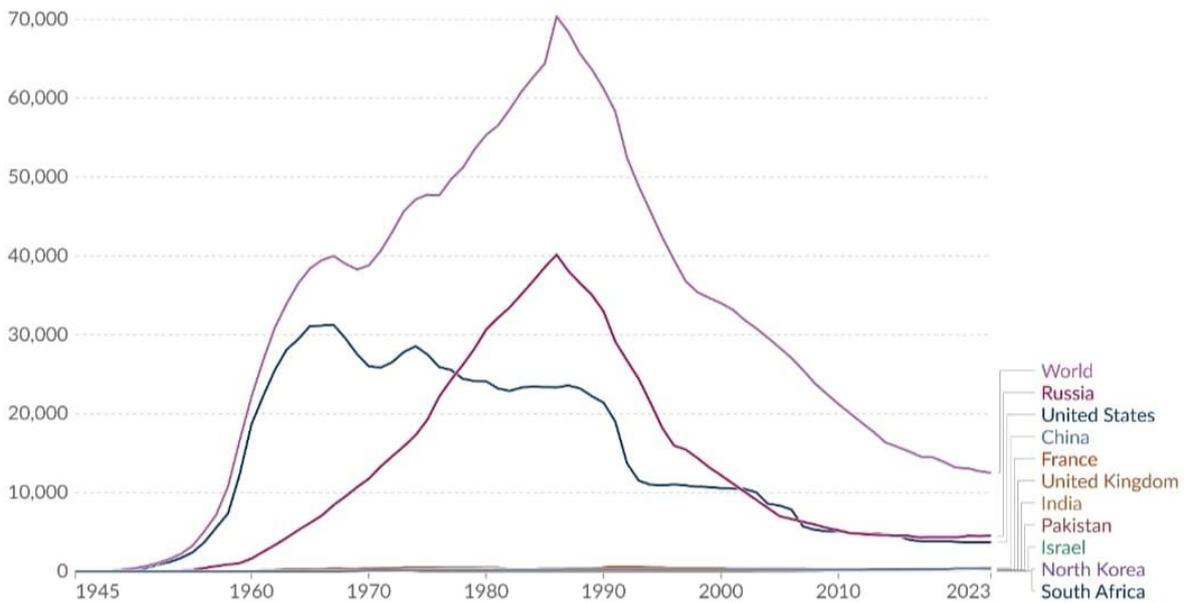
²¹ General Intelligence and Security Service (AIVD), "Proliferation of Weapons of Mass Destruction Risk for Companies and Scientific Institutions" (Belanda: General Intelligence and Security Service, 2003), <https://irp.fas.org/world/netherlands/wmdrisks.pdf>.

²² The Editors of Encyclopedia, "Weapon of Mass Destruction," *Britannica* (blog), March 13, 2024, <https://www.britannica.com/technology/weapon-of-mass-destruction>. Accessed on 2 June 2024.

(UNSC) has taken decisive action. Countries that have nuclear weapons to date include the United States, Russia, the United Kingdom, France, China, India, Pakistan, Israel, and North Korea.²³ In 2023, the world's nuclear powers have about 12,500 nuclear warheads. Recent estimates suggest that nuclear states collectively spent \$82.9 billion on their nuclear weapons programs in 2023.²⁴ Some non-state actors, such as Al-Qaeda, have also publicly stated their intention to acquire and use nuclear weapons.²⁵

Estimated nuclear warhead stockpiles

Stockpiles include warheads assigned to military forces, but exclude retired warheads queued for dismantlement. The latter are only included in the global total.



Source: Federation of American Scientists (2023)

Figure 1. Estimated Nuclear Warhead Inventory 1945-2023

The lack of facilities and complexity in the process of manufacturing weapons of mass destruction has led many non-state actors and rogue countries to seek the help of facilitators to produce weapons of mass destruction or obtain ready-to-use weapons. The facilitator's assistance can be used in any stage of proliferation. Proliferation financing is the act of providing funds or financial services that are used in whole or in part to manufacture, acquire, own, develop, export, transshipment, intermediate, transport, transfer, surrender, or use nuclear, chemical, or biological weapons and the means used to produce them. Submissions and related materials (including technology used for unauthorized purposes) contradict national laws or international obligations.²⁶

²³ Whittaker Joe, "The Role of Financial Technologies in US-Based ISIS Terror Plots," *Studies in Conflict & Terrorism* 1, no. 1 (2022): 1–22, <https://doi.org/10.1080/1057610X.2022.2133345>.

²⁴ Statista Research Department, "Nuclear Weapons - Statistic & Facts," *Statista* (blog), January 10, 2024, <https://www.statista.com/topics/4269/nuclear-weapons/#topicOverview>. Accessed on 2 June 2024.

²⁵ U.S Department of State, "Chapter 7 - The Global Challenge of WMD Terrorism," *Country Reports on Terrorism (United States: Office of the Coordinator for Counterterrorism, April 28, 2006)*, <https://2009-2017.state.gov/j/ct/rls/crt/2005/64660.htm>.

²⁶ Financial Action Task Force, "Combating Proliferation Financing: A Status Report on Policy Development and Consultation."

The stages of WMD proliferation financing, according to the Jersey Financial Services Commission Report, are:²⁷

- 1) Initially, financing can be sourced from fundraising activities or foreign exchange acquisition, both legal and illegal, and does not necessarily involve the proceeds of money laundering. Examples include the procurement or trade of export goods or trade in natural resources, the illegal export of coal and sand, the procurement of oil, the smuggling of cash, gold, and other high-value goods, cyberattacks and crypto, and drug trafficking.
- 2) The more isolated legal entities or individuals or countries that proliferate, for example, because they are subject to sanctions, the more sophisticated the techniques will be used to obscure the source of funds to inject money into their financial system. For example, this is done through unclear ownership or management structures, false documentation, intermediaries, and front companies, i.e., companies that appear to be running legitimate businesses but serve to obscure illicit financial activities.
- 3) Producing and delivering goods and technology is the final stage in which proliferators pay for the goods, materials, technology, and logistics needed for their weapons of mass destruction program.

Nuclear weapons since 1945 have played an essential role in international politics. Countries continue to proliferate nuclear weapons because they are considered security enhancers and prestige enhancers. States Parties to Article IX (3) of the Non-Proliferation Treaty (NPT) shall have an obligation not to transfer nuclear weapons or other nuclear devices or control of nuclear weapons to any recipient.²⁸ The obligation of states that are not capable of nuclear weapons is not to accept the transfer of nuclear weapons or other nuclear devices from any party.²⁹ Proliferation financing, in general, often looks normal as a commercial activity, but there are still challenges or difficulties in overcoming proliferation, according to CNAS report data, namely:³⁰ 1) Proliferation networks tend to be complicated, coupled with the use of false documentation, proliferation-related items, entities involved, and financial transactions. 2) The proliferation risk will increase if the source of funds is legal, but the end users of the goods involved become unclear, making it difficult to identify such activities. 3) Trade finance activities used to avoid sanctions tend to be fragmented, with many parties involved in proliferation activities.

Challenges related to the effectiveness of the NPT in the future include efforts to proliferate countries, the rise of global nationalism, increasing competition between significant countries that have nuclear powers, the spread of nuclear technology, and increasing polarization among NPT member states.

The First Challenge: Countries' Effort in Proliferation

Although the international community has so far sought to reduce the potential dangers associated with the proliferation of nuclear weapons, some countries have stepped up their efforts concerning nuclear proliferation rather than reducing it. First, although North Korea has not conducted a nuclear warhead test since the failure of negotiations with the United States in Hanoi and Stockholm in 2019, Pyongyang continues to develop its delivery vehicles, such as

²⁷ Jersey Financial Services Commission, "Countering Proliferation of Weapons of Mass Destruction and Its Financing (Guidance on Countering the Financing of Proliferation of Weapons of Mass Destruction)" (Channel Island: Jersey Financial Services Commission, 2021). pp. 8.

²⁸ Jonathan L Black Branch and Dieter Fleck, "Nuclear Weapons, Non-Proliferation and Disarmament: A Comprehensive Audit of Relevant Legal Issues and International Concerns" (Berlin: Asser Press, 2014).

²⁹ *Ibid.*

³⁰ Elizabeth Rosenberg et al., "Financial Networks of Mass Destruction" (Washington D.C: Center for a New American Security, 2019). pp. 13.

submarine-launched ballistic missiles and short-range missiles.³¹ Second, since the United States withdrew from the Joint Comprehensive Plan of Action (JCPOA) in May 2018 and then imposed unilateral sanctions on Iran, Tehran has continued its uranium enrichment program efforts, restarted nuclear-related research, developed advanced centrifuge engines and expanded its nuclear fuel stockpiles.³² Finally, in South Asia, Pakistan and India continue to produce nuclear weapons-related materials, develop delivery systems such as sea missiles (India) and short-range ballistic missiles (Pakistan), and deploy nuclear weapons amid the nuclear activities of the two countries.³³

The proliferation efforts of the above countries will increase the losses in security and economic opportunities for competing countries in the region. For example, in East Asia, North Korea possessing nuclear weapons would be a threat to South Korea and Japan. In terms of economy, the nuclear threat posed by North Korea is forcing its neighbors to deploy more resources to build up conventional power. South Korea, for example, spent \$58.8 billion from 2019 to 2023 to build anti-nuclear facilities consisting of radar, stealth fighters, air defenses, and ground-based missiles.³⁴

Iran's hidden nuclear capabilities are likely to prompt its competitors in the Middle East to consider using similar systems. Such security and economic losses could outweigh the cost of developing nuclear weapons and put additional pressure on the leaders of rival states to consider nuclear weapons options.³⁵

Challenge Two: The Rise of Global Nationalism

Nationalism is defined as an ideology and movement that aims to obtain and defend the sovereignty of a country, which contains the belief that every country must be free from outside interference.³⁶ Nowadays, nationalism seems to be increasing in every country.³⁷ For example, in the United States, when President Donald Trump was in power, he called for the construction of a wall along the border with Mexico as well as a ban on Muslim immigrants entering the territory of the United States.³⁸ In Europe, the United Kingdom ended its membership in the European Union after 40 years.³⁹ China is still making strong efforts related to the South China Sea in Asia.⁴⁰

³¹ Kelsey Davenport, "Chronology of U.S-North Korean Nuclear and Missile Diplomacy, 1985-2022," *Arms Control Association* (blog), accessed on June 4, 2024, <https://www.armscontrol.org/factsheets/dprkchron>.

³² Lewis A. Dunn, "The Strategic Elimination of Nuclear Weapons: An Alternative Global Agenda for Nuclear Disarmament," *The Nonproliferation Review* 24, no. 5-6 (September 2, 2017): 401-35, <https://doi.org/10.1080/10736700.2018.1440733>.

³³ *Ibid.*

³⁴ Daryum Ji, "ROK to Spend Over \$84 Billion on New Military Capabilities Over Five Years: MND," *NK News* (blog), January 11, 2019, <https://www.nknews.org/2019/01/rok-to-spend-over-84-billion-on-new-military-capabilities-over-five-years-mnd/>. Diakses 4 Juni 2024.

³⁵ Dunn, "The Strategic Elimination of Nuclear Weapons: An Alternative Global Agenda for Nuclear Disarmament."

³⁶ Anthony D Smith, *Nationalism: Theory, Ideology, History* (United States: Polity Press, 2010). Hlm. 25.

³⁷ Jack Synder, "The Broken Bargain," *Foreign Affairs* (blog), February 12, 2019, <https://www.foreignaffairs.com/articles/world/2019-02-12/broken-bargain>. Accessed on 4 June 2024

³⁸ Liston P Siregar, "Trump's Immigration Policy Makes Indonesian Muslims Worried (Indonesian: Kebijakan Imigrasi Trump Membuat Umat Muslim Asal Indonesia Khawatir)," *BBC Indonesia* (blog), January 30, 2017, <https://www.bbc.com/indonesia/dunia-38792125>. Accessed on 4 June 2024.

³⁹ BBC News Indonesia, "Brexit: A New Era for Britain After Officially Leaving the European Union (Indonesian: *Brexit: Era Baru Inggris Setelah Resmi Meninggalkan Uni Eropa*)," *BBC News Indonesia* (blog), January 1, 2021, <https://www.bbc.com/indonesia/dunia-55505028>. Accessed on 4 June 2024.

⁴⁰ Minxin Pei, "China's Coming Upheaval: Competition, the Coronavirus, and the Weakness of Xi Jinping," *Foreign Affairs* (blog), April 3, 2020, <https://www.foreignaffairs.com/articles/united-states/2020-04-03/chinas-coming-upheaval>. Accessed on 4 June 2024.

The rise of nationalism globally will increase the political impact in two possible scenarios. First, the rejection of non-proliferation obligations will increase when a rival state possesses nuclear weapons. Second, even when no competitor possesses nuclear weapons, nationalist leaders could find the NPT's framework unfair and, therefore, call for renegotiation of the NPT. The resistance may stem not only from the perceived injustice between the Nuclear Weapon State (NWS) and the Non-Nuclear Weapon State (NNWS) but also from the uneven conditions among the Non-Nuclear Weapon States.

The Third Challenge: Competition between Major Powers

One of the main trends in international politics is the return of competition among the major nuclear powers: the United States, Russia, and China. In Asia, the United States has been involved in a trade war against China since the beginning of Trump's presidency.⁴¹ In Europe, the United States government issued a National Defense Strategy in 2022 that named Russia and China as the main threats to the United States.⁴² The United States announced its withdrawal from the Intermediate-Range Nuclear Forces (INF) after accusing Russia of violating the treaty, which requires the United States and Russia not to use ground-launched ballistic and cruise missiles with a range of between 500 and 5,500 kilometers.⁴³ Experts predict that the competition between the United States and China will be even tighter after the Covid-19 crisis in military, economic, and information technology.⁴⁴

Competition between nuclear states in the world can weaken international cooperation in countering nuclear proliferation efforts, thereby weakening the effectiveness of sanctions. In practice, scenarios like this have already occurred. For example, Iran is sanctioned for possession of nuclear weapons from the United States in the form of pressuring other countries to leave the Iranian market and not import Iranian oil. However, many Chinese and Russian companies remain active in the Iranian market and take over the business sector that European companies once dominated. Iran relies on these countries to stay afloat in the face of sanctions imposed by the US. As a result, the willingness of China and Russia to continue to establish relations with Iran will make the sanctions from the US less effective.⁴⁵

China has weakened the efficiency of international sanctions related to North Korea's denuclearization project. Data from the United Nations report revealed at least 148 incidents of illegal oil smuggling by North Korea between January and August 2018, most of which occurred in the Yellow Sea and South China Sea. Some experts even argue that this action shows China has adopted a "tacit agreement" to sanctions imposed on North Korea.⁴⁶

⁴¹ Muhammad Reza Ilham Taufani, "Dismantling the US VS China Trade War Dedollarization Efforts (Indonesian: *Membongkar Perang Dagang AS VS China & Upaya Dedolarisasi*)," *CNBC Indonesia* (blog), April 23, 2023, <https://www.cnbcindonesia.com/research/20230421165302-128-431640/membongkar-perang-dagang-as-vs-china-upaya-dedolarisasi>. Accessed on 4 June 2024.

⁴² U.S Department of Defence, "2022 National Defense Strategy of The United States of America" (United States: U.S Department of Defense, 2022).

⁴³ Miftachul Jannah, Aisyah, and Yuniarti, "Reasons for the United States to withdraw from the Intermediate-Range Nuclear Forces Treaty (INF Treaty) in 2019 (Indonesian: *Alasan Amerika Serikat Mundur Dari Intermediate-Range Nuclear Forces Treaty (INF Treaty) Tahun 2019*)," *Interdependence Journal of International Studies* 4, no. 2 (2023): 78–92.

⁴⁴ Charles Edel and Mira Rapp Hooper, "The 5 Ways U.S-China Competition Is Hardening," *Foreign Policy Magazine* (blog), May 18, 2020, <https://foreignpolicy.com/2020/05/18/united-states-competition-coronavirus-pandemic-tensions/>. Accessed on 4 June 2024.

⁴⁵ Dina Esfandiary and M Tabatai, "Will China Undermine Trump's Iran Strategy," *Foreign Affairs* (blog), July 20, 2018, <https://www.foreignaffairs.com/articles/china/2018-07-20/will-china-undermine-trumps-iran-strategy>. Accessed on 4 June 2024.

⁴⁶ Yosuke Onchi, "North Korea's Oil Smuggling Blows Past Import Cap: UN Report," *Nikkei Asia* (blog), February 26, 2019, <https://asia.nikkei.com/Politics/Trump-Kim-Summit/North-Korea-s-oil-smuggling-blows-past-import-cap-UN-report>.

Fourth Challenge: Deployment of Nuclear Technology

Another challenge to the effectiveness of the NPT is that the worldwide deployment of nuclear technology could add to the burden on the International Atomic Energy Agency (IAEA). According to IAEA statistics, the number of nuclear facilities under IAEA supervision since 2010 has increased by 12 percent or more than 1,300. In the same period, the amount of large quantities of nuclear material stored under IAEA supervision increased by 24 percent to more than 200,000 nuclear materials.⁴⁷

Fifth Challenge: Increasing Polarization Among NPT Member States

Lewis Dunn argues that "the polarization among the NPT states is greater today than ever." First, this polarization is partly due to the frustration of the Non-Nuclear Weapon States with the lack of progress towards nuclear disarmament in article VI of the NPT. The frustration is amplified by some Nuclear Weapon States modernizing their nuclear arsenals with low-explosive warheads and high-precision, high-speed delivery vehicles. Second, the polarization among NPT member states partly reflects the growing concerns of the Non-Nuclear Weapon States regarding the risks of using nuclear weapons.⁴⁸

The policy of non-proliferation can be successful if it receives great international cooperation. Cooperation is necessary because no country or small group of countries can prevent proliferation or stem its impact. This cooperation is possible because many countries have realized that the proliferation of nuclear, chemical, and biological weapons is a real threat to all countries.⁴⁹

Recommendations for Preventing Financing the Proliferation of Weapons of Mass Destruction and the Role of Financial Institutions

The international community's failure to counter the threat from North Korea's nuclear program and other weapons of mass destruction programs, as well as past failures to address the nuclear programs of India and Pakistan, clearly demonstrate the need to strengthen defenses against proliferating states.⁵⁰ This includes measures to prevent proliferation funding.⁵¹ The financing of weapons of mass destruction proliferation should be understood as a serious threat to the international financial system and as a potential key tool to combat proliferation.⁵²

The Financial Action Task Force (FATF) develops recommendation and promotes international cooperation in information exchange between foreign partners. These efforts are

⁴⁷ International Atomic Energy Agency, "Nuclear Share of Electricity Generation in 2022," *Power Reactor Information System* (blog), 2022, <https://pris.iaea.org/PRIS/WorldStatistics/NuclearShareofElectricityGeneration.aspx>. Accessed on 4 June 2024.

⁴⁸ Dunn, "The Strategic Elimination of Nuclear Weapons: An Alternative Global Agenda for Nuclear Disarmament."

⁴⁹ U.S Congress, *Proliferation of Weapons of Mass Destruction: Assessing the Risks* (Washington D.C: U.S Government Printing Office, 1993). pp. 4.

⁵⁰ Valeriia Dyntu and Oleg Dykyj, "Cryptocurrency as an Instrument of Terrorist Financing," *Baltic Journal of Economic Studies* 7, no. 5 (2021): 67–72, <https://doi.org/10.30525/2256-0742/2021-7-5-67-72>.

⁵¹ Jonathan Brewer, "Better Financing of Proliferation Safeguards" (United States: Center for a New American Security, January 1, 2018), <https://www.jstor.org/stable/resrep16988.10>.

⁵² Jonathan Brewer, "The Financing of Nuclear and Other Weapons of Mass Destruction Proliferation," *Center for a New American Security (CNAS)* (blog), January 24, 2018, <https://www.cnas.org/publications/reports/the-financing-of-nuclear-and-other-weapons-of-mass-destruction-proliferation>.

important to strengthen the international framework for identifying and countering proliferation financing. These recommendations are:⁵³

- 1) Customer Due Diligence (CDD), where financial institutions are prohibited from keeping anonymous accounts or accounts with clearly fictitious names. Financial institutions must be required to conduct customer due diligence when a) establishing a business relationship, b) conducting transactions above the established threshold of US\$ 15,000, c) there is a suspicion of money laundering or terrorist financing, d) the financial institution has doubts about the correctness or adequacy of previously obtained customer identification data;
- 2) Correspondent Banking, financial institutions shall be obliged concerning cross-border correspondent banking and other similar relationships, in addition to carrying out customer due diligence measures, shall also be obliged to collect sufficient information about the respondent institution to understand the nature of the respondent's business fully and to determine from the available information including whether the institution has been the subject of a money laundering investigation or the financing of the proliferation of weapons of mass destruction;
- 3) Money or value transfer services, countries shall take steps to ensure that natural persons or legal entities providing money or value transfer services are required to be licensed or registered and subject to an effective system to monitor and ensure compliance with the relevant measures called for in the FATF recommendations;
- 4) Wire transfers: Countries must ensure: a) financial institutions include the required and accurate original and recipient information, b) financial institutions monitor wire transfers to detect transfers that do not have the required original and/or recipient information, c) financial institutions take freezing measures when conducting transactions related to the proliferation of weapons of mass destruction financing in the context of wire transfer processing;
- 5) Internal controls, financial institutions are required to implement anti-money laundering, terrorist financing, and weapons of mass destruction proliferation programs, including establishing policies and procedures for sharing information within groups for AML/CFT purposes;
- 6) High-risk countries, financial institutions are required to implement stricter due diligence measures on business relationships and transactions with natural persons and legal entities, as well as financial institutions from countries requested by the FATF;
- 7) Reporting of suspicious transactions: if the financial institution suspects or has strong grounds to suspect that the funds are the proceeds of criminal activities or related to the financing of the proliferation of weapons of mass destruction, then the financial institution is legally obliged to immediately report its suspicions to the Financial Intelligence Unit (FIU);
- 8) Beneficial ownership: countries should assess the risk of abuse of legal entities for the financing of weapons of mass destruction proliferation, and each country should take effective measures to ensure that shareholders and directors of companies do not misuse finance for the proliferation of weapons of mass destruction financing;
- 9) Regulation and supervision: Each country must ensure that financial institutions are subject to strict regulations and supervision and effectively implement FATF recommendations. The authority or supervisor of the financial institution must take the necessary legal steps to prevent the perpetrators of the crime from holding management functions in the financial institution;
- 10) Financial supervisors: supervisors must have adequate authority to supervise or monitor and ensure compliance by financial institutions with requirements to combat the

⁵³ Financial Action Task Force, "International Standards on Combating Money Laundering and the Financing of Terrorism & Proliferation" (France: Financial Action Task Force, 2023), Customer due.

proliferation of weapons of mass destruction, and supervisors must have the authority to impose various sanctions, including the authority to revoke, restrict or suspend the licenses of financial institutions;

- 11) Financial Intelligence Unit: each country shall establish a financial intelligence unit that functions as a) receipt of suspicious transactions reports, b) receipt of other information relevant to the proliferation of weapons of mass destruction funding;
- 12) Cash Couriers: each country needs to have measures in place to detect the cross-border transport of physical currency and ensure that the competent authorities have the legal authority to stop or detain currency or instruments allegedly related to the financing of the proliferation of weapons of mass destruction.

The Working Mechanism of Cryptocurrency to be Utilized in Funding the Weapons of Mass Destruction Proliferation

Since Bitcoin was launched in 2008, the cryptocurrency has been criticized for allegedly facilitating financial crimes.⁵⁴ Cryptocurrencies are not managed or supervised by trusted third parties, and there is a high degree of anonymity. An additional challenge to innovative technologies is that they often evolve faster than the legal frameworks that govern them, meaning that not only will it take a long time to introduce adequate regulations, but they will become obsolete when they come into force.⁵⁵

Cryptocurrency is a virtual currency that operates in a blockchain-based decentralized system. In contrast, government fiat currencies are centralized and issued by the Central Bank, meaning that all transactions made by fiat currencies are recorded on a central server. Customers generally trust this system because it is based on universally accepted rules and is appropriately regulated by laws and regulations. Conventional banks are required to conduct consumer due diligence (CDD), which includes Know Your Customer (KYC) and Anti Money Laundering (AML) procedures. These procedures include identifying beneficial owners, intended business relationships, origins, and more.⁵⁶

All financial institutions involved in trade finance, regardless of their line of business, must have incentives and legal obligations to conduct CDD and account monitoring by including identification, verification of customer identity, and reasonable measures to identify and verify the identity of beneficial owners, obtain information about the intended purpose and nature of CDD. Meanwhile, cryptocurrency transactions are carried out on a peer-to-peer (P2P) basis without the intervention of financial intermediaries.⁵⁷ As a result, most crypto transactions are not subject to KYC and AML procedures.⁵⁸ The value of state-issued currencies is usually quite stable because it is controlled through monetary policy, while the value of cryptocurrencies

⁵⁴ Kim-Kwang Raymond Choo, "Chapter 15 - Cryptocurrency and Virtual Currency: Corruption and Money Laundering/Terrorism Financing Risks?," in *Handbook of Digital Currency*, ed. David Lee Kuo Chuen (San Diego: Academic Press, 2015), 283–307, <https://doi.org/10.1016/B978-0-12-802117-0.00015-1>.

⁵⁵ Peter Van Valkenburg, "The Difference Between Bitcoin and Libra Should Matter to Policymakers," *Coin Center* (blog), July 8, 2019, <https://www.coincenter.org/the-differences-between-bitcoin-and-libra-should-matter-to-policymakers/#:~:text=Our%20answer%20is%20that%20Bitcoin,tailor%20any%20necessary%20policy%20response>.

⁵⁶ Fabian Maximilian Johannes Teichmann and Marie-Christin Falker, "Cryptocurrencies and Financial Crime: Solutions from Liechtenstein," *Journal of Money Laundering Control* 24, no. 4 (January 1, 2021): 775–88, <https://doi.org/10.1108/JMLC-05-2020-0060>.

⁵⁷ Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System."

⁵⁸ Malcolm Campbell-Verduyn, "Bitcoin, Crypto-Coins, and Global Anti-Money Laundering Governance," *Crime, Law and Social Change* 69, no. 2 (March 1, 2018): 283–305, <https://doi.org/10.1007/s10611-017-9756-5>.

such as bitcoin is often determined by supply and demand.⁵⁹ A central entity cannot control cryptocurrencies.⁶⁰ All transactions are recorded on the blockchain, which serves as a public ledger by making these records available to everyone.⁶¹ A blockchain consists of computers that can be placed anywhere in the world, called "Nodes," and download the blockchain either partially or completely. Nodes that download the entire blockchain validate transactions.⁶² This process is called "mining" and, at the same time, generates new coins.⁶³ Cryptocurrency regulations vary widely between jurisdictions⁶⁴ and mining operations are generally not restricted by national borders.⁶⁵

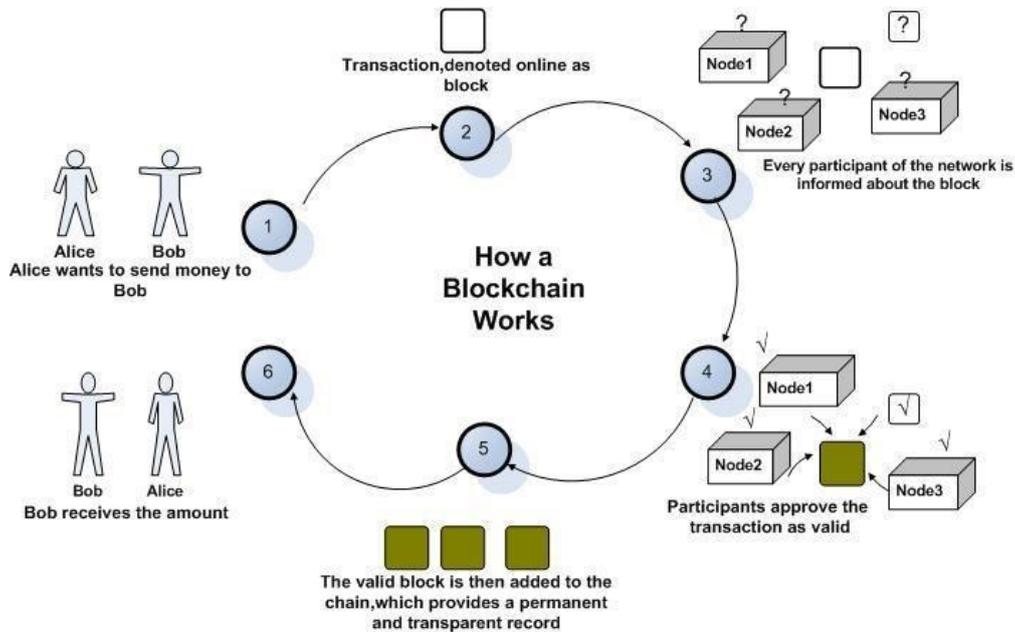


Figure 2. How Blockchain and Cryptocurrency Work

Crypto transactions are very anonymous. Paradoxically, crypto is also very transparent.⁶⁶ Every transaction, time, date, value, and username (public key) of the counterpart of the transaction is recorded. The public key serves as the destination address to which another peer sends the Bitcoin. Peers also have a private, public key that allows them to authorize transactions and access their bitcoins. Bitcoins are stored in software programs called "electronic wallets". Since all transaction details are recorded in a single blockchain, this provides transparency.⁶⁷

⁵⁹ Bitcoin Project, "FAQ," *Bitcoin Project* (blog), 2020, <https://bitcoin.org/en/faq#general>.

⁶⁰ Government Office for Science, "Distributed Ledger Technology: Beyond Block Chain," UK Government Chief Scientific Advisor (United Kingdom: UK Government, 2016), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/492972/g-s-16-1-distributed-ledger-technology.pdf.

⁶¹ Teichmann and Falker, "Cryptocurrencies and Financial Crime: Solutions from Liechtenstein."

⁶² Bheemaiah K, "Block Chain 2.0: The Renaissance of Money," 2015, <https://www.wired.com/insights/2015/01/block-chain-2-0/>.

⁶³ Andreas M Antonopoulos, *Mastering Bitcoin - Unlocking Digital Cryptocurrencies* (Amerika: O'Reilly, 2014).

⁶⁴ Ryan M. Farrell, "An Analysis of the Cryptocurrency Industry," *University of Pennsylvania*, 2015.

⁶⁵ Garrick Hileman and Michel Rauchs, "2017 Global Cryptocurrency Benchmarking Study" (Britania Raya: University of Cambridge, 2017), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2965436.

⁶⁶ Ponsford Matthew, "A Comparative Analysis of Bitcoin and Other Decentralised Virtual Currencies: Legal Regulation in the People's Republic of China, Canada, and the United States," *Hong Kong Journal of Legal Studies* 9 (2015): 29–55.

⁶⁷ Teichmann and Falker, "Cryptocurrencies and Financial Crime: Solutions from Liechtenstein."

Blockchain, in general, has risks given its global applicability, lack of regulation, and high anonymity of crypto transactions. Anonymity, in particular, is the most criticized feature of cryptocurrencies worldwide.⁶⁸ The difference between "anonymity as privacy" and "anonymity as a hidden identity". Some users value cryptocurrencies because crypto privacy intends to minimize interference in their personal lives, while criminals need anonymity to hide their identities to avoid being tracked by authorities.⁶⁹

Criminal prosecution for money laundering, terrorism financing, and financing weapons of mass destruction can be very complicated when there is a transfer of funds in various jurisdictions. Criminals using cryptocurrencies are not restricted by geographical boundaries, facilitating the formation of accounts and digital identities worldwide.⁷⁰ The advent of programmable and artificial intelligence (AI)-driven cryptocurrencies has transformed the international financial system to such an extent that it has weakened legislation, creating barriers in detecting financing proliferation of weapons of mass destruction technology. Crypto enables fast and seamless settlement of transactions between countries,⁷¹ So as to avoid the need for financial institutions to act as intermediaries. The high level of pseudonymization and unique anonymity in cryptocurrencies further exacerbates the situation.⁷²

Cryptocurrencies allow non-state actors to use virtual currencies as a means to conduct complicated and illegal transactions, especially when used to acquire or sell nuclear materials whose use is restricted.⁷³ The non-state actors most likely to be involved in the proliferation of weapons of mass destruction using cryptocurrencies are terrorist groups such as the Islamic State of Iraq and Syria (ISIS), Al-Qaeda, and others.⁷⁴ Then, why cryptocurrencies have the potential to be used by non-state actors in the financing of weapons of mass destruction are:⁷⁵

First is anonymity, where criminals certainly want a system that does not require proof of identity and binds that validated identity to all transactions. It does not want a system that does not require self-identification. Second is global reach, where the system must allow money to be transferred from anywhere to anywhere and in any amount. Third, speed: the system must make transfers quickly, even if it can be done in seconds, because the faster the transaction, the less likely it is that the transaction can be intercepted and blocked. Fourth, non-repudiation transactions must be final immediately. No additional verification or validation is required to execute any transactions. The person sending the money must not cancel or cancel the transfer.

Fifth, it is relatively easy to use; whatever system is used, the system should be easy for non-technical people to use. Sixth, it is difficult for the authorities to track transactions, where, of course, criminals want a system that is not easy for authorities to use to track the transactions of those people or the actions of the group of people. Seventh, there is the potential for increased

⁶⁸ Victor Dostov and Pavel Shust, "Cryptocurrencies: An Unconventional Challenge to the AML/CFT Regulators?," *Journal of Financial Crime* 21, no. 3 (January 1, 2014): 249–63, <https://doi.org/10.1108/JFC-06-2013-0043>.

⁶⁹ *Ibid.*

⁷⁰ Robby Houben and Alexander Snyers, "Cryptocurrencies and Blockchain: Legal Context and Implications for Financial Crime, Money Laundering and Tax Evasion" (Brussels: European Union, 2018), <https://www.europarl.europa.eu/cmsdata/150761/TAX3%20Study%20on%20cryptocurrencies%20and%20blockchain.pdf>.

⁷¹ The Economist, "The Trust Machine," *The Economist* (blog), September 31, 2015, <https://www.economist.com/leaders/2015/10/31/the-trust-machine>. Diakses 30 Mei 2024.

⁷² Emily Turner Tatton, "Blockchain and Cryptocurrencies Undermine Financial Safeguards of Nonproliferation Regime: Necessitate Taskforce Creation," Student Research Reports (United States: Utahstate University, 2018).

⁷³ Tatton, *Op.Cit.*

⁷⁴ *Ibid.*

⁷⁵ Alan Brill and Lonnie Keene, "Cryptocurrencies: The Next Generation of Terrorist Financing," *Defence Against Terrorism Review* 6, no. 1 (2014): 7–30.

security and anonymity, where one wants a system that can implement additional security measures to complicate the task of law enforcement and anti-terrorism agencies.

The ability to conduct transactions through anonymous accounts provided by cryptocurrencies to their users allows the system to be exposed to certain risks regarding money laundering and funding the proliferation of weapons of mass destruction.⁷⁶ Cryptocurrencies allow transfer transactions to be quickly and instantly transferred to the recipient's wallet through a digital identity without the consent and control of a central authority. The low and fast transfer fee through anonymous accounts puts the system at risk of being misused to fund the proliferation of weapons of mass destruction.⁷⁷ Cryptocurrency transactions have been used to finance terrorism, money laundering, drug trafficking, renting, payment killers, as well as financing the proliferation of weapons of mass destruction. The large-scale application of cryptocurrencies shows that the use of cryptocurrency transactions to facilitate the trade of illegal drugs, even those related to weapons of mass destruction.⁷⁸ The main financial elements in financing the proliferation of weapons of mass destruction are, first, involving the collection of funds by obtaining them through illegal means, second, involving the disguise of funds, and third, using the funds to pay for the procurement of materials, technology or logistics related to the financing of weapons of mass destruction.⁷⁹ The convenience of cryptocurrencies can, of course, be used by individuals, terrorist organizations, and even countries to use blockchain technology to finance the proliferation of weapons of mass destruction.⁸⁰

According to a report by the Center for a New American Security (CNAS) written by Neil Bhatiya, emerging threats in the fight against the proliferation of weapons of mass destruction are:⁸¹ 1) The development of cryptocurrency technology due to being more difficult to track and easy to use, many new technologies are built based on distributed ledger technology known as "blockchain," which is one way of decentralizing data collection. With blockchain technology, transaction records can be stored and verified through the agreement of network users rather than through a central authority. 2) The development of advanced manufacturing, chemical or biological innovations, such as three-dimensional printing, synthetic biology, chemical synthesis, and nano-biotechnology, can be cheap and easy to obtain to develop and manufacture weapons of mass destruction.

Steps that can be taken to prevent the proliferation of weapons of mass destruction financing are:⁸² 1) Consumer Due Diligence (CDD), financial institutions and other whistleblowers are required to identify and verify the identity of their consumers and understand the nature of their business and financial transactions. This includes conducting background checks on customers, assessing their risk profile, and monitoring their transactions

⁷⁶ Rizaldy Anggriawan and Muh. Endriyo Susila, "Cryptocurrency and Its Nexus with Money Laundering and Terrorism Financing within the Framework of FATF Recommendations," *Novum Jus* 18, no. 2 (2024): 249–77, <https://doi.org/10.14718/NovumJus.2024.18.2.10>.

⁷⁷ Steven David Brown, "Cryptocurrency and Criminality: The Bitcoin Opportunity," *The Police Journal: Theory, Practice and Principles* 89, no. 4 (2016): 327–39, <https://doi.org/10.1177/0032258X16658927>.

⁷⁸ Tatton, *Op.Cit.*

⁷⁹ Brewer, "The Financing of Nuclear and Other Weapons of Mass Destruction Proliferation." Accessed on 30 May 2024.

⁸⁰ Shacheng Wang and Xixi Zhu, "Evaluation of Potential Cryptocurrency Development Ability in Terrorist Financing," *Policing: A Journal of Policy and Practice* 15, no. 4 (2021): 2329–40, <https://doi.org/10.1093/police/paab059>.

⁸¹ Neil Bhatiya, "Emerging Threats in Combating Proliferation Finance" (Washington D.C: Center for a New American Security, 2020), <https://s3.us-east-1.amazonaws.com/files.cnas.org/backgrounds/documents/CNAS-Report-Emerging-Threats-Final.pdf>.

⁸² Financial Intelligence Centre, "Key Insights About Proliferation Financing of Weapons of Mass Destruction," *Financial Intelligence Centre* (blog), accessed June 2, 2024, <https://www.fic.gov.rw/updates/news-detail/key-insights-about-proliferation-financing-of-weapons-of-mass-destruction>.

for suspicious activity. For high-risk customers, enhanced measures should be taken. 2) Transaction Monitoring: financial institutions and other whistleblowers must monitor their customers' transactions and report suspicious activities to the relevant authorities. 3) Record-keeping: financial institutions and other reporters are required to keep records of their customers' transactions and activities for a certain period, which includes details of the customer's identity, the nature of the transaction, and the source and purpose of the funds. 4) Risk assessments: financial institutions and other whistleblowers should conduct periodic risk assessments to identify and mitigate the risks of money laundering and terrorism financing, which involves analyzing their customer base, the products and services they offer, and the countries and regions in which they operate. 5) Preventive Measures: financial institutions and other whistleblowers are required to implement preventive measures to prevent the provision of financial services for the development of weapons of mass destruction. 6) Training: financial institutions must provide training and awareness programs to their staff regarding proliferation regulations and best practices and implement efficient export controls to detect the proliferation of sensitive goods.

Cooperation between domestic and international institutions is one of the important solutions in handling law enforcement related to crimes related to cryptocurrencies; in handling it, the state must move quickly, constructively, and effectively in international cooperation as widely as possible, especially in the exchange of relevant information related to money laundering, terrorism financing, and other criminal acts.⁸³

Conclusion

Cryptocurrencies with characteristics that support anonymous and cross-border transactions have shown significant potential in funding WMD proliferation. Cryptocurrencies' anonymous and non-transparent nature allows actors to hide the flow of funds and evade detection. The ability of cryptocurrencies to support global transactions without geographical barriers adds to the risk in the context of PPSPM. This study shows that the current non-proliferation regime relies on international financial mechanisms. The international financial mechanism is in the form of government fiat currency issued by the Central Bank and is centralized, which means that all transactions made by fiat currency are recorded on a central server. Customers generally trust this system because it is based on universally accepted rules and appropriately regulated by laws and regulations. Then, the current non-proliferation regime is not fully prepared to face the new threats posed by cryptocurrency technology. As a solution, stronger international cooperation and the development of a financial system capable of detecting and preventing the spread of harmful technologies are needed. Implementing more comprehensive policies and regulations is vital to overcoming the challenges presented by using cryptocurrencies.

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⁸³ Financial Action Task Force, "Update Guidance for Risk-Based Approach to Virtual Assets and Virtual Asset Service Providers," 2021, <https://www.fatf-gafi.org/en/publications/Fatfrecommendations/Guidance-rba-virtual-assets-2021.html>. Accessed on 1 June 2024.

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