

## CHAPTER 1

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# Introduction and Overview

Has the time come for advanced-country governments to start phasing out paper currency (cash), except perhaps for small-denomination notes, coins, or both? A huge number of economic, financial, philosophical, and even moral issues are buried in this relatively simple question. In this book, I argue that, on balance, the answer is “yes.” First, making it more difficult to engage in recurrent, large, and anonymous payments would likely have a significant impact on discouraging tax evasion and crime; even a relatively modest impact could potentially justify getting rid of most paper currency. Second, as I have argued for some time, phasing out paper currency is arguably the simplest and most elegant approach to clearing the path for central banks to invoke unfettered negative interest rate policies should they bump up against the “zero lower bound” on interest rates. Treasury bill rates cannot fall much below zero, precisely because people always have the option of holding paper currency, which at least pays zero interest.<sup>1</sup>

Although in principle, phasing out cash and invoking negative interest rates are topics that can be studied separately, in reality the two issues are deeply linked. To be precise, it is virtually impossible to think about drastically phasing out currency without recognizing that it opens a door to unrestricted negative rates that central banks may someday be tempted to walk through. After all, even today when the door to negative rates is cracked only slightly ajar, several major central banks (including the Bank of Japan and the European Central Bank) have already shoved a foot through. Thus it is important to think about phasing out cash and developing negative interest rate policy in an integrative fashion.

The idea of sharply scaling back the world’s mountain of paper currency seemed like pure fantasy when I first proposed eliminating large bills almost two decades ago.<sup>2</sup> It was an obscure

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academic paper on an obscure topic in a relatively obscure journal, yet something about the crazy offbeat idea of getting rid of \$100 bills caught the eye of *New York Times* writer Sylvia Nasar<sup>3</sup> (author of *A Beautiful Mind*). Her article, in turn, caught the attention of then-US Treasury Secretary Robert Rubin, who raised the issue with his staff. To my chagrin, I was later told that the main thing that Rubin focused on was not my argument for getting rid of all large-denomination notes (say, equivalent to \$50 and above). Rather, it was my conjecture that the planned new 500-euro notes (about \$570) might challenge the dominance of the United States' \$100 bill in the global underground economy. So much for policy influence.

I still think my focus was the right one.<sup>4</sup> The “profits” governments reap by blindly accommodating demand for cash are dwarfed by the costs of the illegal activity that cash, especially big bills, facilitates. The effect of curtailing paper currency on tax evasion alone would likely cover the lost profits from printing paper currency, even if tax evasion fell by only 10–15%. The effect on illegal activities is probably even more important.

There is little question that cash plays a starring role in a broad range of criminal activities, including drug trafficking, racketeering, extortion, corruption of public officials, human trafficking, and, of course, money laundering. The fact that large notes are used far more for illegal activities than legal ones long ago penetrated television, movies, and popular culture.<sup>5</sup> Policymakers, however, have been far slower to acknowledge this reality.

Cash also plays a central role in the illegal immigration problem that bedevils countries like the United States. It is incredible that some politicians talk seriously about building huge border fences, yet no one seems to realize that a far more humane and effective approach would be to make it difficult for US employers to use cash to pay ineligible workers off the books and often below the minimum wage. Jobs are the big magnet that drives the whole process. More generally, cash is an enabler for employers who would skirt employment regulations and avoid making Social Security contributions.

Of course, any plan to drastically scale back the use of cash needs to provide heavily subsidized, basic debit card accounts for

low-income individuals and perhaps eventually basic smartphones as well. Several countries, including Sweden and Denmark, already do so, and many other countries are contemplating similar steps. A simple idea to jump-start the process is to create debit accounts through which all government transfer payments are made. Financial inclusion would be good public policy with or without phasing out cash. In any event, the blueprint I propose in this book leaves small notes in circulation for a long time (perhaps indefinitely), which should cover most concerns about everyday payments for most people. Leaving behind small bills (ideally eventually converting these to slightly weighty coins) also addresses some of the most visceral concerns about security, privacy, and emergencies.

Anyone who thinks that debit cards, cell phone payments, and virtual currencies are already burying cash could not be more wrong. Demand for most advanced-country paper currency notes has been rising steadily for more than two decades. Believe it or not, as of the end of 2015, \$1.34 trillion worth of US currency was being held outside banks, or \$4,200 floating around for every man, woman, and child in the United States. The orders of magnitude for most advanced-country currencies is broadly similar. Incredibly, the vast bulk of this mass stash of cash is in high-denomination notes, the kind most of us don't carry in our purses and wallets, including the US \$100 bill, the 500-euro note (about \$570 at present), and the 1,000–Swiss franc note (a little over \$1,000). Almost 80% of the US currency supply is in \$100 bills. How many people have 34 of them in their purses, cookie jars, or cars, as each individual would need to account for his or her share? And this is for every man, woman and child, so a four-person family would need to be holding \$13,600 just in \$100 bills, and that is not counting smaller bills. Treasuries and central banks routinely make billions from printing large-denomination notes, yet no one quite knows where exactly most of it lives or what it is used for. Only a minor fraction is in cash registers or bank vaults, and surveys of consumers in the United States and Europe don't begin to explain the rest. And it is not just the United States that has a gigantic currency supply dominated by big bills. The problem is nearly universal in advanced economies.

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Even central banks are starting to see their reverse money laundering operations as a mixed blessing. I use the label “reverse money laundering” to capture how central banks effectively take clean large-denomination notes, ship them out to banks where, after a series of intermediate transactions, cash—and big notes especially—often end up as dirty money in the underground economy. Traditional money laundering, of course, takes proceeds from illicit activities and filters them through seemingly legitimate enterprises to produce clean money.

The main motivation for central banks to rethink the role of cash does not so much seem to be a moral awakening as a realization that paper currency has become a major impediment to the smooth functioning of the global financial system. How can something as antiquated as paper currency really matter for a global economy in which the total value of all financial assets dwarfs the total value of cash? The reason is so utterly banal it will shock anyone who hasn’t thought about it.

Paper currency can be thought of as a zero-interest-rate bond. Or to be precise, it is a zero-interest anonymous bearer bond: it has no name or history attached to it, and it is valid no matter who holds it.<sup>6</sup> As long as people have the choice of paper money, they are not going to be willing to accept an interest rate that is significantly lower on any kind of bond, except perhaps for a modest compensating differential because cash is costly to store and insure. As trivial as the problem seems, the zero bound has essentially crippled monetary policy across the advanced world for much of the past 8 years since the financial crash of 2008. If unconstrained negative rate policy were possible—and all the necessary financial, institutional, and legal preparations were made—central banks would never “run out of bullets” (i.e., room to keep cutting interest rates). A good case can be made that open-ended negative interest rate policy would have been extremely helpful in the depths of the financial crisis.

Few policymakers had really been worrying about the problem until the financial crisis struck. The zero bound constraint simply had not been that much of a concern since the Great Depression, outside post-bubble Japan. Since 2008, the situation has changed

dramatically. Indeed, over the past 8 years, virtually every major central bank has wished it could have set significantly negative interest rates at one time or another. A few, including those of Denmark, Switzerland, Sweden, the Eurozone, and Japan, have tiptoed into negative rate territory, probing the boundary where a flight from corporate bank accounts and government debt to cash would make the policy ineffective or even counterproductive. But even if the lower bound on policy interest rates is a little less than zero, it is still a constraint.

The idea that negative interest rates might sometimes be good policy, and that paper currency stands in the way, is hardly new. At the height of the Great Depression, leading economists from across the spectrum, including Yale's Irving Fisher and Cambridge's John Maynard Keynes, reached a remarkable consensus. If only there were some way for governments to pay a negative return on cash, monetary expansion just might be able to push the world out of depression. The problem back then, as in many countries today, is that with short-term policy interest rates already at zero, monetary policy was stuck in a "liquidity trap," with nothing more to do. Inspired by the maverick German thinker Silvio Gesell, Fisher penned a short 1933 book *Stamp Scrip*, exploring the idea of requiring people to periodically put new stamps on the back of their paper currency notes to keep them valid. This, of course, was a very primitive way of paying a negative interest rate on cash. Keynes praised the idea in his 1936 *General Theory* but rightly came to the conclusion that it was utterly impractical.<sup>7</sup> Rejecting Gesell's solution to the liquidity trap helped lead to Keynes's famous conclusion that government spending was the key to propelling economies out of the Great Depression.

Yet Keynes might have reached a very different conclusion in a world like today's, where transactions have already increasingly migrated to electronic media, including credit cards, debit cards, and cell phones. There is nothing impractical at all about paying negative (or positive) interest on electronic currency, such as banks hold; as already mentioned, several central banks are doing it! The main obstacle to introducing negative interest rates on a larger scale is legacy paper currency, particularly the large-denomination

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notes that would be at the epicenter of any full-scale run from Treasury bills into cash.<sup>8</sup> Of course, other institutional obstacles impede full-on negative rate policy, for example, arranging for the payment of negative coupons on debt, proscribing excessive prepayment of taxes, and ruling out long delays in cashing checks. However, as I shall argue in chapters 10 and 11, all these issues can be dealt with, given a long enough lead time.

Phasing out paper currency, or charging negative interest rates on cash, is an emotionally charged issue. Modern-day Silvio Gesells have met with unbridled hostility from some quarters. In 2000, Richmond Federal Reserve official Marvin Goodfriend published a purely academic paper suggesting that one possible way to pay negative interest rates was to put magnetic stripes on currency. Rather than receive praise for his creativity and prescience, Goodfriend quickly became subject to a barrage of hostile and threatening emails, and he was pilloried on conservative radio talk shows. In 2009, Harvard economist N. Gregory Mankiw wrote a whimsical *New York Times* op-ed, where he discussed the zero bound problem, and he mentioned that one of his graduate students suggested the idea of holding periodic lotteries based on the serial numbers on currency. After each lottery, currency with the losing serial numbers would be declared worthless. This unorthodox way to pay a negative rate on cash was put forth tongue-in-cheek for purely illustrative purposes. It is thoroughly impractical. After all, how can people be expected to keep track of all the losing numbers over time? To Mankiw's surprise, he too was immediately subjected to a barrage of hostile emails and commentary, including letters to the president of Harvard demanding that he be fired on the spot.

Not all those who seek to protect paper currency represent End of Days cults or see a connection between a cashless society and the Mark of the Beast. (Although as someone who has long written on sharply reducing the role of paper currency, I can attest that some of those types are in the mix.) Most people who want to protect paper currency have perfectly legitimate reasons for hoping to preserve the status quo. After a lecture I gave at Munich University in 2014, former European Central Bank board member and chief economist

Otmar Issing strongly took issue with my views and commented that paper currency is “coined liberty” (a nod to Dostoyevsky’s *House of the Dead*)<sup>9</sup> that must never in any way be compromised or surrendered. My aim in this book is to take these objections seriously, seeking where possible to ask how one might mitigate them. Some prefer the relative convenience of cash, though its advantages persist in an ever-smaller range of legal transactions. Others value the anonymity, a far more complex issue to deal with. How does society balance an individual’s right to privacy with society’s need to enforce its laws and regulations?

Deciding where that line should be—and how to implement and enforce it—is perhaps the single most critical question that any future task force on ending cash will need to consider. The issue of privacy encompasses much more than cash policy; it raises issues about cell phone records and browsing histories, not to mention the security cameras that are now nearly ubiquitous throughout the world’s major cities. Cash, though, is still an important part of the mix, and if one wants to contemplate phasing it out, it is critical to have a hard look at both the goals and the alternatives (e.g., prepaid cash cards with strict limits). Maintaining the convenience and privacy of paper currency in small transactions are important reasons that any path toward phasing out paper currency needs to begin with large-denomination notes and possibly leave small-denomination notes circulating indefinitely or until fully satisfactory alternatives are in place.

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Organizing a book around a theme that touches on so many diverse topics has been a formidable challenge, especially if one wants to take seriously both the practical and philosophical concerns raised by phasing out paper currency. I have tried to design a structure that makes it easy for the reader to navigate directly to specific topics she is interested in, or simply to read the entire book straight through. A lot of material, particularly citations, has been put into endnotes. These do not necessarily need to be read in detail on a first pass. There are also a few topics that seemed a bit too technical for the text; these have been ganged in a short appendix.

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The main text is divided into three parts. Chapter 2 begins with a selective history of currency, highlighting a few key points that I draw on later. An absolutely critical point is that paper currency really comes in two flavors, backed and unbacked. Under a gold-backed paper currency standard, for example, central banks fix the value of the currencies in terms of gold by standing ready to buy and sell currency for gold at the official price. As we shall see, they can run into trouble if they don't have enough gold to back all the currency they print. Under an unbacked or fiat money regime, the only thing that makes paper currency valuable is a mix of social convention and government decree. In modern times, all major currencies are pure fiat monies, a device that traces back to the Mongol emperors in China.

Absent any need to back paper currency, modern-day governments have pumped out vast piles of it. Chapter 3 lays out the basic facts about the huge paper currency supply outstanding, with a focus on advanced-economy currencies, albeit including some facts about emerging markets. Then in chapters 4 and 5, I trace out the different sources of demand. Who could be holding so much cash? Sources of demand include the legal tax-paying domestic economy, the not-so-law-abiding domestic underground economy (including both tax evasion and crime), and the global economy, including both legal and illegal demand.

Chapter 6 explores a fundamental plus for paper currency, which is the considerable income governments earn from exercising their monopoly. It looks at different measures of the profits from paper currency and develops estimates of how much would be lost if a substantial share of the demand migrated to electronic payments. An important issue is not only the lost future profits but also the cost of retiring a large part of the extant supply, which in the first instance would involve issuing government debt to soak up the cash as it is turned in. The actual cost would likely depend on the extent to which anti-money-laundering laws and cash deposit reporting requirements were suspended during the phaseout period, since that would affect how much dirty money was turned in. I conclude that the overall social benefits to phasing out currency are likely to outweigh the costs by a considerable margin.

Of course, a lot depends on just how much lower tax evasion and criminal activity would turn out to be in a “less-cash” world. This is an unknown, though I speculate that the effects are likely to be substantial, provided the government is vigilant about playing Whac-a-mole as alternative transaction media come into being. The key instruments that the government has are the ability to make it impossible for financial institutions to accept an alternative currency and the ability to make it difficult to use in ordinary retail establishments. Yes, there are always end-arounds: gold coins, uncut diamonds, and virtual currencies. But if one looks into the practicalities of it, and the considerable restrictions already in place (e.g., on licensed diamond and gold dealers), it quickly becomes apparent that the alternatives to cash are likely to be costlier, riskier, and less efficient. We specifically look at virtual currencies in the penultimate chapter of the book.

Chapter 7, the final chapter in part I, contains a concrete plan for phasing out paper currency, up to small notes and coins. The long timeline is intended to give people and institutions time to adjust and to help policymakers navigate unforeseen problems. An important general principle is that an ideal system should create obstacles to large and repeated anonymous transactions but not to small ones; it should also ensure financial inclusion. By leaving small bills or coins in place indefinitely, the blueprint deals with many of the concerns that might arise if cash were completely eliminated, such as blackouts after natural disasters. How quickly paper currency can be eliminated altogether depends on experience and the evolution of technology. Toward the end of chapter 7, I discuss the case of the Scandinavian countries (especially Sweden), which for a variety of reasons have moved further and faster toward being less-cash societies than perhaps any other country so far. It is far too soon to draw any firm conclusions from these early experiences, but they do appear to show that a lot of the more superficial objections to sharply reducing the use of cash can be navigated.

Part II of the book deals with negative interest rates. As already noted, it is hard to seriously study phasing out paper currency without recognizing the possibility that it could fundamentally impact

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central bank policy.<sup>10</sup> After an introduction and overview, chapter 8 explores what is known about just how serious the zero bound on interest rates is in practice. There is a growing and evolving academic literature, but it is based on limited data and experience. Moreover, the models themselves have internal limitations, for example, the crude way in which they treat financial markets. The bottom line is that even though most central bankers intuitively believe the zero bound is likely to be an important and recurrent problem, the academic research is still in its early days, and the results so far are mixed.

Chapter 8 also details some of the efforts central banks have undertaken to mitigate the zero bound without appealing to negative rates. Chapter 9 goes on to look at other ideas for dealing with the zero bound, such as raising central bank inflation targets from 2% to 4%. Chapter 10 takes up alternative approaches to allowing for (open-ended) negative interest rate policy without phasing out paper currency. One interesting and important idea is for the government to issue separate electronic and paper currencies and to manage an exchange rate between them. Chapter 11 explores other frictions and barriers that might prevent negative rate policy from being effective and how to address these frictions. I then turn in chapter 12 to concerns that negative interest rate policy will unhinge monetary stability, and that it will create too much temptation for departures from modern rule-based policy.

Part III of the book takes on topics that span both parts I and II, including international dimensions and digital currencies. Is coordination necessary (chapter 13)? Are there spillovers from negative interest rate policy? Does the dawn of digital currencies make this all irrelevant anyway (chapter 14)?<sup>11</sup> I also consider the case of developing countries and emerging markets; for most it is too soon to contemplate phasing out paper currency, though phasing out large-denomination notes is likely still a good idea. The Final Thoughts chapter concludes the book.

Finally, a few words on terminology. Throughout, I use the term “paper currency” broadly to encompass other transaction media with similar form and function as paper currency, but not literally made from paper. Of course, early Chinese currencies were made

from leather and tree bark, and the relevant alternative today is polymer plastic, which is already being adopted by a number of countries, including Canada and the United Kingdom. Plastic currency notes are definitely more durable than paper and are supposedly more difficult to counterfeit. However, for most purposes here, these are not first-order issues. Aside from a few other small details, which will be highlighted where relevant (e.g., it is potentially easier to scan individual serial numbers on the plastic notes), the reader should think of paper currency and plastic currency as the same thing throughout this book. I will use the term “paper currency” to refer to both.

Relatedly, I drift sometimes into using the terms “paper money” or “cash” instead of saying only “paper currency,” just to avoid being monotonous. They all mean the same thing here. Colloquial usage of the term “cash” sometimes extends to include all forms of liquid wealth, but here in context it should be clear enough that I am always using “cash” to mean “paper currency.” In 75 years, if paper currency is still being used by isolated tribes in the Amazon or East Texas, they will probably have their own words to describe it anyway.