


RESEARCH ARTICLE

“Women, Consider Crypto”: Gender in the Virtual Economy of Decentralized Finance

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Abstract

Decentralized finance, including cryptocurrency and other blockchain-based applications, promises participants benefits such as financial freedom, security, privacy, and wealth accumulation. More recently, it has also offered the promise of participation, lowering financial barriers, and empowerment—especially to women, the poor, and those residing in the Global South. I argue that the rise of decentralized finance as an alternative development platform is explicitly gendered and calls for feminist analysis. I discuss how cryptocurrency-based approaches to development rest on foundations that are gendered, interacting with hierarchies of race/ethnicity and class. I also explore how they are part of a lineage of neoliberalism, leveraging neoliberal beliefs about entrepreneurialism, financial inclusion, and gender roles. The discussion further introduces the concept of neoliberalism as an extension of neoliberal logics that advocates for bypassing states entirely in favor of private actors. The current analysis compares this new model of decentralized finance to similarly problematic development trends and assesses how it has—as of yet—failed to deliver on the promises of participation, lowering financial barriers, and empowerment. This analysis concludes with a call to action for feminist and critical scholars, encouraging further work on the topic.

Keywords: gender; women; political economy; cryptocurrency; decentralized finance

On September 7, 2021, El Salvador became the first country in the world to grant bitcoin¹ the status of a national currency, alongside the U.S. dollar. In advocating for this change, President Nayib Bukele explicitly tied the adoption of cryptocurrency—a decentralized system of digital currency that is not backed by any government—to promises of economic development and financial inclusion. In a series of posts to social media between the passage of El Salvador’s Bitcoin Law in June 2021 and its entry into force in September of the same year, Bukele promised a number of potential benefits to citizens, including a greater ease of

interaction with tourists and foreign investors, a way for small and informal businesses to prove their income and access loans, and a way to send and receive remittances more quickly than in the past and with lower fees.² When the International Monetary Fund (IMF) expressed caution over the move, Bukele and his allies further portrayed crypto adoption as a nationalist and antiestablishment act of defiance against an economic system that “wanted” El Salvador to fail (Cooling 2021).

In promoting cryptocurrency, Bukele injected himself (and his country) into an increasingly visible debate about cryptocurrency’s place in global markets. As Bukele promised benefits to his people, for example, leaders in the United States, including Treasury secretary Janet Yellen and Federal Reserve chair Jerome Powell, were becoming increasingly vocal about the need to more closely regulate cryptocurrency (Lipton and Livni 2021). Hesitancy about cryptocurrency in the United States leverages long-standing concerns about the association of Bitcoin with criminal activities like cyberattacks, online scams, child pornography, and dark web activity, as well as concerns that cryptocurrency is used as a form of tax evasion. The divide between these two perspectives, one envisioning cryptocurrency as a tool for development and financial freedom and the other seeing it as a dangerous scam, is playing out on a global level and against a backdrop complicated by questions about the environmental impact of cryptocurrency—which, according to estimates, leaves a larger carbon footprint than some entire countries (Stoll, Klaaßen, and Gellersdörfer 2019).

Nearly a decade and a half after the development of cryptocurrency and the blockchain technology that supports it (defined in the following section), we are at a critical point in the mainstreaming of cryptocurrency and the larger associated system of decentralized finance (i.e., finance detached from traditional institutions and centralized systems) built around it. While only El Salvador and the Central African Republic recognize bitcoin as an official currency at the time of this writing, other developing countries have flirted with the idea of adoption (Tiwari 2021). In places like Venezuela, where the national currency (the bolívar) is extremely volatile, some have embraced cryptocurrency as a hedge against hyperinflation (Di Salvo 2019). Major corporations including Whole Foods Market, Starbucks, Microsoft, Tesla, and Nordstrom have experimented with accepting payments via cryptocurrency (Castillo 2019; Smith 2014). Experts have further pointed to the rise in cryptocurrency use as part of a broader trend toward creating a decentralized web, leading some academics to conclude it is a concept that can no longer be ignored by political science and international relations (Gill 2021).

Arguments in favor of cryptocurrency as a tool for development, like those made by Nayib Bukele, are explicitly political and speak to theories about social and economic inequality. Political arguments suggest that cryptocurrency and related decentralized systems stand to liberate populations from authoritarian governments, existing social hierarchies, and the instability of traditional currencies in many parts of the world (Golumbia 2016; Vigna and Casey 2015). Cryptocurrency projects carry the promise of reducing inequality by reaching the “unbanked” populations of the world—particularly women and residents of the Global South—offering new avenues for economic empowerment and

promising a transformational effect (Baldet and Powell 2019). For women, access to cryptocurrency has further been promoted as a means to accrue independent wealth, circumvent discriminatory finance practices, and even escape situations of domestic abuse (Powell and Moncino 2018; Vigna and Casey 2015). To date, evidence suggests that these types of transformative effects have failed to materialize. As the rise of cryptocurrency has accelerated over the past decade—with bitcoin appreciating as much as 8,000% per year in value (Golumbia 2016)—data suggest that women, for example, have largely been left out of the resulting economic transformation. Demographic surveys indicate that women represent under 13% of all cryptocurrency users, while surveys of the general public suggest that women have substantially less awareness about this market than men (Coin Dance 2020; ING/Ipsos 2018). Analysts who refer to blockchain as a “gender-neutral technology” express frustration over this apparent reluctance of women to get on board—prompting one female investor to take to social media, saying, “Women, consider crypto. Otherwise the men are going to get all the wealth, again” (Comben 2019; Powell and Moncino 2018).

In this article, I argue for a more critical examination of debates about cryptocurrency, development, and gender. In particular, I argue that there is a pressing need for the application of a gendered lens to the rise of the decentralized economy (including cryptocurrencies and blockchain) and its promise to empower and elevate women, especially the poor and/or women of the Global South. Beginning with a brief primer on the relevant technologies, proceeding to an overview of relevant literature, and finally touching on specific themes and cases related to gender and cryptocurrency, I argue that the liberatory promise of crypto is flawed in specifically gendered ways. Cryptocurrency and blockchain-based applications have thus far failed to deliver on the promise of participation, the promise of lowering financial barriers, and the promise of empowerment. These shortcomings are driven by the failure to recognize that cryptocurrency development initiatives are built over existing social hierarchies, reinforcing without transforming them.

The discussion is linked to broader theoretical and ethical debates in development discourse. Prior development trends like the financial inclusion movement have been critiqued based on their reliance on neoliberal logics—that initiatives built upon the notion that more interaction with the market coupled with less regulatory oversight are the best solutions to poverty. Debates over cryptocurrency arguably take neoliberal thought a step further, coupling advocacy for more market interaction with the complete removal of any state, institutional, or regulatory oversight—even as it relates to activity as foundational as state backing of currency. Insofar as Golumbia (2016) ties theories of cryptocurrency adoption to libertarian pro-market and anti-institutional principles, I refer to this as a neoliberal development logic that intertwines suspicion of institutional actors with notions of technological supremacy that see states (especially, states of the Global South) as obstructions to be bypassed. Ultimately, I argue that this conversation calls for feminist critique. This includes greater discussion about ethical practices of inclusion, consent, and the use of experimental financial technologies on marginalized populations.

A Primer: Blockchain, Cryptocurrency, and Decentralized Finance

The term *cryptocurrency* refers collectively to Bitcoin (the first and most well-known cryptocurrency system) and dozens of other cryptocurrencies and tokens that offer various modifications to the system pioneered by Bitcoin. A central characteristic of all of these cryptocurrencies is that they purport to offer a decentralized monetary system—one that is both digital and detached from direct government oversight and regulation. As a substitute, cryptocurrencies leverage the underlying model of blockchain technology. First conceptualized by Bitcoin founder Satoshi Nakamoto³ in 2008, blockchain offers a peer-to-peer network through which a central ledger is maintained and reconciled. This practice of storing and reconciling the ledger of cryptocurrency transactions across multiple nodes in a large network is meant to provide a safeguard against fraud, hacking, and the potential for users to double-spend a currency that does not exist in physical form. Blockchain has been referred to by various authors as a “truth machine,” a “revolution,” and a way to reduce the “cost of trust” by relying on “impregnable cryptography, rather than trust in fallible humans” (Casey and Vigna 2018; Tapscott and Tapscott 2016; Vigna and Casey 2019). “Decentralized finance” collectively refers to the wider range of financial activity enabled by cryptocurrency use and blockchain technology, including borrowing and lending, movements of currency through exchanges, and the development of self-executing “smart contracts” using the blockchain system (Alkurd 2020).

The extent to which cryptocurrency is truly “money” is the subject of ongoing debate. Economists usually envision money as serving three functions: (1) a medium of exchange, which can be used to purchase goods; (2) a store of value, by maintaining value over time; and (3) a measure of value, offering a baseline against which prices can be compared (Clever 2010; Dasgupta 2007). At this point in time, cryptocurrency primarily serves the first function, acting as a medium of exchange that has received varying degrees of acceptance in different parts of the world. The extent to which cryptocurrencies serve the other functions of money—a store of value or a measure of value—are more debatable. Analysts have argued that price volatility and the limited scale of adoption mean cryptocurrency is unable to truly serve these functions (Columbia 2016; Vigna and Casey 2015). Though evangelists may argue otherwise, cryptocurrencies remain a risky investment because of wild price fluctuations. Even bitcoin, arguably the most established currency, lost about 80% of its value between 2017 and 2019, only to recover much of that value by late 2020 (Di Salvo 2019). Some cryptocurrencies are also fixed-supply currencies, with only a finite amount available, to be released over time. These currencies are (in theory) deflationary; in other words, as long as demand persists, the value of a currency like bitcoin is expected to rise over time. This makes it generally impractical as a reliable store of value and, by extension, as a baseline for determining value. However, in some economies where the value of actual, state-backed money is even more volatile, cryptocurrencies arguably represent an improvement. One clear example of this is in Venezuela, where runaway inflation has prompted the rise of an alternative economy based on cryptocurrency (Chun 2017; Di Salvo 2019).

Such instances bring up relevant points about the decentralized nature of these currencies and their relationship to traditional forms of money. Generally, cryptocurrencies promise both to liberate users from government oversight of money and to mitigate the problem of inflation by controlling the supply of available currency. Analysts have alternatively presented this philosophy as “extremist” or “utopian” in nature (Golumbia 2016; Vigna and Casey 2015). Indeed, with the proliferation of digital⁴ and cryptocurrencies, variation has expanded along the spectrum of degrees of decentralization and how the amount of currency circulation is managed. Common to most cryptocurrency projects is some form of engagement and oversight by users, founders, and/or developers. Labor is also involved, with those who participate in the blockchain devoting computing resources to its maintenance. These individuals may be compensated in the form of cryptocurrency through a process referred to as mining.⁵ However, the rapid expansion of cryptocurrency use in recent years means that mining has become a competitive process, with more parties competing for the finite amounts of currency available through the mining process. Effectively, these systems benefit from large amounts of free labor, increasingly favoring larger actors with more computing power who can succeed in an energy-intensive competition for mining rewards (Baraniuk 2019; Stoll, Klaaßen, and Gallersdörfer 2019).

Applying Feminist insights to Decentralized Finance

What insights can feminist work in international relations and political economy apply to this system? Critical feminist work on political economy since the late twentieth century has focused on the reductive treatment of gender in neoliberal thought and the issues caused by the application of neoliberal dogma in Global South contexts. Neoliberalism in development can be seen packaged into ideas like the Washington Consensus, which specified reforms including deficit reduction, trade liberalization, reduced government intervention in the market, lower spending on benefits and public services, privatization, and deregulation as “best practices” that would foster business growth and competition (Williamson 1993). In theory, the benefits of such reforms were meant to promote transparency and engagement with markets for the benefit all sectors of society. Critical feminist scholarship on political economy argues that, in reality, the neoliberal development paradigm has failed to realize its promises because it overlooks the salience of gender and other social hierarchies. For women in particular, liberalization has been associated with large-scale movement into insecure, low-wage, and at times dangerous jobs. This, while household gender roles remain unchanged—forcing women to do equal duty at work and at home (Griffin 2010; Runyan and Peterson 2013; True 2012).

To the extent that women were “seen” in neoliberal thought, the dominant view was that the mobilization of women into the workforce was a benefit and a symbol of modernity to which states should aspire (Ellerby 2011). As an example, the mobilization of women into export-oriented production in South Korea in the 1980s was sold to women as a means of becoming full citizens, to families as

an extension of women's roles as "dutiful daughters," and to factory owners as a way of attaining a cheap and docile workforce (Enloe 2016; Han and Ling 1998). The primary beneficiaries of the system, however, remained the Western-owned multinationals that benefited from women's labor (Enloe 2016). A generation later, similar ideas were used to mobilize young Chinese women as a force for modernization (Chang 2009). In each case, greater engagement with markets was sold not only as a tool for development, but also as a tool for women's empowerment through this newfound "freedom" to earn wages. The ignorance of neoliberalism regarding gender power dynamics meant that it failed to envision how these freedoms left women—and particularly women of the Global South—vulnerable to abuses, exploitation, and violence (Griffin 2010; Runyan and Peterson 2013; True 2012).

Some work in critical feminist political economy argues that neoliberalism is deeply reliant upon "hierarchies that are internalized and institutionalized" in the pursuit of its objectives (Peterson 2003, 8–9). In other words, to borrow from development parlance, neoliberalism's deployment of gender in service of its goals is a feature, not a bug. Men and masculinities also have a distinct role in this process. Scholars have argued that neoliberalism serves a particular notion of hegemonic masculinity that privileges young, able-bodied, and economically successful men (usually, white men in the Global North), who are perceived as more capable of reaching the ideal of being entrepreneurial, competitive, and self-reliant (Cornwall, Karioris, and Lindisfarne 2016). By comparison, neoliberalism sees men who are poor and/or resident in the Global South primarily as obstacles to change, clinging to outdated notions about manual labor, the patriarchal household, and cultural traditions as the roots of masculinity (Ahmed 2008; Cornwall, Karioris, and Lindisfarne 2016; Natile 2020).

Finally, feminist work in international political economy may see decentralized finance as both a continuation of offline social hierarchies and a force for shaping new inequalities. This specifically recalls Peterson's (2003) feminist analysis of the virtual/information economy as a site where power relationships are shaped by decisions about whose knowledge, data, experiences, etc., can be monetized. The notion that technology is becoming a new axis of inequality brings feminist thought into dialogue with critics of cryptocurrency, who have argued that the system is rooted in logics that promote the moral superiority of technologically capable populations (Golumbia 2016). In the cryptocurrency sector, as noted later, value arguably centers on those who have the most technological capability and access to engage in development and, by extension, the most existing wealth to invest in expanding the sector. In a global context, these are areas in which women are disadvantaged because of existing social hierarchies.

"Financial Inclusion" and Gender Hierarchies

Viewed through a feminist lens, the promise of cryptocurrency as a radically transformative system seems dubious. At the same time, discussions about neoliberalism invite further reflection on how such ideas have moved

rapidly toward mainstream acceptance. I argue that there is an obvious connection between neoliberal policies on financial inclusion (FI) and the growth of neoliberal ideas, in the sense that the former has (unwittingly) set the stage for the latter. Advocated by major institutions including the World Bank, the United Nations (UN), and the G-20, the idea of FI rests on the notion that increasing the depth of financial services in developing communities “reduces income inequality and poverty and is thus particularly beneficial for the poor” (World Bank 2008). The FI agenda is seen by some as a successor to microcredit—promoting similar ideas about the financialization of the poor while sidestepping the abuses and failures attributed to microcredit (Mader 2018; Natile 2020; Wichterich 2017). While FI as an institutional approach is distinct from the decentralized systems underlying cryptocurrency, one can trace an important logical progression from microfinance through financial inclusion and ultimately to decentralized finance. Though established players in finance have expressed some need for caution regarding cryptocurrency, an examination of critical perspectives on FI suggests that these same players have primed unbanked (and underbanked) populations to be receptive to decentralized finance. Specifically, critical inquiry suggests that doctrinal neoliberalism coupled with the discourse of FI has rendered these populations more risk acceptant, valorized technology’s role in financialization, and pushed a movement beyond the state. Placing this work into conversation with feminist perspectives further shows how these movements are gendered, playing into particular stereotypes about men and women in the Global South.

In terms of technology, ideas about FI go hand in hand with the application of technologies including big data, psychometric testing, mobile money systems, and surveillance tools. FI appeals to corporate actors by promising both profit and data as rewards for more inclusive practice (Gabor and Brooks 2017). Some have argued that international political economy and international relations generally underestimate the relevance of technology in this space and its human impact (Bernards and Campbell-Verduyn 2019). For example, psychometric testing as a requisite for financial services conveys notions about the presumed cognitive capacities of poor populations while also institutionalizing gender stereotypes about how risk and honesty map onto identity (Bernards 2019; Gabor and Brooks 2017). Researchers likewise question the degree to which these technologies are valid predictors of creditworthiness, because they focus on individual behaviors rather than offering a holistic view of potential borrowers’ likeliness to succeed in a given venture in a given community (Bernards 2019; Langevin 2019).

This point leads into a further discussion of how technological financialization primes individuals to become more risk acceptant. Assessments of microfinance programs argue that, in many communities, predatory behavior by lending agents has led to over-indebtedness (as lenders sought repeat clients) and shaming (as community members were made privy to the lending habits of others) (Duvendack et al. 2011; Gabor and Brooks 2017; Martin 2002). Paradoxically, although microcredit borrowers (especially women) were often extended loans on the assumption that they were “low-risk” clients, intense anxiety over

repayment drove this same population toward higher-risk ventures in the hopes of attaining bigger rewards that might eliminate their debt (Duvendack et al. 2011; Gabor and Brooks 2017). When such ventures failed, the result could be exhaustion, crisis, and even suicide—as was the case in parts of India (Langevin 2019; Wichterich 2017). More recently, studies on FI argue that it perpetuates the same forms of exhaustion because it failed to internalize the lessons of microcredit. FI advocates argue that earlier initiatives failed to work not because their logic was flawed, but because they did not integrate enough people deeply enough into markets (Langevin 2019; Mader 2018). By this logic, FI strategies are also encouraging traditionally unbanked populations to look beyond the state for solutions to poverty, presenting redistributive policies as anathema to growth and encouraging target populations to embrace a range of “better than cash” solutions like mobile money services (Natile 2020; World Bank 2008). While these solutions are held out to populations as opportunities, in fact they allow commercially oriented financial actors new entry points into people’s everyday lives while raising new barriers to entering the system (e.g., costs to access mobile money platforms) (Gabor and Brooks 2017; Natile 2020; Rodima-Taylor and Grimes 2019a).

As noted earlier, cryptocurrency and blockchain technology have a distinct genealogy that—at least initially—organized itself around an ethos of privacy and anti-institutionalism. Therefore, it may seem counterintuitive to suggest that institutional neoliberalism (especially the FI movement) set the stage for decentralized finance. However, there is direct evidence of institutions leveraging decentralized finance as a tool for FI. In a 2017 report on potential applications of blockchain technology, World Bank experts specifically highlighted blockchain as a potential mechanism to advance FI. This analysis specifically envisioned blockchain as a solution or workaround where existing systems lack secure transaction frameworks, identity verification capabilities, asset verification capabilities (e.g., land registries), and/or affordable products and services (Natarajan, Krause, and Gradstein 2017). In some cases, using blockchain to fill these gaps would allow decentralized systems to perform functions typically associated with the state. While taking a more tenuous view of cryptocurrency, the analysis nonetheless said cryptocurrency “could be especially relevant for financially excluded and underserved populations,” especially when combined with other forms of financial technology (Natarajan, Krause, and Gradstein 2017).

In the same year, the World Bank launched a technology and innovation unit including a blockchain lab with the goal of applying this “disruptive” technology to a variety of use cases, one of which was cross-border payments and FI (Karacaoglu, Mocan, and Halsema 2018). The World Bank was not alone in positioning blockchain and/or cryptocurrency as the next logical step in development. The UN’s Office of Information and Communications Technology has highlighted blockchain as a force for FI, noting its potential to reach the “unbanked” and to facilitate microcredit programs (UN Office of Information and Communications Technology 2018). The United Nations Children’s Fund (UNICEF) first experimented with blockchain in 2015, and in 2019 it established a cryptocurrency fund to attract, hold, and disburse donations in

cryptocurrency. In the lead-up to the establishment of the fund, UNICEF staff justified the move toward cryptocurrency despite its fluctuating value by appealing to the logics of risk and reward. In particular, there was a presumption that “crypto-donors” would a priori be more comfortable with experimentation and risk and would, therefore, be open to seeing their donations used in riskier ways (Fabian 2018). Thus, we see how logics of technology acceptance, risk acceptance, and even a desire to bypass ineffective state systems move along a pathway from neoliberalism to decentralized finance.⁶

Taking a critical view of development trends illuminates the trajectory of neoliberal development ideology. Placing these ideas into conversation with feminist thought, we further see how this landscape is gendered, classed, and racialized. As was the case with microcredit, FI policies center poor women and women of the Global South as entrepreneurs in waiting and low-risk targets for financial products (Martin 2002; Wichterich 2017; World Bank 2008). By contrast, men of the Global South—especially poor men—are viewed as undisciplined, untrustworthy, and even potentially violent in their opposition to change (Bedford 2007). Men are presented with the possibility of personal enrichment only if they embrace norms of entrepreneurial masculinity and accept the financial technologies that might prove them worthy of investment (Langevin 2019; Martin 2002; Wichterich 2017). While feminist studies of political economy have commented on the gendered impacts of microcredit,⁷ the literature broadly suggests a need for more gendered and intersectional assessments of inclusionary development ideologies. While a deeper assessment of institutional approaches to FI is beyond the scope of this article, these lessons as applied to cryptocurrency-based approaches should motivate inquiry into how programs engage with gender roles as they apply to both men and women and how this architecture sees gender interacting with class, race, and Global North/South positionality.

Gender and the Failed Promises of Decentralized Finance

The foregoing discussion offers an entry point for the further exploration of gender and cryptocurrency. Specifically, the discussion in the previous section suggests the need to see continuity from neoliberal to neoliberal thought, to engage with how masculine and feminine gender roles are deployed, and to approach analysis in a way that envisions gender interacting with hierarchies of class and race/ethnicity. Going forward, I apply this analytical lens to three specific “promises” of decentralized approaches to development. These are the promise of participation, the promise of lowering financial barriers, and the promise of empowerment. Each of these are present in the discourse of cryptocurrency advocates, as noted earlier, and each also aligns to some extent with the broader and interrelated discourse of FI. In each case, I argue that a gendered analysis further illuminates the failure of the system to produce transformative results.

The Promise of Participation

Discussions about gender and cryptocurrency are notable mostly for the extent to which they deny that gender hierarchies shape the system. Points like “gender-neutral,” “no barriers to entry,” and “Bitcoin does not know your name or gender” have been used to reassure investors that cryptocurrency markets are a truly level playing field where women have an equal chance to participate (Comben 2019; Vigna and Casey 2015). Yet the realities of the sector tell a much different story. Though engagement with cryptocurrency by women has grown over time—expanding from an estimated 3% of users in 2008, to 9.1% in 2019, to 12.3% in 2020 (Coin Dance 2020; Comben 2019)—their participation in the sector has remained very low. Even to the extent that women are holders or users of cryptocurrencies, it is likely that they hold very little of the available wealth. Among the known mega-rich of bitcoin holders (those whose holdings were estimated at \$10 million or more) after the boom year of 2013, all identified individuals were male (Wile 2013). A 2018 *Forbes* list of the richest people in cryptocurrency likewise included no women and was dominated by white and East Asian men (Ambler et al. 2018). The predominant success of early adopters means that the greatest known concentration of wealth is in the hands of individuals from the technology and finance sectors—areas in which women are historically underrepresented (Bowles 2018).

The experience of women in the field illustrates how the cryptocurrency industry has become deeply entwined with masculinity, especially the norm of the entrepreneurial, tech-savvy male investor/developer. Several women profiled in stories about cryptocurrency have decried the market as being, at best, characterized by a “bro culture” and, at worst, dominated by sexual harassment and exclusionary practices. In 2018, the North American Bitcoin Conference hosted only three female speakers (out of a total of 87) and held its official social event at a strip club (Bowles 2018; Hao 2018). Women in the industry have complained of sexual harassment during job interviews and of being confused for spokesmodels rather than experts at events (Bowles 2018). While some women have responded to the culture by creating their own event spaces, the problem remains that women fear being penalized for speaking out about or pushing back on male dominance in the sector (Hao 2018). These linkages between gender inequality, masculinity, and cryptocurrency recall the discussion of neoliberal, hegemonic masculinities explored earlier in the article. In an environment that is dominated by men and that values wealth, entrepreneurialism, and self-reliant or antiestablishment thought, it is in many ways unsurprising that gender hierarchies have taken root.

In addition to being underrepresented among cryptocurrency users and investors, women are underrepresented as entrepreneurs and developers—those individuals most responsible for shaping the rules of the new system. Drawing on publicly available survey data, Hao (2018) concluded that while women represent about 23% of the workforce engaged in the cryptocurrency sector, they represent only 14% of project founders and just 7% of professional investors. For women engaged in the workforce, she finds they are more concentrated in areas like marketing, and fundraising than in coding and

development (Hao 2018). Statistics like these expose the fallacy of crypto as a gender-neutral sector where women have an equal opportunity to contribute.

A discussion of the larger landscape of cryptocurrency would not be complete without pointing out the links between cryptocurrency and extremist ideologies, particularly those that target women, ethnic or religious minorities, and the LGBTQI community. As noted earlier, scholars argue that the sector advances logics derived from far-right and other extremist views (Golumbia 2016). Therefore, it is hardly surprising that cryptocurrency has found widespread adoption among the so-called alt-right and in conspiracy communities. The Southern Poverty Law Center in 2017 identified over 200 alt-right and white nationalist figures and organizations with significant bitcoin holdings (Barrouquere 2017). These include organizations linked to incel⁸ ideology or the targeting of feminist and LGBTQI rights advocates. Cryptocurrency was allegedly used to fund a failed anti-Semitic plot in Germany in 2019 and provided a source of income for the individual who carried out the 2019 terrorist attacks in Christchurch, New Zealand (Koehler 2019; Macklin 2019). The platform Dlive, used by some far-right figures who participated in the January 2021 attack on the U.S. Capitol, allowed them to collect cryptocurrency donations while livestreaming the event (Browning and Lorenz 2021). Elsewhere on the political spectrum, the Islamic State has allegedly dabbled in cryptocurrency (Mines 2020). Given that the sale and trafficking of women and girls as sex slaves continues to be a substantial source of income for the organization (Hutchinson 2020), there are concerns about how cryptocurrency may be leveraged to launder the proceeds of violence against women.⁹

The Promise of Lowering Financial Barriers

Taking the conversation into the realm of development, cryptocurrency projects have promised to meet the needs of the world's poor by lowering financial barriers, especially the costs associated with the global movement of money. This speaks specifically to the migrant labor force and the transmission of money through remittances. While remittances are a force in the global economy—reaching an all-time high of \$689 billion globally in 2018 (World Bank 2019)—under current financial systems a significant amount of this flow is lost to transaction fees, fraud, and theft.¹⁰ Furthermore, there is evidence that transmission of and experiences with remittances is gendered in specific and important ways. Research published by UN Women, for example, suggests that migrant women transmit a larger portion of their income as remittances than do migrant men, but that women also pay more in fees to remit money—a problem related to low financial literacy and reduced access to money transfer systems (UN Women 2020). Though the discourse about remittances emanating from governments and institutions tends to center the stereotypical image of the male breadwinner/remittance-sender, the participation of women in migrant labor and the remittance system challenges gender roles by increasing women's economic importance and changing power dynamics within families (Kunz 2008; Lam and Yeoh 2018; Lopez-Ekra et al. 2011; Petrozziello 2011). This being the case, an examination of remittances offers the chance to leverage insights in multiple

areas, moving into a realm where we can envision the interaction of gender and Global North/South hierarchies (Parashar 2016).

A variety of cryptocurrency projects have promised to mitigate inequality and promote development by offering significantly lower transaction fees and secure platforms that can be accessed without much technological know-how and investment. The start-up 37coins is a case study in the cryptocurrency's promise to transform remittances, as well as how that promise is racialized and gendered. 37coins is notable in part because the public faces of the project were women. One of these, Songyi Lee, was a former employee of a development NGO who became the project's chief marketer and cofounder, alongside the venture's two male cofounders. The second woman was "Fatima," a Malian refugee with whom Lee had contact through her development work. As told by Lee, Fatima was a mother of five living in a refugee camp. Her husband lived and worked in a neighboring country, but because the couple was disconnected from the banking system, the only way for her to receive remittances was for him to give cash to individuals—sometimes strangers—headed in the direction of the family, in the hopes that they would pass the money to Fatima. This sometimes resulted in money being lost or stolen (Lee 2014; Vigna and Casey 2015). Upon relating Fatima's story, Lee and a friend conceived of the idea for using cryptocurrency to facilitate the fast and safe movement of remittances (Vigna and Casey 2015). Though Fatima had no voice in the project, she became the symbolic face of 37coins, with her image used in promotional materials as embodiment of the project's promise to change lives. By leveraging Fatima as the archetypal female recipient—dependent on transmissions from her husband—the project replicates stereotypes widespread in remittance discourse (Kunz 2008). (Note that it also leverages tropes of masculinity referenced earlier, in particular of Fatima's husband as the typical male laborer who relies on old ways of doing things and jeopardizes his family as a result.) Fatima's image became a gendered, racialized, and classed depiction of cryptocurrency's promise. However, as it turns out, women like Fatima would never actually be served by the project.

Lee and the project's other cofounders proposed to make remittances easier and more secure through the creation of a system to send funds in the form of bitcoin by text message (SMS). By focusing on text message services, the founders of 37coins argued that their project had the potential to reach a population not currently served by cryptocurrency—that is, the vast number of cell phone users in the Global South who have access to SMS but lack access to mobile internet. In a presentation for potential investors in 2014, Lee estimated that 96% of the world's population would be able to use the service, saving remittance senders a potential \$43.4 billion in transaction fees compared with traditional money transfer services (Lee 2014). While small fees would be a part of the system, the founders argued that these fees would be minimized by the use of SMS and reliance on local gateways, which would ensure the transfer of money from sender to recipient and create a digital wallet for the recipient if necessary (Lee 2014). In their pitch, the founders referenced an aim of working with local "partners" who could convert received bitcoin into local currency (presumably, at an additional fee), but this was not addressed in detail.

The model advanced by 37coins' founders was received with enthusiasm. The project was featured in Paul Vigna and Michael J. Casey's (2015) best-selling book *The Age of Cryptocurrency* and funded by a well-known Silicon Valley accelerator for cryptocurrency projects. Yet, within eight months of the publication of Vigna and Casey's book, the project announced that it was ceasing operations (37coins 2015). In its closing announcement, representatives for the venture cited the inability "to deliver a quality product," the rise of competing ventures, and issues attracting reliable partners outside the United States (37coins 2015). Lee, in a later interview, stated that the project's staffing and funding was never sufficient to match its objectives and that the technology to meet the project's core objectives did not exist (Community at Klaytn 2019). Although there seems to be little publicly available feedback from those who actually used the service (perhaps further suggesting demand-side issues), comments from a few individuals who claimed to have used 37coins and its related SMS Wallet service indicate that concerns over the security of the system, errors in using the system, and lost funds were issues.¹¹

Beyond these technical concerns, 37coins never lived up to its promise to reach individuals like Fatima: Users in underdeveloped and conflict-affected states. At the time of its 2014 pitch, Lee stated the project was up and running in 25 countries. However, the majority of these were in the *developed* world, including the United States, Canada, Australia, New Zealand, Japan, South Korea, and a number of European countries. Only two countries in Latin America (Chile and Colombia) and just three in Africa (South Africa, Zimbabwe, and Equatorial Guinea) had established service. Vigna and Casey (2015) state that 37coins chose its markets based on a need to establish initial operations in areas where users were tech savvy and had an awareness of Bitcoin. But this exposes how women and populations in the Global South face a paradox: these populations are expected to develop knowledge about cryptocurrency as a prerequisite for participating in crypto-based remittance systems, yet they cannot acquire that knowledge specifically because the developers of these systems don't view them as worthy of investment. In particular, the fetishization of women of the Global South as vulnerable subjects in need of technologies developed and funded by players in the Global North stands in contrast to the ease with which women like Fatima are discarded when they are not immediately perceived as profitable.¹²

Other start-ups promising to revolutionize the transmission of remittances have likewise failed to realize the promise of lowering transaction costs. Payment provider Ripple launched in 2012 as a for-profit venture with an associated cryptocurrency (XRP) that promised, among other things, to drastically lower the costs of remittances. By 2018, Ripple's RippleNet enterprise blockchain was active in over 40 countries and claimed access to a potential US\$2 billion in inflows (Ripple 2018). However, Ripple encountered a host of problems in actually realizing the promise of low-cost remittances. Unlike traditional blockchains, which are fully decentralized and monitored by system users, RippleNet relies on partnerships with financial institutions to maintain its blockchain. This, combined with Ripple's for-profit model, leaves it open to critiques that it is neither revolutionary, nor philanthropic, nor fully decentralized (Arisandi 2019; Vigna and Casey 2015). Ripple's impact on remittances costs further seems to

have been modest. By mid-2020, it claimed to power about 7% of remittances between the United States and Mexico (Waters 2020). But with the global economic downturn in 2020 as a result of the COVID-19 crisis, the World Bank estimated a drop in remittances of about 20% globally, and sales of Ripple's cryptocurrency stalled (Waters 2020; World Bank 2020). In the midst of this crisis, Ripple announced a strategic "pivot" away from cross-border payments toward more commercial ventures.¹³ This move arguably represents another example of cryptocurrency remittance projects being torn between profit motive and promises to underserved populations, ultimately deciding in favor of profit.

Big-picture thinking on transforming remittances appears to have run up against the hard realities of entrenched financial systems, profit motives, and a market not fully receptive to the technology. Yet the elusive promise of changing the remittance market continues to draw substantial amounts of investment for new cryptocurrency start-ups, even when they are fundamentally recycling business models that have already failed. Much has been written on the similarities between for-profit Ripple and Stellar, a nonprofit with one of the same cofounders that has a similar mission and its own associated cryptocurrency (Arisandi 2019; Pirus 2019; Vigna and Casey 2015). The idea of crypto-via-SMS transfers proposed by 37coins has also found new life in a Venezuelan start-up called DashText, which promised to reach Venezuela's rural poor by facilitating the movement of the Dash cryptocurrency. In an informal pitch in 2018 to the Dash community, the developers behind DashText indicated they had not heard of 37coins and were unable to respond to questions about how their model would be different. Regardless, in a straw poll 86% of Dash community users surveyed supported the concept, which received in excess of 100 Dash (US\$20K in 2018) in start-up funds.¹⁴ DashText's own statistics indicate difficulty in attaining wider adoption of the service, as the service remains more heavily used in Venezuela than in all other countries combined,¹⁵ suggesting its use for cross-border remittances remains low (DashText 2020). The service does not appear to collect or report gender-disaggregated data on its impact.

The Promise of Empowerment

A final issue to explore is cryptocurrency's promise to empower women in developing countries. This again speaks to how women of the Global South are centered as a population that stands to benefit from decentralization. A test case for this has been the use of cryptocurrencies to fund projects meant to empower women in Afghanistan. The utility of cryptocurrency in this sphere has been argued on multiple grounds. The most frequently invoked justifications are that cryptocurrency can allow women build wealth by paying them in a currency more stable than local currency (the afghani) and that it allows them to challenge patriarchal social practices that limit women's ability to control their own wealth (Baldet and Powell 2019; Rome 2019; Vigna and Casey 2015). However, these altruistic concerns have sometimes overshadowed more instrumental reasons for the emphasis on cryptocurrency. A closer examination shows that, in the case of employment, paying Afghan women in cryptocurrency saved employers money in foreign transaction fees while also allowing them to control

how women spent their earnings. As with microcredit, FI, and other similar development trends, initiatives using decentralized finance conceive of women's empowerment as an instrumental rather than rights-based framework for advancement. In other words, they seek to enhance the status of women primarily by making them financial assets to their families. Again, this not only raises moral and philosophical questions about these projects, but also calls into question how they deploy discourse about feminine *and* masculine gender roles in ways that are racialized and classed.

A variety of initiatives aimed at women's empowerment in Afghanistan (some with overlapping founders, donors, and/or staff), have engaged with cryptocurrencies. One early initiative that received significant attention was the Women's Annex Foundation (WAF). This organization was cofounded by two Afghan women with backgrounds in technology, in cooperation with an Italian businessman who ran the online video service Film Annex.¹⁶ WAF provided technology training and employment to women, who populated content for its website online. As of 2014, the organization connected an estimated 50,000 girls to technology and the internet through its 11 computer media labs and paid an estimated 2000 Afghan women as content creators (Keyson and Stevens 2014; Macheel 2014). Macheel (2014) estimates that the average woman employed by WAF earned the equivalent of US\$250 to \$400 per month. As payments were made from overseas in U.S. dollars, the venture encountered problems transferring funds because of the lack of money transfer services available in Afghanistan and high fees charged by those that did operate in the country (Macheel 2014; Rome 2019; Vigna and Casey 2015). As a workaround, a system of payment via bitcoin was introduced.

The system of payment via cryptocurrency was presented as having several advantages. The venture's cofounders and various analysts noted that paying women in cryptocurrency allowed them to avoid having to open bank accounts, which in Afghanistan requires significant documentation and—sometimes—the approval of male relatives (Macheel 2014; Vigna and Casey 2015). Coverage of WAF and other, subsequent ventures involving the payment of Afghan women via bitcoin also claim this payment system was more secure than cash (Baldet and Powell 2019; Macheel 2014). This is somewhat debatable. One analysis of cryptocurrency-based programs in Afghanistan says:

You can take your [cryptocurrency] wallet with you, and you can hold this wallet—it's not really a physical wallet; it's just on your phone, or you can even write it out on a piece of paper if you want. Nobody can really take that away from you, right? (Baldet and Powell 2019)

Yet a phone or a piece of paper literally can be taken away by someone else. Given that one major objection to cash payments was that women could easily be robbed or have the money taken by family members, it is unclear how payment in cryptocurrency fully resolves that issue (Macheel 2014). Possession of bitcoin and other cryptocurrencies is not necessarily tied to one's identity, but rather to a private alphanumeric access key. If unauthorized parties can gain access to the key—for example, because it is written on a piece of paper—they have access to

those funds.¹⁷ Beyond this, though, the repeated advocacy for cryptocurrency as a way to help Afghan women evade or circumvent male family members—presented as controlling and surveilling forces who can be foiled via their own lack of technological aptitude—replicates the same stereotypes repeated elsewhere about the backward, untrustworthy men of the Global South.

A practical issue with cryptocurrency payments to Afghan women was the lack of available opportunities for them to spend the bitcoin they earned. The cofounders of WAF acknowledged that usability was an issue for their employees, as few retailers in Afghanistan accepted bitcoin, and overseas retailers that accepted bitcoin often would not ship product to Afghanistan (Macheel 2014; Rome 2019; Vigna and Casey 2015). To get around this, the WAF and Film Annex opened its own shop, effectively meaning that employees who made bitcoin were limited to spending it at a company store. The store offered inventory including mobile and Skype credit, gift cards, and some technology items (Macheel 2014; Vigna and Casey 2015). These items are arguably not necessities, and the limitations on how bitcoin can be used and spent would seem to undermine advocates' promises of financial freedom—replicating the very financial control they promised to help women escape. Take, for example, statements made about Film Annex's founder in Vigna and Casey's (2015, 204–7) *The Age of Cryptocurrency* regarding the payment of Afghan women:

He wants the [Afghan] girls to spend it [their income] on technology, such as Mozilla's forthcoming \$25 smartphone, which they can convert into a camera and a tool for producing better video and blog content. He is trying to turn the Film Annex website into its own, self-enclosed bitcoin economy.

In the same source, the founder is quoted as saying,

The belief I have is that if you lock these people into this new economy, they will make that new economy as efficient as possible. If you start giving people opportunities to get out of the economy, they will just cut it down.

None of this is to suggest that those associated with WAF or the Film Annex intentionally acted in bad faith with regard to their employees. Indeed, the founders consistently express a concern for the safety of their employees. However, the overriding philosophy behind these ventures—that women are empowered by becoming wage earners and that they should be empowered because they will, in turn, contribute to the economy—places an instrumentalist view of women above rights-based justifications to empowerment. Feminist work has strongly criticized this neoliberal approach to “empowerment,” or the notion that promoting gender equality is worthwhile primarily as a means to an end—be it peace, security, or prosperity—rather than as a moral imperative (Ellerby 2017; Parisi 2020). This notion that “if she’s making money, she is more likely to be protected by her brothers, because she’s an asset to the family instead of a second-class citizen” (Vigna and Casey 2015, 207) repeats and enshrines neoliberal logics about human value, while presenting men (and, especially, poor

men of the Global South) as incapable of philosophical or moral support for women's rights.

Indeed, the degree to which bitcoin-based ventures into women's empowerment improved women's lives in sustainable ways is unclear. By 2017, WAF had rebranded itself as the nonprofit Digital Citizen Fund, with a larger mission to teach digital and financial literacy to women (MIT Initiative on the Digital Economy 2017). While the Digital Citizen Fund and some other nonprofits¹⁸ continue to accept bitcoin donations to fund their aims of women's empowerment, the future for such initiatives remains unclear in the wake of the Taliban's return to power in the country.

Discussion and Conclusion

The foregoing analysis demonstrates how cryptocurrency and the larger sector of decentralized finance have thus far failed to deliver on their promises of development and social transformation. Despite the promise of decentralized financial models as a force for leaving behind social hierarchies of the past, cryptocurrency-based initiatives have failed to promote the participation of, lower financial barriers for, or empower women. A closer examination of each of these areas further highlights the need for additional analysis that sees gender as a force interacting with hierarchies of race/ethnicity, class, and geographic location. Projects discussed here deploy narratives that engage with masculinity, Global North/South encounters, and socioeconomic status in specific, problematic and/or simplistic ways. Each of the examples discussed earlier challenges the notion of cryptocurrency as a gender-neutral innovation, illustrating instead how an emerging technology, harnessed to the same unequal social structures, global hierarchies, and neoliberal/neoliberal philosophy, fails to produce transformative change in spite of good intentions. Decentralized approaches to development suffer from the paradox of offering targeted benefits to women while denying foundational principles of feminist and critical thought like the salience of gender and other social hierarchies. They also belong to a larger lineage of neoliberal and market-oriented solutions that have fostered risk acceptance, technological surveillance, and economic insecurity in the Global South. In so doing, these cases only reinforce a central argument of feminist international relations: i.e., that no phenomenon in our societies is ever truly gender-neutral (Harding 1986; Runyan and Peterson 2013).

Does this suggest that blockchain, cryptocurrency, and decentralized finance are destined to perpetuate harm in the global context? One can argue otherwise. While some have argued that decentralized finance repackages conspiracy theories and other extremist views (Golumbia 2016), others see the system as one rooted in cyber-utopianism (Vigna and Casey 2015, 2019). For some, participation in blockchain maintenance and/or mining processes is fulfilling because it provides membership in a community, not just potential profit (Calvão 2018). While cryptocurrency has been leveraged by far-right figures and outlets, it has also been adopted by democratic opposition and free-press movements in places like Hong Kong (Huang 2019). For countries in the post-Soviet space, blockchain

technology has been viewed as an important means for safeguarding data against Russian cyberattacks, and as a supplement for weak state systems of recordkeeping (Rodima-Taylor and Grimes 2019b). With some authoritarian states planning to implement their own national, digital currencies—which will open a new frontier in the surveillance of economic activity—the privacy arguments for cryptocurrency should not be overlooked (Greene 2021).

More recently, the UN has leveraged blockchain technology for a number of applications including the provision of aid through the World Food Programme (WFP) and a mobile payment system for women in refugee camps in Jordan through UN Women (WFP 2020a). Initial analysis of these programs from the WFP states that participants prefer the safety and convenience of not having to use cash; additionally, they note that during the COVID-19 pandemic, the application of scanning technologies (including the use of QR codes) allowed for improved social distancing at aid disbursement points (WFP 2020b, 2020a). While the gendered impact of such initiatives require more study (and raise new questions about ethics and privacy in the realm of biometrics), they represent potentially beneficial innovations. Importantly, the UN's programming relies on a permissioned, rather than a permissionless, blockchain. This means that, unlike the systems that underpin most cryptocurrencies, their system is not fully decentralized. It also means these systems are subject to internal regulations regarding compliance with international law and gender mainstreaming measures. This includes taking the effects of gender into account in the monitoring and assessment of programs.

These are important stipulations. While current international policy frameworks for gender mainstreaming in development are far from ideal, they still present a baseline and offer some mechanisms for accountability. The movement of international development initiatives toward decentralized finance may bypass established practices related to issues like gender mainstreaming, civil society consultation, and even environmental protections, routing development funds into a system with little oversight and expertise. As we have seen, this system frequently fails to see and understand gender and interlinked social hierarchies, beyond the application of crude stereotypes. Furthermore, the current system rewards those who move fast and pitch well—resulting in programs that repeat earlier failures without adequate reflection, and/or programs that yield unintended consequences.

Should developers in decentralized finance take a genuine interest in producing meaningful, transformative outcomes for marginalized groups, an ethic of responsible engagement must emerge. This would entail the adoption of an industry standard emphasizing the importance of diversity and meaningful action to address complaints of gender-based discrimination and harassment. It would entail developing projects through consultation with civil society, experts, and the local knowledge base. Especially where projects take place in the Global South, participatory practice and informed consent are particularly important to making projects more closely resemble partnerships for development, rather than financial experiments. Ideally, we would also expect to see the adoption of best practices regarding gender mainstreaming, such as the collection of gender-disaggregated data and the analysis of gender in program design.

Politically, implementing these changes might further entail some tradeoffs to the fully decentralized model, including the introduction of mechanisms for industry-wide oversight and accountability. While purists in the decentralized finance community would likely object to these conditions, one could argue that the “decentralization” in decentralized finance is already eroding as international organizations, corporations, and major players in global finance increasingly move in to this space.

Researchers may additionally have a role to play, as there is more that remains to be explored. This research, while centering a feminist perspective, leaves space for a variety of other possible avenues for inquiry. Among these are postcolonial approaches, intersectional analysis, and analyses based on environmental concerns associated with the technology. To the extent that new developments continue to arise, this work should represent a call to “consider crypto” as a force in global political economy and to engage on this topic in a critical way, bringing a diversity of insights to bear on these developments.

Notes

1. Following conventions in the field, I capitalize Bitcoin in this article when referring to Bitcoin as a technology or system. In referring to bitcoin as a unit or units of currency, the lowercase is preferred (see the Associated Press’s Facebook post at <https://www.facebook.com/apstylebook/posts/ap-style-tip-bitcoin-is-a-digital-currency-as-a-concept-bitcoin-is-capitalized-t/688859364470486/> (September 7, 2021).
2. Nayib Bukele (@nayibbukele), “La oposición torpe siempre juega ajedrez de un paso...,” Twitter, August 22, 2021, <https://twitter.com/nayibbukele/status/1429607967767289858>.
3. Satoshi Nakamoto is a pseudonym used by the founder or founders of Bitcoin. Despite speculation over the years, it is unclear whether this is one or multiple individuals, or their gender identity.
4. It is worth noting that cryptocurrencies are distinct from the notion of “virtual” or “digital” currencies advanced in recent years by states including China and India (Jadhav 2021; John 2020). Projects like China’s digital yuan remain fully centralized and do not use blockchain (John 2020). Government control over the ledger raises significant concerns about privacy and surveillance, as it allows the state to more easily track the flow of money.
5. A more complete discussion of “proof of work” versus “proof of stake” models is beyond the scope of this paper, though it suffices to say that not all cryptocurrencies use the competitive mining model associated with “proof of work” systems. As discussed below, some projects have moved toward alternatives that are arguably less fully decentralized. See also Calvão (2018).
6. A valid question, though one beyond the scope of this analysis, is to what extent this economic model remains decentralized once major transnational players like the World Bank, the UN, and an array of transnational financial actors move more deeply into the system. This is another area worth further exploration.
7. See, e.g., Ahmed (2008); Dineen and Le (2015); George (2020); Keating, Rasmussen, and Rishi (2010).
8. “Incel” refers to involuntary celibates, a violent male supremacist ideology. See, e.g., Hoffman, Ware, and Shapiro (2020).
9. In El Salvador’s adoption of Bitcoin, too, there is the suggestion of extremism. President Nayib Bukele has been called the architect of a new “millennial authoritarianism” that cultivates populism via technological branding (Meléndez-Sánchez 2021).
10. One recent estimate put remittance loss to fees alone at \$25 billion in 2018 (Elks 2018).
11. These comments were sourced from users on Reddit and YouTube who claimed to have interacted with the service. I was unable to verify the identities of these users; however, their comments seem generally consistent with the issues identified by the project team.

12. Indeed, it is unclear what happened to Fatima or whether she was actually aware of the project or that her family's story was used in its marketing.
13. More recently, Ripple was the subject of legal action by the U.S. Securities and Exchange Commission (2020), which alleges that Ripple is not a decentralized currency but rather a for-profit company engaged in the unlawful sale of unregistered, digital securities to finance its operation.
14. In Dash's system, 10% of the cryptocurrency mined is reserved for reinvestment into projects developed by the community and voted on by "masternodes," individuals holding at least 1,000 Dash and a static IP (Prusty 2017, 19–20). The community conversation around DashText and details of the start-up budget can be found on the Dash community forum at <https://www.dash.org/forum/threads/pre-proposal-dash-text-sms-wallets-for-everyone-exclusively-for-dash-first-stage-venezuela.39160/>.
15. As of this writing, the service is active in Venezuela, Colombia, the United States, Spain, Italy, Mexico, Cuba, Paraguay, Chile, and Peru, but it had handled a total of 20 transactions or less in most of these countries. The service does not appear to be active in any African countries, despite identifying this as a target region of interest in its initial pitch (see the Dash forum mentioned in note 14).
16. Italian businessman Francesco Rulli has been variously presented as a partner or cofounder in the venture, although some stories notably omit his involvement entirely, presenting the project as a joint venture of two Afghan women, Fereshteh Forough and Roya Mahboob. Compare, for example, histories appearing in Keyson and Stevens (2014); Macheel (2014); Shah (2012).
17. This is to say nothing of the significant financial loss incurred when parties lose access to their private keys. Recent reports estimate that as much as 20% of all bitcoin in existence is considered "lost," because it is held in wallets for which the keys have been lost or forgotten (Popper 2021).
18. Code to Inspire is another example of an organization with a mission related to women's education and empowerment which, as of this writing, continues to accept cryptocurrency donations in the wake of the Taliban's return to power in Afghanistan.

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