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FIAT CURRENCY, FROM WALLET TO MUSEUM: ACCELERATING THE INEVITABLE IN THE NAME OF HOMELAND SECURITY

by

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June 2019

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This research examined what influence large-denomination currency has on the financial networks of terror and criminal groups. This thesis analyzed how the removal of the $50 and $100 bills would affect these illicit groups. A historical review identified the use and effectiveness of large-denomination currency in the context of social acceptance and its place in the modern global financial payment system. This thesis employed a comparative policy analysis to examine alternatives to cash as an effort to combat the illicit world of finance. Recommendations include that the U.S. government reevaluate its obligation with respect to large-denomination circulating currencies, and develop alternate financial frameworks that incorporate the restriction or discontinuation of the $50 and $100 notes.

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FIAT CURRENCY, FROM WALLET TO MUSEUM: ACCELERATING THE INEVITABLE IN THE NAME OF HOMELAND SECURITY

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ABSTRACT

This research examined what influence large-denomination currency has on the financial networks of terror and criminal groups. This thesis analyzed how the removal of the $50 and $100 bills would affect these illicit groups. A historical review identified the use and effectiveness of large-denomination currency in the context of social acceptance and its place in the modern global financial payment system. This thesis employed a comparative policy analysis to examine alternatives to cash as an effort to combat the illicit world of finance. Recommendations include that the U.S. government reevaluate its obligation with respect to large-denomination circulating currencies, and develop alternate financial frameworks that incorporate the restriction or discontinuation of the $50 and $100 notes.

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LIST OF ACRONYMS AND ABBREVIATIONS

BSA	Bank Secrecy Act
CMIR	Currency and Monetary Instrument Report
ECB	European Central Bank
EU	European Union
FATF	Financial Action Task Force
FEMA	Federal Emergency Management Agency
FRB	Federal Reserve Bank
ISIS	Islamic State of Iraq and Syria
RBI	Reserve Bank of India

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EXECUTIVE SUMMARY

The paper money circulated worldwide by the Federal Reserve Bank stands as one of the largest and most effective display of financial power and strength in the world.[1] It is challenging to find another economy in the world that does not have some financial alignment, relationship, or trade tied to the U.S. dollar.[2] The United States remains a world leader in policy concerning most matters of financial transactions and banking. The Federal Reserve Bank, the Central Bank of the United States, takes care to balance the circulating currency with interest rates and debts to remain solvent. However, U.S. paper money circulates throughout the world at an unencumbered whirlwind speed, oftentimes without the safety net similar to the checks and balances found in other banking mediums. Therefore, it can be argued that the same strength and wide acceptance, which makes U.S. currency the most popular intermediary for international business and foreign exchange, is also exploited by underworld financial manipulation.

Due to the dollar's strength and untraceable fungible nature, the U.S. dollar has long been the choice for the financing needs of terror and criminal groups.[3] Cash travels well, especially in large denominations. Large cash amounts can easily be transported, stored, or exchanged with little effort. Most importantly, cash does not leave a financial footprint that can be investigated. Look no further than Osama Bin Laden, the mastermind of the September 11 attacks for evidence of the power of U.S. currency, and his interest in the inter-workings of the U.S. monetary system. On the bookshelves of Osama Bin Laden's compound was a copy of controversial author Eustace Mullins'

[1] Peter Conti-Brown, *The Power and Independence of the Federal Reserve* (Princeton, NJ: Princeton University Press, 2016), 1–7.

[2] George S. Tavlas, "The International Use of the US Dollar: An Optimum Currency Area Perspective," *World Economy* 20, no. 6 (September 1, 1997): 709–47, https://doi.org/10.1111/1467-9701.00098.

[3] "Terrorist Finance Tracking Program (TFTP)," U.S. Department of the Treasury, accessed June 16, 2017, https://www.treasury.gov/resource-center/terrorist-illicit-finance/Terrorist-Finance-Tracking/Pages/tftp.aspx.

Secrets of the Federal Reserve, a book with twisted arguments concerning the monetarization of debt and controlling financial leverage over large populations.[4]

This thesis examines alternative policies that can minimize or eliminate widespread unintentional criminal abuses made possible by current policy of U.S. currency. This research used empirical consumer data and case studies to answer two specific questions related to the topic of current monetary policy in the United States. First, does a conclusive relationship exist between the circulation of large-denomination currencies and the exploitation of those currencies in the illicit world of criminal and terror finance? Then, asking what impacts will any reduction, restriction, or elimination of high denomination currencies have on the U.S. economy, the public, and ultimately, criminal and terrorist organizations? Current literature and data supports an alteration to the current monetary framework, as generational change reveal that while terror and criminal groups continue to enjoy the unrestrictive fait nature of U.S. currency, a growing number of legitimate consumers' use of U.S. currency continues to shrink in number.[5] This thesis hypothesizes a solution to this imbalance with realistic historical applications from the past for consideration.

The analysis and central argument contained in this thesis is that the continued movement in society towards innovative payments systems drastically reduces the need for cash, or at least in the way most people use it. As technological generational gaps continue to close that allows most consumers in a legitimate society to pay for goods and services with a myriad of cash alternatives, the need for cash in everyday commerce is much less, especially for large denomination notes.[6] Over a period of years, a number of payment innovations have replaced the general use of cash. Bartering, store credit,

[4] "Bin Laden's Bookshelf," Office of the Director of National Intelligence, accessed July 21, 2018, https://www.dni.gov/index.php/features/bin-laden-s-bookshelf?start=5.

[5] Shaun O'Brien, "Consumer Preferences and the Use of Cash: Evidence from the Diary of Consumer Payments Choice" (working paper, Federal Reserve Bank of San Francisco, July 21, 2014), http://www.frbsf.org/cash/publications/fed-notes/2014/july/consumer-preferences-cash-use; Gaunt, "Cashless Society Getting Closer."

[6] "Consumers and Mobile Financial Services March 2016," Board of Governors of the Federal Reserve System, last update February 14, 2017, https://www.federalreserve.gov/econresdata/mobile-devices/2016-preface.htm.

checks, and credit cards have all had an effect on the need and use of cash of a period of years. In the most recent age of electronics, a number of payment systems, which quickly found their way into everyday commerce, now dwarf previous alternatives to cash.[7] These electronic innovations are exploited by the criminal elements as well; however, they are not as furtive and simplistic as cash.

The problem with improved ways of conducting commerce, at least from the criminal point of view, is that they often leave an electronic footprint. Governments and law enforcement agencies alike can use these electronic identifiers to track financial paths of money, which however is not the case with cash. Cash, especially in large denominations, can be moved in bulk around the world with a lesser probability of being detected. As a result of the added security and wide-acceptance of the U.S. dollar, it remains not only the choice of legitimate business, but also the criminal element as well. With the logistics of moving large sums of money undetected becoming more difficult if the bills were in smaller denominations, such as a $20 bill, rather than a $50 or $100 bill, the criminal element would surely advocate for their continued use in a global monetary policy.

This thesis envisions a series of accelerated financial policy steps that if implemented, would move ahead, and stay ahead of those who wish harm to the U.S. economy or more notably, its U.S. citizenry. These steps include the systematic restriction, reduction, or elimination of large denomination currency, namely the $50 and $100 bill. This research provides a theoretical roadmap to achieve such a goal with evidence of how a reinvented idea from the past should be socialized now as a new framework to the future.

This new strategy, including systematically removing large denomination currency from circulation, is grounded in factual historical events, which illustrates a real-world solution for the limited areas of the world that requires vast amounts of U.S. currency to continue to circulate. Proponents against the elimination of large

[7] Sarah Hartman, *2016 U.S. Consumer Payment Study* (Columbus, GA: Total System Services, 2016), 13, https://www.tsys.com/news-innovation/resource-center/Research/research-paper-2016-us-consumer-payment-study.html.

denomination currency will correctly argue that U.S. currency remains prevalent in some areas of the world, and because of a limited banking infrastructure, even necessary. Even in the position of the world's banking standard, the Federal Reserve should take steps now to thwart the abuse of circulating cash throughout the global financial enterprise.

The United States does in fact fight a silent war of good versus evil. Every day, criminal or terrorist groups attempt to win the small financial battles of concealing funds in the furtherance of their causes. The availability and use of cash plays a major part in those operations. In a modern banking environment, where legitimate business and populations of people use cash less, and criminal elements continue to use cash on a large scale, it would be irresponsible for central banking systems not to review its cash policy on that fact alone. This thesis makes an argument to that end, provides a path forward, and advocates for sweeping changes to secure U.S. money and citizens further.

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I. INTRODUCTION

A. PROBLEM STATEMENT

As legitimate consumers and financial markets evolve towards a cashless landscape, the criminal underworld continues to operate and flourish within a cash-infused infrastructure. Currencies from the U.S. central banks and the European Union (EU) have enormous appeal to criminal and terrorist groups, as they are financially sound, widely accepted, and most importantly, produced in large denominations.[1] Many experts in the world of financial and criminal research agree that the existence of large-denomination currency supports terrorist acts and large-scale criminal activity. A growing number of businesses and consumers alike use fiat currency alternatives when paying for goods and services.[2] If evidence exists that the legitimate financial world has outgrown the need for large-denomination currency, yet the criminal underworld continues to thrive on its continued availability; monetary policy may be in need of review to examine the limitation or elimination of fiat cash in larger denominations.

Fundamental shifts already exist in the way consumers and businesses around the globe spend money. Indeed, modern societies are trending toward a cashless society.[3] As part of this progression toward cash alternatives, several foreign governments have included the reduction and elimination of high-valued fiat currency.[4] This cashless movement expands with each technological innovation, whereby modern electronic and cyber payment systems become more convenient, user-friendly, and secure. Both the modern global economic markets and the more technologically sophisticated public are

[1] Note: For the purposes of this thesis, large-denomination currency is designated at 50 units or larger.

[2] Note: Fiat currency is a circulating monetary system backed only by the policies of the issuing government. The United States and may other countries currently issue this type of currency, which differs from a currency backed by tangible items, such as gold or silver, generally known as commodity currency.

[3] Bernardo Batiz-Lazo, “Are We Heading towards a Cashless Economy?,” World Economic Forum, January 11, 2016, https://www.weforum.org/agenda/2016/01/are-we-heading-towards-a-cashless-economy/; Jeremy Gaunt, “Cashless Society Getting Closer, Survey Finds,” Reuters, April 26, 2017, http://www.reuters.com/article/us-global-economy-cash-idUSKBN17S001.

[4] “ECB Ends Production and Issuance of €500 Banknote,” European Central Bank, May 4, 2016, https://www.ecb.europa.eu/press/pr/date/2016/html/pr160504.en.html.

becoming less dependent on hard fiat currencies in favor of a cashless global economy.[5] Voices of opposition still remain however, as author and financial journalist Gillian Tett argues, "In the United States, the concept of holding cash has long been associated with a vision of liberty, privacy, and freedom."[6] After all, cash is reliable, and more importantly, fungible. However, this concept may now be an outdated point of view. In fact, the country of Sweden has recently announced that it plans to be the first completely cashless country in the world.[7]

Widespread demand remains for the U.S. dollar overseas, especially in large denominations. Though surveys conducted by the Federal Reserve Bank support an overall movement towards a society using less cash, the requests for cash outside of the United States remains at high levels.[8] Though powerful and necessary on the world's economic stage, large-denomination currencies issued by the U.S. Federal Reserve Bank (FRB) and the European Central Bank (ECB), the two most widely circulating currencies in the world—may unintentionally support terror and criminal activities.[9] In 2013, Treasury Secretary Jacob Lew characterized the U.S. dollar as the "world's reserve currency."[10] A number of less modernized or westernized countries throughout the world also rely on the U.S. dollar. This financial framework must be considered before any monetary policy can be proposed to reduce or restrict financial infrastructure.

The goal of this thesis is to examine what role large-denomination fiat currencies play in the financing of terrorism and other criminal activity. It also analyzes the potential intended and unintended impacts of eliminating large-denomination currency, namely the

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[5] "Global Cards Data and Forecasts," Retail Banking Research, accessed January 14, 2018, https://www.rbrlondon.com/reports/globalcards.

[6] Gillian Tett, "Easy Money," *Foreign Policy*, no. 217 (April 2016): 80, 82.

[7] Susan Fourtané, "Sweden: World's First Cashless Society," Interesting Engineering, February 20, 2019, https://interestingengineering.com/sweden-how-to-live-in-the-worlds-first-cashless-society.

[8] Gaunt, "Cashless Society Getting Closer; "Data," Board of Governors of the Federal Reserve System, last updated November 16, 2018, https://www.federalreserve.gov/paymentsystems/coin_data.htm.

[9] *Investopedia*, s.v. "The 6 Most-Traded Currencies and Why They're So Popular," May 5, 2011. http://www.investopedia.com/articles/forex/11/popular-currencies-and-why-theyre-traded.asp.

[10] "Lew Op-Ed: Lessons from a Crisis," U.S. Department of the Treasury, October 20, 2013, https://www.treasury.gov/press-center/press-releases/Pages/jl2189.aspx.

$50 and $100 notes. Overall, this examination is timely and important in an effort to add to the continuing dialogue of specific policies related to U.S. fiat currency circulating around the world.

B. RESEARCH QUESTIONS

- Does a conclusive relationship exist between the circulation of large-denomination currencies and the exploitation of those currencies in the illicit world of criminal and terror finance?

- What impacts would any reduction, restriction, or elimination of high denomination currencies have on the U.S. economy, the public, and ultimately, criminal and terrorist organizations?

C. LITERATURE REVIEW

It is important to examine the benefits large denomination currency offers the criminal world, identify counter arguments supporting the existence of large size currency, and recognize the historical and overall social acceptance of currency today. This literature review examined existing monetary policy specifically related to fiat cash management. Moreover, the literature was looked upon to unearth proposals related to changes in fiat currency, or identify research to support arguments for or against changes in current cash management policy. The literature review covers three primary financial topics—terror and criminal finance, socioeconomic effects, and policy change—as initial points of reference.

1. Terror and Criminal Finance

Published scholars and government experts around the world overwhelmingly agree that the financial substructure of criminal and terrorist organizations supports their ability to exist and carry out illicit operations.[11] Authors Jeanne Giraldo and Harold Trinkunas assert, "Financial and material resources are correctly perceived as the life-blood of terrorist operations, and governments have determined that fighting the financial infrastructure of terrorist organizations is the key to their defeat."[12] Researchers, governments, and law enforcement organizations often discuss matters of terrorist and criminal finance without specifically discussing the aspects of cash. This lack of consensus may be due to the constant financial innovations coupled by an inconsistent adoption policy throughout the global financial sector.

The existence of large-denomination currency maximizes the abilities of illicit groups to move vast amounts of money while minimizing the odds of detection. In a 2016 working paper, Harvard Senior Fellow Peter Sands contends that cash remains the preferred method of fungible payment, with the ability to leave no paper trail.[13]

The financial snapshot of criminal and terrorist groups might not be as convenient and furtive if relegated to electronic means of transfer. Even as criminal actors attempt to exploit innovative technologies, such as Bitcoin and wire transactions, international banking regulations continue to close the gap by which illicit processes can furtively operate, which make it increasingly difficult for criminal financing through cyberspace.[14] Economic specialists agree that as the world becomes more technologically savvy in the use of electronic finances, the allure of hard currency will most certainly become more

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[11] Loretta Napoleoni, *Terror Inc.: Tracing the Money behind Global Terrorism* (London: Gardners Books, 2004), 24–36; Louis de Koker, *South African Money Laundering and Terror Financing Law* (Durban, South Africa: Lexis Nexis, 2013), 14–16; http://dro.deakin.edu.au/view/DU:30060696; Raphel Perl, "Anti-Terror Strategy, the 9/11 Commission Report & Terrorism Financing: Implications for U.S. Policymakers," *Strategic Insights* IV, no. 1 (January 2005): 9, https://apps.dtic.mil/docs/citations/ADA52 1641.

[12] Jeanne K. Giraldo and Harold A. Trinkunas, eds., *Terrorism Financing and State Responses: A Comparative Perspective* (Stanford, CA: Stanford University Press, 2007), 1.

[13] Peter Sands, *Making It Harder for the Bad Guys: The Case for Eliminating High Denomination Notes* (Cambridge, MA: Mossavar-Rahmani Center for Business & Government, Harvard Kennedy School, 2016), 9, http://www.frankvogl.com/s/Peter-Sands-report-EliminatingHDNfinalXYZ.pdf.

[14] Zachary K. Goldman et al., *Terrorist Use of Virtual Currencies: Containing the Potential Threat* (Washington, DC: Center for a New American Security, 2017), 29–34, https://www.cnas.org/publications/ reports/terrorist-use-of-virtual-currencies; Jdebunt, "What Is the Homeland Security Assessment of Terror ists Use of Virtual Currencies Act?," *The Merkle* (blog), September 13, 2017, https://themerkle.com/what-is-the-homeland-security-assessment-of-terrorist-use-of-virtual-currencies-act/.

prominent for criminal actors.[15] Dr. Michael Freeman, a professor at the Naval Postgraduate School, and an author on terror finance, observes that most governments are prepared to counter the movements of electronic money through financial oversight and regulation.[16]

According to at least one report, even if large fiat currency were significantly restricted or altogether eliminated, terrorist and criminal organizations would most assuredly continue to exploit electronic or alternative forms of finance.[17] As a result of some forward-thinking governments and technological advancements undertaken by law enforcement agencies, the paths for alternate criminal financing avenues continue to narrow. These financial maneuvers exemplify the argument for why illicit groups choose cash over alternative electronic means. Dr. Freeman and other experts on terror finance observe that governments are reasonably prepared to combat the migration of money using monetary oversight regulations and anti–money laundering methods.[18] The United States and other governments that lead the world's economy have the responsibility not only to reevaluate how currencies affect the economy but also to consider the potential impacts to the criminal and terrorist financial landscape. As alternative forms of financing, including progressive decentralized virtual currencies, such as Bitcoin, are becoming more mainstream, so does the discussion on how they fit within the framework of criminal finance. In a recent journal article, Goldman et al. at the Center for a New American Security concludes, "Different countries have adopted varying approaches to the regulation of virtual currencies, posing an enforcement challenge in a globalized field that requires unified response."[19] These inconsistent views are most likely the result of the infancy of this new financial innovation. This same paper, however, rejects the notion that driving terror financing to alternative financial avenues would make it easier for law

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[15] Tett, "Easy Money," 80–82.

[16] Michael Freeman, ed., *Financing Terrorism: Case Studies* (Farnham, Burlington, VT: Ashgate, 2012), 23.

[17] Goldman et al., *Terrorist Use of Virtual Currencies*, 33–34.

[18] Michael Freeman, "The Sources of Terrorist Financing: Theory and Typology," *Studies in Conflict & Terrorism* 34, no. 6 (June 2011): 461–75, https://doi.org/10.1080/1057610X.2011.571193.

[19] Goldman et al., *Terrorist Use of Virtual Currencies*, 2.

enforcement agencies to track, as the widespread use of virtual currencies would be an even larger significant threat.[20] As innovative financial processes, such as digital and virtual financing remain in their early stages, arguments on the topic may change over time.

No matter the intermediate financial form, cash remains the oxygen that fuels terror and related criminal activity. In a 2015 Treasury Department report on the financial risk related to terrorism, cash is cited as one of the primary ways terrorists exchange finances for operations.[21] A number of cash-based crimes with a nexus to terror financing include narcotics, smuggling, trafficking, extortion, kidnapping, theft, counterfeiting, fraud, and robbery.[22] Figure 1 illustrates an individual $205 million cash seizure related to drug trafficking, a commonplace event that periodically makes headlines in the United States and abroad. During a conference on terror financing held at the Naval Postgraduate School, Jeanne Giraldo—citing Loretta Napoleoni, a terror finance authority in Europe—stated, “Terrorists [and others] are relying more on shipment of bulk cash, a rising trend in Europe, . . . using shipping containers to ship cash from one part of Europe to another, and paying for properties with cash.”[23] Aligned groups and governments are joining to combat criminal finance. The Financial Action Task Force (FATF) is one such group.

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[20] Goldman et al., *Terrorist Use of Virtual Currencies*, 2.

[21] “Terrorist Finance Tracking Program (TFTP),” U.S. Department of the Treasury, 2, accessed June 16, 2017, https://www.treasury.gov/resource-center/terrorist-illicit-finance/Terrorist-Finance-Tracking/Pages/tftp.aspx.

[22] Freeman, “The Sources of Terrorist Financing,” 462.

[23] Harold Trinkunas, Barry Zellen, and Harold Giraldo, “Conference Report: Terrorism Financing & State Responses in Comparative Perspective,” *Strategic Insights* 6, no. 1 (January 2005): http://calhoun.nps.edu/handle/10945/11343; Napoleoni, *Terror Inc.*, 19.

Figure 1. Bulk Cash Seizure.[24]

The FATF was created in 1989. Today, the inter-governmental body is represented by 37 member countries including the United States. The FATF boasts its objective to “set standards and promote effective implementation of legal, regulatory and operational measures for combating money laundering, terrorist financing and other related threats to the integrity of the international financial system.” The FATF’s recommendations to combat terrorist financing only briefly touch on cash transactions and couriers in the form of bulk movement of cash. The FATF advises countries that have the legal authority to stop or restrain suspect currency and to enact effective and dissuasive sanctions against those who make false declarations of cash.[25]

Generally speaking, when scholars, policy makers, or governmental bodies address the illicit use of cash finances, as is often done because this problem is definitely not new, their solutions rarely include calls to restrict or eliminate cash on any level. The concentration remains on banking policy, legislating laws, requiring reporting, or enacting restrictive travel requirements.

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[24] Source: DaMajority, “Cash Everywhere, Exotic Animals, Customized Guns Found in Mexican Drug Lord’s Home,” DaMajority, February 27, 2014, https://www.damajority.com/cash-everywhereexotic-animalscustomized-guns-found-in-mexican-drug-lords-home/.

[25] “Home,” Financial Action Task Force, accessed October 14, 2017, http://www.fatf-gafi.org/home/.

In Sands' working paper, a compelling argument is made for eliminating high-dollar notes as a tool to combat criminal and terror financing.[26] However, most of his arguments center on criminal activity rather than terrorism, which leaves the specific terror financing aspect to a much smaller discussion in the paper.[27] Sand does however focus on specific cash amounts to carry out terror attacks, as well as the broader landscape of how money sustains the existence of criminal and terrorist organizations.

2. Socioeconomic Effects

With the increased use of virtual and digital currencies, the United States is already experiencing a significant reduction in the use of cash in everyday commerce. Overall, in instances when Americans choose to pay with cash, they limit cash use to small purchases not requiring a large note. This trend is reflective in the reduction of large-size currency demands within the United States. Additionally, the U.S. Federal Reserve reports noncash payments have increased 5.3 percent over the three-year period between 2013 and 2015, with 144 billion transactions in 2015 alone.[28] This continuing downward trend in the use of cash further supports a cashless movement and the unnecessary existence of large notes. The same Federal Reserve report reveals the overwhelming use of alternatives to cash by millennials, which provides a glimpse into future consumer spending.[29] The Federal Reserve research also examined historical and empirical data related to monetary policy, as well as forecasted government, consumer-based, and banking data. Analytical information provided by the U.S. Federal Reserve has proven to be excellent indicators of the previous, current, and future currency markets. This effort can synthesize a trending theory of how the public uses fiat currency in today's environment, in years past, and trending in the future. Data from a number of sources will educate and clarify where fiat currency moves today, and for what purposes.

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[26] Sands, *Making It Harder for the Bad Guys*, 38–43.

[27] Sands, 24–27.

[28] "The Federal Reserve Payments Study 2016," Board of Governors of the Federal Reserve System, last updated February 16, 2017, https://www.federalreserve.gov/paymentsystems/2016-payment-study.htm.

[29] Jason Steele, "Payment Method Statistics," CreditCards, updated May 30, 2018, http://www.creditcards.com/credit-card-news/payment-method-statistics-1276.php.

Existing research tends not to explore alternatives to the foreign circulation of U.S. currency in areas of the world where cash remains the prevalent source of exchange or where U.S. cash supports the economic infrastructure of a foreign state.[30] In the case of dollarization, where the U.S. dollar circulates as part of a sovereign economy outside the United States, a uniquely designed currency could be designed for a specific geographical location. A restrictive policy requires the defined currency only legal when transacted through a banking system within specific parameters. Such policies also insulates bulk cash movement from one area of the world to another by criminal and terror groups. The bulk and circulating cash restriction methods that have been previously employed by the United States were never fully tested or engaged, which leaves empirical data related to this idea lacking abundant data for comparison. Finally, current economic trends relating to the social impact of such a bold monetary change was found to be void of research.[31] How the public feels about its money and how it uses it today compared to previous generations is an important social framework.

3. Policy Change

Research in the discipline of financial policy is one of the most important aspects of this thesis. Banking systems around the world must maintain a proper balance of fiat cash in circulation to maintain a low inflation rate, which is critical to the purchasing power of the dollar. The Federal Reserve Board of Governors, simply known as the Federal Reserve, is the governing body from which the U.S. monetary policy, specifically cash circulating volumes, is consistently analyzed and adjusted.[32] The Federal Reserve works in concert with the U.S. Congress on monetary policy matters. This relationship is oftentimes controversial and at odds with the legislature to manipulate the existing policy

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[30] Brian M. Doyle, '*Here, Dollars, Dollars...' —Estimating Currency Demand and Worldwide Currency Substitution* (Rochester, NY: Social Science Research Network, January 1, 2000), http://papers.ssrn.com/abstract=231859.

[31] Shaun O'Brien, "Consumer Preferences and the Use of Cash: Evidence from the Diary of Consumer Payments Choice" (working paper, Federal Reserve Bank of San Francisco, July 21, 2014), http://www.frbsf.org/cash/publications/fed-notes/2014/july/consumer-preferences-cash-use; Gaunt, "Cashless Society Getting Closer."

[32] Peter Conti-Brown, *The Power and Independence of the Federal Reserve* (Princeton, NJ: Princeton University Press, 2016), 116–18.

on all financial matters and maintain U.S. solvency. If a realistic and achievable alternative to large U.S. currency were to take shape, the Federal Reserve and the U.S. Congress are the bodies that must weigh the circumstances and collaborate in that effort. The Treasury Department is finding new ways to join the financial fight against terror.

Countries and economic authorities have historically sought to control their currencies for a number of reasons; one of those reasons is to reduce criminal and terrorist financing. Policies directed toward illicit finances are usually employed to reduce tax evasion or failing to report monetary gains. Several foreign states have already enacted policy changes by taking extreme steps to reduce or eliminate their circulating currencies. In recent examples, the EU and India took steps to restrict and eliminate large paper currency in an effort to target and combat criminal and terrorist financing.[33] The EU and India approached these restrictive steps in vastly different ways, which resulted in lasting effects to the public they serve. These two cases and the resulting effects are further examined as case studies in this thesis.

The idea of taking such extreme steps to restrict circulating currency is not a new idea in U.S. policy. During World War II, the United States took steps to restrict or eliminate U.S. currency in strategic areas of the world. Distinctive currencies circulated in the pacific islands and in North Africa.[34] These notes, printed with specifically colored treasury seals and markings, were easily identifiable and limited to designated areas. This case study is also examined in detail later in this thesis.

Overall, this literature review approached the topic of monetary change from a number of important viewpoints, and found a void of specific discussion or argument that included the proposition of restricting or eliminating high-denomination currency. Further, the subject matter specific to fiat currency in a quickly changing generational landscape lacks research and consideration.

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[33] European Central Bank, "ECB Ends Production and Issuance of €500 Banknote"; Rishi Iyengar, "India's Cash Crisis: The 5 Key Questions," CNNMoney, November 18, 2016, http://money.cnn.com/2016/11/18/news/india/india-cash-ban-explainer/index.html.

[34] George S. Cuhaj and William Brandimore, *Standard Catalog of United States Paper Money*, 35th ed. (Blue Ash, OH: F+W Media, Inc., 2011), 133.

D. RESEARCH DESIGN

The objective of this research was to examine the current financial landscape related to the use of fiat currency through the lenses of legitimate cash users, as well those in the criminal underworld, to explore whether the benefits and availability of large denomination cash in use today outweighs its exploitation in the illicit world.

The first research question is does a conclusive relationship exist between the circulation of large-denomination currencies and the exploitation of those currencies in the illicit world of criminal and terror finance?

To answer this question, historical and empirical evidence related to monetary policy, government forecasts, consumer based data and banking data are examined. Data from a number of sources including government reports and business consumer reporting are examined to clarify if and where fiat currency is being held in demand, and for what purposes. The output of this analysis is an understanding of how the American consumer, foreign governments, and illicit groups use fiat in years past, today, and in the near future.

The second research question is what potential impacts would any reduction, restriction, or elimination of high-denomination currencies likely have on the U.S. economy, the public, and ultimately, criminal and terrorist organizations?

To answer this question, the potential effects currency changes are examined from a number of lenses that include social perception, the economy, and any anticipated change to the terror and criminal landscape after a modification in monetary policy occurred.

Two cases from governments outside the United States related to the reduction and elimination of circulating currency are studied. Recent policy changes in cash management in the Europe and India are examined, as they both involved eliminating their largest circulating currencies in an effort to affect the criminal landscape. These cases are reviewed to discern how their policy decisions. These policies were implemented in vastly different ways that affected their ultimate goal of reducing criminal and terror finance.

A third study associated with currency restriction measures that fall short of elimination, when that option is not optimal, is examined as an alternative to complete currency removal. This third case is chosen, as it represents an alternative measure the United States has employed, and serves as a reminder to policy makers of what can be done as a suitable substitute to removing currency. The case studies are compared to each other and to U.S. policy. This systematic analysis examined how other governments are manipulating their monetary policy, as compared to the United States in the name of their own security. Further comparisons are derived from historical and future trends in government and private consumer spending reports, to reveal the lack of an actual need for large-denomination notes in the United States and abroad.

This examination into circulating fiat currency included both a quantitative and qualitative lens. The quantitative values are necessary to gauge accurately the manner in which fiat currency is currently distributed and used throughout the world, and in what denomination, both in the legitimate and illegitimate worlds. A qualitative cost-benefit analysis, rather than a formal cost-benefit analysis, is employed in this research to measure public acceptance, political interference, and any financial ethical dilemmas that presently shrouds circulating currency.

As part of this examination, this research also considers how any significant change in a monetary policy may influence other economic elements of the equation, including the court of public opinion, as is clearly demonstrated in the India case study. Rather than polling ethical questions to a large sample, this area of analysis is voiced by current government and business consumer data and trends, which in general principle, will speak towards the tenor of how and when the public chooses to utilize fiat currency, or use one of a number of alternate forms of payment. Government and consumer data comparisons will highlight the public's appetite for fiat currency vs. electronic payments by studying year over year demands from business consumer data and government currency orders, which predict how much currency is being used and will therefore need to be replaced.

This research is an attempt to reinvent a similar option to restrict currency from criminal and terrorist groups. This restriction includes circulating currencies recognized by size and color with limited use to large regional financial institutions. This action eliminates indiscriminate transportation of cash from one area of the globe to another without regulation or identification.

This analysis provides a clear snapshot to determine if U.S. currency should maintain its place in commerce at current denomination levels, or if it should be altered or removed from the world economic equation, due to a decreased legitimate use in comparison to increases in nefarious use.

The findings of this research have an existential application to the security of the United States. They will recommend an improved cash policy framework for analysis and discussion for subject matter experts in the Federal Reserve, and policy makers' consideration.

This thesis is not a comprehensive study on the monetary policy of the United States and relies on current data available to draw a conclusion related to the continued use of fiat currency. This analysis is limited in scope within the parameters of general monetary policy as it pertains to fiat currency. Moreover, any treaty or agreement with foreign states or international banking institutions requires a more in-depth examination of specific policy and current political environment. Some of these issues may surface throughout this research, but a definitive examination on the aforementioned matters is not a part of this paper. This examination concludes with a hypothesis surrounding what impacts the elimination or reduction of large fiat currencies may have on the fight against criminal and terror finance.

E. THESIS OVERVIEW

Chapter II provides background related to the circulation of U.S. currency in the United States and abroad, and identifies challenges that have affected financial policy as it relates to circulating currency. This chapter also focuses on understanding the social structure concerning peoples' individual relationship with money. This chapter also examines the impacts a significant monetary change, such as eliminating a large-denomination currency, may have to the overall monetary policy from a number of viewpoints. This review includes the effect currency changes may have on social perception, economic effects, disruptions to the terror and criminal landscape, and law enforcement.

Chapter III presents two case studies related to the reduction and elimination of circulating currency and their impacts. These cases examine lessons learned as to how those decisions affected the ultimate goal of reducing criminal and terror finance. This chapter also examines restriction measures previously taken when eliminating a currency was not a suitable option.

Chapter IV presents findings of the research as they apply to the security of the United States. This chapter further recommends an improved framework for analysis and discussion for policymakers' consideration.

II. THE STATE OF U.S. CURRENCY

This chapter provides an overview of existing U.S. currency in circulation today. This discussion includes a brief background of how currency in the United States has evolved over time, as well as how U.S. currency circulates overseas. This chapter also examines the potential impacts that may result in any change in U.S. monetary policy, which includes the restriction or elimination of large currencies, as suggested in this thesis. The result of such a significant change may have wide-reaching effects on how the world uses money. These effects include social and economic suitability, which examines how the public views and manipulates currency. Additionally, how currency changes may disrupt the terror and criminal landscape through the impact to law enforcement agencies. This chapter also examines changes that occur despite legal monetary policy, including modern movements in consumer spending.

A. CIRCULATING CURRENCY IN THE UNITED STATES

U.S. paper money has been printed, issued, and used in the United States officially since 1861 by the federal government. Prior to 1861, paper money was issued by colonies and individual states.[35] Since that date, U.S. currency has been produced and distributed under U.S. federal law, and has experienced a number of changes over the last century, including size and color.[36] Questions concerning just how to regulate the monetary system of the United States dates back to the founders of the United States; however, it was not until 1913 that the modern U.S. central banking system known as the Federal Reserve System was created.[37] Receiving oversight from the U.S. Congress, this independent governing body consists of three separate but equally important entities: a Board of Governors, a Federal Open Market Committee, and its operating arm represented by twelve FRBs throughout the United States.[38] According to the Federal

[35] Cuhaj and Brandimore, 5.

[36] "The Constitution of the United States: A Transcription," National Archives, November 4, 2015, https://www.archives.gov/founding-docs/constitution-transcript.

[37] Conti-Brown, *The Power and Independence of the Federal Reserve*, 16.

[38] Conti-Brown, 70.

Reserve's official website, the Federal Reserve System conducts five key functions in the interest of the U.S. economy, and more broadly, the public good. These functions include "conducts the nations monetary policy, promotes the stability of the financial system, promotes the safety and soundness of individual financial institutions, fosters payment and settlement system safety and efficiency, [and] promotes consumer protection and community development."[39] It was not until 1970 that financial institutions in the United States were required by law to report irregular banking customer practices.

A number of federal laws and regulations have been aimed at controlling the concealment and movement of illicit funds. In 1970, Congress passed the Bank Secrecy Act (BSA) to combat money laundering and the movement of cash. Signed into law by President Nixon, this act outlined a general framework for monitoring criminal financial activity and bulk cash movement.[40] Following the events of September 11, 2001, Congress passed the Patriot Act. Signed into law by President George W. Bush less than two months after the terrorist attacks, this law amended the BSA, and requires more stringent reporting requirements and enforcement within the financial sector.[41] These regulations target criminal groups or individuals who look to skirt the law, such as those who participate in tax evasion to improve law enforcement's fight on terrorist and other criminal behavior.

As the U.S. currency is the most aligned and traded currency used for worldwide transactions, the U.S. dollar itself has always represented purchasing power. As psychoanalytic psychotherapist Lesley Murdin asserts, "Money affects the life of most human beings, either by its presence or its absence. Money makes us both master and slave."[42] In writing her 2012 book *How Money Talks*, Murdin furthers her argument by citing Alla Sheptun, an associate professor at Financial University under the Government

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[39] "Structure of the Federal Reserve System," Board of Governors of the Federal Reserve System, last updated March 3, 2017, https://www.federalreserve.gov/aboutthefed/structure-federal-reserve-system.htm.

[40] The Financial Recordkeeping and Reporting of Currency and Foreign Transactions Act (Bank Secrecy Act) Act of 1970, Public Law 91-507, 84 Stat (1970).

[41] F. James Sensenbrenner, Jr., Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism (USA PATRIOT ACT) Act of 2001, Public Law 107-56 (2001), https://www.congress.gov/bill/107th-congress/house-bill/3162.

[42] Lesley Murdin, *How Money Talks*, UKCP Karnac Series (London: Karnac Books, 2012), 114–115.

of the Russian Federation who coined the following paradox, "Our power over money is real only inasmuch as we are able to understand its power over us."[43]

The $50 and $100 notes have been a part of the American culture since the nation's birth. The $100 bill—the largest denomination available today—is the most recognizable note in the world. With slang terms including "C-note" (denoting the Roman numeral for 100) and "Benjamin," whose vignette has been on the $100 bill since before World War I, is celebrated in music, culture, and is ingrained in the American lexicon itself.[44] The note is often regarded as a sign of wealth, power, and means. Until recent innovations broadened the avenues in which one can pay for goods and services, fiat cash was the preferred payment method of commerce by both consumers and businesspersons alike.

The $100 bill was not always the largest note in general circulation. In 1928, the U.S. government printed notes even higher than that of the $100 bill. Prior to the number of alternative transactional conveniences of today, larger notes were needed to transfer large amounts of funds in legitimate business commerce, and the U.S. printed notes in denominations of $500, $1,000, $5,000, $10,000, and even $100,000.[45] By the mid-1960s, with the development of the modern banking age, and introduction of credit cards, the U.S. Treasury discontinued notes higher than the $100 note. In 1969, the FRBs began to destroy all notes higher than the $100 note, as the notes circulated through the banking system. Since the U.S. Federal Reserve has never recalled, devalued, or otherwise made obsolete any note in circulation, the outstanding $500, $1,000, $5,000, and $10,000 notes previously circulated, remain legal tender.

In a direct correlation, it can be hypothesized that the same fate would eventually befall the $50 and $100 notes as well, arguably over an extended timeframe because of the sheer numbers in circulation. This complex process of removing a denomination from circulation is evident because of previously discontinued U.S. currency. Notes larger than

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[43] Cuhaj and Brandimore, *Standard Catalog of United States Paper Money*, 87.

[44] Cuhaj and Brandimore, 282–287.

[45] Note: The $100,000 bill was restricted for use for bank-to-bank transactions and was not authorized for general circulation.

the $100 bill were last printed during World War II, and officially discontinued from circulation in 1969. However, some specimens remain available today, and are still considered legal tender by the U.S. government. The FRB estimates these previously circulated high-valued notes account for .0005 percent of the total value of currency in circulation today and can still be deposited and honored for face value.[46] Obviously, notes in these large denominations have made an appreciated transformation beyond face value in the area of coin and currency collectors, where the marketplace has realized a premium value due to the rarity those notes now represent.[47] Previously circulated large notes are consistently for sale at coin and currency shows, and online auction sites today.

The world demand for high-denomination U.S. currency remains evident in part by the quantities continually supplied by the U.S. government. According to current FRB records, more $100 notes were in circulation in 2016 (1.1548 trillion notes) than the total number of all denominations in 2012 (1.121 trillion notes). This trend shows no signs of slowing. Table 1 illustrates the FRB's 2018 fiscal year request for currency manufacturing, which reveals a continued upward trend from the 2016 request for 1,276,800 $100 notes and the 2017 request for 1,516,800 $100 notes.[48]

[46] "Currency in Circulation: Volume," Board of Governors of the Federal Reserve System, last updated March 5, 2018, https://www.federalreserve.gov/paymentsystems/coin_currcircvolume.htm.

[47] "Numismatics is the study or collection of currency, including coins, tokens, paper money, and related objects. While numismatists are often characterized as students or collectors of coins, the discipline also includes the broader study of money and other payment media used to resolve debts and the exchange of goods." Wikipedia, s.v. "numismatics," last modified February 21, 2019, https://en.wikipedia.org/wiki/Numismatics

[48] "The nearly 7.4 billion notes included in the FY 2018 order reflect the Board's estimate of net demand for currency from domestic and international customers. The print order is determined by denomination and is based on destruction rates and historical payments to and receipts from circulation. Historically, the majority of the notes that the Board orders each year replace unfit currency that Reserve Banks receive from circulation. The estimated number of notes that Reserve Banks will destroy accounts for about 75 percent of the FY 2018 print order and includes both unfit currency, as well as all old-designs of some denominations received from circulation. The expected growth of Reserve Bank net payments (payments less receipts) to circulation and inventory management adjustments account for the remainder of the notes in the FY 2018 print order." "Currency Print Orders," Board of Governors of the Federal Reserve System, last updated August 9, 2018, https://www.federalreserve.gov/paymentsystems/coin_currency_orders.htm.

Table 1. Currency Printing Demands for 2018.[49]

Denomination	Number of Notes	Dollar Value
$1	2,169,600	$2,169,600
$5	825,600	$4,128,000
$10	569,600	$5,696,000
$20	1,804,800	$36,096,000
$50	364,800	$18,240,000
$100	1,670,400	$167,040,000
Total	**7,404,800**	**$233,369,000**

B. UNITED STATES CURRENCY CIRCULATING ABROAD

The stability and broad acceptance of the U.S. dollar causes high demand around the world, especially in the form of large-denomination notes. Just how many $100 bills reside outside of the United States can be a difficult question to answer. Conflicting estimates between 50–75 percent of all $100 notes in circulation reside outside of its borders.[50] Though estimates remain elusive, another key indicator of the $100 note's popularity and demand overseas is illustrated by U.S. government reports. The Federal Reserve reports that while the most counterfeited note in the United States is the $20 note, outside of the United States, it is the $100 note.[51] Until a substantial electronic alternative to the $100 note can be deployed, the United States must continually meet the

[49] Source: "Board of Governors of the Federal Reserve System."

[50] Jo Craven McGinty, "End the $100 Bill? Uncle Sam Says No," *Wall Street Journal*, June 17, 2016, sec. U.S., http://www.wsj.com/articles/end-the-100-bill-uncle-sam-says-no-1466155982.

[51] "U.S. Fed Ships New $100 Bills with Anti-Counterfeit Features," Reuters, October 8, 2013, http://www.reuters.com/article/us-usa-currency-idUSBRE9970IZ20131008.

high demand of the $100 note to remain a competitor in the world market and to service would-be customers.

As Figure 2 illustrates, the $50 and $100 notes are the largest denominations circulated by the United States and the most commonly accepted form of traded currency in the world. The United States currently has $1.154.8 trillion $100 notes in circulation, a number which has more than doubled from $564.1 billion just 10 years ago.[52] In other words, the $100 bill alone represents over $1 trillion of the total $1.6 trillion of all U.S. currency in circulation today. The $100 note is only second to the $1 note as the highest volume of circulated U.S. currency.[53] The life expectancy of a $100 note in circulation is 15 years versus about five years for the $1 note, which experiences considerably more everyday use.[54]

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[52] "Currency in Circulation: Value," Board of Governors of the Federal Reserve System, last updated March 5, 2018, https://www.federalreserve.gov/paymentsystems/coin_currcircvalue.htm.

[53] Board of Governors of the Federal Reserve System, "Currency in Circulation: Volume."

[54] "How Currency Gets into Circulation," Federal Reserve Bank of New York, July 2013, https://www.newyorkfed.org/aboutthefed/fedpoint/fed01.html.

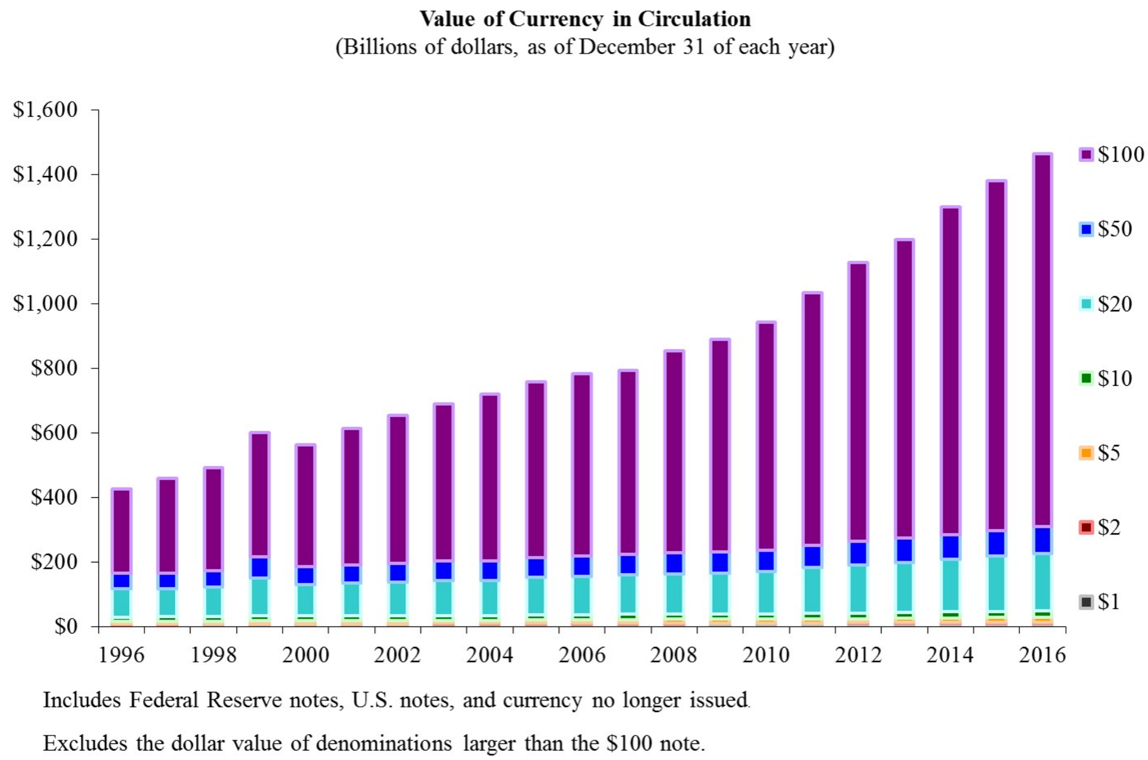

Figure 2. The Powerful and Dominate $100 Bill.[55]

The wide acceptance and fungible nature of cash makes U.S. currency appealing to foreign interests. It also makes a full accountability of circulation beyond U.S. borders all but impossible. Accurate sums of current and historical cash management shipments from several FRBs, which primarily serve foreign countries, cannot provide a true accounting of U.S. currency held overseas. Dollarization is another variable affecting the U.S. dollars' appeal overseas, a financial framework whereby foreign countries, either officially or unofficially, use another country's currency as a legal tender for conducting transactions. The advantage of dollarization is the benefit derived from financial stability in the value of a foreign currency over a country's domestic currency.[56] In the case of the U.S. dollar and its direct relationship to dollarization, the use of U.S. currency is significant and widespread. Foreign states that are void of their own form of currency

[55] Source: Board of Governors of the Federal Reserve System, "Currency in Circulation: Value."

[56] Alain Ize, "Financial Dollarization," in *The Evidence and Impact of Financial Globalization*, ed. Gerard Caprio (Amsterdam: Elsevier, 2012), 463–481.

choose the U.S. dollar over any other currency. The U.S. dollar is also a strong hedge for foreign governments. A number of foreign states use the U.S. dollar as a form of exchange both in backing its own currency, like gold and silver used to be held; or when a sovereign nation or territory uses the U.S. dollar in commerce as the primary form of paper currency.[57] A number of countries including Panama and Liberia have taking steps in the past to flee their own currencies in favor of the stable U.S. dollar. Other counties allow the use of the U.S. dollar alongside with their own currency as a form of stability to their economy.[58] These countries allow visitors to spend U.S. currency freely as an alternate to the currency native to that country, and understanding the benefits of the U.S. dollar, foreign merchants will normally provide change in the native currency.

Outside of the United States, foreign persons, companies, and countries use the U.S. dollar for financial security when poor economic conditions prevail. The appeal and necessity of large-denomination notes, such as the $50 and $100 notes, in the legitimate world are a realistic concern of the dollarization supply and demand, and a strong argument against their elimination. To bridge this potential economic downfall, the U.S. government would need to ensure an alternate U.S. note, such as the $20 bill, is available in ample quantities if the U.S. Treasury were to transition the $50 and $100 notes out of circulation.

Without dollarization, foreign currencies would be limited to a commodity-stored value, such as gold or silver bullion.

Overall, fiat U.S. currency is fungible, holds real value, travels well, and serves as an economic hedge when uncertainties develop in foreign states. In an article prepared for the *Federal Reserve Bulletin*, authors Richard Porter and Ruth Judson argue:

> Foreigners hold U.S. currency for the same reasons that people once held gold coins: as a unit of account, a medium of exchange, and a store of value when the purchasing power of the domestic currency is uncertain or

[57] Ize, 465.

[58] Daniel Avery, "27 Countries that Accept U.S. Dollars as Currency," *Newsweek*, October 15, 2018, https://www.newsweek.com/countries-accept-us-dollars-currency-1169302.

> when other assets lack sufficient anonymity, portability, divisibility, liquidity, or security.[59]

Porter and Judson's research employed 10 methods for estimating U.S. currency abroad. The models tested two direct sources of information, the U.S. Customs Service's Currency and Monetary Instrument Reports (CMIRs) and commercial bank requests to the New York arm of the Federal Reserve, the largest exporter of currency from the United States. The analysis resulted in a "median flow estimate," which reveals a steady circulatory rate of domestic currency and an expanding growth rate subjugated by foreign distribution.[60] Porter and Judson conclude that while the $20 note is more common than the $100 note in domestic use, the $100 note makes up 60 percent of the total currency value in circulation. These facts suggest that current demands for the $100 note primarily originate from outside the United States.[61]

The demand for large-denomination currency overseas has provided a significant profit for the U.S. Treasury, and ultimately, taxpaying citizens by way of seigniorage. The financial dividend of seigniorage is appealing to any country that provides financial instruments for public use. According to *Merriam-Webster*, the most rudimentary definition of seigniorage is the "government revenue from the manufacture of coins calculated as the difference between the face value and the metal value of the coins."[62] Currency seigniorage is calculated as the difference between what the public accepts at face value and the actual costs of the United States to physically make and deliver each note.

The FRB moves currency in and out of its vaults in a choreographed manner to satisfy the supply and demand while balancing its worth against Treasury financial

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[59] Richard D. Porter and Ruth A. Judson, "The Location of US Currency: How Much Is Abroad," *Federal Reserve Bulletin* 82 (1996): 883, http://heinonline.org/hol-cgi-bin/get_pdf.cgi?handle=hein.journals/fedred82&section=168.

[60] Porter and Judson, 884–89.

[61] Porter and Judson, 887.

[62] *Merriam-Webster*, s.v. "seigniorage," accessed September 9, 2018, https://www.merriam-webster.com/dictionary/seigniorage.

instruments.[63] In 2017, the U.S. Treasury's Bureau of Engraving and Printing, the sole producer of U.S. circulating currency, charged the Federal Reserve 15.5 cents to produce and ship a single $100 note.[64] Thus, each individual $100 note that circulates outside one of the 12 FRBs at a face value nets the U.S. government approximately $99.845 of actual profit. Arguments can undoubtedly be made to the external economic forces that influence that equation, such as inflation.

The U.S. government must continually monitor assets and debts and restrict the total value of currency in circulation by policy to maintain and control inflation. If the United States just kept printing and circulating an unlimited number of bills, the resulting inflation would render U.S. currency worthless. Another argument affecting seigniorage is that most notes manufactured year over year are issued as replacement notes for those deemed not suited for re-circulation by the FRBs.[65]

The general argument against the discontinuation of the $50 and $100 notes based on seigniorage alone remains specious, as the resulting seigniorage of five $20 notes to replace a single $100 note would realize a sum near or equal the same value. The United States would still make money whether printing $100, $50, or $20 notes. Assuming U.S. currency remains the prevalent circulating currency around the world, more than five times as many $20 notes would need to be phased into circulation as the $50 and $100 note are systematically removed during the course of normal federal reserve banking.

Net seigniorage gains in recent years were estimated between $15 and $25 billion annually.[66] It is also estimated that one-half to two-thirds of the seigniorage realized is in

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[63] Conti-Brown, *The Power and Independence of the Federal Reserve*.

[64] "How Does the Federal Reserve Board Determine How Much Currency to Order Each Year?," Board of Governors of the Federal Reserve System, last updated December 19, 2014, https://www.federalreserve.gov/faqs/how-does-the-federal-reserve-board-determine-how-much-currency-to-order-each-year.htm.

[65] Board of Governors of the Federal Reserve System. The FRB estimates that 75 percent of the FY 2018 print order will be for replacement notes to include unfit currency, as well as all older designs of some denominations received from circulation.

[66] Porter and Judson, "The Location of US Currency," 899.

the form of high denomination notes circulating overseas.[67] Economist George Tavlas observes the following regarding use of the U.S. dollar abroad:

> The use of a currency internationally occurs whenever a national currency performs the functions of money—i.e., unit of account, medium of exchange, and store of value—in transactions to which the issuing country is not a party. As a unit of account, it is used in invoicing trade and in denominating financial instruments. International currencies are also used by official agents in expressing exchange rate relationships. As a medium of exchange an international currency is used to settle trade and financial transactions. As a store of value, an international currency serves as an investment asset held by nonresidents.[68]

The financial stability of the U.S. dollar provides easy access as an alternate avenue of funding, with dozens of currencies aligning trade to the U.S. dollar on the Forex market daily.[69] One of the more compelling reasons for this extremely high number of $100 notes circulating outside the United States is the supply-and-demand effect of dollarization, and its profitable byproduct of seigniorage. Tavlas further explains money in the context of a public good and compares its use internationally to that of language:

> This analogy focuses attention on the importance of economies of scale associated with the use of money. In the case of language, the greater the number of people who speak a language, the more it can facilitate communication. In the case of money, there are 'network effects' involved in its use because the more popular a currency is, the more useful it is to the holder since there is a greater number of other users.[70]

The transportability of U.S. currency, coupled by its wide-ranging economic advantages, makes cash volumes difficult to track once the cash leaves the FRBs. Due to the popularity and stability of the U.S. dollar, for example, currency destined for use in Montevideo, Uruguay, can easily find its way across the borders to Argentina or Brazil

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[67] Porter and Judson, 899.

[68] George S. Tavlas, "The International Use of the US Dollar: An Optimum Currency Area Perspective," *World Economy* 20, no. 6 (September 1, 1997): 709–47, https://doi.org/10.1111/1467-9701.00098.

[69] The Forex is the market where all the world's currencies trade. The forex market is the largest, most liquid market in the world with an average daily trading volume exceeding $5 trillion.

[70] Tavlas, "The International Use of the US Dollar."

for legitimate commerce or illicit activities. Those same notes can travel to Europe or back into the United States. The fungible nature of the currency itself makes it virtually impossible to track. Even the numerous models used by Porter and Judson fail to account for the volume of currency circulating overseas accurately.

Even without scientific data, it is possible to appreciate the migratory nature of U.S. currency over its lifespan. A website and unique movement called “Where’s George”—so named for the first president’s vignette on the one-dollar note—launched in 1998 to trace the path of individual U.S. dollar bills. Visitors to the website can enter and track serial numbers once they spend the bill and it surfaces again. The website model is far from scientific and most likely designed as a social experiment; a stamp can be added to entice the next recipient of the bill to track its location on the site. Figure 3 illustrates an example of a 1985 series $100 note with eight entries. This bill was traced from California in 2000, to the United Kingdom in 2004, and back to California in 2013, after making interim stops in New York and Tennessee.[71] Considering this particular note was created between 1985 and 1988, the possibilities of location and ownership are boundless. This ability of portability and wide-acceptance exemplifies the fungible nature of U.S. currency.

[71] “FAQs, Rules/User Guidelines, and Privacy Policy,” Where’s George?, accessed October 15, 2017, https://www.wheresgeorge.com/faq-rules-privacy.php?type=faq.

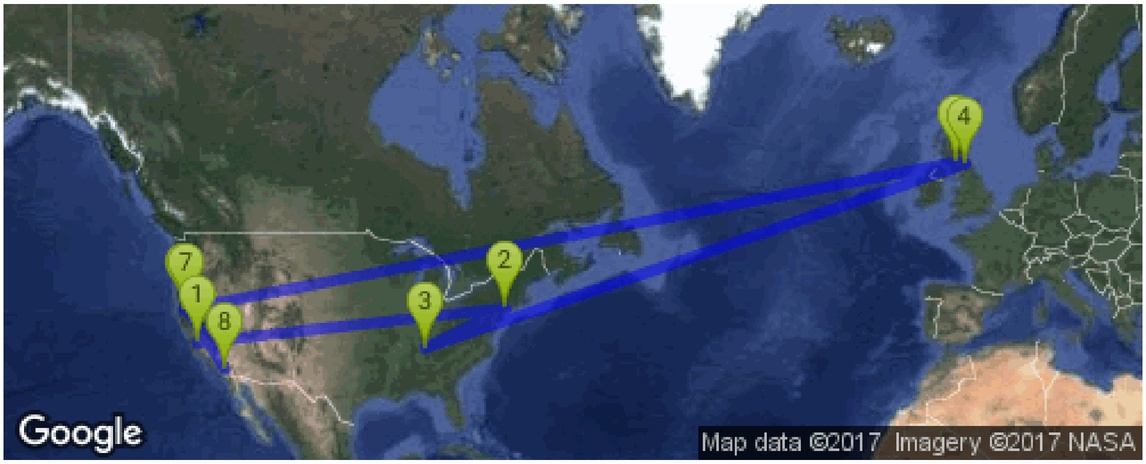

Figure 3. The Well-Traveled U.S. Note.[72]

C. CURRENCY CHALLENGES

A difficult challenge remains. How can the United States ween the public from large denomination currencies, a clear legitimate reason to have them remain does not exist? It is always difficult to incorporate change once a process has been ingrained into individual's daily life. This supposition can be partially explained in a comparative analysis of the United States' current $1 bill and the largely unsuccessful $1 coin program in the United States.

Though the United States is the only remaining westernized country maintaining a circulating paper $1 note, most Americans have little or no knowledge of the circulating dollar coins, despite a number of efforts by the U.S. Mint to bolster their acceptance and use.[73] The United States continues to mint and circulated millions of dollar coins including the Susan B. Anthony, Sacagawea, and Presidential series.[74] The majority of these coins continue to reside in the vaults of FRBs and coin operation centers due to the lack of popularity and rejection. They are obviously bulkier and heavier than their folding paper relatives are. As long as a $1 paper note exists, the $1 coin has little chance of

[72] Source: Where's George?

[73] "Coins and Medals Program," United States Mint, last updated December 6, 2018, https://www.usmint.gov/mint_programs/%241coin/index2cf8.html?action=pres2009.

[74] Kenneth Bressett and R. S. Yeoman, *A Guide Book of United States Coins 2016*, 69 Spi ed. (Atlanta, GA: Whitman Publishing, 2015), 241–246.

being used on a broader stage, as a cognitive social change will remain difficult as long as both options remain available for public use. On the topic of cognitive social change, Social Phycologist Henri Tajfel asserts in part:

> One of the answers appears to be in the terms of the rejection of the existing social reality as the only possible objective state of affairs, and consequently the development of 'cognitive alternatives' to the present situation. In turn, it can be assumed that this rejection of the status quo is powerfully fueled by the perception of the existing social arrangements as being unstable or illegitimate or both.

The United States' neighbor to the north may have understood Tajfel's premise of social change correctly to make currency changes. The Bank of Canada, the central bank that serves the same function as the U.S. FRB, applied a theory described by business professor Richard Thaler as a "choice architect" to guide the public in a new direction.[75] A choice architect is a common practice to steer the audience towards a desired result. People are surrounded by these powerful messages every day, especially is business and government. In 1989, the central bank of Canada became the choice architect when it discontinued the paper dollar. Citizens were weened of the paper currency by requiring them to use the $1 coin. Much like the $1 coins of the United States, the "loonie," was not initially popular. Until the discontinuance of the $1 paper currency, it remained more convenient for Canadians to fold the dollars in their wallets and purses rather than use coins. In a the wake of the Canadian banks success with the $1 coin, the paper $2 bill was discontinued in 1996, when $2 coins, so called the "toonie," were introduced and made available.[76] Evidenced by the coins nicknames, these coins initially received ridicule and rejection by the public, but are now widely used today. Even though the Canadian example was financial in motivation rather than a battle against terror financing, the result of removing a choice in favor of what they believed was a superior choice, is possible in a large social context. It can be inferred that a social change is possible if these examples can be extrapolated as a blueprint for the $50 and $100 bill. Just as the

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[75] Richard H. Thaler and Cass R. Sunstein, *Nudge: Improving Decisions about Health, Wealth, and Happiness* (London: Penguin, 2009), 3.

[76] "Upcoming Changes to Legal Tender Status for Older Bank Notes," Bank of Canada, accessed March 5, 2018, https://www.bankofcanada.ca/banknotes/upcoming-changes-to-legal-tender-status-for-older-bank-notes/.

government has made a number of efforts to broaden the acceptance of the dollar coin, it may have missed Tajfel's "powerfully fueled" statement, by not removing the paper dollar, as did Canada and the ECB, when they moved to dollar [and] two dollar coins. This lack of acceptance concludes that most Americans will not carry dollar coins when a paper dollar still exists. If this analysis holds true for the $50 and $100 note, the United States would need to steer Americans diligently and systematically away from the large notes in the form of an additional supply of the $20 notes.

Making changes to large-denomination U.S. currency across a global landscape may be more difficult to accomplish then supplementing a policy on the $1 note for a coin. Data gathered from the largest foreign exchange marketplace illustrates the U.S. dollar's prominence as the most utilized currency in the world. The daily turnover rate of the U.S. dollar is in the billions of dollars; in other words, the U.S. dollar is the largest share of world transactions per day. This amount is almost three times that of the second place Euro (see Table 2).

Table 2. U.S. Dollar Popularity.[77]

Rank	Currency	Share of daily turnover (%)	Average daily turnover (Billions US$)
1	**U.S. dollar**	**87.62**	**4,458**
2	Euro	31.27	1,591
3	Japanese yen	21.56	1,097
4	UK pound	12.78	650
5	Australian dollar	6.94	353
6	Canadian dollar	5.13	261

The true dilemma is a paradox that large currency notes are the financial strength of the United States, many other countries and market places throughout the world, and

[77] Source: "The Main Currencies Traded on the Forex Market," Forex-Central, accessed September 9, 2017, http://www.forex-central.net/main-currencies.php.

criminal and terrorist groups, especially when considering the ability to conceal funds and the ease of financial movement.

With the development of the modern banking age of computerized accounting, credit card, mobile and virtual payment systems, the U.S. Treasury would be able to manipulate the currency demands to reflect a more up-to-date financial snapshot of its current use better. The FRBs through the normal course of business could initiate a replacement of the values of issued currency with an alternative denomination of currency, while removing the large bills as a valid option to become the choice architect introduced earlier. As the financial technology increases so decreases the need for larger denomination notes as a general use fiat currency. As the financial industry continues to adopt alternative ways to conduct everyday consumer transactions, the need for currency decreases.

Generations change over time, to include the way they approach money. Convenience and innovation affect the way consumers choose to spend money and pay for debt over time. In increasing numbers, consumers of all generations, but often times the younger consumer, no longer carry cash on their person; however, that was not the case just a generation ago. Prior to the modern computer age and advances in the banking system, cash was the primary avenue of commerce. The initial movement away from cash began with the introduction of the credit card in the late 1950s and widely expanded throughout the 1960s.[78] Americans still "like cash," as suggested by a FRB working paper in 2012, which revealed 30 percent of American consumers still chose cash as their first payment choice under a $100 value and used cash 46 percent of the time for transactions.[79] Nevertheless, a 2016 Gallup poll found that fewer Americans are using cash than just five years before; with only 10 percent—down from 19 percent in 2011—saying they use cash for all their purchases.[80]

[78] Jay MacDonald and Taylor Tompkins, "The History of Credit Cards," CreditCards, July 11, 2017, https://www.creditcards.com/credit-card-news/history-of-credit-cards.php.

[79] O'Brien, "Consumer Preferences and the Use of Cash."

[80] "Americans Using Cash Less Compared with Five Years Ago," Gallup, July 12, 2016, http://news.gallup.com/poll/193649/americans-using-cash-less-compared-five-years-ago.aspx.

Today, cash competes for consumer use with other innovations in the financial system, such as PayPal, ApplePay, and Bitcoin. Authors Mark Graham and William Dutton observe that technology is both the driver and enabler of transformational change.[81] In fact, data from a comprehensive study by the Federal Reserve in 2016 indicates a steady and significant millennial shift in the avenues by which consumers spend money (see Figure 4). The full report reveals a pendulum swing between the ways Americans choose to spend funds. Debit cards were chosen almost twice as much as credit cards and accounted for 69.5 of the 144.1 billion transactions tracked in 2015. By contrast, that same number of debit card transactions only accounted for $2.56 of the $179.85 trillion transferred. These results indicate a change within the social construct of how Americans are making ordinary lower-valued transactions and none of them involving the physical use of cash.[82]

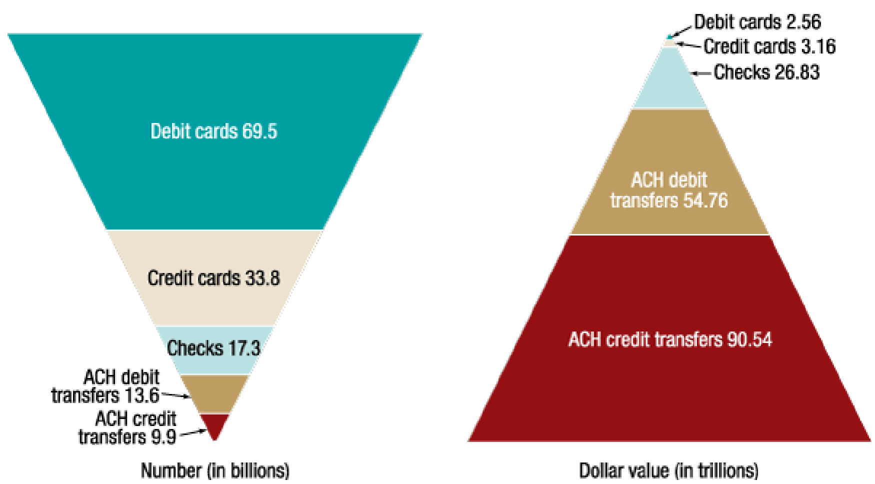

Figure 4. The Changing Public Perception of Money over Five Years.[83]

[81] Mark Graham and William H. Dutton, *Society and the Internet: How Networks of Information and Communication Are Changing Our Lives* (Oxford: Oxford University Press, 2014), 181.

[82] Board of Governors of the Federal Reserve System, "The Federal Reserve Payments Study 2016," 2–6.

[83] Source: "The Federal Reserve Payments Study 2016—Noncash Payments," Board of Governors of the Federal Reserve System, last updated February 16, 2017, https://www.federalreserve.gov/paymentsystems/2016-noncash-payments.htm.

When it comes to advancements in technology, gaps are usually identifiable between age groups by adoptable use. However, a 2016 study conducted by Total System Services, a world leader in business and consumer payment solutions, found that the rate at which consumers use cash rather than credit and debit cards as a form of payment has remained low across all age groups.[84] The study found, “consumers are focused on security, ease of use and control, while also being influenced by features such as rewards and special offers. They have also embraced mobile offerings to manage their day-to-day financial activities.”[85] In January 2018, retail giant Amazon, one of the most innovative, online retail companies in the world, opened what many media outlets are calling the first store of the future. The Amazon Go stores offer brick and mortar shopping with no cashiers or cash registers of any kind. Using advanced smart phone technology rather than cash or credit card machines, Amazon’s plan includes 3,000 stores in the next few years.[86] In December 2018, the convenience store 7-Eleven followed suit and tested the market overseas using facial recognition in lieu of cashiers.[87] A number of large box stores are also testing cash register alternatives as well.

Some people prefer cash to electronic variations of currency. Some consumers prefer the security of having an amount of cash put away for safekeeping or in the event of a natural or manmade failure of the banking system. Federal Emergency Management Agency’s (FEMA’s) Ready.gov site advises all citizens to have cash on hand as part of disaster preparedness.[88] Some might feel the removal of fiat currency by forcing electronic payments constitutes government overreach.

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[84] Sarah Hartman, *2016 U.S. Consumer Payment Study* (Columbus, GA: Total System Services, 2016), 13, https://www.tsys.com/news-innovation/resource-center/Research/research-paper-2016-us-consumer-payment-study.html.

[85] Hartman, 32.

[86] Matt McFarland, “I Spent 53 Minutes in Amazon Go and Saw the Future of Retail,” CNN Business, October 3, 2018, https://www.cnn.com/2018/10/03/tech/amazon-go/index.html.

[87] Panos Mourdoukoutas, “7-Eleven Is Trying To Catch Up with ‘Amazon Go’ Cashierless Stores,” Forbes, December 2, 2018, https://www.forbes.com/sites/panosmourdoukoutas/2018/12/02/7-eleven-is-trying-to-catch-up-with-amazon-go-cashierless-stores/.

[88] “Hurricanes,” Ready, accessed March 4, 2018, https://www.ready.gov/hurricanes.

As part of any examination of the direction of U.S. currency, the largest challenge is to consider whether a new direction is necessary to accelerate the constriction or discontinuation of large notes, as is suggested in this thesis. This research examined a number of facts relating to the public and private dilemmas from a number of viewpoints. The complexities of any watershed policy change to circulating cash will have sweeping effects on the public, business, international banking, and the financial stability of a number of sovereign states around the world. These ancillary effects to the financial war on terror and criminal groups require further examination to reveal how such a change to the circulating cash policy may ultimately affect the global financial landscape.

Large notes like the $50 and $100 notes have been a part of the U.S. monetary system since this nation's birth, but popularity and usability is fading. Today, many business operators prefer not to accept large denominations for a number of reasons including losses due to counterfeiting, as well as burglary and robbery. As demonstrated in Figure 5, notices that businesses are no longer accepting large notes are becoming more commonplace throughout the United States.

Figure 5. Sign Displayed Rejecting the Use of Large Bills.

Business owners understand it makes them a target for robbery when maintaining larger amounts of cash received from customers and who then make change after receiving a $50 or $100 note.

When it comes to moving illicit money, the FATF publishes recommendations and sets the international standard for combating terror financing.[89] First published in 2012, and last updated in 2017, the FATF's *International Standards on Combating Money Laundering and the Financing of Terrorism & Proliferation* provides guidance to governments and law enforcement.[90] The FATF's publications and supplemental best practices guides are voluntarily adopted by members and the legitimate states in the world, and has become the standard on the subject for defeating illegal criminal and terrorist finance activities.[91] The FATF is a cooperative effort of 37 member counties, a number of associate organizations combating white collar crime, money laundering, and terror finance. The FATF associate and obverting members include the World Monetary Fund, the United Nations, and the World Bank.

With similar innovative ideas, responsibilities and concerns, the FATF also joins with other organizations to thwart the ability of terrorist and criminal groups to adapt to alternate avenues of finance. These alternatives include modern financial opportunities made possible by the development of virtual and digital currencies payments and internet-based payment methods. Most countries and international organizations designed to combat terrorist financing recognize the need to stay abreast of these and other emerging financial technologies, as the illicit groups will most assuredly take advantage of the furtive nature such paths may offer.[92] Just as terrorist and criminal groups look to exploit technological advances in the financial enterprise, so do government regulators and law enforcement agencies combat the attempts and close loopholes. As these loopholes and technology gaps become narrowed by law enforcers and banking regulations, a resulting reverse effect is trending back to the fungible and indiscernible exploitation of cash. For this very reason, the U.S. government should consider restricting

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[89] Financial Action Task Force, "The FATF Recommendations," updated October 2018, http://www.fatf-gafi.org/publications/fatfrecommendations/documents/fatf-recommendations.html.

[90] Humphrey PB Moshi, "Capital Flight and Institutional Frameworks to Promote Transparency," in *Capital Flight from Africa: Causes, Effects, and Policy Issues*, ed. S. Ibi Ajayi and Léonce Ndikumana (Amherst, MA: University of Massachusetts at Amherst, 2014), 366.

[91] Moshi, 366–367.

[92] Moshi, 367.

or eliminating high-denomination currency in an effort to assist law enforcement close that avenue as well.

1. Criminal and Terror Perspectives

The use of cash will continue to be a major financial advantage in the malevolent world of terror financing. According to a Congressional Research Service report on the topic of Islamic terrorist financing published by Carla Humud, Robert L. Pirog, and Liana Rosen, "The Islamic State of Iraq and Syria (ISIS), [once] one of the best-funded terrorist organizations in modern history, approved a $2 billion budget for 2015."[93] This financing was a significant advancement compared to al Qaeda's annual BUDGET of $30 million prior to September 11, 2001.[94] How much of this financing is turning into cash at one point or another is a value that cannot be determined. How much of that cash is in the form of large notes is an even more difficult value to determine, but the concealability and transportability of larger denominations means that more money can be moved in smaller bundles, which ultimately reduces the probability of detection.

On the topic of terror and criminal financing and how to combat and minimize their effects, a number of scholarly writings have been published from the area of professional academia to explain the cause and effect. Dr. Michael Freeman suggests the following when considering sources of terrorist financing, "Overall, terrorist groups might be concerned with the following six criteria: quantity, legitimacy, security, reliability, control, and simplicity."[95] This observation furthers the argument that hard currencies like the U.S. dollar with such high appeal make its cash the most attractive avenue of finance when those six considerations are measured.

Without the availability and use of large-denomination currencies, individuals or groups engaged in illicit activities would face a much greater risk of detection. In a

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[93] Carla E. Humud, Robert L. Pirog, and Liana Rosen, *Islamic State Financing and US Policy Approaches*, CRS Report No. R43980 (Washington, DC: Congressional Research Service, 2015), 1, 13, https://fas.org/sgp/crs/terror/R43980.pdf.

[94] National Commission on Terrorist Attacks upon the United States, *The 9/11 Commission Report: Final Report of the National Commission on Terrorist Attacks upon the United States* (Washington, DC: Government Printing Office, 2004), 14, executive summary.

[95] Freeman, *Financing Terrorism: Case Studies*, 9–12.

working paper published in February 2016, Harvard senior fellow Peter Sands argues in favor of removing high dollar currencies, including the $100 note.[96] Sands contends, in part, "By eliminating high denomination, high value notes we would make life harder for those pursuing tax evasion, financial crime, terrorist finance and corruption. . . . Eliminating high denomination notes would disrupt their 'business models.'"[97] Former Treasury Secretary Lawrence Summers, whose signature appears on the 1999 series of the $100 note, supported Sands' hypothesis with an op-ed article in the *Washington Post* by further calling for the elimination of $50 and $100 U.S. dollar and euro notes.[98] In the most rudimentary sense of Sands' argument, criminal elements would have a considerably more difficult time storing, concealing, or transporting $1 million in smaller denominations, such as the $20 note, rather than larger denominations.

Large denominations also provide a greater advantage to the operating criminal element. Sands asserts that greater volumes of cash are significantly more relevant in the financing of underground criminal groups or for those engaging in tax evasion rather than terrorist groups. Citing statistics obtained from the Naval Postgraduate School's Center for Homeland Defense and Security, Sands illustrates that most terror activity requires only a small amount of cash movement; the cost of the 1993 World Trade Center Bombing was only $19,000, and the 2001 hijackers received $10,000 each for their actions.[99] Author and terrorist expert Bruce Hoffman agrees with this conclusion and states that suicide operations are inexpensive to execute.[100] Those opposed to the elimination of the $50 and $100 notes can make a claim that criminal groups, as opposed to terrorist groups, overwhelmingly utilize larger denominations in an attempt to finance activities clandestinely. In contrast to those facts, Michael Freeman observes that because

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[96] Federal Reserve Notes (notes) are the current "type" of issued U.S. currency. Other type of currency previously issued by the United States for general circulation includes: United States Notes, Gold Certificates, Silver Certificates, and National Bank Notes, all of which are commonly referred to as "banknotes," "notes," or "bills."

[97] Sands, *Making It Harder for the Bad Guys*, 41.

[98] Lawrence H. Summers, "It's Time to Kill the $100 Bill," *Washington Post*, February 16, 2016, https://www.washingtonpost.com/news/wonk/wp/2016/02/16/its-time-to-kill-the-100-bill/.

[99] Sands, *Making It Harder for the Bad Guys*, 24–28.

[100] Bruce Hoffman, *Inside Terrorism* (New York: Columbia University Press, 2006), 132–33.

state sponsorship of terrorist activity can be elusive, groups often turn to the same illegal activities as other criminal groups to sustain terror activity. Freeman notes, “Because state sponsorship can be unreliable and constrain terrorist behavior, terrorist groups have increasingly sought funding through illegal activities. These include extortion or ‘revolutionary taxes,’ kidnapping and ransom, theft, smuggling, petty crime, and pirating and counterfeiting goods.”[101] Jeanne Giraldo and Harold Trinkunas explain the topic of terror financing by saying, “Financial and material resources are the life-blood of terrorist operations, and governments have correctly determined that fighting the financial infrastructure of terrorist organizations is the key to their defeat.”[102] During a conference on the topic of terror finance, speaker John Picarelli presented a table of criminal activities in which terrorist groups engage for the purpose of financing. This list included “narcotics smuggling, commodity smuggling, goods smuggling, migrant smuggling, trafficking in persons, extortion, kidnapping, intellectual property theft, counterfeiting, fraud, credit theft and armed robbery.”[103] All these illegal activities can be exchanged for untraceable cash.

Even though an argument can be made that cash is more prevalent in criminal operations outside the world of terrorism, the use of criminal activities employed by the terror groups to finance their activities may support large-denomination note elimination as a step in the right direction. These criminal activities support both traditional non-terror criminal groups and terroristic groups alike, thus closely aligning both enterprises in matters of finance. Therefore, groups that engage in terrorism find these large notes appealing due to their wide acceptance and ease of transference in the same manner as traditional criminal groups do. This assumption, coupled by the simplicity of moving large quantities of money in relatively small packages, make large-denominations an appealing opportunity for any illicit activity.

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[101] Freeman, *Financing Terrorism: Case Studies*, 238.

[102] Giraldo and Trinkunas, *Terrorism Financing and State Responses*, 7.

[103] Trinkunas, Zellen, and Giraldo, “Conference Report,” 5.

2. Related Criminal Effects

The ability to raise money consistently is a paramount concern for a terrorist organization. Ellie Maruyama and Kelsey Hallahan for the Center for a New American Security assert that terrorist fundraising methods often skirt most restrictions imposed by governments and international agreements between financial systems.[104] These fundraising strategies include kidnapping, trafficking, voluntary donations, or involuntary contributions from supporters, or those repressed or controlled. Additional financial support comes from the exploitation of natural resources, the control of the local banking system, and ultimately, state sponsorship.[105] All these criminal activities can be accomplished with a resulting payment in cash.

As with a number of governments throughout the world, the United States continues its longstanding policy against disbursing any financial ransom for kidnapped U.S. citizens. President Obama re-emphasized that policy in 2015 when he stated, "I firmly believe that the United States government paying ransom to terrorists risks endangering more Americans and funding the very terrorism that we're trying to stop."[106] However, many of these same governments that claim this hardline policy against paying ransoms may still be yielding to the kidnapping and ransom demands of terrorist organizations. According to Congressman Ted Poe, the chairperson of the Congressional Subcommittee on Terrorism, Nonproliferation, and Trade, "Ransom payments to terrorist groups amounted to approximately $165 million."[107]

How much of these ransom payments are in the form of fungible fiat cash and what percentage of that cash is in the form of U.S. currency is a point that can be debated,

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[104] Ellie Maruyama and Kelsey Hallahan, "Following the Money," *Center for a New American Security*, 2, June 9, 2017, https://www.cnas.org/publications/reports/following-the-money-1.

[105] Maruyama and Hallahan, 2.

[106] "Statement by the President on the U.S. Government's Hostage Policy Review," White House, June 24, 2015, https://obamawhitehouse.archives.gov/the-press-office/2015/06/24/statement-president-us-governments-hostage-policy-review.

[107] *Ted Poe, Kidnapping, Antiquities Trafficking, and Private Donations, Hearing before the Subcommittee on Terrorism, Nonproliferation, and Trade of the Committee on Foreign Affairs*, House of Representatives, 114th Cong., 1st sess., November 17, 2015, 1, http://docs.house.gov/meetings/FA/FA18/20151117/104202/HHRG-114-FA18-Transcript-20151117.pdf.

but the ability to track the financial payments electronically is an argument in favor or eliminating, or restricting currency to a single region. This argument in general becomes moot when state sponsorship is introduced into the equation; however, some state actors may look to sponsor actions through an intermediary, similar to the case of Iran's interference in the Middle East. These actions, categorized by the former director of national intelligence James Clapper as the "foremost state sponsor of terrorism," could also be hampered by a restriction of currency, a policy by where specific types of currency become unlawful or unusable for financial transactions in certain areas under specific criteria.[108] This area of monetary policy is discussed at length in Chapter IV.

A number of independent actions, including diplomatic, financial, and military actions, need to address the problem of terrorist financing at the same time to have a positive effect on limiting or eliminating the groups' activities.[109] In a statement to the Congressional Subcommittee on Terrorism, Assistant Secretary of Treasury Daniel Glaser stated, "While new terrorist financing challenges will emerge, Treasury and its interagency partners will continue to employ a range of measures to identify, disrupt and dismantle terrorist financial networks, and work to identify and close loopholes that terrorists and other illicit actors can use to access the international financial system."[110] Military-related activity has also made a mark on terrorists' use of cash as part of their financial planning.

In sworn testimony, both Mr. Glaser and Department of Defense Acting Assistant Secretary for Special Operations/Low Intensity Conflict, Ms. Theresa Whelan, detailed reports of coalition forces destroying a number of bulk cash storage areas in Iraq. The estimates total the losses in the "tens of millions and possibly more than $100 million of

[108] Public Affairs Office, *The Honorable James R. Clapper, Director of National Intelligence, Senate Armed Services Committee Hearing—IC's Worldwide Threat Assessment Opening Statement* (Washington, DC: Office of the Director of National Intelligence, 2016), 2, https://fas.org/irp/congress/2016_hr/020916-sasc-ad.pdf.

[109] Maruyama and Hallahan, "Following the Money," 4–6.

[110] *Stopping the Money Flow: The War on Terror Finance, Joint Hearing before the Subcommittee on Terrorism, Nonproliferation, and Trade of the Committee of Foreign Affairs and the Subcommittee of Emerging Threats and Capabilities of the Committee on Armed Services*, House of Representatives, 114th Cong., 2nd sess., 6–8, June 9, 2016, http://archive.org/details/gov.gpo.fdsys.CHRG-114hhrg20383.

ISIL's bulk cash."[111] The use and manipulation of cash for illegal activities is not limited to a general criminal element. Terrorist groups also take full advantage of the fungible nature of fiat currency.

[111] H.R., *Stopping the Money Flow*, 6–8, 30–31.

III. CASE STUDIES

In this chapter, a number of case studies are examined in an attempt to highlight actions introduced by governments in the recent past in an effort to limit, restrict, recall, or devalue their issued currencies. More recently, contemporary examples of such financial movements by governments can be reviewed, analyzed, and synthesized into a model on which to build U.S. policy related to fiat currency. The idea of eliminating or restricting a currency is not a new idea. A number of examples over the period of recorded history of kingdoms, empires, and governments show how they have manipulated their forms of currency for a number of reasons. These efforts were all designed to tamper criminal activity with a number of different outcomes.

Removing a series or denomination of currency has been accomplished a number of times in the past. A delicate balance exists that must occur to maintain solvency or the appearance of solvency to the public when changes to currency take place. The difference between whether the public will accept the change without a panic bank run or not, is whether those currencies will no longer be available due to the cut in production, limited by a time structure, or in the worst case, recalled, or devalued in some way.[112] To avoid such a public panic, the United States has never taken such a step to recall or render obsolete any current or previous series of currency. However, this fear was the reality facing millions of people in the 12 countries that abandoned their coins and currencies for a singular Euro currency on January 1, 2002. Since that date, the original 12 countries that formed the European Union have risen to 19 individual counties.

A. CURRENCY LESSONS FROM THE EU

The ECB is the financial arm of the European Union. The ECB council manages the Europa series (Euro), and represents 330 million people in 19 countries, with an additional 175 million people using currencies pegged to the Euro. The ECB serves as an example of how to recognize the need for significant changes in monetary policy related

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[112] Conti-Brown, *The Power and Independence of the Federal Reserve*, 134.

to fiat currency, as well as a path forward without causing a major disruption to currency levels or causing a public panic or bank run. The ECB is an organization of countries that have already taken steps to remove large-denomination notes from circulation in an effort to combat terror and criminal enterprises.

On May 4, 2016, the ECB announced the discontinuation of its largest note:

> The Governing Council of the ECB concluded a review of the denominational structure of the Europa series. It has decided to permanently stop producing the €500 banknote and to exclude it from the Europa series, taking into account concerns that this banknote could facilitate illicit activities. The issuance of the €500 will be stopped around the end of 2018.[113]

The ECB governing council concluded in a review of the structure of the Euro to halt the production of the €500 note and to remove it systematically from further circulation.[114] This carefully crafted and executed process ensured a public panic, market fluctuation, or bank run did not result. The ECB staged a public education platform to ensure the European Union and world community understood that the note was not going to be recalled under a time restraint, or devaluated. The ECB publically set a target date for the last printing and committed to remove and destroy the notes systematically from circulation as part of the normal course of the currency lifecycle inspection. This public campaign set aside any potential anxiety Europeans may have had concerning the sustainability of the Euro. In making its decision to remove the €500 note from circulation, the ECB council primarily took into account concerns that this note was being used to facilitate illicit activities.[115] In fact, most people who live in any of the European Union countries have never even held a €500 note. The importance of this action cannot be understated; as this achievement marks the first time a major world currency has ever taken such a public stance in announcing illicit activities, such as terrorism, when making a decision to discontinue a denomination of currency. This action leaves the €200 note as the European Union's largest circulating currency.

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113 European Central Bank, "ECB Ends Production and Issuance of €500 Banknote."

114 European Central Bank.

115 European Central Bank.

Calls for the removal of the €500 notes have been argued for a number of years in the Euro's short history. This note has been recognized as a financial avenue of the illicit rather than legitimate commerce. A 2010 article from La Vanguardia, Barcelona, Spain pronounced in part, "500 euro bills, which so few of us have ever had in our hands, represent 35% of the total euro bills currently in circulation. . . . One doesn't need to be an analyst to deduce that behind this phenomenon lie trunk loads of dirty money." [116] That same report asserts that the majority of those €500 notes are hoarded or circulated outside the Euro zone itself, similar to the U.S. $100 bill. The €500 note has a current U.S. exchange value of $615.349.[117] As of this writing, the €500 note has been dubbed the "Bin Laden Note."[118] This label was due to the ease by which illicit groups can move hard cash to finance drug transactions, conduct money laundering operations, and finance terror with its wide acceptance, only second to the U.S. dollar.[119] The ECB reports that as of June 2016, the number of €500 notes has been reduced to about 26 percent of the total valuation, but that number still represents 559,384 €500 Euro notes, which total €279,692,000.00 of the €1,086,563,393.00 value of total Euro notes in circulation.

The example of the €500 note may just be the beginning of a broader movement. Further steps are already taking shape in at least one European country to restrict the use of the Euro's next largest denomination, the €200 note.[120] In the United Kingdom alone, steps are being taken to restrict the €200 note from use as another strike against illicit activities.[121]

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[116] "Euro: Why Criminals Love the €500 Note," VOXEurop, August 16, 2010, http://www.voxeur op.eu/en/content/article/315731-why-criminals-love-500-note.

[117] "Live Market Rates," XE Currency Converter, accessed March 10, 2018, http://www.xe.com/curre ncyconverter/.

[118] VOXEurop, "Euro: Why Criminals Love the €500 Note."

[119] *Investopedia*, s.v. "Countries that Use the U.S. Dollar," April 9, 2015, http://www.investopedia. com/articles/forex/040915/countries-use-us-dollar.asp.

[120] "Euro Banknotes, Euro Banknotes Quantities," ECB Statistical Data Warehouse, last updated March 14, 2019, http://sdw.ecb.europa.eu/reports.do?node=1000004111.

[121] Paula Peachey, "Goodbye, the Money-Launderer's Choice: €200 Note to Be Taken out of UK Circulation," *Independent*, June 19, 2013, http://www.independent.co.uk/news/uk/crime/goodbye-the-money-launderers-choice-200-note-to-be-taken-out-of-uk-circulation-8664648.html.

It remains important that the United States continue to observe ECB legislative changes on these currency related issues. Defenders of large-denomination U.S. currency will argue it is not urgent to remove the $50 or $100 bill from circulation as long as the €200 note stands to take the place of the €500 note in suitcases and other clandestine modes of travel for the underworld, without a major weight and space differential taking place. Currently, the €200 note represents 1.2% of the total Euro notes in circulation according to the ECB. At any point, should the €200 note also be removed from future production, the United States should preempt any such Euro policy change that would make the $100 note exponentially more necessary for terror groups who need to transport cash. Though it is widely accepted that the Central Bank of the European Union made a successful reduction in large denomination currency with no adverse effects to commerce or the general public, the same cannot be said about India's attempt to do the same later that year.

B. CURRENCY LESSONS FROM INDIA

On November 8, 2016, the Reserve Bank of India (RBI) abruptly announced the devaluation, recall, and removal of its largest two denominations of the Indian Rupee Gandhi series, the ₹500 and ₹1,000 notes.[122]

Similar to the ECB announcement, terrorism and other illicit crimes were named as the primary reasons for the policy change; however, the similarities ended there. Unlike the ECB, the RBI demanded the surrender of all targeted notes by December 30, 2016. The government also temporarily closed ATM machines, limited the amount of cash that could be withdrawn from individual accounts, and required identification when making exchanges. These measures proved problematic, as the ₹500 and ₹1,000 bills in circulation represented about 80 percent of all the fiat currency in public hands, and the government was not prepared with ample supplies of smaller notes to issue in their

[122] "Press Releases," Reserve Bank of India, November 8, 2016, https://rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=38520.

place.[123] This change proved to be a failed proposition for a struggling economy, which operates at about 90 percent of its commerce in cash transactions. To add to this problem, the poor value of the Indian rupee when compared against other currencies, about ₹65 per U.S. dollar, caused additional undue suffering for the people of India and the country's economy.[124] Recent reporting on the effects of India's recall of currency found that the 2016 move aimed at recovering criminal funds, proved nothing more than a public panic and bank run, as 93 percent of all the notes were turned in and accounted for. The India Rupee remains at hyper-inflated rates near ₹70 per U.S. dollar.[125] Clearly, India's framework of quickly recalling and devaluing its currency in the hopes of identifying tax fraudsters failed to accomplish its intended goal.

C. CURRENCY LESSONS FROM WORLD WAR II

If arguments, such as dollarization, prevent the eliminating a large-denomination U.S. currency, a sensible counterargument may be found in currency restriction measures. No research needs to leave the borders of the United States to find a salient historical example of how this measure was not only imagined, but also actively employed by a sovereign government. During World War II the U.S. government took such a restrictive action to ensure the security of United States' economic wellbeing and monetary system. In collaboration with the departments of War, Navy, and State, the Treasury department adopted an innovative and forward-leaning step in the event the United States and its allies suffered defeats in the war on a number of strategic theatres.

In January 1942, the United States began to issue special currency for restricted circulation in important strategic areas of the world, in the event allied forces were defeated. During 1942, over 64 million special currency notes were issued in four

[123] Vidhi Doshi, "India Withdraws 500 and 1,000 Rupee Notes in Effort to Fight Corruption," *The Guardian*, November 8, 2016, http://www.theguardian.com/world/2016/nov/08/india-withdraws-500-1000-rupee-notes-fight-corruption.

[124] "INR to USD," XE Currency Converter, accessed March 11, 2018, http://www.xe.com/currency converter/convert/?Amount=1&From=INR&To=USD.

[125] Zeenat Saberin, "India's Banknote Recall Failed to Uncover 'Black Money,'" Aljazeera, August 30, 2018, https://www.aljazeera.com/news/2018/08/india-bank-note-ban-failed-slowed-economy-central-bank-180830093047724.html.

denominations. These notes were printed with brown serial numbers and Treasury seal to distinguish them from other unrestricted notes of the period, which contained blue serial numbers and Treasury seal. These notes also contained the word “Hawaii” overprinted on the front and reverse side of the note for identification. These notes were actively circulated in the Hawaiian territory and other Pacific islands under U.S. Allied control from 1942 until late 1944. In the event the Japanese captured these strategic areas during the war, large amounts of U.S. currency could be quickly identified and devalued as useless by the FRB. These notes were recalled in their entirety in 1946.

In November 1942, the same preemptive technique was employed for the Allied campaign in North Africa and Italy. Almost 131 million notes in three denominations were printed for restricted circulation in these areas. These notes were printed with yellow in the Treasury seal to distinguish them from regular circulating notes. With a similar application as the Hawaii notes, these notes were designed to be devalued and rendered worthless by the Federal Reserve banking system if large amounts of U.S. currency fell to Nazi-aligned forces.[126] Figure 6 illustrates two such notes.

[126] Bureau of Engraving and Printing, *BEP History Fact Sheet, Special and Allied Military Currency* (Washington, DC: Department of the Treasury, 2013), 1–2, http://www.bep.gov/images/FactSheet_SpecialAndAlliedMilitaryCurrency_20130410.pdf.

Original photograph from the author's personal collection.

Figure 6. World War II Emergency Issued Currency.

Both of these notes were designed as a security measure to ensure U.S. solvency if the currency fell into enemy hands, as it could be rendered valueless by policy. Further exploration is needed to draw a clear comparison between the current financial environment and previous war-footing monetary historical markers. However, there is merit to financial restrictions due to war and those that may be employed today in areas around the world to combat the modern war on terror.

D. SYNTHESIS

In an effort to understand the best method to withdraw a current circulating currency from the public, a comparison of the most recent currency withdraws can be examined to understand the best method, and how those effects are received by the consumer. When comparing methods of restricting and eliminating large denomination currency, an analysis of the actions taken related to the Euro and Indian Rupee cannot be more different in how they were handled by their central banks, and received by the public they serve. Both methods of ending a series of currency are effective, but generally not recommended. The Indian Rupee example was more aligned to the World War II example, if the full plan had been fully enacted to render U.S. currency worthless if taken by the enemy. The ECB was prepared with an educational program and supplement notes as not to upset the supply and demand of banknotes. The RBI made no such preparatory announcement and lacked an ample supply of its banknotes. The ECB provided no terms or restrictions on the amount of money or timeframe by which exchanges could be made. The RBI place restrictions on deposits and daily and weekly withdraw limits, and had a definitive deadline to complete transactions. The RBI went further and required identification for deposits and exchanges as an attempt to catch tax evaders, a difficult task for an economy that mostly thrives on cash as a primary means of payment.

The Indian government acted quickly in an effort to fight criminal financing at the expense of its 1.25 billion population and gave them only 50 days to surrender the notes, or the notes would become worthless pieces of paper. In contrast, the ECB took a similar action while not causing an environment that upset the public or economy. In fact, the ECB continues to provide information concerning the €500 note on its official website to ensure the public's trust in its currency and economy by stating, "the first series 500 notes still in circulation will remain legal tender and can therefore continue to be used as means of payment and store of value for an unlimited period of time. The 500 banknote, like the other denominations, can be exchanged at the national central banks of the Eurosystem indefinitely."[127] This same educational background related to U.S. currency can be found on FRB's website.

The ECB was forward-looking in its fight on criminal and terrorist activity and applied steps now that will have far-reaching effects in the future, without disrupting the current fiat cash environment. As the $50 and $100 notes play a similar role in terror finance and other illicit activities, no matter the magnitude, the United States may want to consider taking steps now to minimize and discontinue its circulation and use as well.

The existence of large-denomination currencies issued by both the U.S. FRB and the ECB, share an unintentional supportive effect related to criminal and terror groups. These large-denomination notes act as a financial tent pole that a number of groups

[127] European Central Bank, "ECB Ends Production and Issuance of €500 Banknote."

exploit in both the concealment of funds and in the surreptitious financial movement of money. However, the ECB, as well as several other foreign states around the world, have begun to recognize the role its currency plays in the illicit underworld, and have taken bold steps to restrict these financial avenues for these nefarious groups by eliminating its largest circulating denomination. This thesis demonstrated the supportive effect of large notes propagating in the criminal world, as well as provided arguments pertaining to social acceptance trends in a modern society less dependent on fiat currencies. Finally, this thesis provides a roadmap of monetary policy that should be taken by the U.S. government. An implementation plan directed by a working group comprised of representatives from the FRB, its board of governors, and the Bureau of Engraving and Printing, can realize its full potential of further reducing criminal and terror finance with little or no effect on the general public and legitimate financial markets.

Another comparison to the Euro found by the ECB is the reduced manipulation in everyday legitimate commerce. Though the $50 and $100 note itself has been a part of the U.S. monetary system since this nation's birth, today, many business operators prefer not to accept the large-denomination bills for a number of collective reasons, including the loss due to counterfeiting and theft. Business owners realize that maintaining larger amounts of cash for customers who then make change after receiving a $50 or $100 note transaction also makes them targets for robbery.

With the development of the modern banking age of computerized accounting, credit card, mobile and virtual payment systems, coupled with the reduced need for denominations valued so high, the U.S. Treasury can easily manipulate the currency demands to reflect a more up-to-date financial snapshot better. The ECB was able to accomplish this goal with little fanfare. It cannot be underscored enough that this process is also not altogether foreign to the United States, which discontinued all notes higher than the $100 note in 1969. The current life expectancy of a $100 note in circulation is 15 years, so in comparison, this statistic provides urgency that the recommended actions relating to the $50 and $100 note should be considered with immediacy. The mere existences of high denomination notes provide a greater advantage to the operating criminal element. Stacks of cash are significantly more relevant in the financing of underworld terrorist and criminal groups or those engaging in tax evasion rather than the normal day-to-day financial life of a typical citizen. The gap between those who do not use cash as a primary means of commerce widens with each passing generation and innovative technology.

The proliferation of the €500 note mirrors the $100 note in that the majority of its notes reside outside of the legitimate intended commerce. A conflicting estimate ranging from 50 percent to 75 percent of all $100 notes in circulation reside outside of the United States and its territories. Even though conclusive estimates remain elusive on exactly how many $100 notes regularly circulate outside the United States, one of the key indicators that support this hypothesis is the overwhelming requests for the $100 note from international customers from the NY FRB cash distribution center in Rutherford, New Jersey. Another, and more telling factor of the vast demand for the $100 note overseas, can be illustrated by reports that even though the most counterfeited note inside the United States continues to be the $20 bill, outside of the United States, it remains the $100 note, a testimonial to its extensive use abroad.[128]

[128] Ian Simpson, "U.S. Fed Ships New $100 Bills with Anti-Counterfeit Features," Reuters, October 8, 2013, http://www.reuters.com/article/us-usa-currency-idUSBRE9970IZ20131008.

IV. CONCLUSION AND RECOMMENDATIONS

The first question posed at the start of this examination of whether a conclusive relationship exists between the circulation of large-denomination currencies and the exploitation of those currencies in the illicit world of criminal and terror finance was generally answered in the affirmative. A more definitive answer will continue to evade scholarly research, as the quantitative metrics required to do so remain in the elusive underworld of criminal and terrorist bookkeeping. However, the second question concerning the impacts any reduction, restriction, or elimination of high denomination currencies have on the U.S. economy, the public, and ultimately, criminal and terrorist organizations, remains a living dynamic question and answer.

A. RECOMMENDATIONS

The following recommendations are made based on the analysis in this thesis.

- The United States should begin to remove the $100 note from general circulation through ordinary FRB attrition.

In a time period where the use of large-sized currency may primarily lie within the world of the illicit, most Americans do not carry the larger sized currency, and more stores are refusing to accept them, now may be the appropriate time for the United States to reassess the viability of these notes. With the elimination of the €500 note and the uncertain future of the €200 note, large U.S. currency will continue to remain a key player in matters of criminal finance. In the financial world, where the illicit benefits outweigh the legitimate use of larger denominations, the United States should begin to remove the $100 note from general circulation through ordinary FRB attrition.

- Systematic movement towards an eventual removal would eliminate a public panic, bank runs, and may even go seemingly unnoticed to the American public.

Even as the demand from overseas maintains a high mandate for U.S. currency, as stated previously, the United States could continue to make the $20 note as appealing as the current $100 note by updating the security features similar to security changes of the currently issued $100 note. The most efficient way to accomplish this feat is no longer replace $50 and $100 bills note for note, but instead issue or re-issue comparable $20 notes instead. This systematic movement towards an eventual removal would eliminate a public panic, bank runs, and may even go seemingly unnoticed to the American public. If it can be argued that the discontinuance of the $50 and $100 notes can reduce the autonomy by which illicit and terror groups operate, and could realize a greater chance for identification and capture with more physical cash to move within its operations, governments should consider the option. Jocelyn Pixley surmised, "Uncertainty is not only inevitable in economic activity generally but is magnified in finance because money is based on trust that is inherently problematic."[129] Currency needs the freedom of passage within a complex world economy, and the United States plays an important role in that economy. Therefore, this paper concludes that it is not only feasible to end our relationship with the $50 and $100 note; it is a responsible act.

Government officials and financial experts agree that if high denomination notes were to be removed from the equation, groups involved in illicit actions would face a higher risk of detection. The reality is that the United States Treasury no longer needs to issue a circulating $50 and $100 note. The United States, which widely circulates a number of its financial instruments throughout the world, has the responsibility on a consistent basis, to reevaluate and balance the exchange and use of large-denomination circulating currencies, and gauge how those notes affect the criminal and terrorist financial landscape.

- The United States should begin taking steps now to restrict or remove the $100 note from circulation.

The U.S. government should also consider making an immediate substantive change to its monetary policy. A number of foreign states have not only identified the need to reduce large-valued circulating currencies, but have taken steps to eliminate

[129] Jocelyn Pixley, *Emotions in Finance: Distrust and Uncertainty in Global Markets* (Cambridge: Cambridge University Press, 2004), 1.

further circulation of those notes. Though the full breadth of conclusive pragmatic evidence may be elusive because of the surreptitious nature of terrorist and criminal activities, the United States should therefore begin taking steps now to restrict or remove the $100 note from circulation.

Former Treasury Secretary Lawrence Summers also supports the elimination of the $50 and $100 note, as well as the €100 Euro note. One fact is certain, a person or group committing a crime will find it more difficult to hide, hoard, or move millions of dollars in $20 notes rather than $50 or $100 notes. In the past, criminal actors have continually made changes to their operations and adapted financial processes to exploit the use of technology as a financial tool via Bitcoin, and other electronic means. However, governing policies and banking regulations continue to change the ease and anonymity by which those electronic processes operate, which makes it increasingly difficult for illicit financing via cyberspace to occur. This fact further supports the uptick in the use of cash in criminal and terrorist operations, as economic experts echo that the allure of hard currency will most certainly become more prominent. U.S. currency is easily hidden and transported in large amounts, is fungible, and a first choice as a world currency.

If the U.S. dollar and the Euro remain the top currencies used for illicit financing, defenders of the $50 and $100 note will argue that it is not urgent to remove the $100 note from circulation. Even with the discontinuance of the €500 note, the €200 note can take its place in suitcases and other clandestine modes of travel for the underworld, without a major weight and space differential occurring. It may not make economic sense to discontinue the use of the $100 note, when the €200 note remains in existence and carries a higher value. It is important that the United States continue to monitor further ECB legislative changes should the €200 note also be removed from future production, which will then make the $100 note exponentially more necessary for terror groups who need to transport cash. The €200 note only represents 1.2% of the total Euro notes in circulation according to the ECB. If the $100 note plays a role in terror finance and other illicit activities, no matter the magnitude of that role, the United States should begin to take steps now to discontinue its circulation and use unless a balance of risk and security exists for the greater good that the world financial markets demand.

A policy change suggesting an accelerated restriction or movement away from the next two largest denominations for the reasons of safety and security in the fight against criminal activities and terrorist activities may be appropriate in the current financial environment, but has some realistic challenges. The delicate balance and heavy burden of remaining the top spot as the world's currency has responsibilities to deliver demand. The U.S. government also actually makes money when they make money through a process of seigniorage.

Finally, in an effort to make the $20 note as appealing as the current $100 note to currency users around the world, the United States would have to update the security features of the $20 note commensurate with the enhanced security changes made to the $100 notes issued since 2013.[130] Any reduced seigniorage realized from the increased cost of enhancing the $20 note would be negligible.

The government might consider taking steps now that could have long-lasting future effects on all forms of illicit financing. Even if terror financing alarm bells are not currently sounding, the slow and methodical reduction of the $50 and $100 notes could be occurring in the background. Through the current FRB operations, processes are already in place that could quietly eliminate each large note as it passes unnoticed through its vaults during the normal course of verification, while ensuring ample cash supplies exists in alternative denominations.

B. IMPLEMENTATION RECOMMENDATIONS

In light of the analysis observed from the case review examples, the following implementation recommendations. Any currency policy modifications taken by the United States should follow the framework provided by the ECB, but due to the vast differential in numbers of notes, especially the $100 note vs. the €500, additional safety nets must be in place prior to execution. These measures would ensure the supply of

[130] "$100 Security Features," U.S. Currency Education Program, accessed October 27, 2016, https://us currency.gov/security/100-security-features-2013-present.

alternative replacement notes are distributed throughout the FRB system and a smooth transition is employed. Figure 7 outlies a simplistic timeline, which can be implemented to ensure the U.S. cash management system remains uninterrupted during any currency transformation.

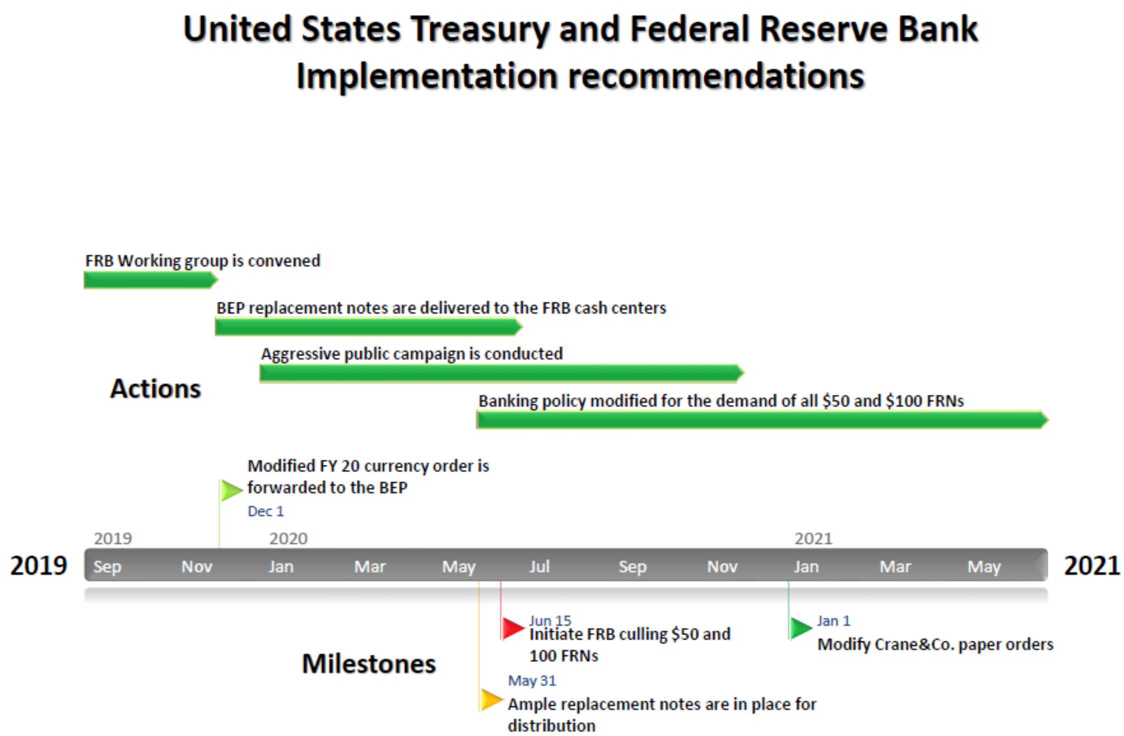

Figure 7. A Step in the Right Direction

1. FRB Working Group

First, the FRB could convene a working group comprised of subject matter experts from all 12 FRBs to reassess public demand. This evaluative process already takes place on a reoccurring schedule. These subject matter experts must conclude as to the accelerated need to produce and supply the national and international banking partners with an adequate supply the $20 notes to be used as replacement notes for the $50 and $100 notes being returned to the FRBs without interruption. Considering all those factors, the working group should decide on a bold but conservative implementation monetary policy change date.

2. Augment Currency Production

Next, the FRB will need to augment the existing FY 2019 currency production order to the Bureau of Engraving and Printing by reducing the $50 and $100 notes and significantly increasing the $20 and $10 notes. This action will provide the Bureau the opportunity to ensure the manufacturing and delivery of ample replacement notes to the FRB cash distribution centers prior to the implementation of the policy change date.

3. Modify Existing Policy to Demand Return of High Value Notes

The FRB could modify existing policy guidance for banks, credit unions, and money remitters to demand all $50 and $100 notes be returned to the FRB rather than be reissued to the public. This minor change will not cause a disruption in the normal course of banking operations. This process is already in place and regularly used by all money remitters who return notes unfit for recirculation. This action is similar to the collection and destruction of the $500 and $1,000 notes in 1969.

4. Initiate Replacement Note Process

The FRB can then initiate a replacement note process on the target date within all FRB currency distribution centers. This culling process is the same used for all unfit notes. All $50 and $100 notes, as part of normal fitness and replacement examination, will be removed, destroyed, and substituted with notes of smaller denominations. This same process remains on going for the recent $5 note substitution, which replaces notes with the Lincoln watermark vignette with the number five watermark.

5. Develop Public Education Campaign

The U.S. government must design and distribute a wide-reaching public education campaign. In support of the policy change, it remains immensely important the international financial markets, as well as the public, are educated and assured the currency of the United States is not being devalued or discontinued. Generational gaps can still be detected in those who still prefer cash over electronic variations of currency exchanges. Some in the public prefer the security of hoarding cash for safekeeping, or in the unlikely event of a failure of the banking system. Others may feel the removal of the $50 and $100 notes constitutes a government overreach or a further constriction of government control over society by forcing electronic payments.

6. Modify Production Contract

The government will need to modify the current contract with Crain&Co, the Dulton, Massachusetts-based company that provides the paper for U.S. notes. This modification will accelerate the transition of the newest security features added to the 2013 series $100 note to be moved into subsequent series $20 notes, which will assume a broader circulation.

C. CONCLUSION

With each passing day, new and innovative payment methods continue to be developed, and accepted by the public, and all represent alternatives to fiat currency. These new payment systems, such as crypto-currency and smart phone facial recognition technology, are also being examined by law enforcement agencies. The convergence of less cash and more technology driven payment systems is sure to have a deteriorating effect on the criminal and terrorist bottom lines. It is a real possibility to remove the large-denomination bills from circulation and from the hands of illicit groups.

If history is a guide, it will be impossible to collect and remove all the $50 and $100 notes, even if the United States stopped the circulation of the $50 and $100 notes today. The collecting and destroying of every $50 and $100 note being routinely returned through one of the 12 FRBs could seemingly take years, if not decades to move the $50 and $100 notes out of public hands and into the previous fates of the $500 and $1,000 note into numismatic favor.[131]

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[131] "Numismatics is the study or collection of currency, including coins, tokens, paper money, and related objects. While numismatists are often characterized as students or collectors of coins, the discipline also includes the broader study of money and other payment media used to resolve debts and the exchange of goods." Wikipedia, "numismatics."

It can be acknowledged that some Americans still prefer some access to cash, but this thesis contends the United States should realize the potential unintended criminal and terrorist effects of the $50 and $100 note and begin to counter those effects with a campaign of systematic removal. This recommendation is drawn from a synergistic view of three case studies that have demonstrated a clear path and warned of pitfalls that can occur as well.

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