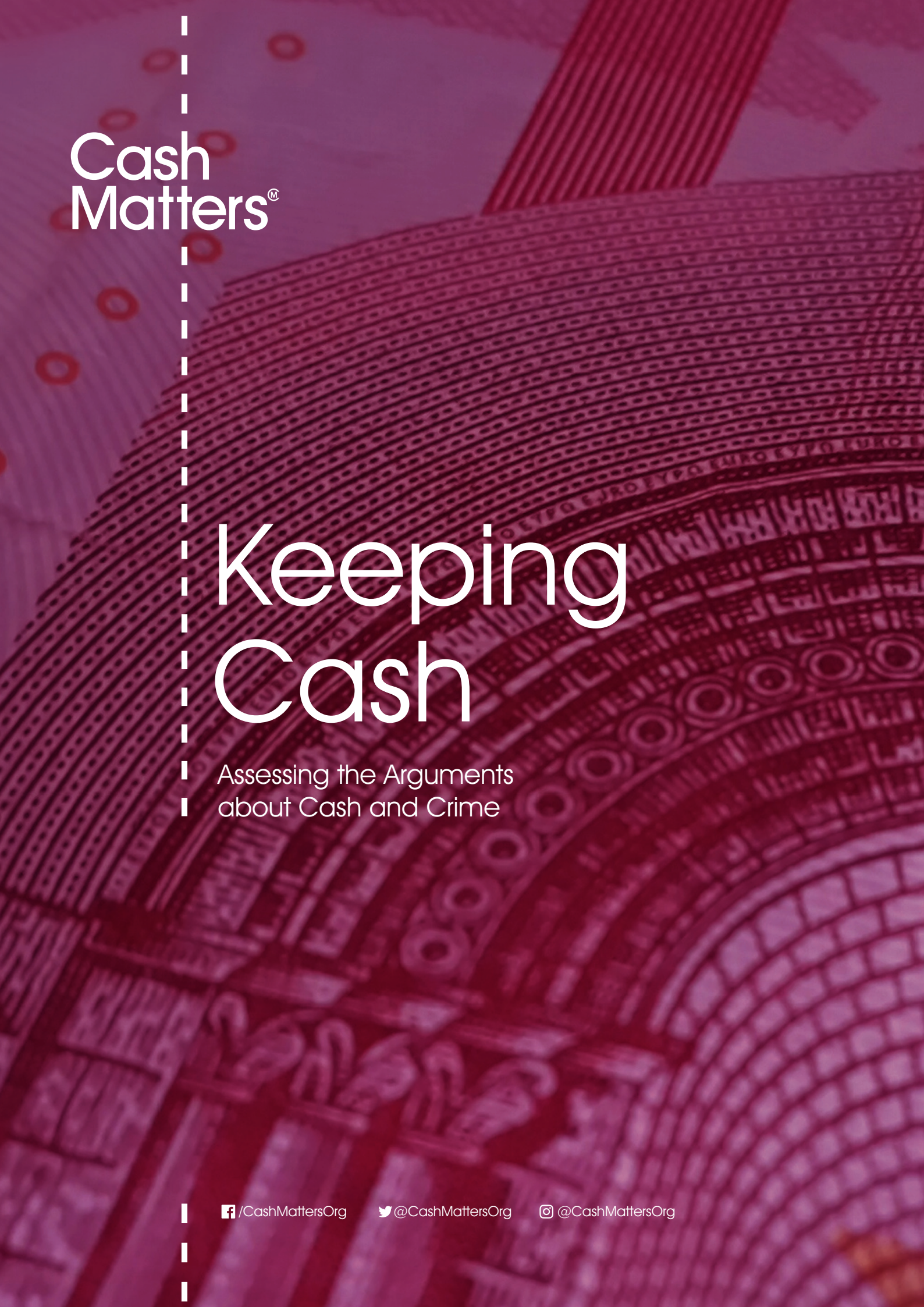




Cash
Matters[®]

Keeping Cash

Assessing the Arguments
about Cash and Crime

 /CashMattersOrg

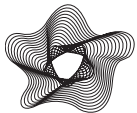
 @CashMattersOrg

 @CashMattersOrg

White Paper Cash Matters

An ICA movement

Written and provided by the



IMTFI

INSTITUTE FOR MONEY, TECHNOLOGY
& FINANCIAL INCLUSION

Ursula Dalinghaus, Ph.D.

Institute for Money, Technology
& Financial Inclusion

Department of Anthropology
University of California, Irvine
uddalingh@uci.edu



Cash
Matters®



Table of Contents

About the Institute for Money, Technology & Financial Inclusion (IMTFI)	6	1. A Preliminary Overview	12
Acknowledgments	7	1.1 Introduction	12
Keeping Cash: Assessing the Arguments about Cash and Crime	8	1.2 Cash diversifies risk	15
Executive Summary	8	1.3 Cash is not a crime: re-framing the problem	18
		2. Money Laundering and Terrorist Financing	20
		2.1 Differences between money laundering and terrorist financing	21
		2.2 Examples: moving money, alternative forms of financial crime and fraud	26
		2.3 Lessons	32
		2.4 Dangers of criminalizing cash	32
		3. Cash Use: Evidence and Data	35
		3.1 Central bank studies on cash usage and choice of payment options	36
		3.2 Cash restrictions and high-denomination notes	38
		3.3 Relationship of cash restrictions to debates around cashless payments and changes in monetary policy	41
		3.4 Payment thresholds' impact on financial and payment ecosystems	42
		4. Case Studies: Unintended Consequences of Changes to Cash Access, Use, and Payment Infrastructures	45
		4.1 India's demonetization (November 2016)	45
		4.2 Greece: capital controls (June 2015)	48
		4.3 Lessons	52
		5. Discussion: Money Instruments, Payment Infrastructures, and the Public Good	53
		Appendix	56

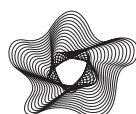
About the Institute for Money, Technology & Financial Inclusion (IMTFI)¹

From cash to livestock to mobile phones – monetary technologies are part of the fabric of our everyday cultural, social, and spiritual lives. IMTFI is dedicated to understanding how people engage with money in all of its forms and examining how policies can best support people's everyday behaviors, activities, and rituals with money. We seek to share our learnings broadly and build a set of global partners dedicated to making monetary technologies meet people's true needs across the world.

Established in 2008 with funding from the Gates Foundation, IMTFI is a research institute based out of the University of California, Irvine. Its core activity has been supporting original research in the developing world on the impact of mobile and digital financial services and has built an extensive transnational network of embedded scholars and researchers who focus on developing grounded, nuanced perspectives on people's everyday financial practices and the impact of new technologies.

To date, IMTFI has supported 147 projects in 47 countries involving 186 different researchers. Those researchers have produced 11 books and 100+ articles in scholarly and other venues, and have been mentioned in the media 170+ times, in venues ranging from Bloomberg Businessweek and the Guardian to Forbes, India. With newly established collaborations with research entities in Pakistan, Mexico, and Senegal, IMTFI looks forward to continuing to foster conversations around financial inclusion.

Learn more at www.imtfi.uci.edu



IMTFI
INSTITUTE FOR MONEY, TECHNOLOGY
& FINANCIAL INCLUSION

Institute for Money, Technology & Financial Inclusion
University of California, Irvine
School of Social Sciences
3151 Social Sciences Plaza Irvine, CA 92697-5100
(949) 824-2284
imtfi@uci.edu

Acknowledgments

The author would like to thank Bill Maurer, Jenny Fan, Nima Lamu Yolmo, Andrea Nitsche, and Gerben van Wijk for providing invaluable guidance, feedback, and support at various stages of the writing, and without whom this paper would not have been possible.

Thanks to the participants of the 2017 CIESAS Occidente Seminar, "Dilemmas Concerning Financial Inclusions," (Guadalajara, Mexico) for early provocations on the topic. The author extends particular gratitude to Aimee Placas and Daniel Knight for generously contributing original data, stories, and insights to the case study on Greece, as well as to Heath Cabot for her thoughts on an early draft. The case study on demonetization in India would not have been possible without the work of the contributors to IMTFI's Special Perspectives Series: Nima Lamu Yolmo, Janaki Srinivasan, Elisa Oreglia, Isabelle Guérin, Santosh Kumar, G Venkatasubramanian, Debashis Acharya, and Vivian Dzokoto.

For permission to include graphics and other original content the author expresses sincere thanks to Heike Mai, Hamed Tofangsaz, Dan Frechtling, Gavin Andrews, Ron Teicher, and Daniel Klein. May Hen, Ai Chun Yeng, and Paolo Campana helped with access to key sources on money laundering and terrorist finance. For critical suggestions on how to improve the final text the author is indebted to Bill Maurer, Taylor Nelms, Paul Bonfanti, Jenny Fan, and Nathan Dobson for their time and careful reading. Special thanks to Anne Olin, Paul Bonfanti, and Mark Mendoza of The Olin Group for design and editing assistance.

The author is responsible for the content and any errors herein. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of any funding agency, funding source or the University of California, Irvine.

About the author: Ursula Dalinghaus is currently a Postdoctoral Scholar at IMTFI. She can be contacted at udalingh@uci.edu. Read more about her research here: <https://ursuladalinghaus.com>

Executive Summary

Over the last decade there has been a revolution in payment technologies. Digitization of bank accounts, new digital payment applications, and an array of new kinds of financial products and services have opened up a wide range of choices for storing, saving, sending, and receiving money. Digital finance has become an important tool in efforts to facilitate formal financial inclusion across the globe.

And yet, cash has also remained an essential tool for people's financial practices and lives alongside these new payment forms. Evidence from both developing and developed payment markets shows that while digital payments may have increased exponentially, the demand for physical banknotes and coins has kept up with the pace of digital finance. Physical currency or physical accounting devices are ancient and cross-cultural technologies, in continuous use since at least 1600 B.C. Aside from risks and benefits, they are wedded to an incredibly durable set of behaviors and social practices.

People use diverse payment methods (from cash, to cards, to payment applications and other alternatives) together. However, the ability to move between diverse payment forms, especially cash, has also featured prominently in criminal activities, including money laundering, tax evasion, and terrorist financing. This

has led government authorities, law enforcement, and other entities to target cash in particular as the supposed core method – and problem – in such activities. The European Commission proposes to institute a cash transaction limit across the EU, claiming that it will prevent money laundering, terrorism, and crime. This follows the decision by the European Central Bank to end issuance of the 500 euro note beginning in 2018.

This white paper for Cash Matters, an International Currency Association (ICA) movement, assesses the current literature on cash, cash usage, crime, and terrorism. Drawing from the Institute for Money, Technology, and Financial Inclusion's accumulated expertise on monetary technologies – from cash to digital – it examines a range of institutional, legal, scholarly, policy, news media, and other sources to understand the current state of debate about – and evidence for – the links between cash, crime, and terrorism.

Part 1 describes some of the problems and risks posed by digitization of accounts and the relationship of cash to digital payment forms. It ends by reframing the debate around cash and crime to consider issues of displacement across tools and jurisdictions when it comes to money laundering and terrorist finance. It also argues that eliminating cash will move criminal activities involving it to other jurisdictions. Curtailing cash will do little when criminals already make use of a diverse portfolio of payment technologies and types.

Part 2 explores the similarities and distinctions between money laundering and terrorist financing and why these differences are relevant to the current policy debate. Similar methods of moving money, including cash, may be used in money laundering activities and in financing acts of terrorism. However, the key point is that in order to move value within or across jurisdictions or convert between different payment forms, multiple methods and tools are necessary, not only those related to cash. Multiple

methods of interdiction are therefore also needed to address money laundering and terrorist financing. Two main differences between money laundering and terrorist financing lie in the cost and intent of these activities. The primary aim of money laundering is profit. Large amounts are often at stake and multiple factors, including transaction costs, may impact which payment forms are used and what methods are deployed to disguise or distance illicit or illegitimate funds from their sources. In contrast, the financing of terrorist attacks can be done through small amounts and the funds are often raised legitimately through a variety of means – from wages, to social benefits, to small consumer loans – and are therefore indistinguishable from daily and routine financial activities. The intent is not one of profit, but of targeted damage and, importantly, criminal activity generally does not precede the event.



These differences call into question the effectiveness of cash restrictions as the main policy tool. Three examples of alternative methods of moving money are used to illustrate how non-cash payment methods can mimic qualities ascribed to cash.

The danger of targeting cash in isolation, or any one method of making payments, is that legitimate use of cash will be criminalized, alongside those who depend upon informal or traditional methods of moving money, such as hawala. Targeting cash misses the need for a holistic approach to the interdiction of money laundering and terrorist financing.

Part 3 examines the current state of research on cash usage and breaks down some of the arguments for phasing out large-denomination notes, restricting cash, and the implications for monetary policy and the payment systems upon which we depend. More research is needed on legitimate cash usage, especially in the European context.

Part 4 details the impact, unintended consequences, and lessons learned from two recent cases involving cash restrictions – demonetization in India and capital controls in Greece.

Part 5 argues for the importance of money, and cash in particular, as a public good. Restrictions on cash proceed as if cash's only function is one of utility.

The multidimensional use and meanings of cash – for individuals, communities, and the global money system – tend to be taken for granted. What are needed in the current policy discussion are holistic and global approaches to cash and financial access; to the protection of identity, privacy, and personal control; and to the long-term stability and regulation of payment infrastructures as a public good that is accessible to all.

Key Assessments

Based on the preliminary view of evidence, this paper finds that a policy that targets cash alone is not only shortsighted; it also misidentifies the problem.

Cash is not a crime: re-framing the problem

Cash is definitely not the root cause of money laundering or terrorist finance, nor is it even one of the main culprits. Based on the existing literature and evidence, while cash may be used in money laundering and terrorist finance, so too are other means of payment, assets, and other modes of transforming and storing value. If anything, the process depends upon the use of multiple methods.

Differences between the cost and intent of money laundering vs. terrorist financing also call into question the effectiveness of cash restrictions as the main policy tool. Money laundering is focused on profit and disguising the origins of illegal or illicit funds. Terrorist financing more often involves the use of legitimate funds that are used toward violent attacks. Money laundering moves large sums while terrorist attacks can often be carried out at a low cost.

Cash exists side by side with a range of other tools. Restricting cash and cash payments:

- Displaces the issue onto other modes of moving value and instruments for making payments;
- Displaces the issue of illicit or criminal use from one jurisdiction onto other jurisdictions (where cash is still available and/or subject to different regulations).

With increased regulations stemming from anti-money laundering and counterterrorism financing, there is already a displacement from cash to alternative payment forms. In other words, targeting cash simply redistributes or displaces the issue onto other jurisdictions and other tools. Singling out cash when criminal activities depend upon multiple tools and methods is ultimately likely to fail in isolation of restrictions on other tools and methods used by criminals to move money and evade restrictions. The policy community must then weigh the economic and social costs of what would be wide-ranging control over all payment methods, even in the absence of cash.

A policy that narrowly targets specific cash denominations or institutes cash payment thresholds in one jurisdiction as the sole mechanism of combatting crime or terrorism will not succeed in addressing the multiple means of moving value within and across borders and distances. It can also not prevent the ways in which small and quotidian transactions may, at some later time, become a means of financing crime and terrorism.

Cash is data

- While cash may be an obstacle, it is also an essential indicator in the fight against financial crime.

For example, monitoring ATM withdrawal activity is a crucial source of evidence. Unusual amounts or frequencies in ATM withdrawals can be triangulated with time and location of withdrawals. Cash may leave few traces of the kind needed for establishing predicate offenses, but it nonetheless leaves a data footprint. Often, cash is the only data available in tracking illegal activities. It is the combination of different methods and channels, of which cash is just one part, that has so far been essential to the investigation of terrorist financing.

Cash is a public good

- In our current monetary system, legal tender – in the form of cash – is a public good that guarantees ease of use, accessibility, a certain level of privacy, and many other unique qualities.

While digitization of accounts has contributed to greater access to the formal financial system and facilitated more inclusive means of storing and sending value, it also entails problems and exposes people to new risks. Cash is an important safeguard against network failures, lack of electricity, or political turmoil on the one hand, and a potential limit upon governmental as well as market overreach into people's financial lives on the other.

Cash is complementary to the explosion of new payment forms as a check on continued limitations to privacy, freedom, and access. Cash has a proven ability to serve as a publically accessible utility, and this aspect should be taken seriously in the current policy climate. Cash is part of diverse social and symbolic practices that are not captured by narrow measures of its economic utility or opportunity costs.

Policy Considerations

In considering the “costs” of cash relative to other payment methods, policy considerations should:

- Adopt a more holistic view of the notion of “costs” and money as a “public good”;
- Keep in mind the broader infrastructures that make payments possible – environmental resources, electricity, connectivity, data storage, analysis, as well as different regulatory regimes around privacy and use (such as the necessity of mobile phone sharing in some contexts). For example, a household, or in some cases, an entire village in rural communities in Uganda or Kenya may share a single mobile device, while in places like Mexico and South America individuals might loan out or share financial instruments such as personal identification numbers or store cards with family members or trusted social networks;
- Take into account the global uses of cash, as well as specific national currencies. Territorial, regulatory, and cultural differences will continue to shape payment practices such that a policy shift entails implications not only for the currency area under focus, but its relationship to other currency communities.

1.0 A Preliminary Overview

Objectives

This white paper examines the current state of debate about – and evidence for – the links between cash, crime, and terrorism. Drawing from IMTFI’s accumulated expertise on monetary technologies, from cash to digital, it examines a range of institutional, legal, scholarly, policy, news media, and other sources to situate and understand this claim. What studies and data underlie the critical policy move of proposing to eliminate cash to address crime?

1.1 Introduction

Over the last decade there has been a revolution in payment technologies. Digitization of bank accounts, new digital payment applications, and an array of new kinds of financial products and services have opened up a wide range of choices for storing, saving, sending, and receiving money.

New digital forms of payment, such as the advent of mobile money in many parts of the developing world, have facilitated access to a means of sending, receiving, and accessing money for those who have otherwise been excluded from formal financial services because of lack of necessary identification or insufficient income. For many of those living in rural or remote areas with poor or uneven infrastructure, where banks are few and far between and the costs of accessing cash have been high, digital payment methods have offered empowering solutions. Digitization of accounts has been promoted because it is useful for reasons that include:

- Improved revenue collection;
- Faster, safer, and more efficient payments, especially across long distances;
- Data analysis of financial transactions (which can improve financial products and better meet consumer needs);
- Control over and access to money, especially for women;²
- Means of saving and investing for future needs;
- Immediate access to funds or credit (which can smooth consumption and provide liquidity);
- Flexible mobile communication tools that facilitate shared use and “creating and maintaining a verifiable identity.”³

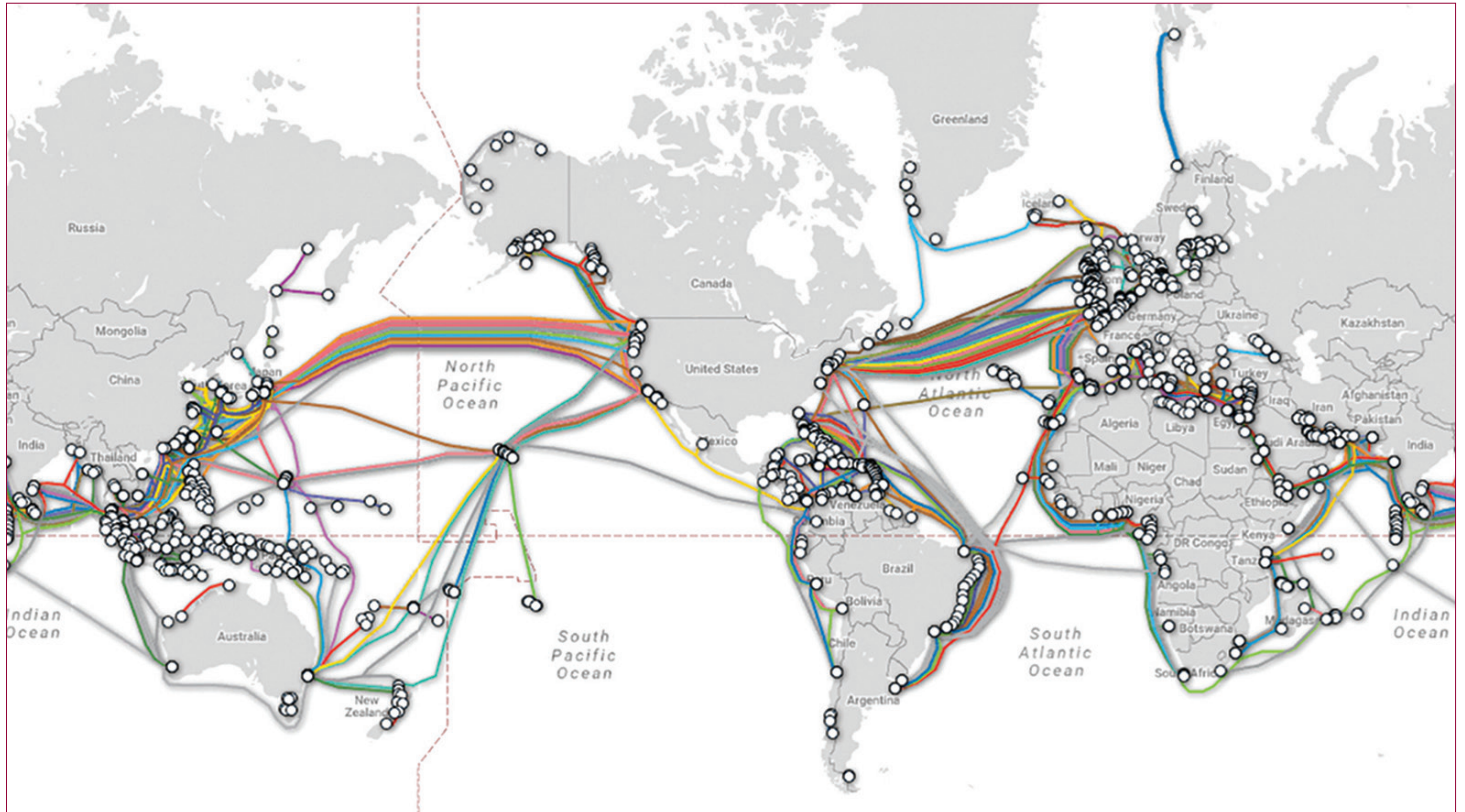
However, digitization of accounts also entails problems, and exposes people to new risks:

- All digital accounts require that behind each digital identity there is a corresponding physical identity, such as proof of a physical place of residence or identity documents, in order to be authenticated when setting up or accessing digital accounts;⁴
- When power outages occur or the system is down (which can happen through technical error or agent misuse/fraud), people lose trust in the reliability and safety of the electronic payment system;
- Digitization produces a visible, durable, and potentially trackable record of transactions, which may clash with other social and informal means of keeping accounts, tracking expenses, or protecting privacy;
- Digitization may reduce options for making payments or saving money through cash and alternative methods;
- Digital finance can impede the ability to save, especially where people still do not have access to banking services or where cash and other methods of saving and lending take place outside formal financial circuits, such as rotating savings and credit associations (ROSCAs)⁵ or table banking;⁶
- Access to a mobile or digital account depends upon PIN codes (and the ability to remember and store them securely); shared use of mobile accounts can pose a risk, especially to the innumerate, illiterate, disabled, and elderly;⁷
- Digital accounts are susceptible to hacks and malware; thus the increased safety/security of digital over cash is relative.

Infrastructural resilience will continue to be an ever-present challenge to a world of growing electronic and digital payments. Physical infrastructures such as electric wires, circuitry, climate-controlled server warehouses, and fiber optic undersea cable networks underlie the digital world of payments and information communication technologies.⁸ These infrastructures, upon which digital payments depend, can be susceptible to damage from humans or natural events, general wear and tear, and intentional or unintentional harm. For example, “ninety-nine percent of transoceanic data traffic goes underneath the ocean” through fiber optic cables, and disrupted or damaged cables have, in some cases, taken down the Internet in entire regions.⁹

Likewise, it is important to keep in mind that something as basic as a constant supply of electricity cannot be taken for granted. Electrical outages are frequent occurrences in many parts of the world. In India the average number of days (per year) lost to power surges or outages from the public grid was 67.15 days in 2006. In 2005, Greece experienced an average of 2.65 days without power while Albania lost more than 194 days that same year.¹⁰ Pakistan currently ranks number one on a list of countries most prone to financial losses due to power outages, with a loss of 33.8% of sales value.¹¹ In 2015, diesel fuel shortages shut down telecommunications services in Nigeria, with mobile telecommunications companies spending as much \$100 million annually to keep the network running.¹²

Cash also involves costs, environmental as well as social, but far less than a complete dependence on digital payments would entail, and cash does not require digital access through a third party in order to be used or accepted.¹³



Screenshot of undersea cable network of the Internet¹⁶

Source: TeleGeography Submarine Cable Map, last updated June 29, 2017
<https://www.submarinecablemap.com/#/>.

1.2 Cash diversifies risk

Evidence from both developing and developed payment markets shows that while digital payments may have increased exponentially, the demand for physical banknotes and coins has kept up with the pace of digital finance (see figures on euro cash and ATM withdrawals). In particular, digital payments have thrived because of the ability to move money by cashing in or out of one system to another and the ability to convert between cash and e-payment forms.¹⁷ Physical currency or physical accounting devices are ancient and cross-cultural technologies, in continuous use since at least 1600 B.C. Aside from risks and benefits, they are wedded to an incredibly durable set of behaviors and social practices.¹⁸

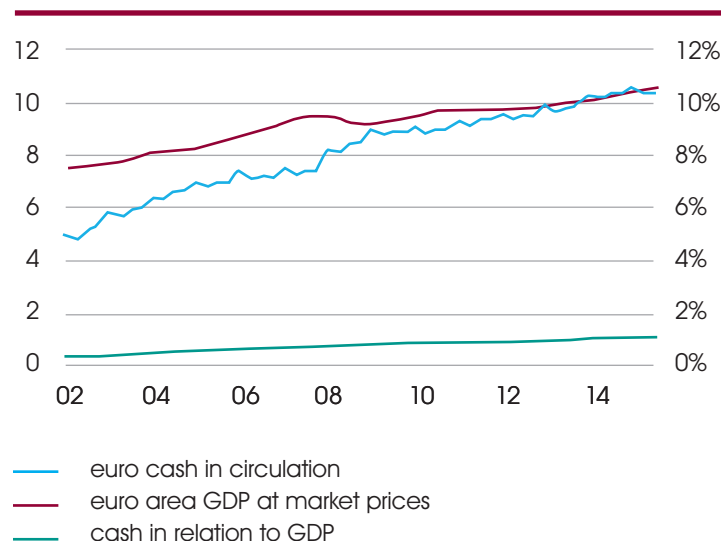
However, the ability to move between other payment forms and cash has also featured in criminal activities, including money laundering, tax evasion, and terrorist financing.

This has led government authorities, law enforcement, and other entities to target cash in particular as the supposed core method – and problem – in such activities. After the European Central Bank for example abolished the 500 euro note,¹⁹ the EU Commission proposed to institute a cash transaction limit across the EU, claiming that it will prevent money laundering, terrorism, and crime.²⁰

This paper will show in more detail that practices around crime and money and the raising of funds for acts of terrorism are quite different in scale and intent than a singular focus on cash allows. These diverse practices operate according to radically different value and payment thresholds and make use of multiple, often quite different methods of moving value.

Even before the rise and increasing importance of virtual and electronic forms of value transfer, cash has always been only one of many means for facilitating value flows, licit and illicit, legal and illegal. Increasingly, electronic forms of transmitting and converting value are just as essential, if not more so, in supporting criminal as well as terrorist activities.

Euro cash in circulation – more and more GDP and cash in EUR trillion (left) cash as a ratio of GDP in % (right)



Sources: ECB, Deutsche Bank Research

Source: Heike Mai, Cash, Freedom and Crime, Deutsche Bank Research 2016, p. 2., figure 1 (Used with permission). https://www.dbresearch.com/PROD/RPS_EN-PROD/PROD0000000000441785/Cash%2C_freedom_and_crime%3A_Use_and_impact_of_cash_in.PDF

ATM cash withdrawals (millions) by country 2012-2014

Country	2012	2013	2014	GR 13/14	CAGR 5Y
Austria	149.6	157.2	257.5	63.8%	11.3%
Belgium	420.1	429.1	347.5	-19.0%	-2.0%
Bulgaria	108.6	116.1	97.5	-16.0%	-1.3%
Croatia	94.8	97.2	106.9	10.0%	2.0%
Cyprus	14.8	15.1	17.7	16.9%	7.4%
Czech Republic	179.5	182.5	184.2	1.0%	2.0%
Denmark	16.3	14.4	13.3	-7.6%	-6.9%
Estonia	41.2	40.1	38.9	-3.2%	-3.6%
Finland	158.3	151.4	145.1	-4.1%	-4.4%
France	1,661.9	1,646.8	1,605.7	-2.5%	-0.5%
Germany	2,127.6	2,116.4	2,657.1	25.5%	5.4%
Greece	190.2	181.4	197.8	9.1%	0.2%
Hungary	124.9	117.5	112.8	-4.0%	-16%
Iceland	4.8	4.5	4.4	-4.2%	-12%
Ireland	179.9	192.3	133.2	-30.7	-7.8%
Italy	747.3	798.9	954.9	19.5%	12.1%
Latvia	51.2	53.3	56.5	6.0%	2.8%
Lithuania	67.7	68.3	67.7	-0.9%	0.8%
Luxembourg	15.9	15.1	15.6	2.8%	19.2%
Malta	13.0	13.2	11.1	-16.0%	-0.4%
Netherlands	438.9	414.5	391.8	-5.5	-3.6%
Norway	73.3	66.8	55.7	-16.6%	-8.9%
Poland	747.7	770.4	759.0	-1.5%	2.5%
Portugal	450.0	452.9	455.6	0.6%	0.0%
Romania	229.4	232.5	225.9	-2.8%	1.1%
Serbia	65.8	71.5	74.4	4.1%	8.1%
Slovakia	90.6	90.7	89.6	-1.2%	-0.7%
Slovenia	59.9	57.3	57.3	0.0%	-1.0%
Spain	928.2	901.1	905.0	0.4%	-1.8%
Sweden	207.0	209.0	214.0	2.4%	-3.7%
Switzerland	128.2	130.4	131.5	0.9%	1.8%
Turkey	970.9	1,036.4	1,109.0	7.0%	8.1%
UK	2,915.0	2,899.0	2,830.0	-2.4%	-0.6%
Euro area	7,689.5	7,671.9	8,318.8	8.4%	2.3%
EU28	12,320.5	12,439.0	12,916.5	3.8%	1.4%
Total	13,672.3	13,743.2	14,323.9	4.2%	1.7%

Nowadays, it is the easy conversion of value, the changing back and forth from virtual and other forms of value to cash and vice versa, that enables value to cross borders and wide distances quickly. Cash is certainly a part of this. By this token, however, the international transfer of electronic funds is just as central, if not more so, in the movement of money for illicit or illegal purposes. One could just as easily target international money transfers and the virtual transfer of value through global payment networks as the means to restrict the potential to misuse or abuse funds. Given that cash is bulkier and more logistically constrained, why not single out the channels and methods through which value can move often instantaneously?

But this, too, would be a weak argument given that it wrongly assumes a cause-and-effect relationship between the monetary instrument or channel and a specific wrongful use.²¹

A policy that narrowly targets specific cash denominations or institutes cash payment thresholds will not succeed in addressing the movement of value across borders and distances as a means of financing crime and terrorism.

ATM cash withdrawals (millions) by country 2012-2014

Source: "European Payment Cards Yearbook 2015-2016" reproduced from table featured in Joyrene Thomas, "The War on Cash, Payments Card and Mobile". Last accessed February 9, 2017. <http://www.paymentscardsandmobile.com/the-war-on-cash-2/>.

Note: Figures are for cash withdrawals from ATMs located in the country with both cards issued in the country and foreign cards; cash withdrawal at POS is not included; Denmark series is for ATM use of foreign-issued cards only. Source: ECB, BIS, national central banks and payment companies.

1.3 Cash is not a crime

Because of the advances in digital payments, the easy solution to the problem of criminal finance appears to be the restriction or even elimination of cash payments. There are two main problems with this approach, one jurisdictional (spatial) and the other relational (across payment forms).

- Targeting cash in one jurisdiction displaces the issue of illicit or criminal use onto other jurisdictions (where cash is still available and/or subject to different regulations). In order for the targeting of cash to be effective, a global strategy would be necessary (i.e. a proposal to restrict cash around the world). Even more so, you would need a global strategy on fighting crime and terrorism, as cash is definitely not the root cause for these problems nor is it even one of the main culprits;
- Targeting cash also displaces the issue onto other modes of moving value and instruments for making payments. People use diverse payment methods (from cash, to cards, to digital payment applications and other alternatives together). Cash exists side by side with a range of other tools. Even if cash were removed it would not impact the larger problem at hand: the illicit or criminal use of payment tools.

Current EU proposals to legislate harmonized restrictions to cash payments do not resolve the problem of jurisdiction between the EU and other territories, nor the continued use of multiple payment tools within the jurisdiction of the EU.

A recent IMF Working Paper on “de-cashing”²² touches upon the jurisdictional implications of proposals to move away from cash, suggesting that a global cash-free zone is possible and within reach. But current evidence shows that we are very far from that reality.

The goal of financial inclusion is to ensure access to a transaction account as a “first step toward broader financial inclusion” by enabling people “to store value and send and receive payments.”²³ According to recent estimates, more than 2 billion adults do not have a bank account.²⁴ In the U.S., a 2015 FDIC national survey determined that as many as 15.6 million American adults (people 16 years and older) did not have bank accounts, with an estimated 51.1 million additional adults falling into the category of underbanked (defined in terms of household account ownership but reliance on alternative financial services and products “outside the banking system,” such as check cashing outlets, payday lenders and pawn shops).²⁵ In Europe, an estimated 139 million adults do not have access to basic financial services.²⁶

Even in the context of rising uptake in mobile payment options in many parts of the so-called developing world, there remain significant differences in where these services take off or fail, in how they are designed, rolled out, regulated, and made interoperable (or not) with other political, legal, and symbolic infrastructures across payment cultures and localities.²⁷

Research such as the IMF working paper does not sufficiently take into account the many issues around diverse payment forms and how these figure within the contemporary as well as future payments landscapes.

Targeting cash simply redistributes or displaces the issue onto other jurisdictions and other tools. If one tool is restricted (or banned) in one jurisdiction, either the other tools still available within that jurisdiction or the availability of cash elsewhere will take over.²⁸ Just as people in a cash-restricted EU would still have non-member Norway as an access point to cash, people across the globe would still have Western Union, where digital money from

the EU could be withdrawn elsewhere in the form of local currency, as cash. By some accounts there has already been a shift in demand from the 500 euro note to the 100 U.S. dollar and the 1000 Swiss franc, which some see as a response to the ECB's recent directive to abolish the 500 euro note.²⁹

In the U.S. and the EU, a greater percentage of cash is held outside the currency area, often in large-denomination notes. For example, Ruth Judson, a staff economist at the Federal Reserve in New York explains that the value of U.S. currency in circulation, by denomination, is dominated by \$100 banknotes. "At the end of 2016, U.S. currency in circulation totaled about \$1.5 trillion, of which nearly \$1.2 trillion, or nearly 80 percent, was in the \$100 denomination."³⁰

At present, then, despite the optimistic claims that a global cashless future is just around the corner, many proponents of the shift admit this is still a long way off.

Indeed, the focus on cash may distract from far more urgent issues in regard to financial crime. For instance, a 2016 global survey by PWC on economic crime showed that asset misappropriation and cybercrime are at the top of the list in most reported types of crime (64 and 32 percent respectively), with money laundering at 11 percent in the years 2016 and 2014.³¹

Despite the fact that cybercrime is the second most reported crime on the list, the PWC report warns that many organizations are not sufficiently prepared or proactive in dealing with cyber vulnerabilities: "Only 37% of respondents – most of them from the heavily regulated financial services industry – have a fully operational plan. Three in ten have no plan at all, and of these, nearly half don't think they need one."³²

Given the scope of the issues, what are other ways to address financial crime?

Key issues around the regulation, stability, and security of digital payments in relation to efforts to address financial crime include:

- Identity;
- Privacy;
- Value storage;
- Choice in making payments;
- Data ownership, use, and access;
- Legal and consumer protections;
- Impact on informal economic practices and the shadow economy.

Another critical issue is compliance and enforcement.³³ In many cases of money laundering and financial crime, there are one or more individuals inside financial institutions, accounting firms, and real estate that assist in the criminal activity by circumventing transaction thresholds or reporting requirements or altering data and accounts. The solution to this problem is not taking cash out of the equation, since even digital and paper records can be altered, destroyed, or not prepared in the first place.³⁴

In summary, setting upper limits for cash payments or restricting its use altogether misidentifies the problem. One size does not fit all. Singling out cash when criminal activities depend upon multiple tools and methods is ultimately bound to fail in isolation of restrictions on other tools and methods used by criminals to move money and evade restrictions. The policy community must then weigh the economic and social costs of what would be wide-ranging control over all payment methods, even in the absence of cash.

2. Money Laundering and Terrorist Financing

Money laundering and terrorist financing involve the movement of money across different jurisdictions and exploit the differences in regulatory and payment infrastructures.

The current literature on money laundering and terrorist financing, often case-based in approach, outlines and emphasizes the relationship between and reliance on multiple methods, instruments, and contexts necessary for moving money, disguising the origins of illegitimate funds and/or intended use.³⁵

Money laundering and terrorist financing make use of similar instruments and methods.

Cash is one of many instruments used. While cash figures prominently at some stage of criminal activity, there are cases where it does not figure at all.³⁶ Other payment methods (such as credit card fraud, cybercrime, stored value cards, virtual currencies, offshore accounts) can figure just as prominently.³⁷ Some measurements exist on the relative use of these different methods and the role each plays in a layered process – though often with the caveat that measures are not entirely reliable due to the nature of the activities. Cases comprise various degrees of complexity.

Instruments are not easily separated from the methods of moving money, which are, in turn, often context-specific. In the literature on money laundering, moving, converting, and disguising illicit funds are broken down into three phases: placement, layering, integration.

Understanding the composition of payment forms in both money laundering and the financing of terrorism attacks is most often retrospective.³⁸ With regard to terrorist financing, studies note the immense challenges in: 1) estimating costs or reliable data on the financial composition or value of activities; 2) predicting potential attacks due to the small amounts in question. Because the transactions are small and routine in nature, they serve as poor indicators of a potential intent to fund terrorist activities, when viewed in isolation.

Much of the literature does not treat cash in isolation but takes a more holistic approach (focusing on, for example, money laundering cycles and/or interplay of different methods). In the retrospective analyses of specific cases it is indeed the interplay that stands out even when cash is in the mix, which adds weight to the evidence that an exclusive targeting of cash is a weak foundation for effective policy measures.

There is in fact an increasing use of new payment methods and their implications for cybercrime and terrorist financing are growing in importance.³⁹ Other targets of debate include prepaid or stored value cards, virtual currencies such as Bitcoin, and (of recent concern) transaction laundering – a new means of money laundering via online businesses and payment processors. These are discussed in more detail below.

By highlighting the prevalence (or potential misuse) of other payment methods in criminal activities or terrorist financing, the intention is not to suggest that the policy solution will be found by targeting any one payment tool. The focus on one payment instrument alone and even its potential elimination will have little to no impact. Rather, one has to look at the mix and the interplay of payment modes, with digital and alternative payment methods taking up an increasing share in the mix. Greater emphasis on high-denomination notes or high-value luxury goods to the exclusion of others may lead policy makers and analysts to overlook other dimensions of financial crime or terrorism financing hidden in plain sight. Small cash denominations might be preferred to less fungible high-denomination notes, just as mundane low-value goods can be the “vehicle” of choice for money launderers.

In fact, regulatory and compliance issues, problems of information sharing, or access to and use of data are just as central to the problems entailed by money laundering and terrorist financing, regardless of payment instrument or method. Restricting or eliminating cash would not address these multiple policy dimensions.

Emphasizing high-denomination notes or high-value luxury goods to the exclusion of others may lead policy makers and analysts to overlook other emergent dimensions of financial crime or terrorism financing.

2.1 Differences between money laundering and terrorist financing

In the literature on methods and sources of terrorist financing, key differences are noted that distinguish it from money laundering in intent and cost.⁴⁰

The practice of including money laundering and terrorist financing under the same regulatory umbrella extends as far back as 2001, in early formulations of the Financial Action Task Force (FATF).⁴¹ As Hamid Tofangsaz, who specializes in criminal law and terrorist financing, notes, this approach has been the subject of debate, because it assumes that terrorist groups are by default committing criminal acts before they commit an act of terrorism, which in fact, may not be the case. For example, up until the moment of attack, the raising and distribution of funds may occur legally, raising no red flags and indeed providing no evidence of intent. By proceeding as if the intent and methods of terrorist financing are the same as money laundering activities, important differences are missed that require substantially different policy and regulatory approaches.⁴²

The general intent behind money laundering is profit and disguising (distancing from the origins of) illegitimate funds. Therefore an important policy factor is the transaction costs money launderers face in deciding which methods to use, and large amounts are often at stake.⁴³

In contrast, the intent behind terrorist financing is one of targeted damage, not profit per se. While terrorists can and do engage in criminal activities, funds are often raised legally, through a variety of means, whether as individual wages or social benefits, or through legitimate business activities, investments, or charitable foundations.

The costs to fund individual attacks tend to be low, and the amount and methods of making financial transactions are often indistinguishable from legitimate day-to-day financial flows. Small amounts usually fall well below current payment thresholds that require reporting.

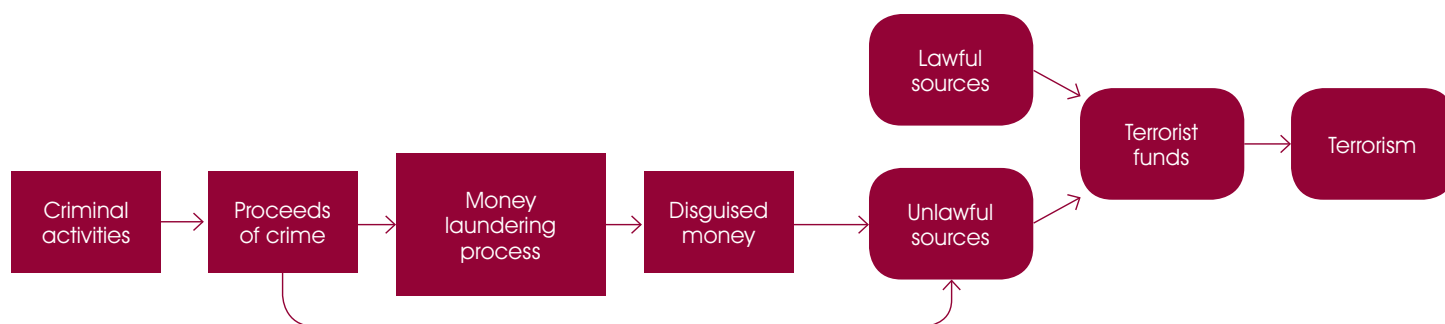
For instance, EU nationals have carried out recent terrorist attacks such as the one in Paris in 2015.⁴⁴ Funds may come from the dispersal of social benefits or an individual's own savings or resources, so that preparations for the attack would not alert authorities. However, one also needs to distinguish between the "costing decisions" of different terrorist groups, many of which are able to operate at a completely local level and where attacks are also local, such that counter-terrorist financing regimes focused on international flows have little impact.⁴⁵

While cash is in the mix of payment methods, whether through payment for daily subsistence or cash smuggling, the formal financial system is often needed to collect, invest, and distribute funds, through bank accounts, loans, wire transfers, and small consumer or student loans or used car leases. Sometimes, money does not move at all, as in the case of informal value transfer systems such as hawala, which has come under intense scrutiny because of its use in terrorist financing activities, with or without the knowledge of the money service business owner.⁴⁶ In this ancient money transfer system, the initiation of the transaction takes place in one country through an intermediary and is paid out by a second intermediary to the beneficiary upon receipt of an agreed upon code.⁴⁷ Accounts between the corresponding agents are settled later, often through

in-kind transfers of money, services, and trade receipts or invoices that do not require concrete cross-border monetary flows. There are often no precise data on which specific sources or methods are generally most important in financing terrorist activities, and the prioritization of one over others is context specific.⁴⁸ State-sponsored terrorist groups, as well as groups occupying territories, will also extract resources locally through taxation, theft, kidnapping, and ransom and may also be well-connected and adept at using the formal financial system.⁴⁹

When analyzing terrorist financing, different typologies and methodologies are needed from those allowed for within an anti-money laundering regime because the motives behind participation in terrorist activities and organizations differ from those engaged in money laundering. For instance, in cases of terrorist financing, "the principal crime (terrorism) has not been committed or even attempted yet" with no clear link between funds and activities.⁵⁰ Whereas in money laundering activities the methods and tools of placement, layering and integration are oriented around the legitimization and accumulation of funds, the aim of terrorist financing is one of getting legitimate funds to terrorists "on the ground." The problem is not how to disguise the origin of funds to accumulate profits but rather how to move money for the purposes of distribution.⁵¹

An illustration of how terrorist financing can be processed



Source: Diagram by Hamed Tofangsaz, "Rethinking terrorist financing; where does all this lead?" *Journal of Money Laundering Control*. 2015. 18(1): 121. <http://www.emeraldinsight.com/doi/abs/10.1108/JMLC-12-2013-0049>. Used with permission.

These differences matter for enforcement as well as legal reasons, because methods of deterrence for money laundering will have little effect on the methods and intents of financing terrorism and may even interfere with international mechanisms for legal recourse and cooperation.⁵²

An approach that targets only one of many possible payment forms or ways to move money may hinder rather than aid in the prevention of terrorism. Moreover, the framing of the problem in terms of singling out one instrument over all others risks assuming stasis and non-adaptability, when in fact terrorist organizations and individuals will continually strategize about which payment forms and methods of acquiring, converting, moving, and disguising money are most relevant. As the examples below will show, terrorists must adapt their ways of financing in a changing regulatory, policy, and payments landscape.⁵³ The existing Anti-Money Laundering (AML) / Counter Terrorist Financing (CTF) reporting regime⁵⁴ for bank transfers and other financial flows has led to both legitimate and criminal interest in using new and alternative payment means like crypto-currencies, and the use of other online methods to move money anonymously. The use of the Internet and social media platforms to raise funds has also grown in importance.⁵⁵

A kind of payment mapping around cash use is indeed central to investigative efforts to link and put in context otherwise isolated transactions that make possible the funding and execution of terrorist incidents.⁵⁶ An excellent example is the study by Normark and Ranstorp based on analyses of financing methods used by 40 jihadi cells.⁵⁷ They show why the diversity and interplay of financing methods is more important than a reliance on a single object or method. They caution against the idea that law enforcement could develop a single indicator based on cases of terrorist fighters' financial activities, which are "designed to appear routine."⁵⁸ Anomalies are only visible by considering the "combined account activity."⁵⁹ Drawing from a 2015 BBC article,⁶⁰ the authors describe a scenario of detecting a pattern by reading various indicators of the financial trail including the combined account activity of using ATMs in jihadi-gathering locations, having a consumer loan in arrears or in default, receiving an unusual number of typically small payments that might be from supporters or donors, or holding a student loan despite not attending classes.⁶¹

An approach that targets only one of many possible payment forms or ways to move money may hinder rather than aid in the prevention of terrorist financing.

Mapping terrorist finance (author's summary rendition)

Methods

- Cash couriers;
- Informal transfer systems (hawala);
- Money service businesses;
- Formal banking;
- False trade invoicing;
- High value commodities.

Movement of funds

- Bulk cash transfers;
- Regulated and unregulated alternate remittance systems;
- Cash smuggling;
- Wire transfers.

Financial flows (legal)

- Salaries;
- Mobile phone;
- Companies;
- Remittances;
- Real estate;
- Donations to charitable businesses.

Financial flows (illegal)

- Counterfeit goods;
- Trafficking;
- Financial fraud;
- Trade in precious commodities.

Transaction methods

- Banking services and international financial system;
- MSB Money service businesses;
- Used for "sequencing" – breaking down amounts into multiple/ sequential transactions below the threshold which would require mandatory reporting;
- Smurfing or proxy techniques to avoid detection;
- Cross-border transfers and withdrawals;
- Hawala networks;
- Cash couriers;
- Social media transactions (crowdfunding; secret chats);
- Use of bitcoin, crypto-currencies darkweb/darknet.

Source: Magnus Normark and Magnus Ransorp, "Understanding Terrorist Finance: Modus Operandi and National CTF-Regimes." Swedish Defense University Report, December 18, 2015.
http://www.fi.se/contentassets/1944bde9037c4fba89d1f48f9bba6dd7/understanding_terrorist_finance_160315.pdf/.

Like Tofangsaz, Normark and Ranstorp argue that, “[t]here is no one-size-fits-all typologies [sic] that will solve the issue of detection of terrorist finance.⁶² Yet it is important to combine many different indicators in different scenarios.”⁶³ They go on to provide a list of indicators, from mapping the use of ATMs and Money Service Businesses in key border areas, to account activity (frequent withdrawals or dormant), account use, credit or loan activities.⁶⁴ It is “important to combine different typologies together with an in-depth understanding of the geography of FTF (foreign terrorist fighters) border areas and processes of transferring funds through legal and illicit means. . . . Terrorists are increasingly using new innovative ways with new technologies that provide infinite possibilities to generate and transfer financial funds.”⁶⁵

As this account exemplifies, it is the combination of different methods and channels, of which cash is just one part, that has so far been essential to terrorist financing and to its investigation.⁶⁶

In this sense, then, cash is data.⁶⁷ While it may be an obstacle, it is also an essential indicator in the fight against financial crime and efforts to analyze the process of raising funds for terrorist attacks. Monitoring ATM withdrawal activity is a crucial source of evidence.⁶⁸ Following unusual amounts or frequencies in ATM withdrawals can be triangulated with time and location of withdrawals. Cash may leave few traces of the kind needed for establishing predicate offenses or the identity of users, but it nonetheless leaves a data footprint. Often, cash is the only data available in tracking illegal activities.

For example, from the standpoint of assessing the actual costs of the component parts of organized criminal activities – measures extraordinarily difficult to come by, according to Peter Reuter, leading expert on financial crime – cases of cash smuggling in the drug trade can yield invaluable evidence.⁶⁹

From the vantage point of the security features built into physical cash itself, from serial numbers to anti-fraud features, cash is an indispensable investigative tool that can be used to track the origin and movement of money back to cases of bank theft, money laundering, or fraud. Analyses of particular patterns and features of counterfeit notes also facilitate investigation into specific counterfeiters or counterfeiting operations, which can also lead to the discovery of other crimes.

Moreover, as the sole issuer of physical legal tender, central banks collect a variety of data on cash movements through the regular banking cycle, from banknote issuance to replacement of old and worn banknotes. In comparison, generally there is no consolidated data on the digital and mobile flows of money,⁷⁰ which directly contradicts the reasoning behind targeting cash alone.

To summarize, one key takeaway from the broad discussions about terrorist financing in particular is that cash payment restrictions would have little to no effect on the existing array of methods of raising funds. And because the crime does not precede the act, a policy orientated solely around cash would be unable to predict or prevent an impending terrorist event.

Restricting cash payments with the intent to anticipate terrorist activities also entails the criminalization of legitimate payment activities or the uneven application of surveillance to some individuals or groups over others, with the potential for discriminatory effect.

Differences between money laundering activities and methods of terrorist financing suggest that different policy targets are needed and require much more than the restriction of cash to be effective. What can other forms of moving money reveal about a more holistic approach to financial crime?

2.2 Examples: moving money, alternative forms of financial crime and fraud

Restricting cash payments entails the criminalization of legitimate payment activities.

Other targets of concern have arisen with the rise in digital and online payment forms. These are increasingly attractive to money laundering and other forms of financial fraud.

Non-cash payment methods are used in ways that mimic the qualities ascribed to cash, such as anonymity, capacity to disguise origins of funds and/or users, lack of data trail or link between purchaser and user, ability to be used by the bearer of the instrument, or access to the account(s).

Three examples – stored value cards, Bitcoin/virtual currencies, and transaction laundering – will be explored as a means of illustrating the fluidity of shifting from one payment medium to another (and back). Given the prevalence of using multiple channels for moving money and the constant search for new ways to hide the origins and intent of such movements, it will become clear how a restriction of one means of payment is more likely to shift misuse onto others rather than preventing misuse.

a) Stored value cards and prepaid instruments

The use of stored value cards, not only for fraud, but more recently in terrorist attacks in Paris,⁷¹ and in moving funds from Australia to Syria and other conflict zones in the Middle East,⁷² is raising concerns about the future of this payment tool. There is now a proposal to widen the definition of cash to include these currently “non-cash” payment forms.⁷³

Stored value cards (SVCs) come in different types. Closed loop cards include loyalty, reward, or store branded cards that are limited in use. Some cards are linked to a centralized accounting system, while for others the value is recorded directly on the card. Open loop SVCs (branded with the Visa or Mastercard logo) can be used anywhere that credit cards are accepted, up to the stored value, and can also be re-loaded. Some require registration and others do not. The card can be purchased with e-payment forms as well as cash. Because these cards are not tied to an individual user, they can be purchased and loaded with value by one person and used anonymously by others. It is more and more common for wages or social benefits to be loaded onto stored value cards. Some cards can be taken across national borders, while others are limited to use in the country of purchase. There are often upper limits to the value that can be loaded on the card and thresholds below which identification is not required.

Due to the small value and payment thresholds, these cards fly below the reporting radar. In the case of the Paris attacks, stored value cards were legally purchased by EU citizens and did not raise suspicion. Because stored value cards afford the anonymity of cash (since names are neither on the card nor required when making purchases below a set limit), but are also more portable than the equivalent value in physical cash, activity that might otherwise have occurred with cash has moved to this new payment form.⁷⁴ Not unlike cash, these cards have become very popular for gift-giving occasions in the U.S.⁷⁵ Restrictions on the use of these cards may shift gift practices back onto cash.

b) Virtual currencies, including Bitcoin - potential uses in terrorist financing

There is limited evidence of use of virtual currencies in existing studies of terrorist financing. Studies that examine the potential uses of digital alternative currencies in raising funding and moving money for terrorist purposes are somewhat speculative in nature. But the use of virtual currencies, including Bitcoin, has been documented.

As cybersecurity experts Angela Irwin and George Milad have pointed out in their examination of potential risks posed by crypto-currencies in the financing of terrorist activities, there is evidence that the Islamic State (IS) and other terrorist entities are engaged in efforts to learn more about alternative payment forms such as Bitcoin as a way of circumventing the risks of cash smuggling as well as being subject to anti-money laundering and counter-terrorist measures when using the formal financial system.⁷⁶ While informal hawala systems have been important, the authors point out that traditional hawala transactions “are inefficient for the collection of funds from multiple sources and disbursement of those funds onwards to geographically dispersed endpoints. Hawala can also slow down the process of funding, planning, and implementing attacks because it can be difficult to find intermediaries who can be trusted to transfer funds without informing authorities of suspected illicit activity.”⁷⁷

These studies test the use of these alternatives in terrorist activities because, like cash, Bitcoin and other similar virtual currencies offer some anonymity. They are decentralized currencies, not managed by a central bank or another third party. While there is a record of each transaction on the distributed public ledger (that cannot be altered), the identity of the transactor(s) is not visible and can usually only be determined if disclosed.

There exist some limited means of linking transactions to the buyer or seller. But similar to cash, Bitcoin ensures a high degree of anonymity. A more detailed explanation of how Bitcoin works, how it is obtained using a Bitcoin wallet, and the methods of buying and selling Bitcoin can be found in the article, which, importantly, is a risk-modeling exercise rather than a description of an empirical case tied to terrorist activity.

Methods for selling Bitcoin online (author's summary)

Direct Trade

- With an individual or intermediary;
- Users must register as a seller and provide ID verification.

Online Exchange

- With an exchange, not an individual;
- Some ID required;
- Sales in exchange for fiat currency dispersed via bank account;
- Multiple payment methods possible;
- Layering possible, allowing for origin and receiver of funds to be obscured.

Peer-to-Peer Trading Marketplaces

- Goods can be exchanged for Bitcoin via credit or debit cards;
- Matches requests to sell Bitcoin with matching amounts for goods; the exchange acts as an intermediary.

Source: Angela S.M. Irwin and George Milad, “The Use of Crypto-Currencies in Funding Violent Jihad.” *Journal of Money Laundering Control*. 2016 19(4): 413-414.
<http://www.emeraldinsight.com/doi/abs/10.1108/JMLC-01-2016-0003>

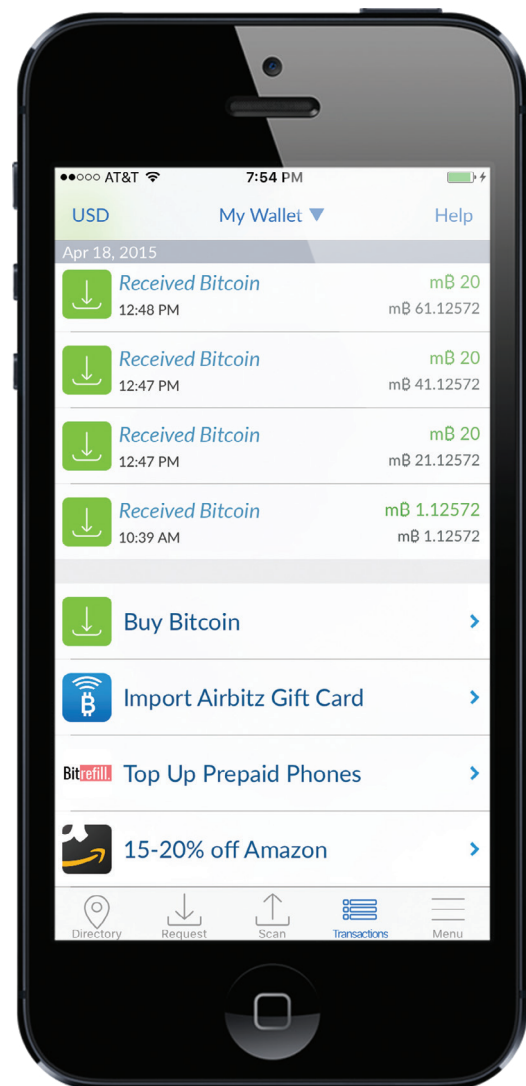
Bitcoin is appealing as a means for raising or moving funds for terrorist activities, but only insofar as the Bitcoin that is purchased is convertible into fiat currency from one jurisdiction to another.⁷⁸ This can be done with trusted individuals, face-to-face exchanges via a third party website or service, or with Bitcoin ATMs (which can be cash-to-Bitcoin or two-way machines). The authors describe how some of these methods of converting are hypothetically susceptible to raising or moving funds for terrorist activities.

In particular, the use and even purchase as well as set-up of two-way Bitcoin ATMs in territories that are less compliant with AML/CTF reporting measures can facilitate, according to the authors, an easy means of raising and converting a substantial amount of funds via Bitcoin. Other methods, such as the use of “dark wallet” services with a Tor browser, offer “complete anonymity.”⁷⁹

The purpose of Irwin and Milad’s ongoing research on the potential uses of Bitcoin in terrorist financing is to raise questions about issues of feasibility, anonymity, and patterns of transactions in moving money. They also look at the extent to which the movement and layering of funds afford openings for those activities to be traced (such as “the beginning and endpoint of transactions” at points of conversion to/ from fiat currency) or points at which anonymity might be lost.⁸⁰

More recently, a report by the Center for a New American Security (May 2017) confirms that there is only anecdotal evidence, also what the FATF found, that virtual currencies are being used to fund terrorist activities.⁸¹ In contrast to cybercrime activities where the use of Bitcoin and other virtual currencies has become more pronounced, the technological complexity and infrastructural requirements needed for use and convertibility are generally not present in many of the territories where various terrorist organizations are operating, thus making it less attractive as a means for moving money in financing terrorism.⁸² One of the reasons for its rise in cybercrime is the ease with which virtual currency can be used to purchase equipment or technology from other actors within criminal networks,

Screenshot of the author's Bitcoin Wallet



Source: Image by Ursula Dalinghaus.

without the need to convert it to cash or e-money.⁸³ In contrast, convertibility to local fiat currency is an important criterion in getting funds to terrorist groups on the ground. Because the use of virtual currencies, including Bitcoin, has not reached the scale or level of trust to facilitate widespread use, it is so far not at risk in being abused, though the report lays out an analysis predicated on a future potential misuse. The report argues that the innovative potential of virtual currencies is at risk of being undermined by the costs of compliance and lack of cooperation between governments, financial institutions, and law enforcement and intelligence communities.⁸⁴

One key takeaway from this report in relation to debates on cash and crime concerns the very fine line between legitimate and illegitimate use of trusted monetary tools, suggesting that the criminal abuse by a few should not outweigh the legitimate use by many and that what is needed going forward is a more balanced regulatory environment for cash, e-money, and virtual alternatives.

c) Transaction laundering - merchant acquirers, payment processors, and third party risk⁸⁵

Recent reports have flagged transaction manipulation as the new virtual form of money laundering. Transaction laundering involves setting up online businesses – legitimate businesses, but also fronts for the sale of counterfeit goods, drugs, or other illicit and illegal services – and accessing various points in the payment ecosystem to move money, disguising the origin and nature of the activities through the fraudulent use of third-party merchant payment processors. Some call this the new and virtual form of money laundering, but with far less possibility for detection than conventional techniques.

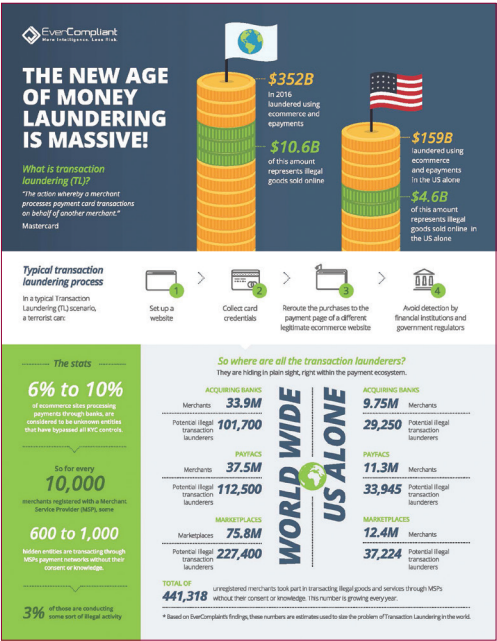
The cyberintelligence technology company EverCompliant, argues that the fraudulent use of e-commerce is a blind spot to current AML and KYC (Know Your Customer) regimes, because these are not set up for the new realities posed by “digital entities” that often have few or any ties to a physical storefront or business.⁸⁶

Criminal abuse of cash by a few should not outweigh the legitimate use by many.

Much of what is known about the details of these activities is through cyber security and intelligence companies such as EverCompliant (noted above) and G2 Web Services, who offer proprietary software solutions to merchant acquirers and payment processors.⁸⁷ Notably, EverCompliant has recently been featured in the May 2017 Nilson Report in an article on the use of fraudulent card payments and merchant card processing services for money laundering and terrorist finance.⁸⁸ According to the report, funds for the 2015 Charlie Hebdo attack in Paris were raised in part through an online merchant selling counterfeit Nike shoes.

In contrast to moving physical cash, transaction laundering offers anonymity and ease. Online businesses are easy to set up and by some accounts, dozens at a time can be used as a front for processing and laundering funds from the sale of illegal services and goods.⁸⁹ The opening occurs because all online merchants need a means for accepting and processing payments. Banks that provide merchants with accounts, known as “acquiring banks,” are responsible for performing due diligence on the underlying business. They also act as the gateway for communicating the transaction data in a transmission chain extending to payment processors and on to a customer or client’s issuing bank over payment rails (for example, the branded Visa or Master-Card networks), ultimately culminating in a final settlement of the payment transaction.

Because of the sheer volume of payment transactions and the variety of entities involved in payments processing, criminals have found ways to use the payment system itself to acquire, disguise, move, and legitimize funds, with even less risk of being caught when compared to handling cash.⁹⁰



Source: EverCompliant Infographics, Data for the Global market. Used with permission.

According to EverCompliant, "ecommerce and mobile payments have essentially enabled money laundering on a never-seen before scale," displacing traditional money laundering methods in favor of borderless, virtual storefronts:

Making illegally-gained proceeds appear legal through the use of a storefront is money laundering by definition. Transaction laundering works based on the same principle. By processing illegal transactions through a storefront merchant account, criminals kill two birds with one stone – they remove the money from its source, while at the same time place the previously laundered money back into circulation, making such monies appear to be normal business earnings. Creating multiple layers of complexity as a way to obscure the real origin of funds and to hide the identity of the real beneficiary of a certain transfer is the main goal of transaction laundering. By creating vast networks of interconnected online entities, criminals can easily separate the true source of funds from the transaction, and thus are able to circumvent anti-money laundering checks and measures without setting off regulatory alarms. This makes the trailing of illegal proceeds extremely difficult for the law enforcement agencies and regulatory bodies.⁹¹

Ron Teicher, the founder and CEO of EverCompliant, says that "six to ten percent of businesses accepting credit card payments are hiding their true identity from the banks and credit card companies that process their transactions. The banks and credit card brands have absolutely no idea who and what these businesses are, and they don't even know what they don't know."⁹²

In this excerpt from a G2 Web Services White Paper, "Cleaning out Transaction Laundering," which is aimed at an audience of acquiring banks and payment service providers, one can nonetheless get a sense of the potential scale and complexity of the issue in this visualization of the multiple pathways through which fraudulent use can enter the payment ecosystem (see figures 1a and 1b, and text box on page 31).⁹³

Importantly, in the shift to online forms of money laundering, it is the "low-risk merchants" that may figure most prominently.⁹⁴ While law enforcement and compliance have traditionally focused on the linkages between high value goods and fraudulent activities, it is in fact the mundane categories of consumer goods that may present the most opportunity to be exploited in organized financial crime.



How transaction laundering uses the payment system

Figure 1a

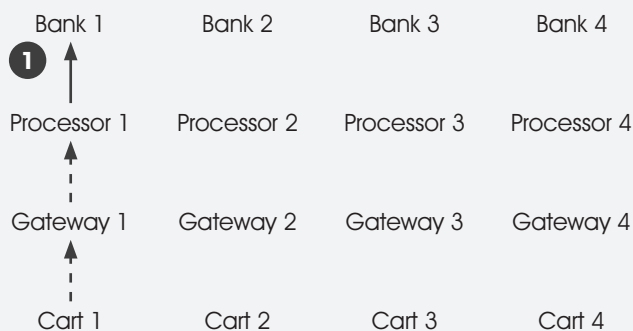
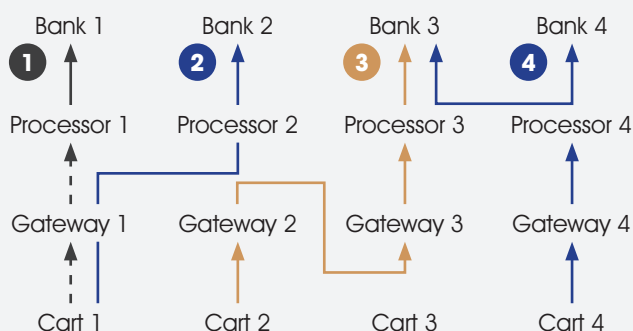
Payments enter the system in numerous paths (a)

Figure 1b

Payments enter the system in numerous paths (b)

Source: Dan Frechtling and Gavin Andrews, "G2 Web Services, White Paper: Cleaning Out Transaction Laundering: A Guide for Risk and Compliance Leaders". Accessed March 2016. Used with permission. <http://www.g2webservices.com/cleaning-out-transaction-laundering/>.

Why transaction launderers are cunning

Transaction Laundering is hard to root out for two reasons. First, violating transactions can enter in multiple places along the payments chain. Life would be easier if all transactions flowed through your payment system in a consistent way, such as e-commerce authorization and settlement traveling from shopping cart to gateway to processor to bank.

But it's not so easy (see Figure 1a). A shopping cart may go directly to a bank (see Figure 1b, path 2). Or two gateways may have a relationship (path 3). Or a gateway may funnel through a processor sometimes and a bank sometimes (path 4). Further, organizations can play multiple roles.

The answer is never obvious. There are hundreds of companies and thousands of permutations. The key challenge is separating laundered transactions from legitimate transactions.

G2 Web Services

In a forthcoming article in the Journal of Payments Strategy and Systems, Dan Frechtling, Chief Product and Marketing Officer for G2 Web Services, describes in detail how transaction and payment launderers are adopting various strategies to disguise and process online payments, testing out as well as switching between conventional and alternative payment methods – and honing in on low-risk businesses and goods specifically “to look as prosaic and low-risk as possible to gain the element of surprise.”⁹⁵ In fact, Frechtling argues that the greater inclusiveness that payments innovations have facilitated for consumers and small businesses has at the same time “democratised money laundering.”⁹⁶ No longer the privileged domain of those with power and money – such as “corrupt politicians, organized crime, wealthy tax evaders” – transaction and payment laundering has opened up opportunities “at the bottom of the pyramid inhabited by online syndicates, cottage criminals and lone wolves.”⁹⁷ These individuals take advantage of the opening up of e-commerce to small

entrepreneurs and businesses, the greater accessibility to payment processing services or providers this has afforded, and the legitimate use of traditional as well as alternative payment methods, including peer-to-peer (such as Venmo), e-wallet (PayPal), prepaid, and mobile banking and money transfer options. As Frechtling brings it vividly to the point: "Bit by bit, byte by byte, money laundering has been reinvented. Why carry a briefcase full of paper money when you can transform it into virtual, digital, nearly untraceable electronic payments? Why would only 'elite' criminals participate when the tools are available to the masses?"⁹⁸

A displacement from cash to other methods is therefore already occurring, which has less to do with the presence or absence of cash and more with the tendency for crime to innovate alongside with new payment options.

As these emergent forms of money laundering show, the focus on cash as the main solution to terrorism and crime is shortsighted, and it may distract from the many other avenues through which fraud is occurring. For example, the solutions to transaction laundering described by Frechtling do not entail banning alternative payment methods or restricting more efficient forms of making and receiving payments and thereby curtailing legitimate e-commerce. Instead, Frechtling outlines ways that organizations and actors in the payments processing ecosystem – for example, sales representatives, underwriters, and account monitors – can identify, from their particular vantage points in the larger system, relevant patterns and indicators, as well as develop ways to share data and information in order to prevent fraud.⁹⁹

Likewise, collective efforts to combat the misuse of cash in money laundering or terrorist financing could look to avenues for better knowledge sharing, cooperation, and coordination between relevant actors, local and international authorities, and institutional stakeholders. Policy should address both the old and the new, emergent risks to the larger payment ecosystem, of which both cash and digital forms of payment are a part.

2.3 Lessons

By highlighting these examples, the point is not to suggest that the problem will be solved by targeting yet more media/means of payment because of their capacity to be deployed in criminal activities. The point is much more to underscore that efforts to target any one tool would be never-ending in the fight against crime. Efforts to evade enforcement will be displaced onto other tools. Indeed, some risks are entailed in the use of all payment media, even if the nature and magnitude of risks varies across diverse payment forms.

2.4 Dangers of criminalizing cash

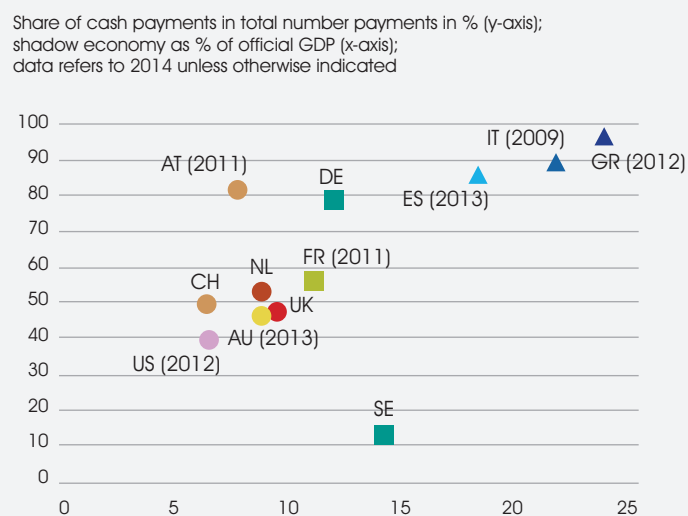
A shared concern and policy implication with regard to money laundering and terrorist financing is that of the blurred boundary between legitimate and illegitimate cash use. The concern is that otherwise legitimate activities risk being criminalized in policy efforts to restrict cash payments, to set payment thresholds, and to regulate the movement of money across borders. There is also wide disagreement about the overall impact that targeting one specific tool – cash – would have in the broader scheme of things.

Analyses of the shadow economy are concerned in particular with problems of tax evasion, country-specific tax payment moralities and habits, and the ability of states to enforce or incentivize payment of taxes. Cash as an "anonymous bearer instrument" is central to discussions about the restriction of payment instruments, even as physical currency continues to be the only form of legal tender that the state emits and is obligated to accept as payment of taxes. The very qualities of cash that have made it an effective tool of the state are those that many engaged in this debate over the future of cash payments are singling out as the reason for restricting and eliminating its use. But given that tax evasion also makes use of multiple tools and methods (most notably the setting up of shell companies and the use of tax havens to park undeclared wealth and assets), the claims that cash alone should be targeted are weak.¹⁰⁰

“Bit by bit, byte by byte, money laundering has been reinvented. Why carry a briefcase full of paper money when you can transform it into virtual, digital, nearly untraceable electronic payments?”

Dan Frechtling

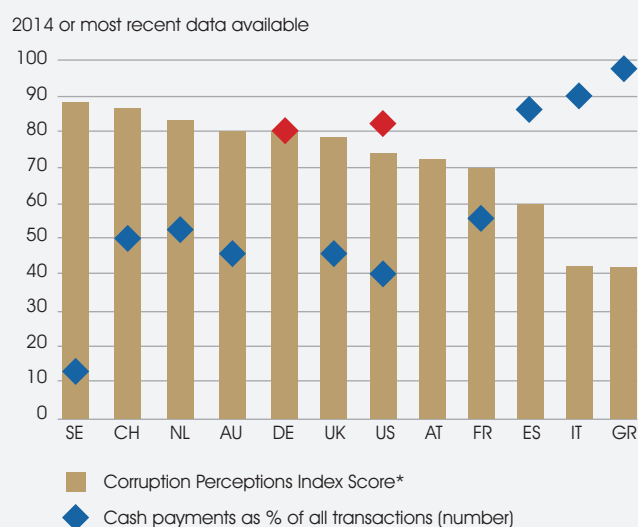
Figure 1. Cash payments are not reliable indicators of the shadow economy



Annotation: Surveys and estimations on cash payments differ between countries. All focus on consumer payment at POS, but surveys may or may not include P2P or online payments or only refer to payments below a certain value.

Sources: Schneider, F. and Boockmann, B. (2016); Bagnall, J. et al (2014), Deutsche Bundesbank, Payments Council, Banca d'Italia, Banco de Espana, De Nederlandsche Bank, Sveriges Riksbank, Verband Elektronischer Zahlungsverkehr, G4S, Federal Reserve Banks of Boston, Richmond and San Francisco, Reserve Bank of Australia, Deutsche Bank Research.

Figure 2. Strong cash usage does not equal “high” public sector corruption



Note: *The Corruption Perceptions Index measures the perceived levels of public sector corruption worldwide on a scale of 0 (highly corrupt) to 100 (very clean).

Sources: Transparency International, Bagnall, J. et al (2016), Payments Council, Verband Elektronischer Zahlungsverkehr, G4S, national central banks, Deutsche Bank Research.

Source for Figure 1 and Figure 2: Heike Mai, Cash, Freedom and Crime, Deutsche Bank Research 2016, p. 8., figures 12 and 13 (Used with permission) https://www.dbresearch.com/PROD/RPS_EN-PROD/PROD000000000441785/Cash%2C_freedom_and_crime%3A_Use_and_impact_of_cash_in.PDF

As the work of Friedrich Schneider and others shows, there is no necessary correlation between high cash usage and the size of the shadow economy, nor is there one between “strong cash usage and high public sector corruption.”¹⁰¹

One might see the “shadow economy” as itself an important threshold case.¹⁰² This is not only because of the problems of defining, bounding, and measuring it, but also because there are further distinctions to be made between “shadow” and “informal” economic practices, wherein poor and marginalized individuals and communities who are (or have been) excluded from the formal financial system depend upon cash and alternative payment arrangements to make their livelihoods, save and invest, and support family members through remittances.¹⁰³ In the literature on terrorist financing, the blurred line between informality and criminality is fraught and requires careful analysis.

Given the importance of informal means of moving money (such as hawala/hundi) that are often used in terrorist financing, it is crucial not to lose sight of the fact that these systems are lifelines to many poor communities and migrant diasporas, where people depend upon these channels to legitimately send remittances and other forms of financial support.¹⁰⁴ In assessing the effectiveness of the EU’s terrorist financing regime, Oldrich Bures notes that there are financial as well as non-financial costs to these measures, which have often had a detrimental impact on the vulnerable, refugees and migrants, and others dependent on informal money transfer systems.¹⁰⁵

The evidence presented thus far shows that limiting cash transactions would likely make little difference to the fight against crime and terrorism, but would hurt those who legitimately use and depend upon cash payments. Others have been highly critical of the costs of the current Financial Action Task Force Regime (FATF), arguing that not only has it “disproportionately affected the kinds of business transactions that serve small, poor communities,” but it has also been costly and largely ineffective.¹⁰⁶ Policies that target and restrict access to informal financial methods or basic financial tools such as cash may do greater harm while wielding little effect in efforts to predict or prevent potential terrorist acts.

Limiting cash transactions would likely make little difference to the fight against crime and terrorism, but would hurt those who legitimately use and depend upon cash payments.

Before proceeding to legislate policy on cash restrictions, it is important to recognize that huge data gaps exist regarding the legitimate use of cash. It seems problematic to craft policy based entirely on the often-anecdotal micro-evidence of money laundering and criminal activities, while ignoring the need for better holistic micro-studies of legitimate cash use.

3. Cash Use: Evidence and Data

There is agreement in the literature that both legitimate and illegitimate cash payment practices are understudied.¹⁰⁷ Existing evidence that would support the targeting of cash as the primary method for combatting crime is weak or case-specific.

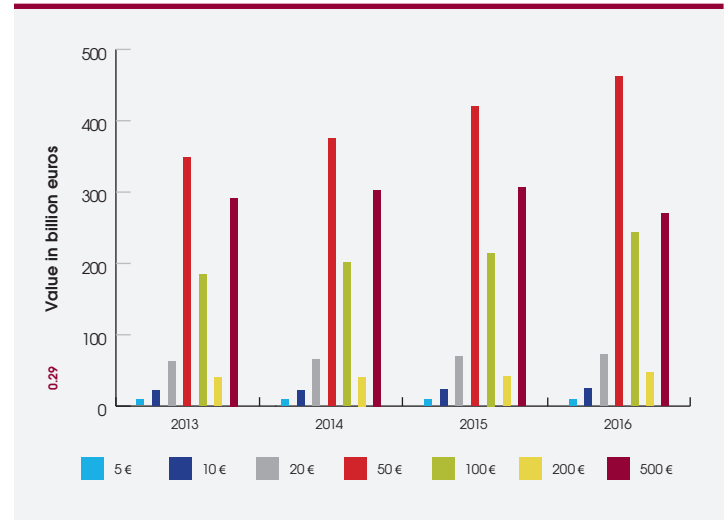
More studies of legitimate cash usage in the European/EU context are needed. Investigative and scholarly reports on both money laundering and terrorist financing are highly dependent on micro-cases that show.

- Processes of placement, layering, and integration through which money laundering is tracked;
- The mix of payment methods and channels, often in the realm of legitimate financial transactions, which is characteristic of terrorist financing.

More qualitative research and micro-studies are needed on the pragmatic as well as local (cultural) factors that influence payment method choice among consumers.

What is the data on legitimate cash use?

Value of euro banknotes in circulation from 2013 to 2016 by denomination (in billion euros)

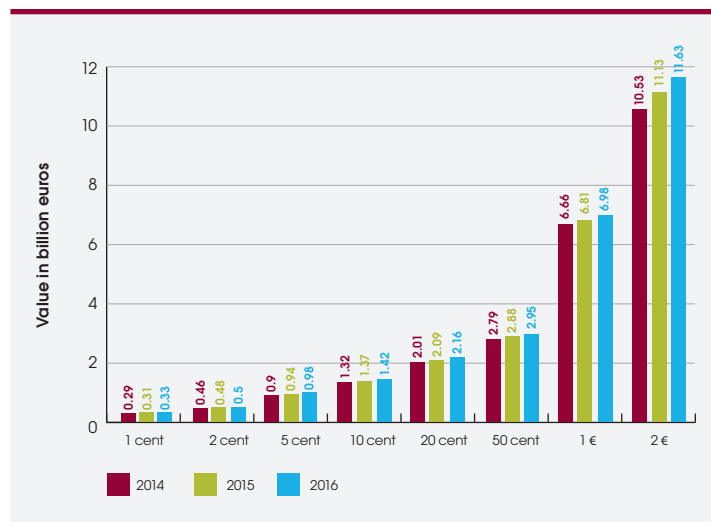


Source: EZB Statista - The Statistics Portal, Statista. Accessed June 17, 2017. www.statista.com/statistics/254201/euro-banknotes-value-by-denomination/.

3.1 Central bank studies on cash usage and choice of payment options

Recent studies by central banks have used payment diaries to understand the relative composition of payments.¹⁰⁸ Findings of these studies show the ongoing prevalence of cash usage, especially for low-value payments. The methodological approach favors statistical analysis and the testing of hypotheses based on inferred assumptions (rather than direct interviews or qualitative surveys). The reasons for using cash tend to be framed in terms of relative cost utility of cash vs. other available payment methods. There are benefits but also limitations to these current studies in the developed market context. Statistical analyses of survey data and data on cash emissions can show a representative sample of the composition of payment media, costs, frequency of use, and other variables.¹⁰⁹

Value of euro coins in circulation from 2014 to 2016 by denomination (in billion euros)



Source: EZB, Statista - The Statistics Portal, Statista.
<https://www.statista.com/statistics/254201/euro-banknotes-value-by-denomination/>. Accessed 17 Jun 2017

Data about the movement of cash, such as insights about the inflow and outflow of specific denomination notes, can be measured and analyzed.¹¹⁰ However, econometric approaches do not capture other dimensions of cash usage, such as the reasons why people choose one particular payment form over another, the contexts that shape such decisions, or the ways that practices with cash diverge with self-reporting about cash use.¹¹¹

Qualitative studies could complement quantitative survey approaches by showing how different payment media are used in daily practices, and how material or physical qualities of payment forms shape calculative practices.¹¹² Ethnographic and qualitative research methods, including interviews, can expand cash and payment surveys, providing further insights about the relative ease of use of different payment forms, the situational contexts that frame use, and relative levels of trust in diverse payment media. For example, payment diary data suggested that when paying with cash participants held off on self-reported impulse spending and felt more satisfaction about the items purchased with cash, than those purchased with debit or credit.¹¹³ Qualitative research could be done to contextualize and test this finding. In general, how social contexts inform cash payment usage as well as divergences in what people say they do in a given context, and what they actually do, is understudied and receives far too little priority in research funding. Mixed methods approaches allow researchers to make grounded and empirically relevant conclusions about current data gaps.

There are also significant differences in available evidence about the broader dimensions of cash usage across studies from “developed” vs. “developing”/emerging market contexts. More has been documented in developing/emerging market contexts as researchers, policy makers, and new payment providers have confronted different patterns of uptake, integration, and acceptance of formal banking and mobile/digital payment forms. For example, studying the impact of mobile money applications such as M-Pesa has opened up new revelations about cash usage as much as the novel ways that individuals and communities are using new payment technologies.¹¹⁴

In the context of research done by the Institute for Money, Technology and Financial Inclusion (IMTFI) on the intersections of new monetary technologies and traditional monetary practices, evidence shows that cash continues to be important for completely legitimate reasons that include:

- People depend upon the option of converting or accessing electronic funds in cash as well as storing value in physical cash;
- Choice in payment instruments allows people to control value on their own terms;
- People use cash to budget, distribute, and earmark;
- Storing value in cash allows people to decide when to keep savings visible or to hide them from the demands of family members, kin, or other relations;¹¹⁵
- Storing value in cash can protect savings from bank failure or fraud.

Overwhelmingly, whether in Kenya, India, or the Philippines, IMTFI research has documented how people continue to view cash as complementary to digital payments, that cash and mobile/digital are used together with other monetary tools, but that digital is often viewed as inappropriate for certain domains of social practice.¹¹⁶

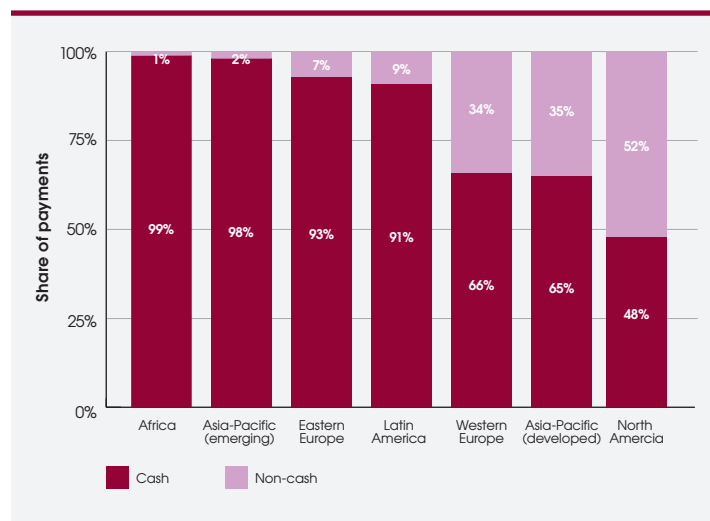
Digital and electronic forms of payment and value transfer do not tell you everything about the identity of the users. Mobile money and other payment media (such as store cards) are often shared (or borrowed) by multiple users – family or kin, and sometimes by members of one’s trusted social network.

In rural communities in Uganda or Kenya a household or, in some cases, an entire village might share a single mobile device, while in places like Mexico and South America individuals might loan out or share financial instruments such as personal identification numbers or store cards with family members, neighbors, work colleagues, or other individuals who are part of one’s trusted social network.¹¹⁷

More micro-studies of the legitimate use of cash and other payment media are needed, especially the “why” of use.¹¹⁸ Such evidence would be essential for designing policy and regulatory measures that could better anticipate the misuse of different payment forms such as e-payments, cash (also specific low/ high-denomination notes), and alternatives such as Bitcoin and other alternative currencies.

Micro-studies of legitimate use of cash are needed, especially the “why” of use.

Proportion of cash and non-cash payments worldwide in 2015 by region



Source: Raconteur. Statista - The Statistics Portal, Statista. Accessed June 6, 2017. <https://www.statista.com/statistics/585858/cash-vs-non-cash-payments-by-region/>.

3.2 Cash restrictions and high-denomination notes

In the context of the current debate on restricting cash payments in the EU, analysts on different sides of the issue admit that eliminating high-denomination notes can aid in the fight against money laundering and terrorist financing, but that this policy should not extend to eliminating cash payments (or cash itself) in the narrow sense of targeting these activities.

The threshold amount for cash transactions is separate from (but not unrelated to) the elimination of high-denomination notes. Some want to merely eliminate high-denomination notes, but keep small denominations. Others want to set an appropriate threshold for amounts paid in cash, but there is no clear consensus about what that limit should be and whether a harmonized limit would be workable across the diverse payment cultures in the EU. For example, Italy recently raised the limit from 1,000 to 3,000 euros. For those who support keeping small denominations, the practical problem remains since high-denomination notes would need to be replaced by more small-denomination notes to make up the difference, thus entailing higher handling costs over the long term.

There are also important cultural differences in payment habits across the EU. Most often noted is the practice in Germany of paying for automobiles in cash. In this case, physical cash is not only important in the case of person-to-person sales where other means of payment are less trusted, but where distinct cash denominations are an indispensable quality of the negotiating process.¹¹⁹ IMTFI researcher Mesfin F. Woldmariam observed something similar in his study of the handling of cash in rural marketplace negotiations in Ethiopia.¹²⁰

Woldmariam has also analyzed how illiterate and innumerate users rely on the physical distinctiveness of currency denominations for calculative as well as ritual practices.¹²¹ In another IMTFI project, Janaki Srinivasan observed how the physical handling of cash denominations is central to the negotiation of prices at fish auctions in Kerala, India.¹²² The handing over of physical cash allows

the buyer to pay a different rate than the price verbally agreed to in the auction. Research in the field of consumer marketing also notes the importance of cash to budgeting and consumer behavior.¹²³

In many EU countries, cash payments continue to make up the majority of payments in value (e.g. Greece, Spain, Portugal) and in number of transactions (e.g. Germany, where small transaction amounts are predominantly paid in cash). Large-denomination notes are often circumscribed to being a store of value for people outside the territory of a currency community, or they are used by other nation states as the main (or complementary) currency (such as with dollarization in places like Ecuador). Thus, decisions at the national and EU level also impact non-citizens and those outside the regulatory space. Currently, in countries where cash payment limits have been instituted, citizens are restricted more than non-citizens, which, from an anti-money-laundering perspective, creates a jurisdictional difference that can be exploited for criminal activities, not to mention raises questions around fairness and constitutional rights.¹²⁴ Pragmatically, future differences between cash and cashless jurisdictions would continue to require practical and policy solutions with regard to those without access to the national or European payment system.

The question remains, why cash, and not other instruments? The logic of banning a specific tool, payment form, or even system can be extended endlessly to other forms. As Jacob W. Petterchack points out in his discussion of the legal and regulatory treatment of hawala in the U.S., the form itself has not been banned. He notes that, "[r]egulators and the law regard hawala as more of a brand than a separate financial system, so it does not play favourites over form rather than substance."¹²⁵ However, the fact that the vast majority of hawala businesses in the U.S. is unregistered and unlicensed exposes hawala operators (hawaladars) to the great risk of criminal liability, asset forfeiture, and imprisonment for aiding terrorist financing even where this is not the case, because the letter rather than substance of the law takes priority.¹²⁶ Moreover, with the passing of the U.S. Patriot Act in 2001, prosecution no longer took into account "intent" when hawala businesses were found to be in violation of licensing, anti-money laundering, and other regulatory requirements.¹²⁷

Petterchak underscores the importance and necessity of hawala as often being the only means of getting funds to remote regions where formal financial institutions are unavailable or do not work. He also argues that the barriers to accessing the formal system of federal and state compliance, especially state licensing, pushes small business further into the shadow economy.¹²⁸ While stating that there is more hawala businesses can do to operate within existing legal parameters to protect not only their businesses but also the rights of customers, Petterchak likewise argues that existing regulations are not proportionate to the needs of most small hawala businesses and that parallel regulatory systems are needed to ensure that it is not only the wealthy who have access.¹²⁹ In other words, what this example underscores is that insofar as tools – such as informal value transfer systems – can be used for good or bad, a substantive and multi-dimensional approach should guide legal and regulatory policy.¹³⁰

A number of experts on terrorist finance have weighed in on proposals to eliminate large-denomination notes such as the U.S. \$100 note. In a 2016 article in *Forbes*, Katie Sola speaks with two leading terrorist finance experts, Colin Clarke and Moyara Ruehsen, on the issue:

*ISIS doesn't depend on big bills as much as people think. 'In the case of ISIS, most of their budgetary spending is inside Syria and Iraq, where large bills don't have as much utility,' [Moyara] Ruehsen explains. For example, fighters don't want to be paid in large denomination bills. 'Those fighters need to buy food for their families, cigarettes, whatever. If everybody only has \$100 bills, that's a problem,' she says.*¹³¹

The article goes on to explain that the mining of financial data would go further in combatting terrorism but that most people, especially Europeans, would object to the infringement on privacy this would entail. Other techniques, such as false trade invoicing, matter more than large-denomination notes.¹³²

Why cash, and not other instruments?
The logic of banning a specific tool,
payment form, or even system can
be extended endlessly to other forms.

In his report for Sveriges Riksbank (Central Bank of Sweden) on digital currency alternatives, Gabriele Camera finds that the “newfound interest in the connection between cash and crime is noteworthy and puzzling at the same time,” not only because of the confusion between causality and correlation, but also because in the case of large-denomination notes, there is little “empirical evidence” on how their removal would be “instrumental in fighting crime.”¹³³ He notes that in the U.S. as well as in Sweden, where higher denomination notes have been phased out in the past, this has not led to a “decrease in criminal activity.”¹³⁴

Even those who argue that criminal activity is best fought with cash payment thresholds have to admit that the very qualities that make cash difficult to track and control would also pose problems in measuring the efficacy of cash payment restrictions:

*Whilst there is anecdotal evidence of the beneficial impact of cash thresholds in curtailing financial crime there is little in the way of hard data to prove their efficacy. This is not surprising since cash transactions cannot be directly measured. We cannot directly record either the baseline of illicit transactions above the threshold level, nor the reduction through the imposition of the threshold. However, the lack of compelling empirical evidence should not undermine the case for imposing such thresholds.*¹³⁵

They suggest that cash thresholds would help to combat crime and tax evasion by requiring purchases of luxury and high-value goods to be made with electronic means, making them accountable and trackable, and yet they also note that cash thresholds could eliminate certain reporting requirements for high value dealers.¹³⁶ This raises questions about what assumptions might inform a program of tracking the efficacy of cash thresholds in light of the issues noted above in relation to transaction laundering, but also the scope and feasibility of tracking and analyzing an increasing volume of electronic payment transactions by law enforcement.

The qualities that make cash difficult to track and control would also pose problems in measuring the efficacy of cash payment restrictions.

3.3 Relationship of cash restrictions to debates around cashless payments and changes in monetary policy

Targeting cash falls into three broad categories of argument:

- Proposals to eliminate large cash denominations;
- Cash's central role in criminal/terrorist/undocumented activities;
- Cash and monetary policy: the relationship between physical cash and proposals to make use of negative interest rates.¹³⁷

Less understood are the implications of eliminating physical currency altogether.¹³⁸ The current European Commission Inception Impact Assessment, "Proposal for an EU initiative on restrictions on payments in cash" (January 23, 2017), ostensibly concerns cash transaction limits (in the narrow sense of amounts, or elimination of high-denomination notes).¹³⁹ But the concern among different and quite diverse stakeholders, as well as "the public," is how this fits into a larger project of eliminating cash. Some see cash restrictions and changes to cash denominations as a first step in a gradual process to phase out cash.¹⁴⁰

Therefore, with regard to the issue of public trust in financial authorities and the stability of the financial system (and future savings), changes to cash use, access, and infrastructures raise the specter of whose, and to what ends, these changes serve¹⁴¹ and whether they are warranted in the cause of fighting financial crime, tax evasion, and potential terrorist attacks. The availability of e-payment infrastructures and options also impacts the choice to pay in cash, just as the maintenance of dedicated cash infrastructures is important to its future use.¹⁴² Cash is a complementary tool to digital and e-payment forms.¹⁴³

Concerns about the future role of cash and the implications of legislation aimed at restricting or abolishing it center around issues that include:

- Inclusion;
- Privacy;
- Property;
- Personal freedom and freedom of choice;
- Accounting;
- Data protection, ownership, use;
- Identity verification.

In the event of terrorist attacks on the financial infrastructure – not to mention natural disaster – physical currency is an essential backup and safeguard. For example, the U.S. Federal Emergency Management Agency's (FEMA) official Earthquake Preparedness advice recommends including a supply of cash in a disaster supplies kit assembled for work, home, and automobile in the event that ATMs and bank as well as credit systems are down or inoperable.¹⁴⁴

Rather than targeting cash, other considerations need to be taken into account in the context of preventing financial fraud, criminal activity, and terrorist financing. These include:

- What are the infrastructural requirements for ensuring the legitimate use of payment data and the stability of the payment system in an increasingly cashless payment world?
- How will the move away from cash hurt the poor, financially excluded, and marginalized in society?
- How will authorities handle payment activities that are trackable/recorded/accounted as well as data trails in ways that prevent criminal activity without wrongfully targeting individuals or groups?¹⁴⁵
- Who controls, owns and can access payment data? Even if payments are all digital and therefore trackable, it is less clear who and when/on what terms the data could be mined, analyzed, used in legal proceedings, or shared with third parties by authorities. This is especially important in regard to efforts to anticipate/catch a terrorist attack before it occurs.¹⁴⁶

3.4 Payment thresholds' impact on financial and payment ecosystems

The imposition of cash payment thresholds could have much broader implications for AML and CTF policy thresholds than are currently recognized. Far too easily, economists argue that large-denomination notes are unnecessary, that they are useful only for criminals, and that eliminating large-denomination notes can proceed with little prior study – or would have few consequences for the financial system as whole.

It is therefore worth noting, then, the potential detrimental effects, acknowledged even by the most fervent proponents of phasing out or eliminating cash, of the potential absence of cash on the financial system – particularly in relation to existing value and macro-economic thresholds. These considerations are relevant to the policy proposals for instituting cash payment thresholds, eliminating large denominations, and restricting cash altogether.

Alexei Kireyev maintains that, “the only useful function of currency, which can be lost with de-cashing, is that demand for cash may help predict financial crises.”¹⁴⁷ The demand for large-denomination notes can be a key indicator of impending crises. He notes the widespread withdrawal of 500 euro banknotes in the 2008 global financial crisis. According to one ECB publication, the increased demand for 500 euro notes at that time was known as the “Lehman Brothers” effect.¹⁴⁸ In Germany, ordinary savers, especially the elderly, were also among those who chose to withdraw their savings in cash to mitigate the risk of losing their life-savings.¹⁴⁹

The distinctiveness of cash, including large-denomination notes, matters to the current financial system.

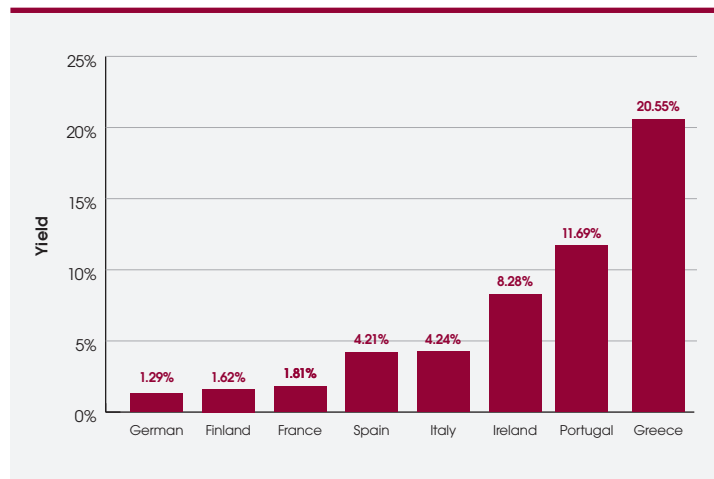
Kenneth Rogoff, whose work and arguments have been the main impetus for economic theorizing about the elimination of large-denomination notes, nonetheless argues that small-denomination notes may continue to be necessary.¹⁵⁰ Drawing on the work of the monetary theorist Neil Wallace, Rogoff explains how Wallace’s work in the 1980s on the so-called “Paradox of Fiat Currency” pointed to the relationship of currency denominations to treasury notes.

Rogoff admits that this distinction could matter to the fragilities of electronic currency.¹⁵¹ This has to do with the fact that fiat currency is non-interest bearing while interest-bearing government debt (treasury notes) is not permitted for transaction purposes. He notes that,

For one thing, the government issues interest-bearing bonds and notes only in large denominations. If three-month Treasury bills paid market interest and if they came in, say, \$100 denominations, they might even be preferred to cash for some transactions. (Something akin to this occurred in the United States during the War of 1812, when small Treasury bills bearing interest were sometimes used as currency). Second, even if the government issues bills and bonds only in large denominations, it has to be careful to prohibit private financial firms from issuing interest-bearing paper money-like substitutes that are 100% backed by government bonds.

Without the second restriction, which the government exercises through its monopoly on currency creation, intermediaries might be able to step in and basically chop up large-denomination bonds into pieces that could be used as paper money, and then sell them at profit. As we all know, the financial system is very good at that kind of game. Wallace argued that absent these restrictions to prevent bonds from competing with currency as transaction media, any efforts by the government to issue intrinsically worthless fiat currency will always be doomed to collapse. Absent restrictions and legal regulations, the only stable system would be a currency that is 100% backed by commodities, for example, gold or silver.¹⁵²

Yield on state bonds with a 5-year maturity in selected European countries as of August 24, 2011



Source: Statista - The Statistics Portal, Statista. Accessed June 17, 2017. www.statista.com/statistics/275818/yield-for-state-bonds-with-a-5-year-maturity-in-selected-european-countries/.

Note: Same currency, different bond yields.

Rogoff points out that for a system of completely electronic currency, the absence of a distinction between anonymous currency and registered interest-bearing bonds poses a risk for the stability of the financial system. "In the limit, bonds could undermine currency and make it difficult for the government to control the price level, essentially, because too many currency-like instruments would be floating around."¹⁵³

What this discussion suggests is that the distinctiveness of cash, including large-denomination notes, matters to the current financial system and that more care needs to be given to the consequences entailed in restricting or eliminating cash.¹⁵⁴ To draw an analogy to the 2010 sovereign bond crisis in the euro zone, one might consider how the disappearance of nationally denominated

debt with the introduction of the euro led speculators and financial actors to treat the sovereign debt of euro member states equally, ignoring the differences in liability and risk across member states.¹⁵⁵ The disappearance of nationally denominated currency, in a sense, had unintended consequences for how financial markets rated and evaluated the European bond market.

Cash therefore upholds and makes possible a variety of distinctions that are important to the regulation and governance of electronic flows of money. As anthropologist Bill Maurer observed in his work with professionals in the mobile money payment industry, purse limits for mobile money services or stored value cards have tended to be oriented around the value threshold represented by the largest denomination note. Stored value on the phone below a certain threshold (U.S. \$100) would be exempt from Know Your Customer (KYC) requirements.¹⁵⁶

In fact, the value threshold of U.S. \$10,000 upholds the current anti-money laundering and counter-terrorist financing regime and has been the subject of bipartisan policy efforts to revise this limit.¹⁵⁷ Established by the U.S. federal government in 1972, the \$10,000 limit is the transaction threshold for deposits and withdrawals in cash at which banks are required to file a Currency Transaction Report (CTA). In the 1970s, this amount would have represented "more than an entire year's worth of income for the typical American household. More than four decades later, that \$10,000 figure remains unchanged, despite substantial inflation and economic growth."¹⁵⁸ To put the \$10,000 threshold limit in perspective, in 1972 an average household income was \$9,700 whereas in 2015 it was estimated at \$53,657. An infographic by the Bipartisan Policy Center shows a price comparison of car and home prices, as well as tuition expenses in 1972 and 2015.¹⁵⁹ For example, a Ford Mustang cost \$2,766 in 1972, well below the cash transaction limit of \$10,000, whereas in 2016 a similar car would cost \$23,895. A purchase of the car in cash in 2015 would automatically trigger the requirement to file a CTA report. "Today, there is not a

Cash *as such* is an important indicator and marks specific value thresholds through physical cash denominations.

single new car you could buy in cash without triggering a report.”¹⁶⁰ What this example suggests is that although the \$10,000 value threshold has not kept up with current values in the market, it has served to hold other things in place such as various interlinked reporting requirements that are important to law enforcement. Such standards endure for a variety of reasons, and revision is often unfeasible or subject to disagreement.¹⁶¹

Given that much of the regulatory space around alternative payment methods is tied to the setting of various value thresholds that have consequences for how value transfer is regulated relative to banks, but also inform such things as identification and reporting requirements or the insurance and security of deposits and other forms of stored value, more careful study is needed on the relationship between physical cash denominations (with set units of value) and virtual forms (where any amount is possible). Physical cash denominations set important parameters for electronic value that impact the real economy in how they are used (such as price formation and practices of rounding up or down).¹⁶²

While fraudulent use of e-payment and virtual monies is currently steeply on the rise – and will likely continue to be in the future – more experience and specific use cases of the relationships between cash and digital are needed to understand and design appropriate regulatory measures.¹⁶³ In summary, cash *as such* is an important indicator, not only for identifying points of entry/exit from one money form or channel to another, or specific movements across territorial or jurisdictional boundaries, but as much through its capacity to mark specific value thresholds. Physical cash denominations concretize value and act as a stabilizing agent in the financial system.

4. Case Studies: Unintended Consequences of Changes to Cash Access, Use, and Payment Infrastructures

What are some of the unintended consequences of policies targeting cash? In this section, examples from two case studies are considered – India and Greece – where cash has suddenly and unexpectedly been restricted in some form. These cases offer insights from both a policy and a research perspective on the consequences arising from cash restrictions. Such recent episodes remind us that a change in money as well as access to a public money infrastructure has consequences. This is just as true in developed as well as developing market contexts. While in certain parts of the developing world cash payments dominate, for countries across the globe, monetary futures are tied together through monetary policy decisions and emergent payment systems that extend far beyond national borders.

4.1 India's demonetization (November 2016)

On November 8, 2016, India's Prime Minister Narendra Modi made the surprise announcement that the two highest denomination rupee notes, the Rs500 and Rs1,000, were no longer valid currency. These bills would be replaced by new Rs500 and Rs2,000 banknotes, but people would have only a little over a month to exchange their now cancelled notes at banks, and only up to a value of Rs4,000.

ATM withdrawal limits were set at a daily limit of Rs2,000. At the time of the announcement, the new replacement notes were still in production and the ATMs were not yet configured to dispense the new cash. By demonetizing these two notes, 86% of the value of currency in circulation was effectively withdrawn from the economy overnight.

In a country where cash usage rates were as high as 98%, this decision led to a cash crunch, with a vast majority of businesses not equipped to handle electronic payments, not to mention a large unbanked population with limited access to means of payment other than cash.¹⁶⁴ In addition to logistical, economic, and social upheaval, demonetization caused physical duress and even substantial harm: long lines in front of ATMs and banks meant not only wasted time, but in some cases, wasted lives, as reports of casualties and deaths

A change in money entails different stakes for individuals, segments of a society, as well as national and transnational communities.

from waiting in line circulated over the next few weeks.¹⁶⁵ The reasons given for the demonetization included the need to stamp out so-called black (untaxed) money, the goal of reducing counterfeit notes, and the national push toward promoting greater use of digital finance. In one analysis of keywords used by Modi in his speeches on demonetization, there is a shift in importance of these various objectives, with black money dominating in early November and the terms "cashless" or "digital" dominating the discourse by the end of that month.¹⁶⁶

IMTFI researchers on the ground, working in communities where they have conducted longitudinal or extensive research, provided an initial assessment of the unintended consequences of this policy measure in a special series on demonetization.¹⁶⁷ Among the most important concerns were the increased costs of financial transactions for the poor, limitations on the means for saving and securing value, and the potential for long-term distrust in government and monetary institutions.

It is clear that assessing the effects of demonetization will be a long-term affair. For many commentators the verdict is still out on the impact of demonetization with regard to the policy measure's official aims to root out corruption and to facilitate a shift to digital means of payment, or what its broader macro-economic effects will be, and whether institutional credibility may suffer over the long run. A few of these issues will be discussed below.

The Reserve Bank of India has come under critique¹⁶⁸ for its lack of transparency about the process, poor preparation, and creating uncertainty by making further changes to the rules of the changeover.¹⁶⁹ Some fear this will lead to long-term mistrust of the monetary authority and the future reliability of national currency.¹⁷⁰

The abrupt form of this demonetization move – without the necessary digital and payment infrastructures in place to ensure a smooth transition – will place further pressure on state institutions, the RBI, and providers to build trust in the reliability of infrastructures in the future, in the event of further crises and infrastructural failures.¹⁷¹ As IMTFI fellows working in India have noted, there is a great deal of distrust in banks and reluctance to engage with bank employees, especially for poor women.¹⁷² Even in cases where de- or re-monetization is carefully planned and presented primarily as a practical measure, perceived political intent can undermine confidence.¹⁷³

A great deal of skepticism remains about whether the demonetization move has met its stated goals of addressing so-called black money and corruption. Many analysts have observed that black money was rarely held in physical cash or large-denomination notes. Instead, real estate and gold were key assets for storing untaxed value (not to mention foreign bank accounts or other international/offshore holdings). “The fact of close to 90% of the notes banned finding their way back into the banking system as deposits only serves to underscore the fact that the notion that “rich and corrupt” Indians keep their ill-gotten wealth stashed in cash is an extremely dated and perhaps a somewhat dramatic one.”¹⁷⁴ According to a Global Financial Integrity estimate that put the amount of illegal money flows from India to accounts and tax havens abroad at close to \$462 billion in 2014: “Nearly a third of black money transactions were believed to be in real estate, followed by manufacturing, gold and consumer goods purchases.”¹⁷⁵ Indeed, by some accounts, demonetization created yet further openings for profiting at the expense of the poor as well as the state and tax-paying citizens, as intermediaries stepped in to change the invalid notes on behalf of those who could not or did not want to wait in the long ATM or bank queues or for those who had illicit money to hide.

Framing the problem as one of “black money” has had a significant impact on women’s autonomy and savings as well as upon household dynamics:

*Categorizing all unreported cash as “black money” risks putting into one policy basket the multiple (and legally valid) contexts that lead people to keep money hidden and store value in cash form. In particular, a large section of women, including many belonging to the middle class, have had good reasons to hide their small savings in rice bins and cosmetic jars, away from husbands and other family members. This cash is more than money – it is “women’s agency, built through years of under-consumption and self-exploiting sacrifices” (Tara Nair, IMTFI financial inclusion workshop, 2016, Bangalore). Demonetization has suddenly compelled women to reveal to men their secret cash stashes, bringing women’s savings practices to the attention of their husbands - with potentially negative consequences for women’s autonomy.*¹⁷⁶

“This cash is more than money – it is women’s agency, built through years of under-consumption and self-exploiting sacrifices.”

Tara Nair

The demonetization event sparked new reflections on money for those designing digital financial products. The role of cash and the value placed on it was suddenly front-and-center – a question being asked and addressed on the streets, not just in academic workshops.¹⁷⁷ Whether or not, and to what extent demonetization will persuade people to switch entirely from cash to digital applications and formal means of payment is an open question, and more research is needed on the interplay between digital and cash payment forms in this context. As Janaki Srinivasan points out:

*Design 101 tells that an analysis of user needs should form the core of designing a product (whether in technology or policy). Yet, time and again, we have seen that the design of technologies (and of policies) starts by identifying a problem and solutions that are assumed to be desirable (cashlessness), and a vision that is neutral and unproblematic on the surface (who could be against eliminating 'black money' and 'corruption?'), without consulting with its diverse potential users. While we have made headway in identifying the diverse practices on the ground that inhabit every monolithic category or concept on paper, it is perhaps time to explore in parallel how 'desirable' solutions get constructed in the first place and on whose interests and experiences of desirability these are based.*¹⁷⁸

While there has been an increase in use of mobile applications such as those provided by Paytm (and other providers), many, especially the poor and members of the rural population, have returned to cash payments.¹⁷⁹ For yet others, demand has risen for gold and other precious commodities able to serve as a more stable source of value for future social and material needs. There has been an increase in fees and prices as a result of the switch to e-payments. Some reports and anecdotes indicate that use fees (waived during the height of demonetization) are returning and that the switch to digital has led to increased prices. (Similar phenomena related to price increases have been noted in currency shifts such as the change to the euro and dollarizing economies).¹⁸⁰

During a field visit to a village near Hyderabad participating in a cashless village experiment following demonetization, Debashis Acharaya and his team observed that the costs of installing and maintaining Point of Sale (PoS) devices were a source of concern for village grocers.¹⁸¹ According to one respondent, "It's difficult to invest Rs10,000/- for one PoS machine on my part and pay a monthly rent of Rs800/. Why can't the government bear this cost for at least two grocers in this village? This will instill confidence among us and the users too. We won't mind paying for this once we realize the benefits."

Many outstanding questions remain as to how cost incentives will be structured, who should share the costs, and how digital payment infrastructures will be built out in sustaining the digital drive, long-term.

By some accounts, those hurt most by Prime Minister Modi's policy have, in the short-term, been most supportive of demonetization. Despite losing savings and enduring the emotional as well as physical distress, the desire to see corrupt behavior punished outweighed the pain.

In their contribution to IMTFI's Demonetization Series, Isabelle Guérin, Santosh Kumar, and G. Venkatasubramanian describe how in the region of Tamil Nadu, where they were conducting research at the time, some poor rural agricultural workers accepted advance payment in the invalid notes for work later in the season, but with the plan of not showing up to do the work.¹⁸²

However, others abstained from such practices because they did not wish to be "complicit in the whitening of black money." Guérin and her colleagues write:

*The strength of the rural poor's political awareness and commitment to the fight against corruption is astonishing. It is striking how much ordinary people have been affected by the demonetization and at the same time have support for it. But once citizens realize that it is merely an illusion, the disappointment is likely to be bitter.*¹⁸³

As numerous cases of financial crisis and monetary reforms demonstrate, the effects of such policy events unfold over time and often evenly across society. These experiences have a tendency to sit deeply within individual and collective histories in ways that reinforce distrust of the state and formal financial institutions (or modes of payment), and that can be re-activated at later times of great financial, economic, political, or technological disruption and/or change.¹⁸⁴

4.2 Greece: capital controls (beginning June 2015)¹⁸⁵

Capital controls and restrictions on cash withdrawals politicized payments in the euro zone and reflected new divisions within and outside Greece, expressed most viscerally in daily trips to the ATM. A number of ethnographic essays documented these experiences on the ground, as events were unfolding in the summer of 2015.¹⁸⁶ What precipitated these extraordinary measures?

While causes, origins, and timelines for the Greek sovereign debt crisis differ, most accounts cite the October 2009 revelation by the then-newly elected Greek government that the budget deficit in Greece was more than 12.5% of GDP (well above the 3% threshold allowed for member states in the euro zone) as a key trigger of the resulting “euro crisis.”¹⁸⁷ With Greece shut out from financial markets and a potential sovereign default on the horizon, a systemic failure of the euro zone loomed large. From 2009 to the summer of 2015 Greece experienced a series of financial crises requiring two bailout packages and parliamentary passing of numerous austerity packages dictated by the European Commission (EC), European Central Bank (ECB), and the International Monetary Fund (IMF).

By the summer of 2015, Greece’s new left party in power, Syriza, was negotiating the terms of a third bailout package. After five years of austerity and structural adjustment, these negotiations were deeply contested on all sides, leading Greek Prime Minister Alexis Tsipras to call a national referendum on whether to accept the terms of a third bailout package. Ahead of the vote, a bank holiday and imposition of capital controls was announced on June 28th, with a daily ATM withdrawal limit set at 60 euros and international electronic payments prohibited.¹⁸⁸ Unsuccessful in securing an extension until after the referendum to repay an IMF loan due on June 30, 2015, Greece defaulted on the debt. The outcome of the July 5th bailout referendum was a majority vote of “no” to the bailout terms. However, following the resignation of the Greek finance minister Yanis Varoufakis and other

changes to the cabinet, by the end of July 2015 the Greek parliament ultimately agreed to the negotiated terms of a third bailout package. Capital controls have remained in effect in Greece since 2015. A precedent had been set in March 2013 with capital controls instituted in Cyprus as a result of the banking crisis and bail-ins there, but these controls had mostly been lifted by April 2015. Greece is currently the only euro member state in the 19 member currency union subject to these restrictions.¹⁸⁹

Many of the unintended consequences and deleterious effects of the capital controls were immediate, while others have been long-term and are still unfolding. More evidence and data is needed on the different strategies people have adopted in relation to cash in the context of capital controls and austerity measures in Greece. A number of anthropologists and other researchers have already been studying these developments. Some of these researchers’ observations, which are relevant to the larger debate on the effectiveness and potential impact of proposed EU-wide cash restrictions, will be discussed below.

With the imposition of capital controls in 2015, new distinctions in access to money arose. Foreign tourists and international visitors could withdraw higher amounts than Greek residents. The initial daily limit for Greek residents was 60 euros in cash, and “there was no limit on the use of cards within national boundaries.”¹⁹⁰ PayPal and other alternative payment services were abruptly inaccessible; small businesses, students living abroad, and professionals were tied to a cash limit linked to their primary place of residence in Greece.¹⁹¹ UK-based anthropologist Daniel Knight writes of his experience at the time of waiting in line for the ATM and consciously weighing the decision to withdraw more than 100 euros for his own necessary expenses against the likelihood this would deplete the available cash in the machine needed by others.¹⁹² Greek anthropologist Dimitris Dalakoglou described how conversations in the queue gravitated toward the “real value of the euro.” “People still loudly translate their 60-euro allowance into the old Greek currency. They talk about how much they could buy with 20,000 drachma and how little they can get with 60 euros.”¹⁹³

Many elderly and pensioners did not possess ATM or debit cards and were unable to access their money.¹⁹⁴ But it was not only the elderly who struggled. Aimee Placas, an anthropologist based in Athens, has been conducting long-term ethnographic research on consumer finance and everyday experiences of price consciousness in Greece since the introduction of the euro. She details the longer history of such experiences.¹⁹⁵ Greece had low average numbers of debit card use before the introduction of capital controls, but debit card usage increased dramatically afterwards.¹⁹⁶ Low usage of debit cards and other financial products was particularly acute in rural areas of Greece. Daniel Knight, who has done long-term fieldwork in rural central Greece, writes:

I would reiterate that it is not only elderly people who do not have credit cards and are ignorant of how to operate ATMs. In those ATM queues when capital controls were introduced I would say that anyone over the age of 30 was having problems. Rural Greece was just not attuned to using cards - many people in their 30s and 40s who had never had the need to leave the country (overseas travel is a primary reason someone would get a cash card issued) either did not have a card or did not know how to use it. Also, there is so much travel involved to find an ATM or bank. [In one village, residents are] 90 minutes drive away from the nearest ATM or bank. The village has no Internet connection (not even dial-up) so online transactions are impossible. Cash is king out of necessity. And this village is not unusual.¹⁹⁷

Problems with access and use of debit cards or online banking services therefore extended to even more fundamental issues such as connectivity and Internet use, which are also markedly different in rural Greece, compared to Athens. Knight explains,

It is not unusual for people in their 30s and 40s to have never operated a computer, or know how the Internet works. Public servants in council offices, municipal posts, health care etc. often do not know how a computer operates. Also, severe cutbacks on public spending mean that when a computer is available it is often old, slow, or does not work. When I wanted to pay the outstanding tax owed by a recently deceased relative to the amount of 2,500-euro I went to the tax office in Trikala in person. I offered to pay by card but they didn't have a machine (evidently they did once but nobody knew how to operate it and then it got lost in the office). I offered to make a bank transfer but they said that was impossible as no such system was set up. To pay 2,500-euro outstanding tax I had to use my UK credit card over the course of 5 days to withdraw cash, carry it through the streets of the town and physically put it on the desk of the office clerk. That is normal in Greece outside Athens.¹⁹⁸

Before the 2015 referendum, many Greeks (especially elderly, those with substantial savings) made daily withdrawals of money to store in cash in their homes because of the lingering crisis and fears that Greece might be forced to leave the euro.¹⁹⁹ Many Greeks want to stay in



the euro. Holding savings in euro cash is a visible claim on continued membership and also a sign of the loss in trust in their own financial system and institutions.²⁰⁰ These withdrawn savings and other income are stored in various denominations, including 500 euro notes. Knight confirms:

*Cash is stored in sometimes staggering quantities in the home. Many of my informants draw out their maximum allowance every week and hide it at home, meaning that there are, in some cases, tens of thousands of euros cash in the house. This is both dangerous - there are increasing cases of robbery/burglary - and defeats the object of the EU-wide anti-cash policy because these stored amounts could hypothetically be used to fund any shady activity the family pleased.*²⁰¹

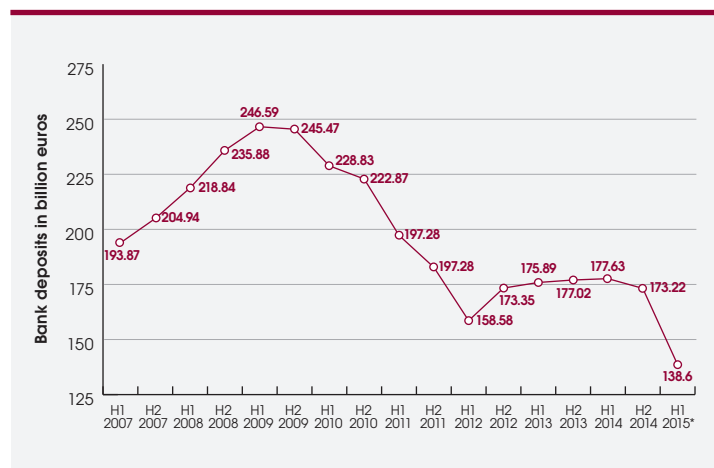
There are reports that all exchanges of large-denomination notes for smaller notes are being recorded, and that fees are charged for exchanging the notes.²⁰² According to Placas, "Greek consumer protection agencies have made consistent complaints for years now about the unfair fees charged in Greece's retail banking sector (an oligopoly)

including fees on electronic transfers and transactions; commerce unions have joined the concern over POS (point of sale) charges. The concentration of all non-cash payment systems in this non-competitive industry is problematic for consumers."²⁰³ Placas explains that the state has also passed a new law this year (in 2017) requiring all tourism-related businesses to have a POS machine for electronic transactions, effectively eliminating cash-only businesses. Other sectors are included and more will follow apparently in 2018."²⁰⁴ The state-mandated shift to digital payment options is placing great financial burdens on small entrepreneurs: "Transaction fees for plastic money (including mobile phone monies, which currently are Visa Europe products) can be quite onerous for smaller shops, with many reporting that they are also paying transaction fees on the 24% value added tax (VAT) added to sales."²⁰⁵

Cash payments have therefore been essential to evading some of these fees and the high costs of electronic payments. In rural areas, the role of cash is even more central to "getting crucial jobs done," Knight explains. He illustrates this with a personal example where a relative in Trikala needed an urgent operation this past spring:

*He booked his appointment with the surgeon but required 4,000 euro cash to pay the doctor who was to operate. How does one get 4,000 euro in one week, when capital controls are in place? Okay, I know that these 'fakelaki'²⁰⁶ payments would be viewed as corruption in northern Europe, but that surgeon - and every surgeon - would simply not operate if the cash is not handed over. I know cases where people have died in ambulances because the family didn't have cash to hand. Gathering 4,000 euro cash could be seen as a suspicious activity by the EU, but it is life or death on the ground in rural Greece. In the case of my relative, he had to call in favours from the extended family and also get money withdrawn via a British friend of mine living in Trikala who had a UK bank card with them. And of course, the fakelakia, which are not seen as corruption in Greece but simply a normal part of socio-economic relations, are in every walk of life, with the whole point being that they are cash not card payments. Public services would grind to a halt.*²⁰⁷

Greek bank deposits total values from first half of 2007 to first half of 2015 (in billion euros)



Source: Quartz. Statista - The Statistics Portal, Statista. Accessed June 9, 2017. www.statista.com/statistics/440752/greek-bank-deposits-value/.

Other means besides cash are being used to avoid taxes. A recent report indicates that businesses are avoiding taxes by paying workers in coupons rather than wages.²⁰⁸ But there is a danger in stigmatizing the informal economy in Greece, especially for a majority of citizens and small business owners who could otherwise not make ends meet. New forms of consumer credit, such as “holiday loans” and other installment payment options, since the introduction of the euro have contributed to indebtedness and shifting categories of risk and creditworthiness.²⁰⁹

Now, tax relief is tied to spending with e-payments rather than cash, but certain fixed expenses such as rent and utilities may not count toward the amount. It is the poor and small businesses, and not wealthy tax evaders, that are negatively impacted.²¹⁰ Placas confirms that, “this has tremendously affected consumption payment patterns.”²¹¹ Under the new tax regime, consumption is increasingly limited to taxable transactions:

*The Finance Ministry announced in 2016 that only transactions conducted with credit and debit cards, or through electronic bank transfer, would be counted toward general expenses for personal income tax forms (announced by the same deputy finance minister who also publically criticized high bank fees and commissions). Spending a specific percentage of one’s income through these forms is required for tax exemptions, and falling short of that percentage brings a fine.*²¹²

In the context of the current debate around the future of cash in relation to other payment forms, these requirements raise important questions about the future division of public/private responsibility for ensuring inclusive and affordable access to payment infrastructures. Placas argues that “tax enforcement through encouraging plastic money consumption is, in effect, the privatization of accountability; credit card companies and banks track transactions for the state, taking their not so insignificant percentage for doing so.” This also has consequences for defining what will count as legitimate, “authorized and accountable consumption.”²¹³

“Tax enforcement through encouraging plastic money consumption is, in effect, the privatization of accountability.”

Aimee Placas

While restrictions on daily ATM withdrawals for Greeks have lessened, with capital controls still in place since 2015 there has been a further erosion of trust in banking institutions.²¹⁴ “This is a sector that did not have a lot of trust to begin with. Great attention has been paid during the crisis to the debt owed to the banks by the political parties, as well as by mass media companies, with suggestions that the sector has benefited from holding such debt.”²¹⁵

4.3 Lessons

“People are realizing they have far more money in theory than they can get in hand.” But they are also becoming aware of some of the advantages of cash: “Cash doesn’t disappear if your phone battery dies; it doesn’t require an Internet connection” (Barrett, 2015).²¹⁶

Recent experiences in India and Greece have prompted renewed reflection on the “money gap” between physical cash and electronic money. These newest episodes of cash restrictions offer important lessons about the consequences and societal impact of abrupt changes to the composition and accessibility of cash. “A change in money – even if only to cancel or replace particular denomination banknotes or temporarily limit access to ATM withdrawals of cash – entails different stakes for individuals, segments of a society, as well as national and transnational communities.”²¹⁷ Central bank money – physical cash – is a public good that all can use without charge and without requiring electrical or telecommunications network services. Those arguing for the switch to digital, downplay the future status and stakes of fees and tolls on digital transactions and problems of interoperability among digital systems.

The importance of euro cash to the single currency project exemplifies perhaps best how physical cash continues to signal a more durable agreement between citizens and state entities. While cash can also be altered or revoked by the state – as the examples in India and Greece show – the control over electronic value channels may potentially pose a greater risk to being abused by government authorities, corporations, or other agents than a physical change in cash. Moreover, how will the costs of building out and maintaining digital payment infrastructures be fairly distributed across societies?

In sum, the recent demonetization move in India and ongoing capital controls in Greece raise highly relevant questions about the role of cash and payments as a public good and about who will bear the costs of implementing, supporting, and maintaining the necessary environmental, technological, and social infrastructures upon which payments depend. These issues should be opened up to a broader collective discussion.

Who bears the costs of
implementing, supporting,
and maintaining the necessary
environmental, technological,
and social infrastructures upon
which payments depend?

5. Discussion: Money Instruments, Payment Infrastructures, and the Public Good

Ongoing debates about the future of money are prompting greater reflection on the importance of cash to contemporary payment systems and to society at large.²¹⁸ Concerns about cash should be placed within the broader context and more urgent question of money's role as a public good – part of a public infrastructure that everyone in society can use and access.²¹⁹

In our current monetary system, legal tender – in the form of cash – is an essential public good that guarantees ease of use, a certain level of privacy, accessibility, and many other qualities that have been discussed above. But for some who would restrict or eliminate cash, the beneficial qualities of cash are weighed against the social harms of money laundering and terrorist finance with the belief that digital and electronic forms of money offer a reliable and transparent means of audit and visibility that can be used for the greater social good.

Though the rise of new payment methods may suggest a more complete and transparent record of transactions, research is showing that this does not necessarily pass the reality test. Not all electronic transaction data is transparent or easily trackable. Digital transactions can be easily obscured, and the truly vast amounts of data they can generate place on shaky ground the claim that digital transactions are transparent. In turn, cash is often the only reliable marker when it comes to data records in payments.

Concerns about cash should be placed within the broader context and more urgent question of money's role as a public good – part of a public infrastructure that everyone in society can use and access.

New and alternative payment methods are already shifting the terrain of notions of anonymity such that KYC (Know Your Customer) and due diligence regulations and their enforcement need to be updated. The collection of biometric data as a form of ID linked to multiple accounts raises questions not only of privacy and methods of identity verification,²²⁰ but how security breaches to such systems will be dealt with in the event that such data is compromised.²²¹ The push towards digital systems of payment raises the specter of overreach and abuse whether on the part of the state or the market when users are no longer free to choose when, how, and on what terms to use formal financial services.²²² Payment systems can be shut down not only due to technical failure but also for political purposes.²²³ Moreover, private financial entities and service providers increasingly have control over what they consider to be their proprietary data. It is an open question as to how data access, ownership, and control will be legislated in a future where data is becoming a valuable commodity in its own right.²²⁴

Often left out of the debate around moving from cash to digital forms of payment is the issue of tolls and fees that are currently required to access various payment networks and to maintain payment applications and bank accounts.²²⁵ In a complete shift to cashlessness, new arrangements would need to be worked out, and would certainly differ across payment cultures, with regard to a socially accepted division of labor between public and private institutions in creating money and ensuring the stability, security, accessibility, and trustworthiness of the payments infrastructure. In this sense, payments could also be seen as a public utility guaranteed by the state, like access to safe drinking water and other essential services that allow societies to function.²²⁶

Responses to these issues and many more require greater attention to the role of cash and the importance of physical money objects in an increasingly virtual, networked world.

The societal benefits of cash depend on the very qualities that enable its misuse. Like other financial tools, as well as other commodities or social innovations, cash can be used for good or for ill, for social benefit or for harm. As others in this debate have pointed out, a car can be used to drive to work, school, or for travel, but it can also cause accidents or even intentional deaths. A smart phone can be used to communicate with others and as a financial tool, but it can also be used to record people's conversations without permission, to perpetrate fraud or online stalking, or even trigger a bomb. The Internet presents people around the world with unprecedented access to knowledge, making life easier on many counts. At the same time, it provides terrorists and criminals with countless venues to plan and execute their activities. But there are no plans to eliminate these tools or platforms, even though they also can be seen as harming the environment, draining natural or financial resources, or being enmeshed in exploitative labor practices or regulatory trickery. To take the case of alcohol, as one commentator has done,²²⁷ the prohibition era in the U.S. did not prevent certain actors from taking advantage of and even benefitting from the prohibition by those able to circumvent the ban and therefore corner the market on alcohol provision.

But does this warrant more study on the harmful effects of cash?²²⁸ Are not the investigative cases arising from money laundering or terrorist finance already contributing to that agenda? Central banks and other entities should be paying more attention to cash usage, costs, and patterns as a positive investigative project. There remains an enormous data gap in qualitative and well as quantitative studies on cash and its interplay with other payment forms. This applies especially in the European context, paradoxically, perhaps, because most observers just assume that payment in Europe is "modern," "seamless", and increasingly "cash-light".²²⁹

The "cash user" perspective is therefore important to setting the right policies, not only in respect to fighting crime and potential terrorist activity, but in regard to legitimate and legal uses of cash and other payment instruments.

More research has been done on user experiences with cash in the so-called developing world – necessitated in part by the advent of mobile money and efforts to include more people in the formal financial system.²³⁰ The interplay between cash, traditional currencies, formal banking, and new payment forms has broadened our understanding of the importance of cash.²³¹ In the U.S., where the safety net provided by the state is thin and incomes are volatile, financial diaries²³² and studies of payday lending²³³ have provided empirical weight to the role of cash usage in negotiating this terrain. Users can and do choose not to use new payment methods. Trust in new technologies is contingent upon many factors that include the stability of value systems and the sources of authority upon which they depend.²³⁴ Much less research has been done on similar issues in the EU, research that is needed to better understand the granular nature of payment practices and the implications of policy changes to cash in particular.

The interplay between cash, traditional currencies, formal banking, and new payment forms has broadened our understanding of the importance of cash.

IMTFI research shows the importance of maintaining cash as one of the many financial tools available to the poor. Similarly, older technologies such as the “dumb phone,” the basic feature mobile phone that predominates in many parts of the world, have been framed as on their way out. Current trends in the industry are rushing to push smart phone technology in the mobile money space. But as one recent report has shown, maintaining the infrastructure for the “dumb phone” for mobile payments in many parts of the developing world is crucial to accessibility for a vast majority of poor users.²³⁵ The assumption that one can quickly move on to the latest innovation is problematic from a policy standpoint when it comes to inclusion. Governments have an obligation to all their citizens, not just to the ones at the forefront of technology, education, and wealth.

Indeed, the best analogy for situating the continued importance of cash is the Internet:

- The Internet is the essential infrastructure on which so many social and financial practices depend (for good or for ill);
- Because of its importance in providing broad access to people at an unprecedented scale, the Internet is in many respects a public utility. Current discussions around net-neutrality highlight the need to maintain the Internet as a publically accessible infrastructure.

Cash is complementary to the explosion of new payment forms as a check on continued limitations to privacy, freedom, and access. Cash has a proven ability to serve as a publically accessible utility, and this aspect should be taken seriously in the current policy climate.

But cash is not simply a commodity, nor is it only a tool that fulfills its function as a payment instrument (means and measure of exchange, store of value, and method of keeping accounts).²³⁶ Cash is part of diverse social and symbolic practices that are not captured by narrow measures of its economic utility or opportunity costs. In considering the “costs” of cash, relative to other payment methods, policy considerations should:

- Adopt a more holistic view of the notion of “costs” and money as a “public good”;
- Keep in mind the broader infrastructures that make payments possible – environmental resources, electricity, connectivity, data storage, analysis, and use (sharing) as well as different regulatory regimes around “privacy.” Cash is an important safeguard against network failures, lack of electricity, or political turmoil on the one hand, and a potential limit upon governmental as well as market overreach into people’s financial lives on the other;
- Take into account the global uses of cash, as well as specific national currencies. Territorial, regulatory, and cultural differences will continue to shape payment practices such that a policy shift entails implications not only for the currency area under focus, but its relationship to other currency communities.

Considering these recommendations will lead to a more holistic understanding of cash as a necessary complement to other payment forms and a vital part of our monetary system.

The “cash user” perspective is important to setting the right policies, not only in respect to fighting crime and potential terrorist activity, but in regard to legitimate and legal uses of cash and other payment instruments.

Appendix

- 1 The Institute for Money, Technology & Financial Inclusion (IMTFI), housed in the School of Social Sciences at the University of California, Irvine, was formed in 2008. IMTFI has funded 147 research projects in 47 countries; these projects explore the intersection of existing money practices with new technologies, especially the mobile money.
- 2 For example, women micro-entrepreneurs in Kenya described how they used their M-Shwari deposit account on their mobile phones to hide savings earmarked for their business activities from their husbands - Milcah Mulu-Mutuku and Castro Ngumbu Gichuki. "Object-Centered Focus Group Discussions: Stimulating Conversations On Mobile Money Practices and Culture." IMTFI Blog, October 17, 2016. <http://blog.imtfi.uci.edu/2016/10/object-centered-focus-group-discussions.html>
- 3 On patterns of sharing and use, see Ch. 7. "What can you do with a mobile phone?" Bill Maurer, *How Would You Like to Pay? How Technology Is Changing the Future of Money*. Durham, NC: Duke University Press, 2015: 109-116. <https://www.dukeupress.edu/how-would-you-like-to-pay>.
- 4 Another drawback is that the "identity" linked to the account is assumed to be a single individual, which does not allow for cases of legitimate shared use (such as when a household shares an account).
- 5 IMTFI researcher Andrew Crawford is developing a financial education board game on this savings practice, which is found across many different cultures, and in which physical cash figures centrally. IMTFI research has shown that these kinds of informal organizations are not easily digitized for legitimate cultural and social reasons. Andrew Crawford, "New ROSCA Board Game at the Mekong Financial Inclusion Forum." IMTFI Blog, September 6, 2016. <http://blog.imtfi.uci.edu/2016/09/new-roscas-board-game-at-mekong.html>.
- 6 Table banking is an informal savings association (similar to village banking or rotating savings and credit organizations) where, as in the example of Kenya, women entrepreneurs raise capital for their micro enterprises by pooling resources in order to extend credit to members on a rotating basis. Because the money is not saved in a bank but is held among the members, women can access credit more flexibly than would be possible in the formal banking system. For more on table banking in Kenya, see Milcah Mulu-Mutuku and Castro Ngumbu Gichuki, "Influence of Mobile Money on Control of Productive Resources among Women Micro Entrepreneurs participating in Table Banking in Nakuru, Kenya." IMTFI Final Report, January 2017. http://www.imtfi.uci.edu/files/docs/2016/Mulu_Mutuku%20and%20Gichuki%20Final%20Report%20for%20IMTFI_January%202017.pdf.
- 7 Matt Honan, "Kill the password: a string of characters won't protect you," *Wired*, Nov 15, 2012. <https://www.wired.com/2012/11/ff-mat-honan-password-hacker/>.
- 8 See European Union Agency for Network and Information Security, "ENISA study on the security aspects of virtualization." ENISA. Feb 10, 2017, <https://www.enisa.europa.eu/news/enisa-news/enisa-study-on-the-security-aspects-of-virtualization> Nicole Starosielski, "Undersea cable network operates in a state of alarm [excerpt]." *Scientific American*, March 27, 2015, <https://www.scientificamerican.com/article/undersea-cable-network-operates-in-a-state-of-alarm-excerpt/>.
- 9 In 2007, cables near Vietnam were disrupted, cutting off Internet service and leading to delays in service of over three months. Nicole Starosielski, "Undersea Cables String Together the Internet." *Science Friday*, April 10, 2015, <https://www.sciencefriday.com/segments/undersea-cables-string-together-the-global-internet/>.
- 10 NationMaster electrical outages, Days, countries compared: 2005 <http://www.nationmaster.com/country-info/stats/Energy/Electrical-outages/Days#2005> and 2006 <http://www.nationmaster.com/country-info/stats/Energy/Electrical-outages/Days#2006>
- 11 World Atlas, "Countries most prone to power outage financial losses." March 1, 2017 (last updated). <http://www.worldatlas.com/articles/countries-most-prone-to-power-outage-financial-losses.html>.
- 12 Yomi Kazeem, "Nigeria's electricity problem is burning a \$100 million hole in the pockets of phone companies." *Quartz Africa*. July 3, 2015 <https://qz.com/443167/nigerias-electricity-problem-is-burning-a-100-million-hole-in-the-pockets-of-phone-companies/>.
- 13 Bhaskar Chakravorti, "Cash is falling out of fashion – will it disappear forever?" *The Conversation*. June 25, 2017. <https://theconversation.com/cash-is-falling-out-of-fashion-will-it-disappear-forever-79316>.
- 14 Sarah Whitten, "Starbucks sees payment system outage in US and Canada." *CNBC*. May 16, 2017. <http://www.cnn.com/2017/05/16/some-starbucks-seeing-payment-system-outages.html>. See also Robert Channick, "Starbucks payment outage a rude awakening for some Chicago customers." *Chicago Tribune*. May 16, 2017. <http://www.chicagotribune.com/business/ct-starbucks-payment-outage-chicago-0517-biz-20170516-story.html>. At one Starbucks location on the campus of the University of California, Irvine, I observed how employees accommodated some frequent customers, such as myself, by writing down the prepaid loyalty card number on a notepad, to be entered into the system as soon as operations were restored.
- 15 Cash has continued to be crucial in supporting women's savings practices, as in the case of Deepti Kc and Mudita Tiwari's small-scale randomized control trial with rural women in India, that combined a simple lock box and key for cash savings with financial education tools, allowing women to save more and maintain control of the money they put aside: "Innovative and Interactive Ways to Improve the Savings Habits of Women." IMTFI Blog. January 2, 2016. <http://blog.imtfi.uci.edu/2016/01/innovative-and-interactive-ways-to.html> – For a snapshot of IMTFI's approach to the world of payments, as well as key takeaways for financial institutions, technology developers and policy makers when making decisions that impact people's monetary and financial lives, see this recent post by Jonathan Miller, "In fast-moving world of money and payments, anthropology finds a niche." IMTFI Blog. April 27, 2017. <http://blog.imtfi.uci.edu/2017/04/in-fast-moving-world-of-money-and.html>. On gender and monetary practices, see "Snapshots of Gender and Financial Inclusion." IMTFI Synthesis. <http://www.imtfi.uci.edu/files/articles/2014/GenderFinancialInclusion-singles.pdf>.
- 16 Concept from Nicole Starosielski, "Undersea Cables String Together the Internet." *Science Friday*. April 10, 2015, <https://www.sciencefriday.com/segments/undersea-cables-string-together-the-global-internet/>.
- 17 See for example Jens Eberhardt, "Last Mile in Mobile Money is 'cash.'" *Cash Handling Journal*. Dec 11, 2015, <http://en.cashhandling.eu/last-mile-in-mobile-money-is-cash/>. A number of recent cash reports provide further evidence of the usage and continuing importance of cash: G4S European Cash Report <http://www.g4s.com/cashreport>; PYMNTS <http://www.pymnts.com/cash/2016/europe-cash-usage/>; <http://www.pymnts.com/amazon-entertainment/2017/united-states-cash-usage/>; CapGemini World Cash Report <https://www.worldpaymentsreport.com/download>; ECB https://www.ecb.europa.eu/stats/policy_and_exchange_rates/banknotes-coins/circulation/html/index.en.html. Sveriges Riksbank, "Payment statistics for Sweden." <http://www.riksbank.se/en/Statistics/Payment-statistics/>; ING International Surveys: https://www.ezonomics.com/ing_international_surveys/mobile-banking-2017-cashless-society/.
- 18 Thanks to Bill Maurer for this formulation regarding the long history of currency usage. For a brief overview of this long history, see Chapurukha Kusimba, "When – and why – did people first start using money?" *The Conversation*. June 19, 2017. <https://theconversation.com/when-and-why-did-people-first-start-using-money-78887>.
- 19 European Central Bank, "Press Release: ECB ends production and issuance of 500 banknote." ECB. May 4, 2016. <https://www.ecb.europa.eu/press/pr/date/2016/html/pr160504.en.html>
- 20 European Commission, "Proposal for an EU initiative on restrictions on payments in cash: Inception Impact Assessment." EC. Jan 23, 2017. http://ec.europa.eu/smart-regulation/roadmaps/docs/plan_2016_028_cash_restrictions_en.pdf.
- 21 Gabriele Camera, who specializes in experimental economics and finance, points out the fallacy of arguments that equate the privacy afforded by cash with the intent to commit a crime – "not all those who prize privacy commit crimes" – and imply that "privacy ultimately causes misconduct," Gabriele Camera, "A Perspective on Electronic Alternatives to Traditional Currencies." Sveriges Riksbank, Penning- och valutapolitik 2017. 1: 143. In the arguments about cash and crime, there is a kind of slippage between the object (cash) and its attributes (e.g. privacy) in addition to the causal relationship implied by the link between cash and crime. http://www.riksbank.se/Documents/Rapporter/POV/2017/rap_pov_artikel_6_170120_sve.pdf
- 22 Alexei Kireyev, "The Macroeconomics of De-Cashing." IMF Working Paper WP/17/71, March 27, 2017. <https://www.imf.org/en/Publications/WP/Issues/2017/03/27/The-Macroeconomics-of-De-Cashing-44768>

- 23 World Bank, <http://www.worldbank.org/en/topic/financialinclusion/overview#1>, updated April 5, 2017.
- 24 "Access to Cash: The First Step toward Financial Inclusion." ATMA and AGIS Consulting. April 2017. <http://cashesentials.org/docs/default-source/publications/cash-and-financial-inclusion-31-mar-2017.pdf?sfvrsn=2>.
- 25 FDIC, "2015 FDIC National Survey of Unbanked and Underbanked Households." FDIC. Oct 20, 2016: 1; Executive summary, <https://www.fdic.gov/householdsurvey/2015/2015execsumm.pdf> – On income volatility, see James Militzer, "Dear Diary: New Financial Diaries research explains why many Americans are so angry." Next Billion Blog, April 24, 2017. <https://nextbillion.net/dear-diary-new-financial-diaries-research-explains-why-many-americans-are-so-angry/>.
- 26 MasterCard and World Bank 2016, cited in "Access to Cash." ATMA and AGIS Consulting. Ibid. p. 9. <http://cashesentials.org/docs/default-source/publications/cash-and-financial-inclusion-31-mar-2017.pdf?sfvrsn=2>. Mastercard, "The Road to Financial Inclusion, Mastercard Financial Inclusion Survey, Key Learnings Report." December 2016. https://newsroom.mastercard.com/wp-content/uploads/2016/12/Road-to-Inclusion_Mastercard-Financial-Inclusion-Survey-2016.pdf – Detailed data on a country or region-specific basis can be accessed through the 2014 World Bank Global Findex database, <http://datatopics.worldbank.org/financialinclusion/> accessed June 23, 2017.
- 27 David S. Evans and Alexis Pirchio, "An Empirical Investigation of Why Mobile Schemes Ignite in Some Developing Countries but Flounder in Most." University of Chicago Coase-Sandor Institute for Law & Economics Research Paper No. 723. March 14, 2015. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2578312. For a cross-cultural perspective, see IMTFI, "Design Principles." http://www.imtfi.uci.edu/files/docs/2013/imtfi_dps_2010.pdf
- 28 Examples of current jurisdictional "hotspots" are noted in a recent overview for the US Congress, Rena S. Miller and Liana W. Rosen, "Anti-Money Laundering, An Overview for Congress." Congressional Research Service. March 1, 2017. <https://fas.org/sgp/crs/misc/R44776.pdf>
- 29 "Circulation of 1,000 Swiss franc notes jumps in Switzerland." The Economic Times. Feb 22, 2016. <http://economictimes.indiatimes.com/news/international/business/circulation-of-1000-swiss-franc-notes-jumps-in-switzerland/articleshow/51095121.cms> – See also Bernardo Batiz-Lazo and Marybeth Rouse, "Why Scrapping the Euro 500 note may not help counter terrorism." The Conversation. March 1, 2016. <https://theconversation.com/why-scrapping-the-500-note-may-not-help-counter-terrorism-55527>.
- 30 Ruth Judson, "The Death of Cash? Not So Fast: Demand for U.S. Currency at Home and Abroad, 1990-2016." Bundesbank International Cash Conference, March 2017: 7 http://www.bundesbank.de/Redaktion/EN/Downloads/Tasks/Cash_management/Conferences/2017_04_24_judson.pdf?__blob=publicationFile
- 31 "PWC Global Economic Survey." PWC, 2016: 9. <https://www.pwc.com/gx/en/economic-crime-survey/pdf/GlobalEconomicCrimeSurvey2016.pdf>
- 32 PWC "Cybercrime, a boundless threat." <http://www.pwc.com/gx/en/services/advisory/forensics/economic-crime-survey/cybercrime.html>
- 33 Selina Keesoony, "International anti-money laundering laws: the problems with enforcement." Journal of Money Laundering Control. Vol 19(2) 2016: 130-147. <http://www.emeraldinsight.com/doi/full/10.1108/JMLC-06-2015-0025>; Norman Mugarura, "Does the broadly defined ambit of money laundering offences globally a recipe for confusion than clarity." Journal of Money Laundering Control. 2016. 19(4): 432-446. <http://www.emeraldinsight.com/doi/abs/10.1108/JMLC-06-2015-0024?mobileUi=0&journalCode=jmlc>. For a recent case, see: Christian Focacci, "AML officers gone wild!" Transpirt Blog. June 26, 2017. <http://transpirt.com/blog/2017/06/26/aml-officers-gone-wild/>.
- 34 See for example, Ch. 3 on transforming cash (38-39), in EUROPOL, "Why is cash still king? A strategic report on the use of cash by criminal groups as a facilitator for money laundering." European Police Office, 2015. <https://www.europol.europa.eu/publications-documents/why-cash-still-king-strategic-report-use-of-cash-criminal-groups-facilitator-for-money-laundering> – See also the APG Typology Report on Trade Based Money Laundering, July 20, 2012. http://www.fatf-gafi.org/media/fatf/documents/reports/Trade_Based_ML_APGReport.pdf
- 35 Michael Freeman and Moyara Ruehsen, "Terrorism Financing Methods: An Overview." Perspectives on Terrorism. 2013. 7(4): 5-26. <http://www.terrorismanalysts.com/pt/index.php/pot/article/view/279/html>. Michael Freeman, "The Sources of Terrorist Financing: Theory and Typology. Studies in Conflict & Terrorism. 2011. 34(6): 461-475. http://calhoun.nps.edu/bitstream/handle/10945/47781/Freeman-The-Sources-of-Terrorist-Financing_2010.pdf?sequence=1; Muhamet Aliu, Mejdi Bektashi, Arben Sahiti, Arbana Sahiti, "A Review of Sources on Terrorist Financing." 2017. AUDJ 13(1): 97-107. <http://journals.univ-danubius.ro/index.php/juridica/article/view/3756/4025>
- 36 EUROPOL, "Why is cash still king? A strategic report on the use of cash by criminal groups as a facilitator for money laundering." European Police Office. 2015. <https://www.europol.europa.eu/publications-documents/why-cash-still-king-strategic-report-use-of-cash-criminal-groups-facilitator-for-money-laundering>
- 37 In the US, the recent shift to chip and pin (EMV technology) card transactions at the physical point of sale (POS) has been accompanied by an increase of fraudulent card use online, so-called "card not present" fraud, PYMNTS, Card-not-present fraud picking up in US, PYMNTS. January 18, 2017. <http://www.pymnts.com/news/security-and-risk/2017/card-not-present-fraud-picking-up-in-us/>. For a recent and ongoing project to test the potential use of Bitcoin in terrorist financing, see Angela S.M. Irwin and George Milad, "The Use of Crypto-Currencies in Funding Violent Jihad." Journal of Money Laundering Control. 2016 19(4): 407-425, discussed below. <http://www.emeraldinsight.com/doi/abs/10.1108/JMLC-01-2016-0003>. In the context of financial cybercrime, see Matthew Leising, "The Ether Thief." Bloomberg. June 13, 2017. <https://www.bloomberg.com/features/2017-the-ether-thief/>.
- 38 EUROPOL, "Why is cash still king? A strategic report on the use of cash by criminal groups as a facilitator for money laundering." European Police Office. 2015. <https://www.europol.europa.eu/publications-documents/why-cash-still-king-strategic-report-use-of-cash-criminal-groups-facilitator-for-money-laundering>.
- 39 "FATF Report, Money laundering using new payment methods." FATF. Oct 2010. <http://www.fatf-gafi.org/media/fatf/documents/reports/ML%20using%20New%20Payment%20Methods.pdf>
- 40 For a critical genealogy of representations of terrorist finance in scholarly as well as diverse media accounts, see Ch. 1, "Mediating terrorist Money," in Marieke de Goede, *Speculative Security: The Politics of Pursuing Terrorist Monies*. Minneapolis: University of Minnesota Press, 2012: 1-26. <https://www.upress.umn.edu/book-division/books/speculative-security>
- 41 p. 113, Hamed Tofangsaz, "Rethinking terrorist financing: where does all this lead?" Journal of Money Laundering Control. 2015. 18(1): 112-130. <http://www.emeraldinsight.com/doi/abs/10.1108/JMLC-12-2013-0049>
- 42 *ibid*. From a legal standpoint, Tofangsaz notes that the "nature and definition of terrorism" remains fraught (2015: 123). In contrast to organized crime, about which there is more agreement on certain characteristics, a similar consensus does not hold for terrorism or terrorist groups (123). On the differences between terrorism and money laundering in relation to accounting methods and techniques, see Frédéric Compin, "The role of accounting in money laundering and money dirtying." *Critical Perspectives on Accounting*. 2008.19: 591-602. <http://www.sciencedirect.com/science/article/pii/S1045235407000135>
- 43 The cost of methods to address money laundering is also a factor. Cash is believed to increase the costs for law enforcement in deterring money laundering. But handling cash is also expensive for money launderers, which is why many are turning to new payment methods and electronic forms of laundering money. It is less costly and can often be done without the risk of face-to-face interaction.
- 44 BBC News, "Paris attacks, who were the attackers." BBC News Europe. April 27, 201. <http://www.bbc.com/news/world-europe-34832512>
- 45 V. Balasubramaniyan, "Understanding the costing decisions behind terror attacks – an analytical study." Journal of Money Laundering Control. 2015. 18(4): 475-487. <http://www.emeraldinsight.com/doi/abs/10.1108/JMLC-03-2014-0009>

46 This aspect of hawala is further discussed in section 3.2 of the current paper.

47 Patrick M. Jost and Harjit Singh Sandhu, "Hawala: The Hawala alternative remittance system and its role in money laundering." FinCEN, US Department of Treasury, n.d. <https://www.treasury.gov/resource-center/terrorist-illicit-finance/Documents/FinCEN-Hawala-rpt.pdf>

48 Hamed Tofangsaz, "Rethinking terrorist financing; where does all this lead?" *Journal of Money Laundering Control*. 2015. 18(1): 112-130 (citing Koh 2006, 116). <http://www.emeraldinsight.com/doi/abs/10.1108/JMLC-12-2013-0049>

49 Tofangsaz, *ibid.*, 117-119.

50 Hamed Tofangsaz, "Rethinking terrorist financing; where does all this lead?" 121.

51 *Ibid.*, 121. Some analysts refer to this as "reverse money laundering," however as Tofangsaz argues, this analogy is misleading because it implies that terrorist financing can be treated within a money laundering regime, as if it were a "sub-category" of, or "predicate to money laundering, when this is generally not the case, especially given that the sources and methods of raising and moving funds very often fall within legitimate means. The complexity of layering and integrating funds as in the case of money laundering is therefore not necessary." 124.

52 *Ibid.*, 122-123. In other words, the framework needed for the deterrence of terrorism will be of a different nature than one narrowly focused on the transaction costs and risks associated with moving money in the case of money laundering.

53 For an earlier discussion of these issues, see Andrew Zerzan, "New technologies, new risks? Innovation and countering the financing of terrorism." World Bank Working Paper; no. 174. Washington, DC: World Bank, 2009. <http://documents.worldbank.org/curated/en/119071468151762526/New-technologies-new-risks-Innovation-and-countering-the-financing-of-terrorism> – See also Major Robert Feldman, "Fund Transfers – African Terrorists Blend Old and New: Hawala and Satellite Telecommunications." *Small Wars & Insurgencies*. 2006. 17(3): 356-366. <http://www.tandfonline.com/doi/abs/10.1080/09592310600672867>

54 Anti-money laundering (AML) "refers to a set of procedures, laws or regulations designed to stop the practice of generating income through illegal actions" <http://www.investopedia.com/terms/a/aml.asp> – The Bank Secrecy Act of 1970 established reporting requirements for banks and other financial institutions with regard to monetary transactions in cash. A concise "primer" can be found here <http://www.acamstoday.org/sixthings-every-aml-person-needs-to-know/>. Originally the act focused on the reporting of taxes but was extended to money laundering and more recently terrorist financing (since 2001 US Patriot Act). Banks are required to comply with procedures that include KYC ("know your customer" identification rules) and reporting requirements for currency transactions above certain thresholds (over \$10,000 in a single or daily aggregate of smaller transactions), suspicious activity (transactions aggregating 5,000 or more), record keeping and other matters of compliance. The Financial Crimes Enforcement Network (FinCEN) <https://www.fincen.gov/sets-reporting-requirements> and the Financial Action Task Force (FATF) <http://www.fatf-gafi.org/about/historyoffatf/>, an inter-governmental standard-setting body, "promote[s] 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" <http://www.fatf-gafi.org/about/whoweare/>. FATF provides international recommendations and policy guidance based on the analysis of money laundering and terrorist financing techniques, ongoing updates on methods and trends for assessing technical compliance [http://www.fatf-gafi.org/publications/methodsandtrends/?hf=10&b=0&s=desc\(fatf_releasedate\)](http://www.fatf-gafi.org/publications/methodsandtrends/?hf=10&b=0&s=desc(fatf_releasedate)) and <http://www.fatf-gafi.org/media/fatf/documents/methodology/FATF%20Methodology-March%202017-Final.pdf> – FATF also tracks high-risk and non-cooperative jurisdictions. For more on terrorist financing, see here <http://www.fatf-gafi.org/publications/methodsandtrends/documents/nationalmoneylaunderingandterroristfinancingriskassessment.html> and here <http://www.fatf-gafi.org/media/fatf/documents/reports/FATF-Terrorist-Financing-Strategy.pdf> The ACAMS (Advancing Financial Crime Professionals Worldwide (ACAMS) is another helpful resource for publications and other media on AML and terrorist financing. See for example here: ACAMS Combatting Terrorist Financing, <http://www.acams.org/aml-resources/combating-terrorist-financing/> – For basics on money laundering see Maria Coppinger-Peters, "Money Laundering 101." *The Compliance and Ethics Blog*. May 5, 2014. <http://complianceandethics.org/money-laundering-101/>.

55 Martin Rudner, "Electronic Jihad": The Internet as Al Qaeda's Catalyst for Global Terror. *Studies in Conflict & Terrorism*. 2017. 40:1, 10-23. <http://www.tandfonline.com/doi/abs/10.1080/1057610X.2016.1157403> – John Hunt, "The new frontier of money laundering: how terrorist organizations use cyberlaundering to fund their activities, and how governments are trying to stop them." *Information & Communications Technology Law*. 2011. 20(2): 133-152. <http://www.tandfonline.com/doi/abs/10.1080/13600834.2011.578933>

56 Magnus Normark and Magnus Ranstorp, "Understanding Terrorist Finance: Modus Operandi and National CTF-Regimes." Swedish Defense Forsvarshögskolan, Report, Dec 18, 2015. http://www.fi.se/contentassets/1944bde9037c4fba89d1f48f9bba6dd7/understanding_terrorist_finance_160315.pdf

57 *ibid.*, 8.

58 *ibid.*, 24.

59 *ibid.*, 24.

60 Tom Keatinge, "Could banks help identify jihadi fighters?" BBC News. May 17, 2015. <http://www.bbc.com/news/business-32722318>.

61 Magnus Normark and Magnus Ranstorp, "Understanding Terrorist Finance: Modus Operandi and National CTF-Regimes." Swedish Defense Forsvarshögskolan, Report, Dec 18, 2015: 24. http://www.fi.se/contentassets/1944bde9037c4fba89d1f48f9bba6dd7/understanding_terrorist_finance_160315.pdf

62 Tofangsaz, *ibid.*, 124; Normark and Ranstorp, *ibid.*, 24-25.

63 Normark and Ranstorp, *ibid.*, 24.

64 Normark and Ranstorp, *ibid.*, 24-25.

65 Normark and Ranstorp, *ibid.*, 25. See also the FATF Report, "Emerging Terrorist Financing Risks." FATF. Oct 2015, <http://www.fatf-gafi.org/media/fatf/documents/reports/Emerging-Terrorist-Financing-Risks.pdf>

66 In a more recent 2016 study on the financial activities of individuals from Sweden and Denmark who joined terrorist groups in Syria, Normark, Ranstorp, and Filip Ahlin have found that credit fraud, VAT fraud, creation of online businesses, fundraising activities, unpaid loans, and the use of social benefits are playing an increasingly important role in terrorism financing, and that social media applications and other forms of online fundraising are not easily linked to bank and other financial transactions. Normark, Magnus, Magnus Ranstorp, and Filip Ahlin, "Financial Activities Linked to Persons from Sweden and Denmark who Joined Terrorist Groups in Syria and Iraq During the Period 2013-2016." Swedish Defense University, 2017. <http://www.fhs.se/Documents/Externwebben/forskning/centrumbildningar/CATS/publikationer/2017/terrorismfinansiering-fi-cats-2017-eng.pdf>

67 FATF Report, Money Laundering through the physical transportation of cash, Oct 2015, <http://www.fatf-gafi.org/media/fatf/documents/reports/money-laundering-through-transportation-cash.pdf>.

68 Keatinge, Could banks help identify jihadi fighters? May 17, 2015 <http://www.bbc.com/news/business-32722318>

69 Melvin Soudijn and Peter Reuter, "Cash and Carry: the high cost of currency smuggling in the drug trade." *Crime Law Soc Change*. July 2016. http://faculty.publicpolicy.umd.edu/sites/default/files/reuter/files/cash_and_carry_published_version.pdf – For Reuter's earlier deliberations on the relevance of cash for AML prevention in monitoring of electronic finance, see Peter Reuter and Edwin M. Truman, *Chasing Dirty Money: The Fight against Money Laundering*. Washington D.C.: Institute for International Economics, 2004: 73. <https://piie.com/bookstore/chasing-dirty-money-fight-against-money-laundering>

70 See for example discussions here about non-standardization of payments and risks to consumers: FinCoNet, "Online and Mobile Payments: Supervisory Challenges to Mitigate Risks." FinCoNet. September 2016. http://www.finconet.org/FinCoNet_Report_Online_Mobile_Payments.pdf

- 71 India Times, "Intel Reveals How Terrorists Used Prepaid Cards To Finance Their Preparations For Paris Attacks." India Times. Dec 1, 2015. <http://www.indiatimes.com/news/world/intel-reveals-how-terrorists-used-prepaid-cards-to-finance-their-activities-for-paris-attacks-247931.html>
- 72 Nine.com.au staff, "Terrorists using Australian gift cards to fund attacks: report." Nine. May 2, 2017. <http://www.9news.com.au/national/2017/05/02/07/23/store-cards-used-to-fund-terrorist-attacks>.
- 73 The European Economic and Social Committee, "Fight against terrorism financing requires wider measures." April 27, 2017. <http://www.eesc.europa.eu/news-media/press-releases/fight-against-terrorism-financing-requires-wider-measures>
- 74 In the context of financial crime by organized groups, prepaid gift cards are being used in money laundering activities known as "smurfing" – breaking up large amounts into smaller bundles of value stored on cards that can be difficult to track because of the "disjointed relationship between banks issuing the cards, merchant acquirers processing the cards, the card companies with their name on the cards and the merchants using the cards," Brian Monroe, "Merchant-Based money laundering part 2: Prepaid gift card smurfing." Association of Certified Financial Crime Specialists (ACFS). Jan 26, 2017. <https://www.acfcs.org/news/328136/Merchantbased-money-laundering-part-2-Prepaid-gift-card-smurfing.htm>.
- 75 PYMNTS, "Consumers prefer gift cards for special events." PYMNTS, May 25, 2017. <http://www.pymnts.com/news/payment-methods/2017/consumers-prefer-gift-cards-for-special-events/>.
- 76 Angela S.M. Irwin and George Milad, "The Use of Crypto-Currencies in Funding Violent Jihad." *Journal of Money Laundering Control*. 2016 19(4): 407-425. <http://www.emeraldinsight.com/doi/abs/10.1108/JMLC-01-2016-0003>.
- 77 Ibid., 408.
- 78 Ibid., 414.
- 79 As explained by Irwin and Milad, a Tor Browser is an Internet Protocol tool that can be used to "anonymize" or "cloak" transactions "to avoid anomaly detection software," 419. Dark Wallet and Bitcoin Fog are "services [that] propose to enhance the anonymity of transactions by allowing illicit transactions to digitally 'piggyback' on non-illicit transactions – this is similar to the mingling of funds that is common in money laundering. This creates a single transaction that obfuscates both legitimate and illegitimate coins." 420.
- 80 Ibid., 420.
- 81 Zachary K. Goldman, Ellie Maruyama, Elizabeth Rosenberg, Edoardo Saravalle, Julia Solomon-Strauss, "Terrorist Use of Virtual Currencies: Containing the Potential Threat." Center for a New American Security (CNAS). May 2017. <http://www.lawandsecurity.org/wp-content/uploads/2017/05/CLSCNASReport-TerroristFinancing-Final.pdf> – See chronology of episodes on p.13.
- 82 Ibid., 27. The authors provide a currency typology of fiat and virtual currencies on p. 14; blockchain is explained on p. 16.
- 83 Ibid., 6; 14; the report features 5 case studies (chapter 3) on the illicit use of new financial technologies in financial crime, with the aim of identifying lessons for establishing effective fraud and compliance programs, 18-24.
- 84 Goldman et al, *ibid*, 30-34.
- 85 Thanks to Ron Teicher and Daniel Klein of EverCompliant and Dan Frechtling and Gavin Andrews of G2 Web Services for granting permission to include graphics and content.
- 86 EverCompliant, "Digital KYC: A Key to Tackling Transaction Laundering," May 31, 2017. <http://evercompliant.com/digital-kyc-key-tackling-transaction-laundering/>; see also Izabella Kaminska, "Why transaction laundering is turning into a huge financial blindspot." *Financial Times Alphaville*. March 17, 2017. <https://ftalphaville.ft.com/2017/03/17/2186157/why-transaction-laundering-is-turning-into-a-huge-financial-blindspot>
- 87 See EverCompliant, <https://www.g2webservices.com/blog/8605/what-is-transaction-laundering/> and G2 Web Services, <http://www.g2webservices.com/blog/8605/what-is-transaction-laundering/>. Ben Dwyer offers a helpful primer on credit card processing and the financial entities involved, CardFellow.com <https://www.cardfellow.com/how-credit-card-processing-works/>. Authorize.Net features a 7-step guide here: <https://www.authorize.net/resources/howitworksdiagram/> – Further examples include: Odysseas Papadimitriou, "How Credit Card Transaction Processing Works: Steps, Fees & Participants." *WalletHub*. Apr 2, 2009. <https://wallethub.com/edu/credit-card-transaction/25511/>; MasterCard, "A typical transaction." <https://www.mastercard.us/en-us/about-mastercard/what-we-do/payment-processing.html> Accessed June 27, 2017.
- 88 "How Criminal Merchants Launder Payments." *The Nilson Report*. Issue 1110. May 2017 https://www.nilsonreport.com/publication_newsletter_archive_issue.php?issue=1110
- 89 For example, drugs, pornography, weapons, and other goods are sold through online front businesses, which, based on transaction data and billing statements, appear to be selling products like flowers or spices.
- 90 An infographic from G2 Web Services that breaks down methods of transaction laundering by type, method, and example can be accessed here: http://storage.pardot.com/46992/121663/TL_Chart.jpg – The details of a recent case investigated by the Federal Trade Commission involving a credit card laundering scheme can be accessed here: <https://www.ftc.gov/news-events/press-releases/2015/12/credit-card-laundering-scheme-participants-settle-ftc-charges>. (Cited in Dan Frechtling, "Recognising and thwarting transaction and payment laundering." *Journal of Payments Strategy and Systems*. Forthcoming in Summer 2017. 11: 2. <https://www.henrystewartpublications.com/jps> – There is no such thing as low-risk merchants, June 12, 2017 <http://evercompliant.com/today-theres-no-such-thing-as-low-risk-merchants/>
- 91 EverCompliant, <http://evercompliant.com/transaction-laundering-new-advanced-form-money-laundering/>.
- 92 Simona Weinglass, "On the Internet, nobody knows you're a money launderer." *The Times of Israel*. May 17, 2017. <http://www.timesofisrael.com/on-the-internet-nobody-knows-youre-a-money-launderer/>. The article features a series of three infographics from EverCompliant that explain the transaction laundering process, the types of business used, and "where" transaction launderers are "hiding in plain sight."
- 93 Dan Frechtling and Gavin Andrews, "Cleaning Out Transaction Laundering: A Guide for Risk and Compliance Leaders." *G2 Web Services White Paper*. March 2016. The white paper can be requested here: <https://www.g2webservices.com/cleaning-out-transaction-laundering/>.
- 94 EverCompliant, "There is no such thing as low-risk merchants." June 12, 2017. <http://evercompliant.com/today-theres-no-such-thing-as-low-risk-merchants/>.
- 95 Dan Frechtling, "Recognising and thwarting transaction and payment laundering." *Journal of Payments Strategy and Systems*. Forthcoming in Summer 2017. 11: 2. Special thanks to Dan Frechtling for generously sharing an advance copy of the article, which has greatly improved my understanding of this phenomenon. <https://www.henrystewartpublications.com/jps>.
- 96 Ibid.
- 97 Ibid.
- 98 Ibid.
- 99 Ibid. See also G2 Web Services Fact Sheet on transaction laundering detection, which can be accessed from a drop down tab here: <https://www.g2webservices.com/acquiring/>
- 100 Offshore tax havens are a good example of how jurisdictional differences are used for evading regulations and restrictions in one's country of residence. Notably, in the recent case of leaked documents from the law firm Mossack Fonseca in Panama, tax avoidance and money laundering were enabled by a variety of legal and accounting procedures, beyond cash and electronic means of transmitting and storing value. For a detailed analysis of the Panama Papers, see Andy Hira, Brian Murata, Shea Monson, "Understanding Offshore Finance: The Panama Papers in Perspective." *Work in progress*. March 17, 2016. <https://wpsa.research.pdx.edu/papers/docs/anihira.pdf>

- 101 Heike Mai, "Cash, Freedom and Crime." 2016: 8. https://www.dbresearch.com/PROD/RPS_EN-PROD/PROD0000000000441785/Cash%2C_freedom_and_crime%3A_Use_and_impact_of_cash_in_PDF
- 102 For an anthropological perspective on informality and tax compliance in Sweden, see Gustav Peebles, Ch. 3, "Receipts and Deceits: Currency regulation, black markets, and borders." *The Euro and its Rivals: Currency and the Construction of a Transnational City*. Bloomington: Indiana University Press, 2011: 69-91. http://www.iupress.indiana.edu/product_info.php?products_id=672339
- 103 Friedrich Schneider, "Restricting or Abolishing Cash: An Effective Instrument for Fighting the Shadow Economy, Crime, and Terrorism?" Paper prepared for the Deutsche Bundesbank International Cash Conference, 25-27 April, 2017. Revised version, April 4, 2017. https://www.bundesbank.de/Redaktion/EN/Downloads/Tasks/Cash_management/Conferences/2017_04_24_schneider.pdf?__blob=publicationFile – For an earlier and helpful analysis of the relationship between cash usage and the shadow economy, as well as problems of measurement, see Kari Takala and Matti Viren, *Is Cash Used Only in the Shadow Economy?* International Economic Journal. 2010. 24(4): 525-540. <http://www.tandfonline.com/doi/abs/10.1080/010168737.2010.525992>
- 104 Hawala (Arabic, meaning "transfer") and hundi (the term used in India) are informal value transfer systems and will be discussed in section 3.2 of this paper. For an overview, see the Wikipedia entry on hawala and hundi for an overview. Wikipedia. <https://en.wikipedia.org/wiki/Hawala>. On the importance and interplay of hawala and mobile money monetary circuits for Somali refugees, see Gianluca Iazzolino, "Contingency Routes: Somali Financial Flows and Transnational Spaces between Kenya and Uganda." IMTFI Final Report. 2014. http://www.imtfi.uci.edu/files/docs/2014/gianlucaiazzolino_report_final_101414_2.pdf – See also his more recent report, "Following Mobile Money in Somaliland." Rift Valley Institute Research Paper, No 4, 2015. <http://riffvalley.net/publication/following-mobile-money-somaliland/#.WZNNaSMrLJz>
- 105 Oldrich Bures, "Ten Years of EU's Fight against Terrorist Financing: A Critical Assessment." Intelligence and National Security. 2015. 30(2-3): 207-233, p. 224. <http://www.tandfonline.com/doi/abs/10.1080/02684527.2014.988443>. See also chapter 4, "Cash and the Circuits of Transnational Kinship, in Marieke de Goede, *Speculative Security: The Politics of Pursuing Terrorist Monies*. Minneapolis: University of Minnesota Press, 2012. <https://www.upress.umn.edu/book-divison/books/speculative-security>
- 106 Charles Kenny, "Why is the World So Bad at Tracking Dirty Money." JurisTax. February 23, 2015. http://juristax.com/news_detail.php?news_id=11, original article on Bloomberg.
- 107 John Bagnall, David Bounie, Kim Huynh, Anneke Kosse, Tobias Schmidt and Scott Schuh. "Consumer Cash Usage: A Cross-Country Comparison with Payment Diary Survey Data." International Journal of Central Banking. 2016. 12 (4): 1-61. <http://www.ijcb.org/journal/ijcb16a4a1.pdf> – Tobias Schmidt, "Cash payments more popular in Germany than in other countries." Deutsche Bundesbank Research Brief. 1st edition, February 2016. https://www.bundesbank.de/Redaktion/EN/Downloads/Bundesbank/Research_Centre/2016_01_research_brief.pdf?__blob=publicationFile
- 108 Federal Reserve of San Francisco, "The State of Cash, Preliminary Findings from the 2015 Diary of Consumer Payment Choice." FedNotes. Nov 3, 2016. <http://www.frbsf.org/cash/publications/fed-notes/2016/november/state-of-cash-2015-diary-consumer-payment-choice> – David A. Price, Zhu Wang and Alexander L. Wolman, "What Two Billion Retail Transactions Reveal about Consumers' Choice of Payments." Federal Reserve Bank of Richmond Economic Brief. April 2017, 17(04). https://www.richmondfed.org/publications/research/economic_brief/2017/eb_17-04 – Cassie Davies, Mary-Alice Doyle, Chay Fisher and Samuel Nightingale, "The Future of Cash, Reserve Bank of Australia." RBA Bulletin. December Quarter, 2016. <http://www.rba.gov.au/publications/bulletin/2016/dec/pdf/reserve-bank-bulletin-2016-12.pdf#page=45>
- 109 Anneke Kosse, Heng Chen, Marie-Hélène Felt, Valéry Dongmo Jiongo, Kerry Nield and Angelika Welte, "The Costs of Point-of-Sale Payments in Canada." Bank of Canada Staff Discussion Paper. 4. March 2017. <http://www.bankofcanada.ca/wp-content/uploads/2017/03/sdp2017-4.pdf> – The Federal Reserve 2016 Payments study: <https://www.federalreserve.gov/newsevents/press/other/2016-payments-study-20161222.pdf>. Tom Fish and Roy Whymark, "How has cash usage evolved in recent decades? What might drive demand in the future?" Bank of England Quarterly Bulletin. 2015, Q3. http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2015/q3prerelease_1.pdf
- 110 European Central Bank, Estimation of euro currency in circulation outside the euro area, April 6, 2017, https://www.ecb.europa.eu/pub/pdf/other/estimating_eur_in_circulation_outside_the_euro_area-201704.en.pdf – Yassine Bouhdaoui, Leo Van Hove, "On the socially optimal density of coin and banknote series: Do production costs really matter?" Journal of Macroeconomics. June 2017. 52: 252-267. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2972025. On the importance of the composition, production, movement, and management of cash denominations to the euro project see Antti Heinonen, *The First Euros: The creation and issue of the first euro banknotes and the road to the Europa series*. Suomen Pankki and the European Central Bank, 2015. https://www.ecb.europa.eu/pub/pdf/other/the_first_euros_2015en.pdf
- 111 Carin van der Crujisen, Lola Hernandez & Nicole Jonker, "In love with the debit card but still married to cash." Applied Economics. 2017 49(30): 2989-3004. <http://www.tandfonline.com/doi/abs/10.1080/00036846.2016.1251568?src=recsys&journalCode=raec20>
- 112 For a glimpse into the physical qualities of money and payment forms over time, see *Money through the Ages (Geld im Wandel der Zeit)* Deutsche Bundesbank Geldmuseum, 09/01/2011 (text in German and English). https://www.bundesbank.de/Redaktion/EN/Downloads/Publications/Bundesbank/money_through_the_ages.pdf?__blob=publicationFile
- 113 Martina Eschelbach, "Pay cash, buy less trash? – Evidence from German payment diary data." Deutsche Bundesbank 2017 International Currency Conference, Island of Mainau, Germany, April 25-27, 2017. https://www.bundesbank.de/Redaktion/EN/Downloads/Tasks/Cash_management/Conferences/2017_04_24_eschelbach.pdf?__blob=publicationFile – Avni M. Shah, Noah Eisenkraft, James R. Bettman, Tanya L. Chartrand, "Paper or Plastic?": How We Pay Influences Post-Transaction Connection." Journal of Consumer Research. 2016 42(5): 688-708. <https://faculty.fuqua.duke.edu/~jrb12/bio/Jim/shah%20eisenkraft%20bettman%20chartrand.pdf> – For an example of the continuing importance of cash for young adults in the US, see: NPR, "Is Cash-Free Really The Way To Be? Maybe Not For Millennials." NPR Morning Edition. April 6, 2015. <http://www.npr.org/sections/alltechconsidered/2015/04/06/396781707/is-cash-free-really-the-way-to-be-maybe-not-for-millennials>
- 114 Sibel Kusimba, Harpieth Chaggar, Elizabeth Gross, & Gabriel Kunyu. "Social Networks of Mobile Money in Kenya." IMTFI Working Paper Series. 2013-1. http://www.imtfi.uci.edu/files/2013-1_kusimba_1.pdf
- 115 For the impact of demonetization on such practices in India, see section 4, Case Studies, of the current paper.
- 116 For an overview of IMTFI research projects in Sub-Saharan Africa that have documented how people use mobile money together with traditional monetary tools, see Mirinalini Tankha, "The Mobile Money Experience in Sub-Saharan Africa: Lessons from the Institute for Money, Technology, and Financial Inclusion (IMTFI)." The African Technopolitan Magazine. January 2016. 5: 96-105. http://www.imtfi.uci.edu/files/articles/The_African_Technopolitan_MTankha%20article.pdf
- 117 See for example José Ossandón, "My Story has No Strings Attached": Credit Cards, Market Devices, and a Stone Guest." IMTFI Working Paper Series. 2014-3. http://www.imtfi.uci.edu/files/blog_working_papers/2014-3_Ossandon_Working%20Paper%202.pdf – Magdalena Villarreal, Joshua Greene, and Lya Niño, "Juggling Currencies in Transborder Contexts: Field Notes from Sabinilla and Calexico (Part 2)." IMTFI Blog. May 20, 2015. http://blog.imtfi.uci.edu/2015/05/juggling-currencies-in-transborder_20.html; Prince Karakire Guma, "Reimagining Rurality in Mobile Money Times: Life, Identity, and Community in Southern Uganda (Part 1)." IMTFI Blog. Sept. 21, 2015. <http://blog.imtfi.uci.edu/2015/09/reimagining-rurality-in-mobile-money.html>
- 118 Carol Coye Benson, "Don't Trash-Talk Cash." Glenbrook Paymentsviews. April 8, 2013. <http://paymentsviews.com/2013/04/08/dont-trash-talk-cash/>
- 119 See for example here: Haiko Prengel/fayvels Büro, "Kfz-Branche gegen Bargeld-Limit der Regierung, Autokauf nur noch per Kreditkarte?" Mobile.de. 2016. http://www.mobile.de/magazin/news/2016/bargeld_beim_gebrauchtwagenkauf_10402.html

120 For a discussion of this research, see IMTFI's Consumer Finance Research Methods Toolkit, 21-23. http://www.imtfi.uci.edu/files/consumer_finance_research_methods_project/IMTFI%20Consumer%20Finance%20Research%20Methods%20Toolkit_beta%20version_Reduced%20size.pdf

121 Mesfin Fikre Woldmariam, "One researcher's thoughts on money and metadata based on fieldwork in Ethiopia." IMTFI Blog. May 20, 2014. <http://blog.imtfi.uci.edu/2014/05/one-researchers-thoughts-on-money-and-metadata.html> – Mesfin F. Woldmariam, Gheorghita Ghinea, Solomon Atnafu and Tor-Morten Groenli "Monetary Practices of Traditional Rural Communities in Ethiopia: Implications for New Financial Technology Design." *Human-Computer Interaction*. 2016. 31: 473-517; <http://www.tandfonline.com/doi/abs/10.1080/07370024.2016.1139461> – a review post of the article can be accessed here: Ursula Dalinghaus, "Review Post: Monetary Practices of Traditional Rural Communities." IMTFI Blog. Sept 19, 2016. <http://blog.imtfi.uci.edu/2016/09/review-post-monetary-practices-of.html>

122 Janaki Srinivasan and Elisa Oreglia, unpublished manuscript in preparation based on their research on intermediaries, see: "Intermediaries, Cash Economies, and Technological Change in Myanmar and India (part 2)." IMTFI Blog. Nov 8, 2016 http://blog.imtfi.uci.edu/2016/11/intermediaries-cash-economies-and_8.html.

123 See Martina Eschelbach, Deutsche Bundesbank 2017 International Currency Conference, Island of Mainau, Germany, April 25-27, 2017. https://www.bundesbank.de/Redaktion/EN/Downloads/Tasks/Cash_management/Conferences/2017_04_24_eschelbach.pdf?__blob=publicationFile

124 For example, demonetization in India impacted citizens in other countries, notably Nepal, where Indian rupees were widely in use for daily transactions. Families of Nepalese migrants working in India were especially hard hit because remittances were predominantly sent to Nepal in 500 and 1000 rupee notes. Traders, migrants, and their families were stuck with invalid notes and no way to change them. See here: Deepak Adhikari, "Stuck with India's old notes, Nepalese struggle with losses." *Nikkei Asian Review*. Nov 30, 2016. <https://asia.nikkei.com/Politics-Economy/International-Relations/Stuck-with-India-s-old-notes-Nepalese-struggle-with-losses> and here: "Nepal to get exchange facilities for demonetised Rs 500 and Rs 1000 banknotes." *Hindustan Times*. March 03, 2017. <http://www.hindustantimes.com/india-news/nepal-to-get-exchange-facilities-for-demonetised-rs-500-and-rs-1000-banknotes/story-rbb6x7P1OECpHwCjgmRZl.html>. See also: Charu Sudan Kasturi, "India's cash chaos is screwing over their neighbors – oops!" *Ozy*. June 9, 2017. <http://www.ozy.com/fast-forward/how-indias-cash-chaos-is-screwing-over-their-neighbors-oops/78977>.

125 p. 117, Jacob W. Petterchak, "In Defense of Hawala – Rethinking Regulation of Customary Banking." *SOAS Law Journal*. 2017 4(1): 107-141. http://heinonline.org/HOL/Page?handle=hein.journals/soas4&div=10&g_sent=1&collection=journals

126 Ibid., 114; 118-121.

127 Ibid., 119.

128 Petterchak provides a detailed overview of existing federal and state (New York) requirements and offers practical advice for ways that hawala operators can meet accounting and compliance procedures in an imperfect regulatory environment.

129 Ibid., 130.

130 For example, the London-based peer-to-peer (P2P) money exchange service TransferWise has been described as a hawala-like digital service that moves money without crossing national borders by algorithmically matching requests for outgoing and incoming money transfers. Leo Mirani, "Facebook's first funder just backed Transferwise, a startup that's like an ancient Islamic money transfer system." *Quartz*. May 14, 2013. <http://qz.com/84388/facebook-first-funder-just-put-his-money-into-a-start-up-thats-a-lot-like-an-ancient-islamic-money-transfer-system/>; Jeremy Kahn, "London's Lonely Unicorn: Two Frugal Expats and their Billion-Dollar Startup." *Bloomberg*. June 13, 2016. <https://www.bloomberg.com/news/articles/2016-06-13/london-s-lonely-unicorn-two-frugal-expats-and-their-billion-dollar-startup>

131 Katie Sola, "Killing the \$100 Bill won't stop ISIS, But you'll hate what will." *Forbes*. Feb 19, 2016. <https://www.forbes.com/sites/katiesola/2016/02/19/killing-the-100-bill-wont-stop-isis-but-youll-hate-what-will/#5151b6345f14> – Indeed, in many of these discussions about the usefulness of large-denomination notes, the practical and regulatory obstacles as well social work of breaking a large note into smaller units of value is often taken for granted. The fungibility of cash is quite often subject to a great deal of contingency as well as social factors. See: Eric Hirsch, "Making Change in Peru: Big Bills, Financialized Development, and the potentializing limits of fungibility. Part 1." IMTFI Blog. Nov 24, 2014. <http://blog.imtfi.uci.edu/2014/11/making-change-in-peru-big-bills.html> Part 2: http://blog.imtfi.uci.edu/2014/11/making-change-in-peru-big-bills_24.html. On questions of convertibility, structured illiquidity, and value scales, see "Design Principles." IMTFI. http://www.imtfi.uci.edu/files/docs/2013/imtfi_dps_2010.pdf

132 Moyara Ruehsen, interviewed in Katie Sola, "Killing the \$100 Bill won't stop ISIS, But you'll hate what will." *Forbes*. Feb 19, 2016. <https://www.forbes.com/sites/katiesola/2016/02/19/killing-the-100-bill-wont-stop-isis-but-youll-hate-what-will/#5151b6345f14>

133 Gabriele Camera, "A Perspective on electronic alternatives to traditional currencies." *Sveriges Riksbank, Penning- och valutapolitik 2017*: 142. http://www.riksbank.se/Documents/Rapporter/POV/2017/rap_pov_artikel_6_170120_sve.pdf

134 Ibid.

135 Peter Sands and Ben Weisman – currently at Harvard Kennedy School – and their colleagues Haylea Campbell and Tom Keatinge of the Royal United Services Institute, have produced a preliminary overview of the existing empirical evidence for limiting high-denomination notes in their working paper, "Limiting the use of cash for big purchases: Assessing the case for uniform cash thresholds." HKS/RUSI Working Paper. April 2017: 20. https://www.bundesbank.de/Redaktion/EN/Downloads/Tasks/Cash_management/Conferences/2017_04_24_campbell.pdf?__blob=publicationFile – Appendix A outlines the hypotheses and data to be collected, 29. The paper was presented at the Deutsche Bundesbank's 2017 International Currency Conference, Island of Mainau, Germany, April 25-27, 2017. https://www.bundesbank.de/Redaktion/EN/Termine/2017/2017_04_25_international_cash_conference.html

136 Sands et al., "Limiting the use of cash for big purchases: Assessing the case for uniform cash thresholds." HKS/RUSI Working Paper. April 2017: 20, p. 23. https://www.bundesbank.de/Redaktion/EN/Downloads/Tasks/Cash_management/Conferences/2017_04_24_campbell.pdf?__blob=publicationFile

137 The basic principle underlying the argument about cash and negative interest rates is the understanding that the existence of physical cash acts a barrier to the imposition of negative interest rates on reserves or demand deposits. In this scenario, cash retains and even increases in value as people decide to hold value in cash rather than lose value on money in the bank. By eliminating cash, so the argument, central banks could use negative interest rates as a monetary policy tool to stimulate spending and thereby economic growth. However, others point out that central banks, and ultimately the state, would lose seigniorage interest earned from cash holdings, if cash were abolished. For a concise discussion of negative interest rates, also talked about in terms of the "lower zero bound," see Heike Mai, "Cash, Freedom and Crime." *Deutsche Bank Research*. 2016: 5-7. See also the table on p.1, which clarifies why cash and deposits are both money, but not the same. In other words, only physical cash is legal tender. https://www.dbresearch.com/PROD/RPS_EN-PROD/PROD0000000000441785/Cash%2C_freedom_and_crime%3A_Use_and_impact_of_cash_in.PDF – A brief explanation of seigniorage and how it works in the euro currency union, see "What is seigniorage?" ECB, April 7, 2017. <https://www.ecb.europa.eu/explainers/tell-me/html/seigniorage.en.html>

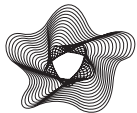
138 In particular, the implications of negative interest rates for the financial system as a whole are not addressed in the macroeconomic models of cashlessness and its potential for new monetary tools. See „Zur Diskussion um Bargeld und die Null-Zins-Politik der Zentralbank.“ *Wissenschaftlicher Beirat beim Bundesministerium für Wirtschaft und Energie (BMWi)*. February 9, 2017. http://www.bmwfi.de/Redaktion/DE/Publikationen/Ministerium/Veroeffentlichung-Wissenschaftlicher-Beirat/gutachten-wissenschaftlicher-beirat-gutachten-diskussion-um-bargeld.pdf?__blob=publicationFile&v=6

- 139 European Commission Inception Impact Assessment, Jan 23, 2017, http://ec.europa.eu/smart-regulation/roadmaps/docs/plan_2016_028_cash_restrictions_en.pdf
- 140 See, for example, Jörg König, "Bares bleibt Wahres-Bargeld als Garant für Freiheit und Eigentum, Argumente zur Marktwirtschaft und Politik." Stiftung Marktwirtschaft. 2016. Nr. 136. <https://www.stiftung-marktwirtschaft.de/wirtschaft/publikationen/argumente/detailansicht/nr/136-bares-bleibt-wahres-bargeld-als-garant-fuer-freiheit>
- 141 Brett Scott argues that in the war on cash, banks and card networks stand to win, "If plastic replaces cash, much will be lost." AEON Essays. March 1, 2017. <https://aeon.co/essays/if-plastic-replaces-cash-much-that-is-good-will-be-lost> – See also his 2016 article at TheLong+Short, "The War On Cash." August 19, 2016. <http://thelongandshort.org/society/war-on-cash>. For another perspective on this issue, see Larry White, Baptists and Bootleggers in the Global War on Cash, Foundation for Economic Education, February 1, 2017 <http://fee.org/articles/baptists-and-bootleggers-in-the-global-war-on-cash/>.
- 142 Mai, Heike, "Cash, Freedom, and Crime: Use and Impact of Cash in a World Going Digital." Deutsche Bank Research, Frankfurt, 2016. https://www.dbresearch.com/PROD/DBR_INTERNET_EN-PROD/PROD000000000427044/Cash%2C_freedom_and_crime%3A_Use_and_impact_of_cash_in.pdf
- 143 "Access to Cash: The First Step toward Financial Inclusion." ATM Industry Association and AGIS Consulting. April 2017. <http://cashessentials.org/publications/publication/2017/04/28/access-to-cash-the-first-step-toward-financial-inclusion>
- 144 FEMA, Earthquake Safety Checklist, FEMA B-526, December 2014. https://www.fema.gov/media-library-data/1421937886237-e683b4975c2c324b18967ead20336b2f/FEMAB526_2014.pdf.
- 145 Legislative restrictions on cash (especially in the fight on terrorism) may push people away from, rather than into, "transparency" – as suggested by the important American Civil Liberties Union study, ACLU, "Blocking Faith, Freezing Charity: Chilling Muslim Charitable Giving in the War on Terrorism Financing." June 2009. <https://www.aclu.org/report/blocking-faith-freezing-charity-chilling-muslim-charitable-giving-war-terrorism-financing>
- 146 Moyara Ruehsen, "The Paris Attacks have forced a European Rethink on Terrorism Finance." Newsweek. January 26, 2016. <http://www.newsweek.com/paris-attacks-have-forced-european-rethink-terror-finance-419733>. For a recent discussion of the ambiguity surrounding the EU's Terrorism Finance Tracking Program (TFTP) see Marieke de Goede and Mara Wesseling, "Secrecy and security in transatlantic terrorism finance tracking." Journal of European Integration. 2017. 39:3, 253-269. <http://www.tandfonline.com/doi/full/10.1080/07036337.2016.1263624>
- 147 Alexei Kireyev, "The Macroeconomics of De-Cashing." IMF Working Paper. WP/17/71. March 27, 2017: 15. <https://www.imf.org/en/Publications/WP/Issues/2017/03/27/The-Macroeconomics-of-De-Cashing-44768>
- 147 "Access to Cash: The First Step toward Financial Inclusion." ATMA and AGIS Consulting. April 2017. <http://www.cashrepository.com/wp-content/uploads/2017/04/Cash-and-Financial-Inclusion-31-MAR-2017.pdf>
- 148 European Central Bank, "The Use of Euro Banknotes: Results of Two Surveys among Households and Firms." ECB Monthly Bulletin April 2011: 81. https://www.ecb.europa.eu/pub/pdf/other/art2_mb201104en_pp79-90en.pdf
- 149 I was conducting research in Frankfurt am Main, Germany, at this time and learned of examples through informal interviews with bank employees and Bundesbank staff. A brief essay on this research can be accessed here: Ursula Dalinghaus, "The Euro in the Making." Newsletter of the European Union Center of Excellence at UC Berkeley. Spring/Summer, 2013. https://www.academia.edu/12359676/The_Euro_in_the_Making
- 150 Kenneth Rogoff. The Curse of Cash. Princeton: Princeton University Press, 2016. <http://press.princeton.edu/titles/10798.html>.
- 151 Ibid., 225-227.
- 152 Ibid., 225-226.
- 153 Ibid., 226. The elimination of cash would certainly impact price formation in other regards. With the absence of cash, the way in which physical cash denominations inform or act as a barrier to price formation in the cost of goods or the value of wages would be radically altered. See Mesfin Fikre Woldemariam, "One researcher's thoughts on money and metadata based on fieldwork in Ethiopia." IMTFI Blog. May 20, 2014. <http://blog.imtfi.uci.edu/2014/05/one-researchers-thoughts-on-money-and.html>.
- 154 As Roy Whymark (Bank of England, The Banknote Directorate) explains in this short video clip on the future of cash "Cash is anonymous, it's helpful with budgeting, it's widely accepted, and it provides free and easy settlement finality without the need for any technology. And to date, no other payment method has matched all these attributes or improved upon them." Sept 15, 2015. http://www.bankofengland.co.uk/publications/Pages/quarterlybulletin/2015/q3prerelease_1.aspx – See also: Tom Fish and Roy Whymark, "How has cash usage evolved in recent decades? What might drive demand in the future?" Bank of England Quarterly Bulletin 2015, Q3. http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2015/q3prerelease_1.pdf
- 155 Speech by Benoît Coeuré, "The euro area sovereign debt market: lessons from the crisis." June 28, 2012. https://www.ecb.europa.eu/press/key/date/2012/html/sp120628_1.en.html – See also Mark Blythe, "The Sovereign Debt Crisis That Isn't: Or, How To Turn A Lending Crisis Into A Spending Crisis And Pocket The Spread." 2014 http://aei.pitt.edu/59147/1/ACES_Case_Blythe_2014.pdf
- 156 Bill Maurer, "Afterword: Mobile money, money magic, purse limits and pins: tracing monetary pragmatics." Journal of Cultural Economy. 2011. 4:3: 349-359, p. 353. <http://escholarship.org/uc/item/0582m3k0>.
- 157 Aaron Klein and Kristofer Reading, "Why Do 1970s Prices Dictate Anti-Money Laundering Rules?" Bipartisan Policy Center. March 17, 2016. <https://bipartisanpolicy.org/blog/1970s-prices-anti-money-laundering/>
- 158 Ibid.
- 159 Ibid. <https://cdn.bipartisanpolicy.org/wp-content/uploads/2016/03/Price-Comparison-1.png>
- 160 Ibid.
- 161 Alison Jimenez, "Should the currency transaction report threshold be \$60,900?" DSA. April 22, 2014. <http://securitiesanalytics.com/should-the-currency-transaction-report-threshold-be-60900/>. On the importance of the \$10,000 threshold to reporting requirements, see the GAO February 2008 report on the Bank Secrecy Act cited in the article, "Increased Use of Exemption Provisions Could Reduce Currency Transaction Reporting While Maintaining Usefulness to Law Enforcement Efforts." 18-19. <http://www.gao.gov/assets/280/272447.pdf>
- 162 These also impact people's daily practices with money, as observed by Thomas Malaby in his study of the rollout of the euro in Greece. Thomas Malaby, "The Currency of Proof: Euro Competence and the Refiguring of Value in Greece." Social Analysis. 2003. 47(1): 42-52. <http://www.berghahnjournals.com/abstract/journals/social-analysis/47/1/sa470104.xml?rskey=ndT1zS&result=4> – Many aspects surrounding physical cash differ across euro member states and could also be called into question in the event of imposing uniform cash restrictions across the EU. In some euro member countries, it is still possible to exchange the former national currency for euros at the 1999 rate of conversion. Time limits differ across the Eurozone with countries like Germany setting no time limit and allowing unlimited exchange of banknotes and coins. <https://www.ecb.europa.eu/euro/exchange/html/index.en.html>
- 163 European Commission, "Special Eurobarometer 423, Cyber Security," EC. 2015. http://ec.europa.eu/commfrontoffice/publicopinion/archives/ebs/ebs_423_en.pdf A recent report notes that one million Brits have cancelled credit and debit cards due to fraud: Finextra, "One million more Brits cancel credit and debit cards in the last year due to fraud, Finextra. May 23, 2017. <https://www.finextra.com/pressarticle/69355/one-million-more-brits-cancel-credit-and-debit-cards-in-the-last-year-due-to-fraud>
- 164 For percentage of cash payments in India, see Mayank Jain. "The Beginning of the End of the Parallel Economy in India?" Bloomberg. Nov 9, 2016. <https://www.bloombergquint.com/business/2016/11/09/the-beginning-of-the-end-of-the-parallel-economy-in-india>

- 165 For a helpful timeline of key dates and decisions, see Manu Balachandran, "Timeline: 20 days of demonetization: Narendra Modi's biggest gamble with the Indian economy," Quartz, Nov 28, 2016. <https://qz.com/846454/timeline-20-days-of-demonetisation-narendra-modis-biggest-gamble-with-the-indian-economy/>.
- 166 Praveen Chakravarty, "How Modi Changed (And Changed) The Demonetisation Narrative," India Spend, December 5, 2016. <http://www.indiaspend.com/cover-story/how-modi-changed-and-changed-the-demonetisation-narrative-54391>
- 167 A synthesis of the series with links to contributors' blog posts can be accessed here: http://blog.imtffi.uci.edu/2017/02/special-perspectives-series-on_22.html. For a perspective on how demonetization ties in with broader debates about the future of cash and payments, see Ursula Dalinghaus, "Introducing a new blog series on demonetization in India, from the Institute for Money, Technology, and Financial Inclusion," Socializing Finance Blog, March 3, 2017. <https://socfinance.wordpress.com/2017/03/03/introducing-a-new-blog-series-on-demonetization-in-india-from-the-institute-of-money-technology-and-financial-inclusion/>
- 168 PTI, "Now RBI cites 'threat to life' exemption to deny RTI query on demonetisation decision," The Wire, Jan 1, 2017. <http://thewire.in/90974/90974/>.
- 169 Rahul Gandhi, "RBI changing demonetisation rules like PM changing his clothes," India Today, December 20, 2016. <http://indiatoday.intoday.in/story/rbi-demonetisation-rules-pm-narendra-modi-rahul-gandhi-congress/1/838952.html>. Indian Express, "Demonetisation woes: RBI issues a new rule again and Twitterati can't stop guessing what'll be next," Indian Express, December 20, 2016. <http://indianexpress.com/article/trending/trending-in-india/demonetisation-woes-rbi-issues-a-new-rule-again-and-twitterati-cant-stop-guessing-whatll-be-next-4436842/>. Sohini Mitter, "India questions its federal bank's capabilities to handle demonetization woes," Mashable, Dec 21, 2016. <http://mashable.com/2016/12/22/rbi-demonetization-rules-amendments-india/#sQS9AVQvHqE>.
- 170 Arjun Jayadev, "India: Demonetization and its Discontents," Institute for New Economic Thinking Blog, Nov 28, 2016. <https://www.ineteconomics.org/perspectives/blog/india-demonetization-and-its-discontents>
- 171 Kenneth Rogoff recently discussed the demonetization move in India during a public lecture at the LSE. Though he advocates for a "phasing out of large denomination notes," he argues that is should be done gradually. <http://www.lse.ac.uk/website-archive/newsAndMedia/videoAndAudio/channels/publicLecturesAndEvents/player.aspx?id=3663>
- 172 Deepti Kc, "How is digital payment working for women in rural India," IMTFI Blog, Sept 12, 2016. <http://blog.imtffi.uci.edu/2016/09/how-is-digital-payment-working-for-women-in-rural-india.html>
- 173 Dzikoto and Imasiku, "Cashless or Cashlife? Mobile Money Use and Currency Redenomination in Zambia," IMTFI Final Report, 2016: 40. <http://www.imtffi.uci.edu/research/2013/Zambia%20Report%20Dzikoto%20and%20Imasiku%20final.pdf>
- 174 Manjira Dasgupta, "Moving Towards 'Cashlessness' In An Emerging Economy: A Case Study Of Latest Policy Steps In India," Deutsche Bundesbank International Cash Conference, April 2017: 12. https://www.bundesbank.de/Redaktion/EN/Downloads/Tasks/Cash_management/Conferences/2017_04_24_dasgupta.pdf?__blob=publicationFile
- 175 Ibid., 12.
- 176 Ursula Dalinghaus, Nima Lamu Yolmo, Janaki Srinivasan, "Special PERSPECTIVES Series on Demonetization in India – Insights, Challenges, and Ways Forward," IMTFI Blog, February 22, 2017. http://blog.imtffi.uci.edu/2017/02/special-perspectives-series-on_22.html. Tara Nair quoted in Janaki Srinivasan and Elisa Oreglia, "No cash, no intermediaries? Different scenarios for a digital economy," A report on the IIT Bangalore-IMTFI workshop held on Nov 11, 2016 at IIT-Bangalore (based on rapporteur reports written by IITB students Anisha Nazareth and Sanjay V.P.). <http://www.imtffi.uci.edu/files/docs/2017/OregliaSrinivasan-BIRWorkshopReportFinal.pdf>
- 177 Ibid., Janaki Srinivasan and Elisa Oreglia, No cash, no intermediaries?
- 178 Janaki Srinivasan, "Demonetization and its Discontents," IMTFI Blog, January 24, 2017. <http://blog.imtffi.uci.edu/2017/01/special-perspectives-series-on-india.html>
- 179 PYMNTS, "In India, Cash is putting up a fight," PYMNTS, May 22, 2017. <http://www.pymnts.com/cash/2017/cash-usage-india-post-demonetization/>
- 180 Taylor C. Nelms, "Dollarization, Denomination, and Difference: Rounding Up in Quito, Ecuador," n.d. unpublished manuscript.
- 181 Debashis Acharya, V V Subbarao, and T K Venkatachalapathy, "Special Perspectives Series on Demonetization in India: The Recent Indian Demonetization and Cash Exclusion (Part 2)," IMTFI Blog, Feb 13, 2017. http://blog.imtffi.uci.edu/2017/02/special-perspectives-series-on_13.html
- 182 Isabelle Guérin, Santosh Kumar and G Venkatasubramanian, "Special Perspectives Series on Demonetization in India: The dangerous liaisons between demonetization and the Indian informal economy (Part 1)," IMTFI Blog, Jan 30, 2017. <http://blog.imtffi.uci.edu/2016/07/cashlite-or-cashless-it-depends-on.html>
- 183 Ibid.
- 184 IMTFI research, Myanmar: Janaki Srinivasan and Elisa Oreglia, "Intermediaries, Cash Economies, and Technological Change in Myanmar and India (Part One)," IMTFI Blog, November 7, 2016. <http://blog.imtffi.uci.edu/2016/11/intermediaries-cash-economies-and.html>; Zimbabwe: I.T Mahiya and S. Gukurume, "Negotiating and Converting Money in Zimbabwe's Multicurrency Environment," IMTFI Blog, November 14, 2016. <http://blog.imtffi.uci.edu/2016/11/negotiating-and-converting-money-in.html> – Ghana: Vivian Dzokoto & Mwiya Imasiku, "Cashlite or Cashless? It Depends on the Financial Ecosystem," IMTFI Blog, July 5, 2016. <http://blog.imtffi.uci.edu/2016/07/cashlite-or-cashless-it-depends-on.html>
- 185 I am grateful to Aimee Placas, Daniel Knight, and Heath Cabot for their feedback on a first draft of this section, and for contributing invaluable data and insights to the case study presented here.
- 186 Bernardo Bátiz-Lazo, Leonidas Efthymiou and Sophia Michael, "When Payments Infrastructure Turns Political: The 2015 Greek Financial Crisis Through Social Lenses," Charisma Consumer Market Studies Network, Oct 7, 2015. <http://www.charisma-network.net/finance/when-payments-infrastructure-turns-political-the-2015-greek-financial-crisis-through-social-lenses> – Heath Cabot, "Life Goes On. Banalities and Sociabilities of Crisis Greece," Allegra Lab, July 14, 2015. <http://allegralaboratory.net/life-goes-on-banalities-and-sociabilities-of-crisis-greece/> – Daniel Knight, "Poignant Past and Uncertain Futures In The Greek Crisis: Ethnographic Snippets From ATM Queues," Allegra Lab, July 15, 2015. <http://allegralaboratory.net/poignant-past-and-uncertain-futures-in-the-greek-crisis-ethnographic-snippets-from-atm-queues-2/>; Dimitris Dalakogiou, "Want to know how Greeks see the future? Get in the ATM queue and ask them," The Conversation, July 8, 2015. <https://theconversation.com/want-to-know-how-greeks-see-the-future-get-in-the-atm-queue-and-ask-them-44382>. See also Aimee Placas, "Money Talk," <https://culanth.org/fieldsights/856-money-talk> and Stamatis Amarianakis, "Changing Economic Cultures: What has happened in post-referendum Greece," PopAnth, June 21, 2016. <http://popanth.com/article/changing-economic-cultures-what-has-happened-in-post-referendum-greece> – For a perspective on the effects of the 2013 capital controls imposed in Cyprus, see Leonidas Efthymiou and Sophia Michael "The Cyprus Cash Crash: A Case of Collective Punishment," In B. Bátiz-Lazo, L. Efthymiou (eds.), *The Book of Payments*. London: Macmillan, 2016: 131-140. <http://www.palgrave.com/us/book/9781137602305>
- 187 For a discussion of different timelines and debates about the crisis, see Daniel M. Knight, *History, Time, and Economic Crisis in Central Greece*. New York: Palgrave Macmillan, 2015: 12-13. <http://www.palgrave.com/us/book/9781137501486>. For a breakdown of the economics of the crisis in charts, see Matt Phillips, "The complete history of the Greek debt drama in charts," Quartz, June 30, 2015. <https://qz.com/440058/the-complete-history-of-the-greek-debt-drama-in-charts/>
- 188 A timeline of developments preceding and following the imposition of capital controls in Greece can be accessed here, Timeline: "How the Greek economy hit a roadblock," The Financial Times, June 28, 2015. <https://www.ft.com/content/9d8caace-1da8-11e5-aa5a-398b2169cf79>
- 189 A recent overview of the economic situation in Greece from the perspective of the US has been published by the Congressional Research Service: Rebecca M. Nelson, Paul Belkin, James K. Jackson, "The Greek Debt Crisis: Overview and Implications for the United States," Congressional Research Service Report, April 24, 2017. <https://fas.org/sgp/crs/row/R44155.pdf>

- 190 Aimee Placas, "Disrupted and Disrupting Consumption: Transformations in Buying and Borrowing in Greece." *Living under Austerity: Greek Society in Crisis*. Evdoxios Doxiadis and Aimee Placas, eds. New York: Berghahn Press, forthcoming.
- 191 Shelly Banjo, "PayPal no longer works in Greece - and why that matters." *Quartz*. July 2, 2015. <http://qz.com/444188/paypal-no-longer-works-in-greece-and-why-that-matters/>; Joe Deville, "Greece is a reminder of the fragility of money and the need to deal with debt." *The Conversation*. July 9, 2015. <http://theconversation.com/greece-is-a-reminder-of-the-fragility-of-money-and-the-need-to-deal-with-debt-44400>.
- 192 Daniel Knight, "Poignant Past and Uncertain Futures In The Greek Crisis: Ethnographic Snippets From ATM Queues." *Allegra Lab*. July 15, 2015. <http://allegralaboratory.net/poignant-past-and-uncertain-futures-in-the-greek-crisis-ethnographic-snippets-from-atm-queues-2/>
- 193 Dimitris Dalakoglou, "Want to know how Greeks see the future? Get in the ATM queue and ask them." *The Conversation*. July 8, 2015. <https://theconversation.com/want-to-know-how-greeks-see-the-future-get-in-the-atm-queue-and-ask-them-44382>
- 194 Stamatīs Amariānakis, "Changing Economic Cultures: What has happened in post-referendum Greece." *PopAnth*. June 21, 2016. <https://popanth.com/article/changing-economic-cultures-what-has-happened-in-post-referendum-greece>
- 195 Aimee Placas, "Disrupted and Disrupting Consumption: Transformations in Buying and Borrowing in Greece." *Living under Austerity: Greek Society in Crisis*. Evdoxios Doxiadis and Aimee Placas, eds. New York: Berghahn Press, forthcoming.
- 196 Aimee Placas, personal communication with author, June 8, 2017.
- 197 Daniel Knight, personal communication with author, June 8, 2017.
- 198 Daniel Knight, personal communication with author, June 8, 2017.
- 199 Stamatīs Amariānakis, "Changing Economic Cultures: What has happened in post-referendum Greece." *PopAnth*. June 21, 2016. <https://popanth.com/article/changing-economic-cultures-what-has-happened-in-post-referendum-greece> – Yiannis Papadogiannis, "Greece's 500-euro-note bank run." *Ekathimerini*. Feb 11, 2016. <http://www.ekathimerini.com/205913/article/ekathimerini/business/greeces-500-euro-note-bank-run>. Bloomberg Video, "The Fearful Greeks hiding wads of euros at home." *Bloomberg*. June 19, 2015. <https://finance.yahoo.com/video/fearful-greeks-hiding-wads-euros-074251082.html> – Bloomberg, "It really looks like Greeks are hiding cash under the mattress." March 20, 2015. <https://www.bloomberg.com/news/articles/2015-03-20/it-really-looks-like-greeks-are-hiding-cash-under-the-mattress>.
- 200 Ursula Dalinghaus, "When cash is the tie that binds: situating affective monetary attachments in the Euro-Zone." Paper Presentation for the Society for the Advancement of Socio-Economics Conference, University of California, Berkeley, June 24, 2016. <https://sase.confex.com/sase/2016am/webprogram/Paper5688.html> – For an important perspective of practices of hoarding and stabilizing monetary reserves, see Gustav Peebles, "Rehabilitating the Hoard: The Social Dynamics of Unbanking in Africa and Beyond." *Africa* November 2014. 84(4): 595-613. https://www.academia.edu/10737705/Theorizing_Hoarding_and_Unbanking.
- 201 Daniel Knight, personal communication with author, June 8, 2017.
- 202 Evgenia Tzortzi, "Exchanging a 500-euro note with smaller bills can set you back five euros." *Ekathimerini*. March 17, 2016. <http://www.ekathimerini.com/207082/article/ekathimerini/business/exchanging-a-500-euro-note-with-smaller-bills-can-set-you-back-five-euros>
- 203 Aimee Placas, personal communication with author, June 8, 2017. These points have not been discussed as deeply in English, Placas says, but she recommends this article as a point of reference: Kerin Hope, "Greece to probe debt racked up by former ruling parties." *Financial Times*. March 3, 2016. <https://www.ft.com/content/9e3f80b4-f650-11e5-96db-fc683b5e52db>
- 204 Aimee Placas, personal communication with author, June 8, 2017.
- 205 Citing the Athens Chamber of Tradesmen 2015, Aimee Placas, "Disrupted and Disrupting Consumption: Transformations in Buying and Borrowing in Greece", forthcoming. See also Stamatīs Amariānakis, "Changing Economic Cultures: What has happened in post-referendum Greece." *PopAnth*. June 21, 2016. <https://popanth.com/article/changing-economic-cultures-what-has-happened-in-post-referendum-greece>
- 206 Fakelaki (plural, fakelakia) means "little envelope," and refers colloquially to a bribe given in exchange for better service or other favors.
- 207 Daniel Knight, personal communication with author, June 8, 2017.
- 208 Sotiris Nikas and Antonis Galanopoulos, "Greek firms have found a way to dodge payroll charges." *Bloomberg*. March 6, 2017. <https://www.bloomberg.com/news/articles/2017-03-07/tax-weary-greek-employers-pay-in-kind-as-creditor-demands-rise>
- 209 Aimee Placas, "Disrupted and Disrupting Consumption: Transformations in Buying and Borrowing in Greece." *Living under Austerity: Greek Society in Crisis*. Evdoxios Doxiadis and Aimee Placas, eds. New York: Berghahn Press, forthcoming. Drawing on three Bank of Greece surveys conducted in 2002-3, 2005, and 2007, Placas shows that debt-levels of households were often below euro area averages, with the problem of servicing consumer debt primarily due to the changed economic circumstances and levels of income as a result of the crisis, rather than "profligate" spending. She reminds that the "finances of states and the finances of households" have "little practical relationship" with one another (Placas, forthcoming). See also, Aimee Placas, *Trickle-Down Debt, Hot Spots*, Cultural Anthropology Website, October 31, 2011 <https://culanth.org/fieldsights/257-trickle-down-debt>.
- 210 Magda Panoutsopoulou, Greeks unhappy over online banking push, *Anadolu Agency*, Jan 14, 2017, <http://aa.com.tr/en/economy/greeks-unhappy-over-online-banking-push/726910>.
- 211 Aimee Placas, personal communication with author, June 8, 2017.
- 212 Aimee Placas, "Disrupted and Disrupting Consumption: Transformations in Buying and Borrowing in Greece." *Living under Austerity: Greek Society in Crisis*. Evdoxios Doxiadis and Aimee Placas, eds. New York: Berghahn Press, forthcoming.
- 213 Aimee Placas, *ibid*. In a personal communication with anthropologist Heath Cabot, who has studied the situation of refugees and practices of political asylum in Greece, Cabot wrote that she has also observed the recent increase in credit card use, and based on anecdotal evidence, has experienced how this is something people are seen to be striving for. Personal communication with author, June 9, 2017.
- 214 Aimee Placas, Heath Cabot, and Daniel Knight all made a point of emphasizing the longstanding distrust of Greeks in banking and financial institutions in their personal communications with me. See also C.J. Polychroniou, "Stanley Morgan Survey finds that 9 of 10 Greeks don't plan to redeposit their money with Greek banks." *Greek Reporter*. Feb 11, 2016. <http://greece.greekreporter.com/2016/02/11/stanley-morgan-survey-finds-that-9-out-of-10-greeks-do-not-plan-to-redeposit-their-money-with-greek-banks/>
- 215 Aimee Placas, personal communication with author, June 8, 2017.
- 216 Brian Barrett, "Greece's Empty ATMs show the surprising power of cash—even in 2015." *Wired*. June 30, 2015. <https://www.wired.com/2015/06/greece-atms/>.
- 217 Ursula Dalinghaus, "Introducing a New Blog Series on Demonetization in India, from the Institute of Money, Technology and Financial Inclusion." *Socializing Finance Blog*. March 3, 2017. <https://socfinance.wordpress.com/2017/03/03/introducing-a-new-blog-series-on-demonetization-in-india-from-the-institute-of-money-technology-and-financial-inclusion/>.
- 218 For examples of recent reflections on the role of cash in payments in response to these current debates, see "Why Cash Matters: Ten reasons for the popularity and relevance of cash." *Cash Matters*, 2017, <http://www.cashmatters.org/why-cash-matters-top-10-reasons-for-the-popularity-and-relevance-of-cash/> and the paper by Agis Consulting, *Cash Essentials: Beyond Payments*. n.d. <http://cashessentials.org/docs/default-source/booklet/CashEssentials.pdf?sfvrsn=8> – On efforts to achieve the qualities of cash in instant electronic payments, see Heike Mai, "Instant Revolution of Payments? The Quest for real-time payments." *Deutsche Bank Research Current Issues*. Dec 9, 2015. https://www.dbresearch.com/PROD/DBR_INTERNET_ENPROD/PROD000000000378543/Instant_revolution_of_payments%3F_The_quest_for_real.pdf

- 219 Stephen C. Rea, Ursula Dalinghaus, Taylor C. Nelms, and Bill Maurer. "Riding the Rails of Mobile Payments: Financial Inclusion, Mobile Phones, and Infrastructure." The Routledge Companion to Digital Ethnography. Larissa Hjorth, Heather Horst, Anne Galloway and Genevieve Bell, (eds.) New York: Routledge, 2016. <http://escholarship.org/uc/item/3fr714qz> – see also, for example, Gabriele Camera's framing of the monetary system as a public good, "A Perspective on Electronic Alternatives to Traditional Currencies", Sveriges Riksbank, Penning- och valutapolitik 2017. http://www.riksbank.se/Documents/Rapporter/POV/2017/rap_pov_artikel_6_170120_sve.pdf
- 220 Ignacio Mas, "I'm a Victim of DFS: Digitizing my dollars is fine, the problem is digitizing me." Next Billion Blog. June 5, 2017. <http://nextbillion.net/im-a-victim-of-dfs-digitizing-my-dollars-is-fine-the-problem-is-digitizing-me/>; George Peabody, "Internet identity, privacy, and a blockchain – SecureKey." Glenbrook Payments on Fire podcast series, April 4, 2017. <http://paymentsviews.com/2017/04/04/episode-50-internet-identity-privacy-and-a-blockchain-securekey/>.
- 221 Glyn Moody, "Aadhaar: India's billion-person biometric database is the world's biggest privacy experiment." Privacy News Online. May 25, 2017. <https://www.privateinternetaccess.com/blog/2017/05/aadhaar-indias-billion-person-biometric-database-worlds-biggest-privacy-experiment/> – David Medine, "India Stack: Major potential but mind the risks." CGAP Blog. April 10, 2017. <http://www.cgap.org/blog/india-stack-major-potential-mind-risks>
- 222 Antonio Madeira, "Amsterdam conscripts homeless in the war on cash." Bitcoinist. Dec 29, 2016. <http://bitcoinist.com/amsterdam-homeless-war-cash/>.
- 223 Chris Bold and Rashmi Pillai, "The Impact of Shutting down Mobile Money in Uganda." CGAP Blog. March 7, 2016. <http://www.cgap.org/blog/impact-shutting-down-mobile-money-uganda>.
- 224 Sonja Kelly, "Data are NOT neutral, Part one." CFI Blog. May 15, 2017. <http://cfi-blog.org/2017/05/15/data-are-not-neutral-part-1-of-2/>.
- 225 For a helpful discussion of fees and tolls in payments and their relationship to emergent questions around data, ownership, and access, see Bill Maurer, "Data-Mining for Development? Poverty, Payment, and Platform." Territories of Poverty: Rethinking North and South. Ananya Roy and Emma Shaw Crane, eds. Athens, GA: The University of Georgia Press, 2015: 126-143. <http://escholarship.org/uc/item/66w4x8n8>
- 226 Bill Maurer and Lana Swartz. "Post #2: Curating the New (and Old) Stuff of Money." Socializing Finance Blog. June 28, 2017. <https://socfinance.wordpress.com/2017/06/28/blog-series-from-bill-maurer-and-lana-swartz-post-2-curating-the-new-and-old-stuff-of-money/>
- 227 Larry White, "Baptists and Bootleggers in the organized effort to restrict the use of cash." Alt-M. Jan 31, 2017. <https://www.alt-m.org/2017/01/31/baptists-and-bootleggers-in-the-organized-effort-to-restrict-the-use-of-cash/>.
- 228 As Peter Sands has recently argued in a speech entitled, "The Dark Side of Cash," given at the 2017 Deutsche Bundesbank International Cash Conference, April 24, 2017. https://www.bundesbank.de/Redaktion/EN/Downloads/Tasks/Cash_management/Conferences/2017_04_24_sands.pdf?__blob=publicationFile
- 229 Thanks to Bill Maurer for clarifying this last point.
- 230 IMTFI funded research: <http://www.imtfi.uci.edu/research/index.php>.
- 231 "Warning Signs and Ways Forward." IMTFI Synthesis. June 2013. <http://www.imtfi.uci.edu/files/docs/2014/imtfi-dpcu2-digital-lores.pdf>
- 232 US Financial Diaries, <http://www.usfinancialdiaries.org/>.
- 233 Lisa Servon, The Unbanking of America, <https://www.lisaservon.com/>. Mehrsa Baradaran, How the Other Half Banks <https://www.youtube.com/embed/PEs0qil-L8?width=425&height=281&frame=true>
- 234 IMTFI, "Trust and Money: it's Complicated." IMTFI Synthesis. <http://www.imtfi.uci.edu/files/articles/2017/TRUST%20Book-final-Aug-9-17.pdf>
- 235 Leon Perlman, Technology Inequality: Opportunities and Challenges for Mobile Financial Services. Center for Financial Inclusion/ACCION, April 2017. <http://www.centerforfinancialinclusion.org/publications-a-resources/browse-publications/851-technology-inequality-opportunities-and-challenges-for-mobile-financial-services>
- 236 Thanks to Nima Lamu Yolmo for the observation that the current debate on the utility and replaceability of cash proceeds as if cash is only a commodity. On the tendency to view cash and currency only in terms of its functions, see Bill Maurer, How Would You Like to Pay? How Technology Is Changing the Future of Money. Durham, NC: Duke University Press, 2015: 46. <https://www.dukeupress.edu/how-would-you-like-to-pay>.



IMTFI

INSTITUTE FOR MONEY, TECHNOLOGY
& FINANCIAL INCLUSION

University of California, Irvine

School of Social Sciences

3151 Social Sciences Plaza

Irvine, CA 92697-5100

tel: (949) 824-2284 fax: (949) 824-2285

email: imtfi@uci.edu website: imtfi.uci.edu



Cash Matters[®]

 /CashMattersOrg

 @CashMattersOrg

 @CashMattersOrg