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MAKING ENDS MEET BY MINING ON BLOCKCHAIN: SUBALTERNITY, MATERIALITY, AND YEARNINGS OF CHINESE AMATEUR CRYPTO MINERS

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ABSTRACT

While public narratives indicate that blockchain is widely used in developed societies among privileged elites, either from socio-economic, ethnic, or techno-cultural perspectives, this study examines how some disadvantaged marginal others, specifically the subaltern *shehuiren* in China, survive in the increasingly precarious post-socialist Chinese society by engaging with blockchain and cryptocurrencies. Literally translated as “society people”, *shehuiren* are the socio-economically and techno-culturally disadvantaged others who face marginality due to various post-socialist institutional inequalities. This study aims at unpacking how, on the one hand, the blockchain scene has been reconfigured by the disadvantaged in the local context, and on the other hand, how subalternity is actualized in post-socialist China, where blockchain-related technologies deeply intertwine with various forms of social inequalities. By tracing a group of *shehuiren* crypto miners through ethnography, I demonstrate that this subaltern scene of blockchain not just reshapes the *shehuiren* individuals’ notion of time, space, and value and the social relationship among themselves, but also profoundly impacts the power dynamics between the subalterns, the more privileged others, and the state authorities. Specifically, I underline that, despite being treated as losers, outsiders, and potential wrongdoers due to the existing social structures, *shehuiren* miners are neither victims nor rebels opposing either the authoritarian state or the global neoliberal order. Instead, they are actors who harvest limited profits through their unacknowledged creativity, adeptly making use of various resources within their reach and weaving their differential aspirations by attaching themselves to the larger technology-mediated networks in an unequal post-socialist society where a united subaltern hardly exists.

Keywords: blockchain; subaltern; materiality.

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1 INTRODUCTION

During a WeChat phone call during the spring festival of 2021, Brother Gu, in his early thirties for the first time revealed his economic troubles to his younger brother Little Gu. Before the Covid-19 pandemic broke out, Brother Gu and his wife, Sister Wang, supported their two children by running a breakfast stall in the early morning and a noodle restaurant throughout the daytime in a city in Hunan, a mountainous province in southern China. However, the pandemic significantly changed their tiring yet promising situation, as both the breakfast stall and noodle restaurant were prohibited from opening in early 2020. Even though the lockdown was quickly lifted, and the municipal government claimed that the region had returned to normal within less than three months, the impact was severe on Brother Gu's family because their stall and small restaurant never regained their business. The couple struggled for over half a year, spending most of their savings to cover daily expenses, but still found no solutions to climb out of their economic deficit. Brother Gu had no other choice but to seek help from his younger brother.

Little Gu, though a precarious contract worker himself, did provide a feasible solution to his elder brother. He persuaded Brother Gu to step into the field of cryptocurrency to make ends meet. Though at first not familiar with the mechanisms of cryptocurrency himself, Little Gu was a fast learner. Within one month, he decided to purchase several computer graphics cards (GPUs) from Xianyu, a second-hand e-commerce app, and built his first equipment to mine Ethereum, at that time the second largest blockchain network after Bitcoin. This trial met with success, which encouraged him to believe that crypto mining could bring a lucrative income at a relatively low cost and thus significantly improve both his brother's and his own living conditions.

Some scholars and practitioners argue that by being independent from both the government and traditional financial intermediaries, blockchain as a decentralized and new technology could help to financially incorporate the impoverished, particularly the unbanked, in developing countries, and endow these disadvantaged social groups with greater opportunities (e.g., Larios-Hernández, 2017; Mavilia & Pisani, 2020). If this assumption is true, how specifically can the disadvantaged benefit from blockchain? How does blockchain, as a set of technologies, along with the value of cryptocurrencies, influence the marginal population in return?

To tackle these empirical questions, this study follows a group of amateur miners who offer their computational power to the peer-to-peer network, adding new blocks to the chain in order to win crypto coins as a supplementary income during their under/unemployment. Specifically, I argue that these amateur miners can be regarded as members of *shehuiren*, literally “society people”, a specific type of subaltern in post-socialist Chinese society. Based on the intertwining of various remaining socialist structures and neoliberal economic reform “with Chinese characteristics” since 1978 (Harvey, 2005), the term itself connotes a

subordinate, inferior, temporary, and even ambiguously illicit social position. By following these *shehuiren* miners, this study specifically unpacks (1) how and why they act by adopting, adjusting themselves to, and revamping the dynamically changing blockchain-related technologies; and (2) if their adoption, innovation, or quitting of these technologies can create certain outcomes, at which level these outcomes will appear, and how they will in turn affect the miners themselves. I pay special attention to the multiple types of actions and agencies that occur during this process of reconfiguring a subaltern scene of blockchain. Here, the blockchain scene refers to collections of heterogeneous actors—technologies, discourses, places, institutions, artifacts, forces, and people—that together assemble the particular socio-technical phenomena as a form of ordering around blockchain (Casemajor & Straw, 2017). Therefore, rather than being restricted to human beings’ motivations, I concentrate on the traceable impacts and dislocations through which various entities have the potential to “make some differences to a state of affairs” (Latour, 2005, p. 53). In this specific case, these entities include, but are not limited to, the subaltern miners, blockchain as a set of technologies, public narratives, cryptocurrency markets, and the Chinese authorities. In other words, by investigating how some subaltern *shehuiren* engage in blockchain as amateur miners, this research tries to enrich the understanding of how blockchain infiltrates disadvantaged populations’ everyday lives, reshaping their perceptions of time, space, value, and social relationships. At the same time, I also examine the extent to which blockchain technologies are, in turn, transformed amid local scenes that physical structures, community systems, people of diversified backgrounds, and cultural values impact in different ways (Silver & Clark, 2016). These mutual interactions thus reconstruct a subaltern scene of using, poaching, and reshaping blockchain in a specific socio-economic and techno-cultural context beyond the socio-technical scenscape that is frequently dominated by urban elites who enjoy rich cultural capital.

The following section starts with a brief introduction to the role of amateur miners on blockchains, including their technical functions, sociological backgrounds, and the basic mechanisms of their digital profiteering. Then I propose that *shehuiren* can be utilized as an alternative perspective to understand how subalternity is actualized in post-socialist China in particular. After defining the two key terms of this current study, miners and contextualized meanings of the subaltern, and describing my ethnographic method, I analyze in detail three aspects of how *shehuiren*—as a specific subaltern subjectivity in post-socialist China—are reshaping and being reshaped through crypto mining. First, I examine how the subaltern, who are usually mystified as the late adopters or even conservative refusers of new technologies, actively incorporate themselves into the emerging technology-oriented network. I argue that because of being marginalized in existing unequal socio-economic structures, *shehuiren* are more likely to accept not just new technologies but any new ideas that can help them overcome economic struggles even just temporarily once they have access to reliable learning resources.

Nonetheless, their learning paths and creativity are seldom recognized among wider audiences. Second, by mining cryptocurrencies, these *shehuiren* miners participate in and experience the global financialization of people’s everyday lives, while non-human actors such as mining rigs in a local context and the precarious crypto market at a global scale profoundly reshape these miners’ living environments, everyday habits, and the dynamics of their emotions in return. Thirdly, the subaltern reconfiguration of the blockchain scene in China is specifically understood in a historical period when both the Chinese central government and its regional branches imposed stricter as well as convoluted restrictions regarding crypto mining and trading in 2021. By examining the differential aspirations of *shehuiren* miners who live at the margins of post-socialist China, I demonstrate the oversimplification of assuming that the subaltern—as a united social group with clear collective consciousness—could either be empowered by a decentralized blockchain to resist a repressive state or a ferocious neoliberal digital economy. Instead, *shehuiren* miners are actors in the subaltern blockchain scene who deliberately attached themselves to the larger technology-mediated networks in a post-socialist Chinese society that constantly marginalized them as the inferior other with different structural dynamics.

2 AMATEUR CRYPTOCURRENCY MINERS AS NEW DIGITAL PROFITEERS ON BLOCKCHAINS

Blockchain can be imagined as an open, distributed ledger where transactions between any two parties are recorded in a verifiable way (Iansiti & Lakhani, 2017). Rather than being stored and managed by some central authorities or trusted third-party intermediaries, such as banks, this public ledger is dispersed on a peer-to-peer network across the world (Kher et al., 2021). When each private computer in this network keeps a record of the public ledger and can verify its authenticity, it becomes extremely difficult for any single player to falsify or fabricate the already documented information. Though displayed publicly, each transaction is strictly encrypted through certain protocols and thus enabled without disclosing one’s identity. Literally, the term “block” refers to each set of structured transaction information, whereas “miners” are those who constantly add new blocks to a “chain” to verify each new transaction. Though the concept of cipher block chaining sparked several pioneering attempts from the early 1990s, Bitcoin (proposed in 2008 by Satoshi Nakamoto, whose real-world identity is unknown) was the first success that led to a dramatic increase in both blockchain databases and cryptocurrencies (Kher et al., 2021). The number of cryptocurrencies based on different blockchains exceeds 9,000 by November 2022.¹

¹ Data on cryptocurrencies can be found on <https://coinmarketcap.com/>, retrieved 14 November 2022.

If the technological characteristics function as the skeleton defining the framework of blockchain, then miners, or the people who record each transaction, serve as the flesh of the system providing essential content. However, who can become a miner, why are they willing to take responsibility, and how can a miner benefit from the process? Another distinct feature of many blockchain networks is their hash-based proof-of-work (hereafter PoW) challenge to enable crypto mining. For example, when a block needs to be added to the chain of Bitcoin, multiple miners wish to do the job as they can receive a transaction fee as well as a block reward once it has been accomplished. To identify a reliable miner, Bitcoin, in particular, requires its members to use their computers to solve specific mathematical puzzles as proof of their work. For each transaction, any miner who can correctly solve the mathematical problem at the fastest speed is granted the chance to add a new block to the chain and is thus rewarded. Therefore, to participate as a miner, one should not just accept the PoW mechanism but also demonstrate their computational capability to earn the chance to add a new block. Nonetheless, for each cryptocurrency, how PoW is specifically implemented varies widely. For example, Chia, a blockchain claiming itself to be greener Bitcoin, utilizes miners' hard drive space rather than computational power.² Moreover, due to the high consumption of energy, Ethereum transitioned from PoW to an alternative mechanism, proof-of-stake (PoS), on 15 September 2022, giving mining power based on the percentage of coins held by a miner.³ The dynamics and variations of these technological mechanisms have significantly affected how miners can participate in and seek profits from blockchains.

Notably, the following steps that manifest how an individual miner could profit, for example, from mining Ethereum, were archival documentation of the time when I conducted the bulk of ethnography in 2021, when PoW still dominated Ethereum blockchain and crypto mining in general (Figure 1). Usually, a miner first purchased as many GPUs as possible to boost his or her computational power when addressing mathematical puzzles. With multiple GPUs, he or she could start building the mining rig, a specially designed computer, to more efficiently accommodate the mining process. Assembling a mining rig individually was usually a painstaking or even exasperating task, even though there were plenty of accessible tutorials online, as everyone would confront different problems, ranging from component mismatch to failures in optimizing system—especially for the socio-economically disadvantaged miners because, in many cases, they could only afford low-cost knockoffs or second-hand components. Moreover, the mining rig needed to be constantly maintained because their computational power as well as electricity

² Detailed information about Chia's PoW mechanism can be found on its official page <https://www.chia.net/faq/>, retrieved on 11 November 2022.

³ The transition from PoW to PoS, called The Merge, is introduced on <https://ethereum.org/en/upgrades/merge/>, while the detailed mechanism of Ethereum's PoS can be found on <https://ethereum.org/en/developers/docs/consensus-mechanisms/pos/>. The two sources were both retrieved on 11 November 2022.

consumption would always be affected by contextual factors such as interior temperature, ventilation, operating systems, GPU settings, etc. After addressing the hardware issues, one could choose either to mine solo or within a pool. Due to the increasingly intensive competition among miners, particularly because of the existence of large-scale mining farms, it had become more difficult for individual miners to win a full block reward. A mining pool thus distributed the mathematic puzzle among scattered miners, and according to each one's computational power, individual miners could share the block reward once they succeeded in collectively adding a new block. After receiving the crypto tokens as rewards, miners could utilize different re-investing strategies, for example, converting to fiat currencies such as USD or RMB, depositing cryptos in centralized exchanges such as Binance or FTX, trading non-fungible tokens (NFTs), and participating in the Initial Coin Offerings (ICO) of various projects and receiving airdrops to either consolidate or increase their gains.⁴ The process created different types of economic costs for an individual miner, including but not limited to the purchase of computer components, constant maintenance of mining rigs, electricity bills, and the volatile prices of certain cryptocurrencies. Moreover, a Chinese individual miner also had to bear various social costs, particularly caused by the multiple levels of the Chinese government with their inconsistent and campaign-style policies (Zhou, 2022).

Since the success of Bitcoin, scholarship on blockchain and cryptocurrencies has significantly increased. Nonetheless, we still have little knowledge about real-world miners, who they are, in what conditions they live, and whether and how they make money by being a node on a blockchain. Though some scholars have investigated the psychological dynamics among crypto traders and their impacts on, for example, Bitcoin prices (e.g., Aloosh & Ouzan, 2020), most economic studies still assume blockchain users, both traders and miners, to be *homo economicus* who can always fit into a generalized model or theorem despite different social and cultural conditions (e.g., Biais et al., 2019). However, such a universal assumption could offer little help in advancing our understanding of the reconfiguration of localized blockchain scenes as a technology, or as a cultural artifact in general, and its related circumstances always embody distinctive meanings, uses, and re-designs by populations of various backgrounds (Brock, 2020; Burrell, 2012).

⁴ Because non-fungible tokens (NFTs) contain references to digital files such as images, photos, audio, and videos, they are uniquely identifiable assets recorded in a blockchain. People can thus purchase, sell, and trade NFTs through blockchain networks. Initial Coin Offering (ICO) is a blockchain-based money raising strategy. Any entity (company, collective, or individual) can raise funds by creating new crypto coins, sharing the whitepaper to articulate their vision, and crowdfunding on blockchain. Interested investors can receive crypto token as a stake in the project.

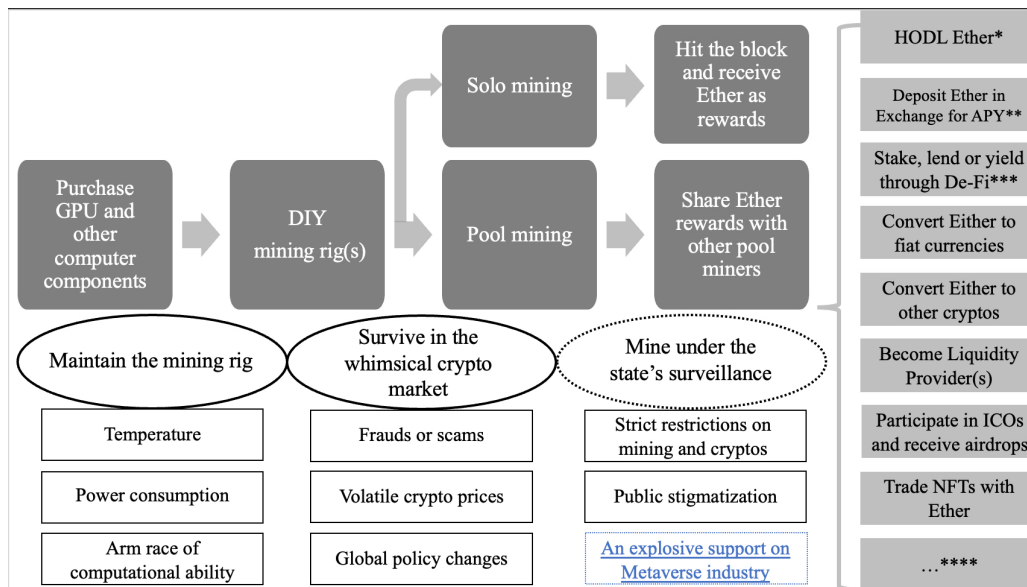


Figure 1. How an individual miner profits from the Ethereum blockchain and the various socio-economic costs one might encounter during the process.⁵

Due to the anonymity of the community, it is indeed difficult to localize blockchain users. Nonetheless, using quantitative data from public surveys and search engines, some sociologists tended to generalize blockchain users as techno enthusiasts, speculative investors, liberals, and criminals (Bohr & Bashir, 2014). Specifically, cryptocurrencies that are untraceable for authorized financial institutions are notorious in public discussions for being widely used by criminals to launder money or fund terrorism (Yelowitz & Wilson, 2015). By participating in offline conferences and workshops in Australia, Tana and her colleagues (2019) more specifically portrayed blockchain users as fortune-hunters, knowledge seekers, and visionary entrepreneurs. At the same time, apart from a few leading figures such as Vitalik Buterin, the founder of Ethereum blockchain, or Elon Musk, the centibillionaire who is also a cryptocurrency enthusiast, the ordinary miners who actually update new blocks to the chain rarely appear in the media. The attention to Chinese individual miners and traders is even less as media reports—both in Chinese and English—tend to depict cryptocurrency mining in China as a full-fledged industry where mining farm owners have already taken control of the

⁵ *HODL, an acronym for “hold on [for] dear life”, is a memetic strategy among crypto investors, indicating that they do not believe in short-term trades amid the notoriously volatile crypto market. **APY, short for annual percentage yield, is a way of passive investing, sharing similarities with deposits in traditional financial intermediaries, such as banks, exchanges, and brokerages.

***De-Fi, short for decentralized finance, refers to financial instruments by using smart contracts on blockchain networks instead of financial intermediaries, either the traditional ones or centralized exchanges in crypto market.

****In the right part of the figure, I only enumerate the re-investing strategies frequently used or discussed among my interviewees based on Ethereum blockchain. This is thus not a comprehensive list, while these strategies are not mutually exclusive of each other either.

purportedly decentralized blockchain networks by possessing enormous computational power, thus largely devaluing the role of scattered individual miners.

The academic and public narratives together indicate that blockchain is actively mined and used by privileged elites either from a socio-economic, ethnic, or techno-cultural perspective. If the disadvantaged are ever to have any chance to benefit from blockchain, they can only wait to be taught, included, and rescued. However, in this study, I argue that some disadvantaged marginal others, specifically the subaltern *shehuren* in China, have endeavored to survive in the increasingly precarious post-socialist Chinese society by actively adopting blockchains. Before going into their stories, I will first discuss the meaning of the subalternity of Chinese *shehuren* to better understand the reasons as well as the social contexts for them to become amateur crypto miners.

3 *SHEHUIREN*, AN ALTERNATIVE TYPE OF SUBALTERN IN POST-SOCIALIST CHINA

The terms “subaltern” and “subalternity” first gained significance as a substitute for “proletariat” after appearing in the writings of Antonio Gramsci, the Italian Marxist. In his view, the power of either the ruling class’s repression or the subaltern’s resistance is not decisive, but negotiable and reciprocal. An “expansive” hegemony always strategically acknowledges and partially incorporates the subaltern’s aspirations into the worldview of a dominant group to effectively maintain its powerful status (Jones, 2007). The Subaltern Studies Group (SSG), a team of post-colonial scholars focusing on the South Asian social context, later carried forward the term through their attempts to re-narrate the region’s history from the perspective of below. For example, according to Ranajit Guha (1982), “subaltern” refers to all Indian populations that are not elite, regardless of whether they are determined by class, caste, age, or gender. He also underlined a shared character across various subaltern groups: the impulse to resist domination from the elite (Louai, 2012). However, such a point received severe criticism from Gayatri Spivak, a feminist critic who also used to be an important contributor to SSG. In her well-known long essay, “Can the Subaltern Speak?” (1988), by pointing out that the female subalterns were more likely to be muted, excluded, and misunderstood, she revealed the absurdity of imagining a united, homogeneous subaltern subjective identity and questioned the possibility of subalterns’ collective actions.

Subaltern groups in China today share commonalities with these features, including that (1) the subaltern is highly heterogeneous, usually without shared interests; (2) subaltern consciousness thus does not necessarily exist, neither do these people necessarily act or politically engage according to an imagined collective class consciousness; (3) diversified subaltern groups could still negotiate with the interlocking matrix of oppression in a hegemonic structure. However, it must be noted that subalternity is always actualized in a local context through various mechanisms. For example, in contemporary China, some ethnic groups such as the

Yao, Bai, Dai, and Yi people are assumed to be major members of subalterns for being the others of the dominant Han Chinese, as they often struggle with intersectional marginalization, including ruralness, poverty, disease, drug use, and cultural alienation (Liu, 2010; McCarthy, 2011). From the perspective of Marxist sociologists, such as Ngai Pun (2005), Chinese rural migrant workers, who trade their cheap labor to global capital producing shoes, toys, and electronics for the world, comprise “a specifically Chinese subaltern” (15). Although they work in sweatshops in the cities, most of the over 200 million Chinese rural migrant workers are only temporary urban residents according to the specifically designed household registration system (*hukou* in Chinese) (Chan & Seldon, 2014). Both the central and regional governments thus not only evade the responsibility to provide them with proper welfare benefits, but, more importantly, undermine the transition from peasants to the working class as an unfinished process (Pun, 2016). The socio-political remaking of rural migrant workers as a specific type of Chinese subaltern is further justified by the prevalent public discourses that usually label them as inferior others of low quality (*suzhi*) compared to their urban counterparts (Anagnost, 2004; Jacka, 2009; Kipnis, 2006; Yan, 2003).

Briefly, subaltern groups, such as ethnic minorities and rural migrant workers, are determined by the intertwinement of socio-economic, political, and cultural factors in contemporary China. Nonetheless, due to the rapid changes of global capitalism and the reconfiguration of Chinese society, the meanings and compositions of subalterns have significantly expanded to broader social groups beyond the two most notable groups. The subaltern particularly includes those who do not fit within existing sociological categories, such as the second or third generation of rural migrant workers who used to be called “left-behind children” or “floating children” (Mu, 2018). With Little Gu being a typical example, many of them refuse to work in factories in adulthood like their parents or grandparents once did, but make a living in various temporary, part-time, low-wage jobs that can offer little occupational identity or work-based sense of belonging, or become vagabonds wandering between cheap internet cafés (Standing, 2016; Tian & Lin, 2020). Other subaltern groups who are not widely recognized among the wider public involve dropout teenagers or vocational school students who are viewed as losers by the formal education system and, therefore, as future unskilled workers (Willis, 2019; Woronov, 2015), early retirees with a small or even no pension, self-employed workers, or small business owners like Brother Gu and Sister Wang (Qiu, 2009). Rather than determining one’s subaltern position simply from a single dimension, such as ethnicity, rural/urban division, occupation, or income level, the mechanisms to identify and construct subalternity are particularly heterogeneous, complicated, and even inexplicable after the 2010s because of various structural dynamics, including but not limited to the recurrent global financial crises, the Sino-US trade war, the long-term impacts of the COVID-19 pandemic, and China’s zero-COVID policies, as well as the deep embeddedness of various digital

technologies, not just in social production, distribution, and consumption but also in people's everyday lives.

Therefore, I propose *shehuren*, a post-socialist term, as an alternative perspective for understanding subalternity in China today. Literally translated as “society people”, the original meaning of the term refers to all the individuals who were beyond the scope of the previously ubiquitous socialist work unit systems in urban areas and the commune systems in the countryside (Xiang, 2018). These work units and rural communes, together with the enduring household registration system that strictly restricts population movements, have never been completely eradicated since the country's neoliberal economic reform in 1978, but only transformed into more subtle forms for generating social differentiation in post-socialist China (Afridi et al., 2015; Bray, 2005). Being identified as deviant in the household registration system (e.g., ethnic minorities and rural migrants), or excluded from either the formal educational system (e.g., floating children, dropout teenagers) or the authorized labor market (e.g., small business owners, laid-off and underemployed workers), the outsiders of these post-socialist institutions are all inevitably *shehuren*. Lacking access to institutional resources and sufficient social support, *shehuren* often gain knowledge and experience of the world by wandering from one place to another or switching from one job to another in precarity. In their own words, they depend on themselves to *chuang shehui* or *hun shehui*, to “loiter around and see life”, as “the society people”. The amateur miners I followed in this study live under such circumstances. As small business owners, dropout students, and part-time or contract workers, their unstable income means that they cannot fully make ends meet, and/or their day job exhausts them both physically and mentally, so they always have to look for alternative ways to survive. The term *shehuren* thus connotes a marginal, subordinate, inferior, informal, and precarious social position.

More importantly, *shehuren* implies a grey or sometimes illicit position that is neglected, discouraged, or (nominally) prohibited in legitimate public accounts. For example, a widely known *shehuren* image is that of Liu Huaqiang, a protagonist in *Conquest* (2003), a popular TV crime series, who not only earns money by leading a gangster in a survival-of-the-fittest scenario but also makes a name for himself by seeking revenge on the ones who once bullied him and his family members. The fictional figure assuages the frustrations of many real-world subalterns who feel powerless and deprived. In response, they learn and develop the practical value of being *shehuren*, that one must depend on him or herself by whatever means—whether morally or legally controversial or not—to survive in a transitional post-socialist society that is marked by unequal opportunities, fragmented principles, and conflicting ethics. The term *shehuren* implies not just gangster or street violence (Li et al., 2020), but also folk outlaws, petty crimes, and participation in any sectors beyond the Chinese government's administrative scope. To take crypto mining and trading as an example, the Chinese government released formal restrictions on crypto mining and trading respectively in 2013, 2017, and

2021. However, because of the ambiguous regulatory descriptions, technical difficulties, and economic costs in implementing these policies in practice, many individual crypto miners still anonymously contribute to the global crypto market by using various methods, such as virtual private networks (VPNs), which are also illegitimate but widely used among China-based internet users to access the internet beyond the Great Firewall (Roberts, 2018). On the other hand, whereas crypto mining and trading are strictly prohibited in China, some concepts such as blockchain and metaverse, which can hardly be separated from cryptocurrencies, are enthusiastically embraced as the new trends of the future digital economy both by government officials and industrial practitioners.⁶ In sum, the grey and unstable positions of blockchain-related technologies in the sophisticated system of Chinese internet regulations also determine the subalternity of disadvantaged crypto miners or traders.

Last but not least, as Spivak (1990) argues, if the subaltern can to some extent express themselves despite limited space and resources, they are partially incorporated into the hegemony by at least being heard, though in most cases imprecisely. For example, some members of the subaltern, particularly the rural migrant workers, never give up trying to “talk back” to the structures of power that erase or distort their subjectivities and realities by writing poems (Sun, 2010), creating documentaries (Sun, 2014), dressing with hairstyles and make-up that are inconsistent with mainstream aesthetic values (Sun & Qiu, 2015), mocking themselves as “pubic hair” (*diaosi*, which figuratively means “losers”) (Cao 2017; Sun, 2017; Szablewicz, 2014; Witteborn & Huang, 2015), or expressing their frustrations through user-generated rap videos on specific platforms (Hou, 2021). Notably, when these various cultural practices may generate collective consciousness and mutual interaction among the subalterns themselves, they often trigger denunciations among the upper and middle class for being identified as morally and aesthetically problematic (Hou 2020), thus reinforcing the subaltern as both a position and a process of becoming the inferior and marginal other in China today. Despite having no intention of neglecting the subaltern position of the more widely acknowledged ethnic minorities or rural migrant workers, I underline the difficulty of speaking and naming the other diversified subaltern groups who have not yet entered the public discussion. The amateur miners in this study, as well as many other disadvantaged people, fall into this epistemic gap for being hard to name or categorize using existing sociological terminology. I, therefore, suggest *shehuren*—

⁶ For example, in both the Ministry of Industry and Information Technology and some provincial and urban governments’ official outline for the 14th five-year plan (2021-2025), including but not limited to Shanghai, Zhejiang, Jiangxi, blockchain and metaverse are all mentioned as the new pillar to advance the local economy. Related policies can be found on, for instance, http://www.gov.cn/zhengce/zhengceku/2021-12/01/content_5655205.htm, <https://app.sheitc.sh.gov.cn/cyfz/691547.htm>, https://www.zj.gov.cn/art/2022/8/3/art_1229630150_4052.html, http://www.jiangxi.gov.cn/art/2022/6/10/art_4968_3989281.html. All retrieved on 25 August 2022.

the outsiders who have only themselves to depend on, using whatever means, in order to survive in the post-socialist Chinese dynamics that unequally marginalize them with interlocking socio-economic, political, and cultural forces—as a stopgap way to call for attention to disadvantaged individuals/groups who are still relatively silent and invisible.

Acknowledging that the intellectuals' attempts to speak on behalf of the unnoticeable subaltern and name them with a fictional identity within their discipline creates "epistemic violence" and risks aggravating the silence of the disadvantaged (Spivak, 1988, p. 283), I still try to listen to, record, and interpret *shehuiren* miners' stories in my research. Nonetheless, instead of generalizing my interpretation of how subalternity has been actualized as a revelation of fact, I only demonstrate the existence of a pattern in which blockchain-related technologies, crypto markets, the regulations of the Chinese government, and the disadvantaged individuals' own desires together contribute to the reconfiguration of a subaltern blockchain scene in contemporary China through the case of *shehuiren* miners. Specifically, I pay attention to how these miners perceive technology, profits, and risks and the impacts they create, no matter how local in scale. Here, I follow Bruno Latour's (2005) definition of agency as "making some difference to a state of affairs" (p. 53). Rather than building on human beings' motivations, subjectivities, and intentionality, Latour's definition directs me to concentrate on the traceable impacts, particularly the dislocations these miners have made during their engagement in blockchain-related activities. If their adoption, innovation, or rejection of the dynamically changing blockchain technologies can create certain outcomes, at which level will these outcomes appear, and how will they in turn affect the miners themselves? Or, in other words, how did the subaltern blockchain scene take shape in China today, with specific forms of marginality and exclusion? The following sections will address these questions.

4 METHODS

I conducted ethnography tracing people, stories, artifacts, and connections across different sites both online and offline. Being an impoverished PhD student with economic struggles similar to those of other subaltern miners, I have attended several WeChat and Telegram chatting groups and several private offline gatherings about cryptocurrency since March 2021. Initially, I anticipated finding and entering a concrete field site, for example, the kind of mining farm usually depicted in news reports, where mining rigs were neatly placed on rows of shelves, or a single platform where amateur miners constantly interact with each other. However, there is no such isolated "field" and thus no "reality" about Chinese subaltern miners out there somewhere, waiting for me to step into it (Rabinow, 1986). Rather than one physical or virtual place existing in the first place, the field of this research is a set of emerging associations, or a network of different actors including but not limited to subaltern miners, their family members or friends,

various second-hand computer components, mining rigs, cryptocurrency-related information (and disinformation), mining pools, trading platforms, and, of course, the blockchain itself. My ethnography here is consistent with the principles of actor-network theory, in that I followed different actors, investigated the traces they left when building and reshaping connections, and recorded my own interpretation as a participant and researcher (Latour, 2005).

Specifically, I focused on five subaltern miners who engaged in mining two crypto coins, Ethereum and Chia, with multiple tools.⁷ Launched in 2013, Ethereum is the second largest cryptocurrency after Bitcoin by market capitalization. With its smart contract functionality, it is characterized by affording a variety of decentralized finance applications and services. Chia is a more recent cryptocurrency, founded in 2017, which features the use of time and hard drive storage as its PoW mechanism instead of GPU computing. With this specific design, Chia is usually described as a greener alternative to Bitcoin or Ethereum because it consumes much less electricity power during mining. The market prices of both these two cryptocurrencies change drastically even within a single day. For this article, I used their prices on 1 September 2021 as a reference (for Ethereum: 1 ETH = 3,529 USD; and for Chia: 1 XCH = 218 USD).

As cryptocurrency trading is now strictly supervised and regulated by Chinese authorities, all the interlocutors' identifiable information was intentionally anonymized to fully protect their identity. With their consent, I obtained data from the following sources. First, by frequently visiting their living areas and talking to them through video chats, I observed how their (our) everyday experiences have been interrupted and transformed by multiple activities related to crypto mining. I followed how they set up their own mining rigs, chose a specific mining pool, cashed out RMB, and generated alternative income from their Ethereum or Chia investment. I paid special attention to how they interacted and discussed crypto mining with friends, family members, and acquaintances. Second, these miners were very generous in sharing how and from where they accessed crypto-related information on multiple social media platforms. Creating my own accounts, I subscribed to exactly the same key opinion leaders, vloggers, group discussions, and channels on WeChat, Discord, Telegram, Bilibili, Weibo, and Douban to keep in step with them. Third, I collected information from news reports, policy documents, the cryptocurrencies' own whitepaper, technological and business analyses, etc. In doing so, I tried to position the subaltern miners' actions and opinions in a broader social context, taking into consideration how they are (un)perceived by others. The initial bulk of my ethnography was conducted from March 2021 to December 2021, while I also conducted occasional follow-up interviews and information collection afterwards.

⁷ More detailed information about the five miners can be found in Appendix 1.

5 SUBALTERN MINERS' INVISIBLE LEARNING AND INNOVATION

Rather than being passive and ignorant, the subaltern *shehuren* are actually more than happy to accept not just new technologies but any new ideas that can make profits, because they have to survive under the post-socialist social structures that often place them in an inferior position. As long as they have reliable information and access to learning materials, and the cost is affordable, they never refuse any chances to solve their economic struggle, even just temporarily. For example, when Brother Gu was obsessed with learning to be a crypto miner, his wife, Sister Wang, took full responsibility for boosting the sales of their noodle restaurant during the post-pandemic downturn. By creating funny and inspirational stories about herself and her sons and sharing them on Douyin's Nearby channel (a location-based service of this mobile app), she tried to enlarge her Douyin fanbase and transform them into potential consumers. Sister Wang felt delighted with the outcome because she did not invest any money but created some new possibilities to profit "all by herself".

While Douyin is designed to encourage all its users to post easily with mobile phones, there are greater technical obstacles to learning to be a crypto miner. Luckily, Brother Gu and Liang all found their own ways of learning. Brother Gu crossed the threshold led by his younger brother, while Liang's interest started by following several Bilibili tech channels, in particular some famous computer hardware bloggers on the platform (e.g., Ancient Computer Builder).⁸ Liang also emphasized that viewing online discussions about how the price of GPU has been affected by the crypto market only raised his interest in crypto mining. But if he had not met "Engineer" during an offline hotpot party, he would never have thought about mining Ethereum himself. "Engineer" was the nickname for Feng, who lived by repairing and recycling used computer components on Xianyu, the largest second-hand e-commerce platform in China backed by Alibaba. His prior knowledge of fixing and testing hardware made it easier for him to construct mining rigs. New miners like Liang consulted "Engineer" either remotely or during their irregular gatherings, while "Engineer" either helped them fix, for example, the GPU temperature problem himself or told them where they could find tutorial videos. "Engineer" always did these things for free, but by doing so he gained respect and trust from the others, so that when they needed computer components, they purchased them directly from Feng's Xianyu shop.

As in Xiang's (2005, p. 14) finding among the Zhejiang rural emigrants working in the clothing business in Beijing, *guanxi* (which can be roughly translated as "networks") played a significant role in building connections within the subaltern crypto miner community. For an individual, the information coming from a

⁸ Ancient Computer Builder (*yuangu shidai zhuangjiyuan*) is among the top hundred video creators on Bilibili, concentrating on teaching his audience how to build one's own computer. All his videos can be found from <https://space.bilibili.com/35359510/>.

networked and reliable source (family members, relatives, or friends of similar age) is worth much more attention than news reports or online discussions, especially when deciding whether to start a business or not. When Chia was about to launch in late April 2021, Little Gu and Liang gathered information from the internet, discussed their plans, and decided to seize the opportunity, buying as many hard drives as they could to mine the new coin. Liang said:

I skimmed through their [Chia's] whitepaper, but I am not sure whether I can digest all this [information] or not. You know the field is full of scams, and there are so many projects. But if Little Gu thinks it's a good choice, I will follow him. He is an ace. I think this is really important, maybe the most important. While thinking about investment, you need to cooperate with a trustworthy person.

However, unlike Zhejiang emigrants' use of the term *guanxi*, particularly regarding the ways in which people can actively mobilize their connections with privileged government officials or the wealth to look for money-making strategies (Xiang, 2005, p. 16), miners are inclined to reinforce or establish new *guanxi* with people who have expertise and knowledge. In other words, authority in the network is developed based on whether one has prior knowledge and, more importantly, whether one is not just a good learner himself or herself but also a potentially good teacher inspiring others to learn or even to innovate.

Subaltern miners are not just quick learners but also creative innovators who are capable of making full use of any resources to which they have access. Being a rural migrant who never finished high school and has no previous knowledge about either finance or internet technologies, Brother Gu quickly adapted himself, learning how to identify the quality of a used GPU, replace a GPU's thermal paste, and connect four or five GPUs to one mainboard in order to assemble a DIY mining rig. At a time when high hashrate GPUs were in short supply, he even created a unique structure where a laptop mainboard was positioned on top of a PC cooler to decrease the GPU temperature from nearly 90 to 54 degrees Celsius, thus greatly enhancing the machine's mining efficiency (Figure 2).⁹

However, the learning and innovation of the subaltern are hardly visible in public discussion. In July 2021, when mining farms were expelled from Xinjiang and Sichuan Province for their excessive use of local electricity, *Caixin*, one of the few Chinese business media outlets still in favor of professional journalism, published a photo showing how a local female worker was recruited to clear out the place.¹⁰ By portraying the dismantling of mining rigs by the poor as similar to harvesting cotton, flowers, or agricultural products, the picture indicated that the subaltern have no ability to understand the significance of the political or technological change but could only work as highly disposable generic laborers. A

⁹ Brother Gu shared the picture with the author through WeChat on May 3, 2021. He was very excited at that time, joking that the innovative structure, despite its strange appearance, should top the world in solving the high temperature problem of laptops while mining.

¹⁰ The photo can be viewed from this URL address: <https://weekly.caixin.com/2021-07-10/101738443.html>, accessed on July 14, 2021.

similar narrative can be found in Wang's (2020) exploration of how technology has transformed the Chinese countryside. When rural farmers devoted themselves to feeding chickens on a blockchain-based farm (where all chicken information was stored on blockchain to secure food safety), they showed no interest in the technology itself.

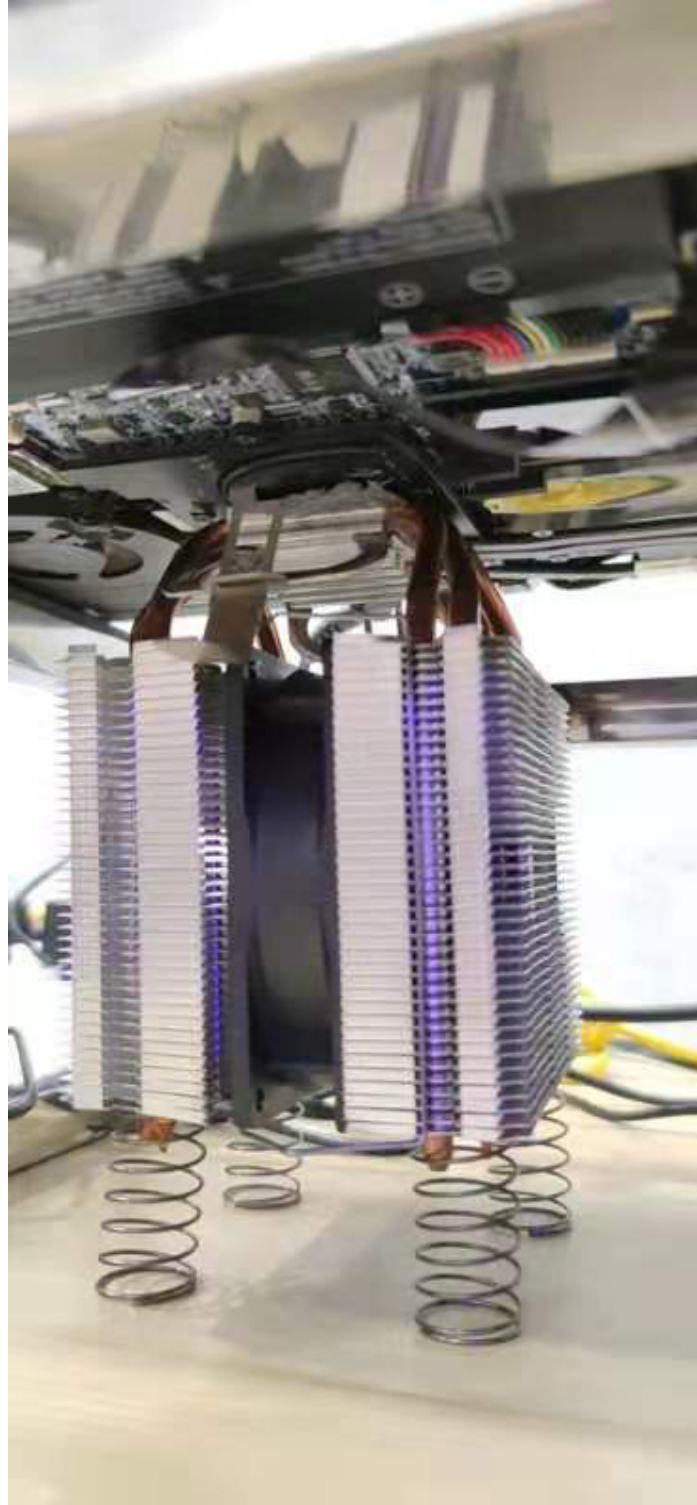


Figure 2. The strange-looking mining rig created by Brother Gu joins a laptop mainboard with a PC cooler to efficiently decrease the GPU temperature.

These portraits of the subaltern are typical in the world of representation across the globe, where they are seldom regarded as knowledgeable or innovative actors in the network and platform society (Castells 2011; de Kloet et al., 2019; van Dijck et al., 2018). On the one hand, Chinese subaltern—rural migrants, in particular—have been severely exploited by global capital as cheap labor, lacking a safe working environment or basic welfare support. On the other hand, the products they produce, re-design, and modify are usually perceived as either low quality or copycats. Moreover, the Chinese population in general is also confronted with the post-colonial debate about whether the Chinese are capable of innovation. Some scholars argue that Chinese people simply cannot innovate because the problematic Confucian philosophy does not allow students to act divergently or question any authority (Lockette, 2012), or because the Chinese Communist Party’s institutional prohibitions constrain local companies from pursuing any type of breakthrough (Abrami et al., 2014). Neglecting the fact that the developed world is also complicit in taking advantage of Chinese subalterns’ labor and creativity, these arguments transform Western society’s superior position in defining innovation into essentialist discrimination against the subalternity of emerging markets.

Numerous recent studies concentrating on *shanzhai* culture, especially *shanzhai* mobile phones, have expanded the concept of innovation to include incremental adaptations to address users’ needs in a localized context (Cai, 2020) and the politics of hybridity (Chubb, 2015). In particular, Han (2017) reminded us that *shanzhai* products, though initially copycats or knockoffs, actually complicate the meaning of originality and fakeness. By exploring the transition of Shenzhen, the special economic zone in South China, from a site of copycat production into a legitimate and threatening rival of Silicon Valley, Lindtner (2020) argued that refashioned imperial power not only persists but also reverberates through technological innovations that claim to promise participation and agency. In short, rather than saying that Chinese subaltern cannot create, their innovations are hardly acknowledged either domestically or globally. The lack of textual or visual representation confined Brother Gu’s creative low-budget mining rig to his own living room. Even if subaltern innovations occasionally enter the public discussion, they are either underrated or inappropriately exploited, in most cases.

From the perspective of political representation, subaltern miners can hardly speak for themselves on the “decentralized” blockchain either. Thus, miners, whether subaltern or not, have little power to impact the technological features of blockchain. Similar to the model of social media platforms, core developing teams (in parallel to commercial platforms, such as Facebook or Google) decide the key features and structures for each transaction, while miners (similar to social media users in this analogy) often have to either accept them all or simply quit. In August 2021, Ethereum activated its London hard fork with a primary change in its mechanism for calculating transaction fees. To smooth the transaction process, part of the ethers generated during transactions would be burnt rather than awarded to

miners.¹¹ That said, miners in general received fewer ethers as a reward for facilitating each transaction, but the developing team expected that the price of ethers would thus become higher and less volatile. Although the upgrade did coincide with a rise in the price of ethers, it is still difficult to estimate whether miners will benefit from such a change in the long term. For whatever the changes in the structure of blockchain, miners have few alternative options besides either accepting or quitting. To alleviate their perennial precarity, amateur miners could only practice the values of *shehuiren*: to rely on constantly equipping themselves with new knowledge and endless learning. Otherwise, they will no longer have the chance to profit from blockchains.

Finally, I have to make it clear that all five miners observed during my ethnographical research were male. This is a direct result of my snowball sampling strategy, while it might also demonstrate a more general tendency for Chinese women to be less likely to participate in cryptocurrency mining, trading, or development. As a female, when I watch tutorial videos, follow social media updates, and participate in offline gatherings, I often encounter sexist comments against women. For example, in Laptop Repair Man's videos, the video creator always strangely stresses the phrase "plug in the charger and open the machine" to amuse his (mostly male) audience by suggesting sexual intercourse, because the phrase is homophonic with "insert" and "penis".¹² On Xianyu, a second-hand GPU described as "used by girls" can be sold at a higher price than the others, because it is commonly assumed that women usually lack knowledge of computers, particularly hardware, and they will never use their personal computers to mine cryptocurrencies. The sexist atmosphere clearly makes the field unfriendly for women. If Little Gu and "Engineer" Feng can build their authority in the subaltern network by demonstrating their learning ability and knowledge, why cannot Sister Wang take a similar role, since all three are excellent learners of new digital technologies? Learning and creating regarding blockchains, the seemingly neutral factors, are, in practice, gender-divided. If, to some extent, a group of subaltern men can make profits by mining cryptocurrencies, "subaltern as female is even more deeply in shadow" (Spivak, 1988, p. 287). The subaltern innovation itself is also intertwined with existing social inequalities in various forms (Irani, 2019).

In sum, blockchain-related technologies first redefine the network structure among *shehuiren* when assembling the blockchain scene in a Chinese local context. Subaltern individuals earn respect and trust from others depending on their ability to gather information, learn new technologies, and innovate, rather than whether or not they can mobilize connections with government officials, the rich, or the

¹¹ Related information can be found from Vitalik Buterin's notes <https://notes.ethereum.org/@vbuterin/eip-1559-faq> or news reports such as <https://www.cnbc.com/2021/08/04/what-to-know-about-the-ethereum-london-hard-fork-eip-1559-upgrade.html>, both accessed on August 15, 2021.

¹² Laptop Repair Man (*bijiben weixiusi*) is another famous tech channel, sharing his computer repairing experiences, on Bilibili <https://space.bilibili.com/382666849/>.

other privileged. Nonetheless, it must be noted that the seemingly neutral ability to learn and create is unequally distributed and gender-biased in practice. Compared to their male counterparts, subaltern women are less likely to be welcomed in the scene or to make a profit from blockchains, which again reinforces the non-existence of shared interests or equal chances that can benefit the subaltern on the whole. Furthermore, in most cases, the learning, creating, and innovating of *shehuiren* miners are only acknowledged among themselves with a very limited scope. The proclaimed “decentralized” blockchain does not change the prevalent disregard for and inappropriate exploitation of the subaltern’s technological efforts, for the discourses around it hardly challenge the public imagination towards the subaltern, nor does blockchain, as a set of technologies, offer alternative power for the subaltern to express themselves. In other words, the subaltern blockchain scene, at this stage, is still far from debunking the silence and invisibility of the subaltern in front of the socio-economically, ethnically, or techno-culturally privileged public audiences.

6 FINANCIALIZING THE SUBALTERN MINERS’ EVERYDAY LIFE

The economic struggle for *shehuiren* as the subaltern is simultaneously influenced by two trends in post-socialist China. First, the income they achieve from precarious work is not enough to make ends meet, even though none of the miners in my study ever consume conspicuously. The collapse of traditional guaranteed welfare, such as pensions, education, and health care, adds further costs for individuals to secure a living (Hacker, 2019). At the same time, if recruited for a temporary job, Chinese subaltern are subjected to inhumane working conditions. In the tech industry, for example, the famous online protest “996, ICU” in 2019 opposed the notorious work schedule prevalent in tech enterprises. The ironic name of the movement indicates that an employee usually works from 9 am to 9 pm, six days a week, and he or she will consequently be burnt out, risking their health and perhaps needing to be treated in an Intensive Care Unit (ICU) someday.¹³ Whereas tech professionals already enjoy a relatively prestigious position compared to the subaltern population, labor conditions for *shehuiren* are even worse. According to Pun’s (2005) observation, long-term intensive labor and stress left almost every young female rural migrant worker with chronic pain such as headaches, backaches, and menstrual pain. Long working hours also make them vulnerable to occupational injuries because they can hardly concentrate when operating machines. The situation has not improved since digital platforms offer new working opportunities. For example, subaltern *shehuiren* frequently choose Didi drivers (Chen & Qiu, 2019) and food delivery couriers (Sun, 2019) as their job options. Lacking any state

¹³ The online protest attracted much media attention. This is just one example of related news reports <https://radiichina.com/g,ithub-protest-chinese-tech-996/>, accessed on 8 August 2021.

or institutional support, they not only suffer from long working hours and high risks of being injured; platform datafication and algorithms exercise additional power in disciplining their labor.

Individuals are therefore expected to handle risks and make arrangements by themselves against unemployment, illness, and even macro financial crises due to this wide expansion of neoliberalism and a deteriorating work environment (Pellandini-Simányi, 2020). Utilizing various financial products became a necessary strategy to address an individual's economic struggles, particularly for the subaltern *shehuren*. For example, during the state-led market transition and urbanization starting in the 1990s, both laid-off workers and peasants whose land had been expropriated could receive a certain amount of money as compensation, mostly ranging from 10,000 to 100,000 RMB. Despite debate as to whether the amount was reasonable or not, the money did serve as an essential starting point for a new calculative, responsible, and self-governing life. According to Maso (2015), the Chinese stock market could hardly prosper without the active participation of the scattered amateur investors, made up of the unemployed and early retired, who enthusiastically invested in response to their loss of secure labor, even though the chances of success were always dim.

By simplifying the procedure and facilitating it on mobile phone applications, digital platforms such as Alipay became one of the world's top money market funds (MMF), managing 712 million Chinese users' 780.8 billion yuan of assets by the end of June 2021.¹⁴ The easy access and everyday use of these digital tools not only enable ordinary people to actively engage with various financial products but also present it as a rational and promising activity to balance multiple risks. Financialization thus infiltrated the subalterns' everyday lives as a hegemonic mechanism because when managing their assets and risks individually, the subaltern reinforces the value of *shehuren* by embracing a calculative and self-governing subjectivity and reclaiming autonomy, empowerment, and security (Langley, 2020). Nonetheless, with such governance through freedom, people not only buy into neoliberal logic, considering successful investment or management of money as essential for a meaningful individual life, but also neglect other alternatives and risks, exposing themselves to various latent socio-economic costs (Pellandini-Simányi, 2020).

For the *shehuren* miners, crypto mining is not an alternative but is consistent with the existing financialization of people's everyday lives utilizing blockchain. To proliferate, mining functions similarly to the purchasing of MMF or stock. However, it particularly attracts the subaltern by generating lucrative returns with relatively low economic costs. Four of the miners in this study put in 10,000 to 60,000 RMB as the initial investment to set up their own mining machines (except Little Gu, who is very good at saving money in his daily life and invested 120,000

¹⁴ Data can be found in the following news report <https://finance.caixin.com/2021-09-01/101767277.html>, accessed on 3 September 2021.

RMB). By putting in 30,000 RMB, Liang provided 300Mh/s computing power to the mining pool he participated in, which meant he could receive about 0.25 ether in return per month. After deducting the maintenance costs, basically the electricity bills and transfer fees, he could still receive 4,000 RMB every month as a supplementary income. Even if unexpected macro changes happen - if, for example the Ethereum price collapses below the electricity bill, or the Chinese authorities ban individual crypto mining - Liang is seldom anxious because he can “just shut down the machines and it will cost nothing”. And he believed that by selling all the second-hand GPUs, he could also partially recover the initial cost. “Regarding the money I have already earned, the worst situation is that I can no longer profit through it, but I won’t lose my principal.”

Crypto mining’s second attraction, especially compared to other potential working opportunities, is freedom and acceptable labor input. Brother Gu regards it as a much better choice compared to working as a courier, a common option for the subaltern to survive during and after the pandemic, or whenever they lost their original precarious job.

After I set up a mining machine, I don’t need to look after it all day. Maybe I check whether it is too hot or whether the software works well, but it is not a lot of work. Imagine if I delivered food for Meituan, I would be running outdoors all day, like ten hours or twelve hours, leaving Sister Wang alone to take care of the restaurant and the boys. But now I can earn about 5,000 or 6,000 *yuan* per month through mining, and I can continue to make noodles at our restaurant.

The ways in which the lucrative potential and flexible conditions attract *shehui*ren to step into crypto mining is similar to the condition of other social groups who experience exclusion; for example, some Japanese women intentionally choose to participate in the sex industry to escape the broader societal constraints (Koch, 2020). Nonetheless, what is significant about the case of subaltern miners is that these financial practices thus deeply infiltrate their everyday lives, reshaping their ways of living. Whereas existing studies mainly understand the financialization of everyday lives from the subjective perspective, which means it functions through a calculative and self-governing subject (Pellandini-Simányi, 2020), I note that regardless of whether they have a conscious subjectivity or not, subaltern miners are profoundly impacted by the financial practices of mining cryptocurrencies at the material level. In other words, the system of mining, with both its hardware and software as non-human actors, does not just facilitate but also profoundly affects the subaltern miners’ actions and emotions.

Unlike mining farms, usually set up either in warehouses or refurbished abandoned factories, individual *shehui*ren miners could only place their DIY mining rigs next to their beds, around their desks, or in any available place in their personal everyday living environment (Figures 3 and 4). Therefore, the constant heat and noise produced while the GPU computes cannot be ignored. One of the minor motivations Little Gu used to persuade himself to start building his first

mining rig was that his room was freezing cold during the spring festival, and he thought that even if mining would not turn lucrative, at least he could use it as a heater. But the situation became unbearable in the summer. Heat dissipated from the running GPUs made every miner's home like an oven, so that they either chose to buy an air conditioner or had to change their room layout frequently, switching the positions of their mining rigs to find the place with the best ventilation. The problem for Brother Gu was even tougher, because he had to maintain multiple mining rigs while his two preschool kids played in the same cramped room. He therefore transferred some of his mining rigs to his parents' place in the countryside, but the 50-kilometer distance added time and energy costs when he needed to maintain these facilities.



Figure 3. Liang's Ethereum mining rigs are positioned beside his bedroom window to have better ventilation.¹⁵

¹⁵ Liang shared the picture with the author through WeChat on 8 July 2021.



Figure 4. Little Gu's Chia mining rigs are positioned just behind his PC on a desk, which he shares with his roommate.¹⁶

Compared to the heat in summer, the noise seemed much more tolerable, because the longer they mined, the more they got used to the whirring GPU fans. More importantly, without any additional noise, the whirring indicated that all the mining rigs were operating smoothly, and thus crypto coins were constantly awarded when new blocks were added to the chain. Rather than enduring the noise, they enjoyed it as a symbol of hope, because, whenever needed, the whirring can be exchanged for fiat currency to address their economic struggles.

As they consumed so much electricity, mining rigs also greatly changed miners' everyday habits for the use of electric home appliances. For example, Zhao

¹⁶ Little Gu shared the picture with the author through WeChat on 15 August 2021.

lived in a rented apartment with 30 amps as the maximum circuit limit. The rating is sufficient for ordinary use, but with mining rigs running in the home, Zhao had to calculate carefully when to use high-power electrical equipment to avoid circuit breaks. In the morning, he only used his microwave oven to heat up food after boiling water with an electric kettle. The circuit break itself did not matter, but every time his mining rigs restarted, especially after a forced shutdown, they encountered malfunctions in connecting different components, entering the system, or starting the mining software. After experiencing several breaks, which meant he had to reassemble the mining rigs from time to time, he became so stressed that he forced himself to give up drinking boiled water, even though tap water in China is generally not potable. To avoid the stressful situation, others tried to upgrade their household circuit breaker to 40 amps or even 60 amps. However, such action brought greater risks, including damage to the equipment, body injuries or even fire. Again, if these accidents happen, it is the subalterns' own responsibility to bear all consequences.

More subtly, crypto mining reframed the miners' affective perceptions of time and value and the rhythms of their emotions. As a long-time video game player, the initial reason Little Gu tried to learn about computer hardware was to gain better game-playing experiences. Nonetheless, after starting to mine crypto, he gradually felt guilt rather than pleasure while playing. As all his equipment was assigned to mining crypto all day, stopping one of the machines to play games became a luxury.

My game computer shares the same motherboard with one mining rig. So playing games just makes mining inefficient... I used to play every day after work, but now I only allow myself to play once a week, just three hours on Saturday afternoons. Even for these three hours, I give up earning tens of RMB. Doesn't it mean I'm actually paying a ticket to play video games? Each time I come up with this idea, I tell myself, go find something else for fun and leave the mining machines alone! They are making money for you!

As mining rigs continuously work 24/7, the trading of cryptocurrency also never ends. Unlike the stock market, where prices only change within trading hours, miners' emotions can be interrupted at any time by volatile prices, technological changes (such as Ethereum's London hard fork), new ICO projects, and unstable policies. Every day, they were inundated in a sea of information (and disinformation), which took their time and energy to digest, categorize, and evaluate to anticipate future dynamics and manage their assets at the same time as managing their emotions. The time and energy they spent on cryptocurrency was much more than simply maintaining the mining rigs as equipment. They could not ignore all the updates, or miners would be continuously affected by the overwhelmingly numerous changes in the crypto market. Therefore, none of the subaltern miners could resist the temptation to check and even collect more information about cryptocurrency, because of the existence of money-making chances, no matter how small the probability of succeeding in the novel digital

profiteerings. Either for those who hope to earn a sustainable income to better support their families or for those who expect sudden wealth, blockchain tempts them with promising opportunities and thus interpellates them as neoliberal, particularly financialized, subjects.

In short, although it facilitated a novel set of blockchain technologies, crypto mining and trading is similar to, for example, investing in the stock market and buying MMF, or the prevalent trend of financialization which already infiltrates the everyday life of ordinary people and reshapes our neoliberal subjectivities. Compared to other strategies, crypto mining is feasible and attractive to the subaltern *shehuren* due to its relatively low economic cost, acceptable labor input and promising returns. On the other hand, the materiality of blockchain-based financialization particularly generates different levels of consequences in the local scenscape. First, individual miners' perceptions of domestic space, time, labor, and value are deeply reshaped due to the existence of mining rigs and the dynamics of the global crypto market in their everyday lives. Second, blockchain-related technologies largely expand the boundary of the scene as an urban-centric concept. In other words, the blockchain scene constructed by and around Chinese *shehuren* miners is an amalgam of a virtual landscape across global time zones based on blockchain networks and scattered domestic environments located not just in low-cost living areas in cities but also urban fringes and rural areas. Therefore, the subaltern blockchain scene restructures the assembling of a scene by incorporating previously inconsequential or peripheral actors/elements.

7 PURSUING DIFFERENTIAL “CHINESE DREAM(S)” ON BLOCKCHAIN AMID PRECARITIES

The subaltern is not a united group with a clear collective consciousness. Even among the five miners of this study who all wish to make a living, their concrete aims and strategies for engaging in cryptocurrency significantly diverge from each other. I argue that they developed as different types of financialized subjects while investing in cryptocurrencies. Such a process has been deeply embedded in a highly precarious circumstance simultaneously determined by the volatile global crypto market and the Chinese governments' ambiguous and campaign-style policies regarding crypto mining/trading and blockchain. In other words, whether the *shehuren* miners can succeed in making ends meet first depends on how well they can react to the changes in the mechanism of blockchain technologies, prevent themselves from being caught by all kinds of crypto-related frauds or scams, convert their mined Ethereum or Chia to other fiat or crypto currencies at proper prices, and use various strategies to safeguard their financial gains. For example, the transition of Ethereum from PoW to PoS made all the *shehuren* miners in this study no longer useful to this blockchain network, as mining power was determined by the coins one could stake rather than the computational power one could contribute. They could do nothing but shut down their Ethereum mining rigs and

sell off their GPUs and other components. Moreover, the crash of the Luna crypto network in the summer of 2022 significantly affected the price of TerraUSD, a self-proclaimed algorithmic stable coin, and nullified the crypto assets of those who were holding TerraUSD as the crypto equivalents of USD. Towards the end of the same year, FTX, the second largest centralized exchange in the crypto market, collapsed due to its fraudulent crypto scheme and liquidity crisis. Users of the platform either could not withdraw their deposits or these were directly stolen after the bankruptcy of FTX. These unpredictable dynamics of the crypto market turned out to be a heavy blow for Little Gu and Liang, causing them to lose not just tens of thousands of RMB, but also their confidence about whether they could still pursue profits by mining and trading on blockchains.

Second, the precarity of the global crypto market is further exaggerated for Chinese miners in particular. However, rather than simply assuming that the Chinese authorities strictly forbade all blockchain-related activities from 2021 onwards, as the media often describe, I list some key governmental documents in Table 1, indicating the nuances and complexity of Chinese blockchain-related regulations. These public accounts first indicate that different governmental departments, particularly those of the finance sector, have already paid attention to managing and disciplining specific cryptocurrency (Bitcoin) or crypto activity (token financing) since 2013. The scope of regulations targeting crypto mining only significantly escalated in 2021, when not only the finance sector but also the State Council in general, the Ministry of Public Securities, the State Administration of Taxation, the National Energy Administration, and provincial governments also became crucial governing institutions. Crypto mining in particular has thus been officially identified as an illegal activity due to its potential use in criminal activities, high consumption of electricity, and negative impact on financial stability. Paradoxically, blockchain in general is actively supported by both national and regional governments, being widely regarded as the next pillar of the Chinese digital economy. The conflicting attitudes implied in these regulations thus gave much grey space to the unauthorized use of blockchains. Moreover, apart from the Inner Mongolian policy, which publicly claimed to penalize individual miners, these policies primarily concentrated on institutional entities—mining farms, trading platforms, exchanges, etc.—rather than individual miners. In practice, individual miners could easily anonymize themselves by using VPNs. Even though internet connections through VPNs might not always be stable, at the time this article was written, these *shehuiren* miners could still temporarily escape the nationwide internet surveillance with some technical tactics.

Table 1. Examples of Chinese policies regarding crypto mining/trading and blockchain (see Appendix 2 for the abbreviations of governing institutions)¹⁷

| Scope | Institution(s) | Document | Attitude | Date Published | Retrieved |
|------------|--|--|---|----------------|------------|
| National | PBC, MIIT, CBRC, CSRC, CBIRC | Notice about safeguarding against risks of Bitcoin | Institutional Restriction | 12/5/2013 | 11/17/2022 |
| National | PBC, CAC, MIIT, SAIC, CBRC, CSRC, CBIRC | Notice about safeguarding against risks of token financing | Restriction | 9/4/2017 | 11/17/2022 |
| National | PBC, CAC, SPC, SPP, MIIT, MPS, SAMR, CSRC, CBIRC, SAFE | Notice about safeguarding against risks of crypto trading | Institutional Restriction | 9/15/2021 | 9/10/2021 |
| National | NDRC, CPD, CAC, MIIT, MPS, MOF, PBC, STA, SAMR, CBIRC, NEA | Notice about remediating crypto mining | Institutional Restriction | 9/3/2021 | 11/17/2022 |
| Provincial | NDRC of Inner Mongolia | Eight measures to penalize crypto mining | Strict Restriction | 5/25/2021 | 9/10/2021 |
| Provincial | MIIT of Qinghai | Notice about rectifying crypto mining | Institutional Restriction | 6/9/2021 | 11/17/2022 |
| Provincial | NEA of Yunnan | Notice about managing the electricity consumption of Bitcoin mining | Institutional Restriction | 6/12/2021 | 11/17/2022 |
| Provincial | NDRC of Sichuan | Notice about cleaning up all crypto mining projects and ladder electricity price | Institutional Restriction | 4/15/2021 | 11/17/2022 |
| Provincial | Anhui | Cleaning up all crypto mining projects | Institutional Restriction | 7/14/2021 | 11/17/2022 |
| National | MIIT | Official plan for developing software and information industry (2021-2025) | Support blockchain | 11/15/2021 | 11/17/2022 |
| Provincial | Yunnan | Three-year plan for developing digital economy | Support blockchain and restrict crypto mining | 4/27/2022 | 11/17/2022 |

Nonetheless, I do not mean that Chinese authorities had little or less impact on shehui ren miners compared to the volatile global crypto market. I will demonstrate in this section that the subaltern individuals’ various yearnings and frustrations coexist in tension with the hegemonic Chinese mainstream political narrative of the “Chinese dream” when post-socialist institutional structures always treat them unfairly as losers, outsiders, or potential wrongdoers. Ever since the start of his presidency in 2012, Xi Jinping has proposed the term as the guiding vision of the new leadership. Specifically, the “Chinese dream” connotes three layers: the economic prosperity and strength of the country, the rejuvenation of the nation, and the happiness of the people.¹⁸ Existing studies have focused on the concept’s

¹⁷ http://www.gov.cn/gzdt/2013-12/05/content_2542751.htm
http://www.gov.cn/xinwen/2017-09/04/content_5222657.htm
http://www.gov.cn/zhengce/zhengceku/2021-10/08/content_5641404.htm
https://www.ndrc.gov.cn/xxgk/zcfb/tz/202109/t20210924_1297474_ext.html
http://fgw.nmg.gov.cn/xxgk/zxzx/tzgg/202105/t20210526_1596731.html
<https://finance.sina.com.cn/tech/2021-06-09/doc-ikqcfnc0121533.shtml>
<https://www.163.com/tech/article/GC9N1CLK00097U7R.html>
<http://fgw.sc.gov.cn/sfgw/tzgg/2022/4/15/4d392a1bf7914e49afaeae2cce181dfa.shtml>
<https://finance.sina.com.cn/china/dfjj/2021-07-14/doc-ikqciyzk5429321.shtml>
http://www.gov.cn/zhengce/zhengceku/2021-12/01/content_5655205.htm
http://www.yn.gov.cn/zwgk/zcwj/yzf/202205/t20220510_241902.html

¹⁸ Xi Jinping articulated the “Chinese Dream” as a concept in his speech after being officially elected as the President of People’s Republic of China by the National People’ Congress in March 2013.

political implications at the macro level, such as its role in enhancing the Party's domestic legitimacy and the changes in the Chinese position in the international context (Mahoney, 2014; Wang, 2014). Others interpret the Core Socialist Values, proclaimed by the authorities, as detailed features for realizing the “Chinese dream” (Feng, 2015). Responding to the Chinese dream, the Core Socialist Values depict an idealized citizen as an individual with patriotism, dedication, integrity, and friendship who lives in a society with a bright vision. However, living in the shadow of these positive ideological discourses, *shehui* miners were profoundly impacted by both the direct restrictions on crypto mining and the precarious nature of the crypto market in reshaping their subaltern subjectivities.

I roughly divide the subaltern miners' dreams into four types: financialized, entrepreneurial, downshifting, and speculative. Brother Gu's family belongs to the first type, which regards crypto mining as an additional source of income consistent with utilizing other financial products. By whatever means, Brother Gu and Sister Wang need a stable cash flow to support their family. In the increasingly precarious society, this simple aspiration becomes harder to achieve because as *shehui*, they can only depend on themselves to address all types of economic difficulties and carefully manage any potential risks. Nonetheless, risks beyond their control always exist. For example, Brother Gu regularly converted the Ether and Chia he mined into RMB, not because he lacked confidence in their long-term return, but simply because he needed cash to pay bills. In doing so, he was not only deprived of trading at a better price, but he also exposed himself to the legal grey area and the risk of financial loss. Even though Brother Gu can still rely on centralized exchanges registered outside China, such as Binance, nobody knows how long the government's current neglect on individual miners will last. Moreover, he lives in constant anxiety, imagining his bank account might be frozen or his GPUs could be expropriated someday, not just because of the ambiguous narratives in the state's blockchain-related regulations, but also as a result of wide-spread rumors among the online communities of *shehui* miners.

Zhao and Little Gu represent the second and third types, who both hope to “lie flat” on the blockchain and perceive it as a long-term alternative path to achieving financial independence and exploring a more meaningful life. Lying flat is a defeatist lifestyle that gradually evolves into a non-cooperation movement among the Chinese younger generation, who refuse to surrender to the oppressive work culture where the rat race only yields vague chances for upper mobility.¹⁹ Blockchain offers some *shehui*, who are excluded from the formal labor market, an additional way to pursue profits and imagine success amid socio-political precarities. Zhao explained that as a graduate student majoring in mechanical

His full speech can be read at http://www.gov.cn/ldhd/2013-03/17/content_2356344.htm, accessed on 6 September 2021.

¹⁹ The “lying flat” lifestyle also attracted media attention, for example the BBC discussed the issues on <https://www.bbc.com/news/world-asia-china-57328508>, accessed on 3 September 2021.

engineering, he used to think it worthwhile to pursue a career in his field, but after devoting himself to cryptocurrency, he totally changed his mind:

No matter how hard I work for a boss, I always make more money for them than for myself. Even if someone pays me 100,000 yuan or 200,000 yuan a year, I need to make much more money for him (or her) in return. And I have to sacrifice my own health for them. What's the point? I would rather use that time and energy to develop myself.

The aspiration to self-development is another feature of the neoliberal entrepreneurial subject that emphasizes the individual taking full control and responsibility for themselves. Though “lying flat” seems to contradict the dominant ideology, as the state authorities, for example, President Xi, emphasized in his New Year’s speech of 2018 that happiness can only be achieved through great endeavors,²⁰ it at the same time connotes an entrepreneurial subject that coheres with the national policies to boost mass entrepreneurship and innovation, encouraging individuals to find and create opportunities by themselves and for themselves as a new engine for China’s economic growth.²¹

More radical than Zhao, Little Gu articulates his reflections on consumerism and anticipates utilizing cryptocurrency to achieve a kind of personal freedom.

I don’t think buying a lot of commodities is a meaningful way of living. Consumption only produces trouble. I still need to make money, but just to have more free choices for my own future.... You know, I saved plenty of money even when I worked part-time as a student. Without those savings, I would not have been able to invest in cryptocurrency... Since my current income [in cryptocurrency] can already cover my daily necessities, I am thinking of moving to some very low-cost areas, like the Rust-Belt regions in Northeast China... It’s meaningless for me to be cramped in big cities.

Little Gu’s lying down may be even flatter than Zhao’s. He interprets freedom not just as independence from the labor market but also from consumerism and materialism by emphasizing frugality (Taylor & Davies, 2021). Such a pursuit of personal freedom is undoubtedly in contrast to the national endeavor to construct a prosperous consumer society, though nominally frugality is still a commonly praised virtue. However, it also needs to be noted that such freedom is achieved through investment and the full use of various financial instruments (Taylor & Davies, 2021). We can hardly imagine how in practice an individual can live as a recluse in contemporary consumer society.

Liang and Feng represent the last category, of those who hope that cryptocurrency can be a shortcut to becoming super-rich one day. For example, during the early phase of Chia mining, Liang and Feng refused to use a mining

²⁰ President Xi’s speech can be found from http://www.xinhuanet.com/2017-12/31/c_1122192418.htm, retrieved on August 30, 2021.

²¹ National policy about Mass Entrepreneur and Innovation can be found from http://english.www.gov.cn/premier/news/2016/03/03/content_281475300571752.htm, retrieved on May 27, 2021.

pool, expecting to earn several full coins by themselves, especially when the initial trading price once peaked at nearly 2,000 USD. Pooled mining produces a constant revenue of smaller value, whereas sole mining is more like winning a lottery: the block reward tends to be more erratic, but once a miner successfully adds a block, he or she receives the full set of the block reward. Moreover, to maximize the reward, Liang also put all his gain from previous Ethereum mining into Chia, as he believed the latter's mechanism would become popular among crypto investors. Nonetheless, the price of Chia has decreased ever since its first trading, and we cannot predict when Liang will recover his all-in investment. The last speculative subjects internalized the neoliberal logic that the subaltern position is a consequence of personal bad choices. Therefore, what they anticipate is for some luck to escalate in the hierarchy so they can then enjoy some prestige, which they can hardly access as a subaltern *shehuiren*. Nonetheless, these high-risk investing strategies are also inconsistent with the state's expectations for social and financial stability.

By describing the role of subaltern miners' own dreams in reconfiguring the blockchain scene in contemporary China, I try to step away from two common interpretations of digital technologies among Chinese internet users: one of an empowering digital technology that returns power to users and citizens, in particular affording them resistance to an authoritarian party-state; and the other of how powerful social sectors such as the government oppress, or commercial institutions and neoliberal market contaminate or co-opt a once authentic grassroots culture. Both narratives romanticize the democratic intervention of digital technologies and grassroots resistance (Lindtner, 2020). Just as Spivak (1988, p. 296) proposed, the metaphor "white men are saving brown women from brown men" is itself problematic because neither the imperialist subjects nor the local nativists actually listened to or even cared about the subaltern Indian women's voice. To adapt Spivak's analogy, I argue that it is biased and tricky to presume to ask whether the blockchain can save the subaltern from either the oppressive authoritarian state or the engulfing global neoliberalism. First, the two powerful social structures do not necessarily conflict with each other but coexist in a dynamic tension. At the same time, they are both able to exercise greater influence with technological elites to shape and reshape the features of a specific blockchain and thus affect the actions and aspirations of the subaltern. On the other hand, I also do not mean that the subaltern are only victims of the broader social structures who have no choice but to accept a structural position. Nor are they resistant subjects with clear consciousness about an imaginary foe. If the subaltern can, to some extent, benefit from their engagement with blockchains, harvesting some profits through their unacknowledged creativity, they adeptly make use of various resources within their reach, weave their differential aspirations, and become actors by attaching themselves to the larger blockchain scene that is simultaneously reshaped by various types of societal precarities (Latour, 2005, p. 217). During the process, they confront frustrations, powerlessness, and difficulties in a post-socialist society that never stops structurally positioning them as the subaltern through policies,

institutional structures, hegemonic political discourses, nation-wide surveillance, unneutral technological designs, and global economic dynamics. In other words, though also influenced by the yearnings and actions of *shehuiren* miners, the subaltern blockchain scene is not yet or may never develop into a completely alternative grassroot-oriented scenscape, but again is always deeply intertwined with various existing forms of inequalities.

8 CONCLUSION

Over a year of ethnographic research, this study traces and records the actions, aspirations, and frustrations of a group of amateur cryptocurrency miners who inevitably fall into an unnamable subaltern position in contemporary China, due to their impoverished, precarious, and ambiguously illicit conditions. Specifically, I use *shehuiren*, a phrase I appropriate from the subaltern's everyday language, as a stopgap terminology to describe the heterogenous disadvantaged groups and their unacknowledged subordinate position in post-socialist China today. Because of being marginalized in existing social structures, *shehuiren* are more likely to adopt and make use of new technologies to overcome their financial struggles, even just temporarily. Engaging with blockchains and mining and trading cryptos has thus been not only a novel form of digital profiteering for them to make ends meet but also a way to negotiate with the larger social structures that constantly exclude them as the losers, outsiders, and potential wrongdoers.

Shehuiren miners first played a key role in reconfiguring the subaltern blockchain scene in local context, incorporating previously inconsequential peripheral elements, including but not limited to their unnoticed and underrated knowledge and creativity, their domestic living environments and everyday habits, and their yearning and desires to the dynamically changing assemblage around blockchains. The subaltern blockchain scene also significantly redefined the network structure and social relationship among *shehuiren*, in return. Specifically, subaltern individuals earned respect and trust from others depending on their ability to gather information, learn new technologies, and innovate, rather than whether or not they can mobilize connections with government officials, the rich, or the other privileged. Moreover, with multiple non-human actors, such as mining rigs and the volatile global crypto market, the subaltern blockchain scene transformed these participants' perceptions of domestic space, time, labor, value, and future.

Nonetheless, the subaltern blockchain scene never existed in a power vacuum, but was constantly intertwined with various forms of existing inequalities. In particular, my ethnography shows that, first, the seemingly neutral ability to learn and create is unequally distributed and gender-biased in practice. Compared to their male counterparts, subaltern women are less likely to be welcomed in the scene or to make a profit from blockchains, which again reinforces the non-existence of shared interests or equal chances that can benefit the subaltern on the whole. Second, the proclaimed "decentralized" blockchain does not change the prevalent

disregard for and inappropriate exploitation of the subaltern’s technological efforts, for the potential that subaltern can be knowledgeable and innovative does not cohere with the public imagination about the subaltern both in China domestically and abroad. Third, to manage risks and handle various forms of precarities simultaneously generated by the global crypto market and Chinese state authorities, *shehuren* miners again have to embrace a calculative and self-governing logic in order to survive in the increasingly unequal world. By carefully weaving their financialized, entrepreneurial, downshifting, and speculative aspirations into the hegemonic narrative of “Chinese dream”, I underline the non-existence of a united subaltern with a clear consciousness opposing either the oppressive authoritarian state or the global neoliberal order. Neither are they simply placeholders of the larger social structure. Instead, they are always actors, in Latour’s sense, who left traces in reconfiguring the subaltern blockchain scene by adeptly making use of various resources within their reach, harvesting limited profits through their unacknowledged creativity, and attaching their differential aspirations to the larger amalgam of technologies, neoliberalism, and state authorities.

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APPENDIX

1. THE AMATEUR MINERS INTERVIEWED IN THIS STUDY

| No. | Code name | Day job | Born in | Estimated initial investment |
|-----|-----------------|------------------|---------|------------------------------|
| 1 | Little Gu | Contract worker | 1993 | 120,000 RMB |
| 2 | Brother Gu | Restaurant owner | 1989 | 20,000 RMB |
| 3 | Liang | Contract worker | 1995 | 30,000 RMB |
| 4 | Zhao | Student | 1996 | 15,000 RMB |
| 5 | “Engineer” Feng | E-shop owner | 1990 | 60,000 RMB |

2. LIST OF INSTITUTIONAL ABBREVIATIONS

| | |
|-------|---|
| PBC | People’s Bank of China |
| MIIT | Ministry of Industry and Information Technology |
| CBRC | China Banking Regulatory Commission |
| CSRC | China Securities Regulatory Commission |
| CBIRC | China Banking and Insurance Regulatory Commission |
| CAC | Cyberspace Administration of China |
| SAIC | State Administration for Industry and Commerce |
| SPC | Supreme People’s Court |
| SPP | Supreme People’s Procuratorate |
| MPS | Ministry of Public Security |
| SAMR | State Administration for Market Regulation |
| SAFE | State Administration of Foreign Exchange |
| NDRC | National Development and Reform Commission |
| CPD | Central Propaganda Department |
| MOF | Ministry of Finance |
| STA | State Administration of Taxation |
| NEA | National Energy Administration |