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Article

The Ethics of Fractional-Reserve Banking System: A Private Property Rights Approach

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Abstract: It is generally stated that the fractional-reserve banking system (FRBS) is consistent with sustainable economic growth and development. While it assumes that depositors will not be a joint demand who will claim all their money simultaneously, it supposes that a monetary aggregate greater than the monetary base will not harm economic performance. However, the FRBS's call to central banks casts doubt on the sustainability argument and its ethical support. This article explores the FRBS from the ethics of private property, proving a radically different course to promote sustainable economic growth and development. After reviewing and discussing the ethics of private property for the FRBS and its call for central banks, the case of fiat inflation and business cycles clarifies the narrow relationship between ethics and sustainability. These findings are applied to some modern ethical dilemmas around the FRBS, proving novel avenues for policy reform and research opportunities.

Keywords: private property; fractional-reserve banking; 100 percent reserve requirements; business cycle; banking ethics



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1. Introduction

The fractional reserve banking system (FRBS) is one of the most significant phenomena in banking history and predominates worldwide (Van den Hauwe 2016; Newman 2020; Huerta de Soto 2020). It allows banks to lend part of their clients' deposits to finance investment activities, holding a small "fraction" of the original deposits as a "reserve" to meet redemption demands. The FRBS aims to increase loanable funds above the natural monetary base to earn additional profits. The reasoning behind the emergence of the FRBS is as follows: money is a fungible good (i.e., those goods considered equivalent), and the bank must return the tantumdem (i.e., the money of the same quantity and quality). As bank deposits increase, governments and bankers perceive that people are not simultaneously requesting deposits. The business consists of lending parts of the deposits and making them profitable, fulfilling their obligation to return the deposits to the extent their owners request (Van den Hauwe 2006). The monetary economics literature generally suggests that the FRBS is consistent with sustainable economic growth and development (Selgin and White 1994; Yeager 2010; Selgin 2020; Aghion et al. 2021). While it assumes that depositors will not be a joint demand who will claim all their money simultaneously, it supposes that a monetary aggregate greater than the monetary base will not harm economic performance.

However, the FRBS's call for central banks as lenders of last resort to ensure monetary stability and the efficiency of the financial system casts doubt on the sustainability argument and its ethical support. How ethical and sustainable is the FRBS? Interestingly, there is little literature on the ethics of the FRBS, its call for central banks, and its relationship with sustainable economic growth and development. This article explores the main economic, legal, and ethical factors behind the FRBS from the ethics of private property, i.e., the principle that every individual has a natural right to own and dispose of his being and

private property. It considers ethics as a set of non-coercive moral norms that govern the individual's conduct in any sphere of life, such as legal equality in a free society based on contractual ties (Hülsmann 2008). As the economic theory states, sustainable development is the widening range of entrepreneurial alternatives open to people, and sustainable growth is a phase of sustainable development based on genuine savings to finance increasingly capital-intensive production structures (Espinosa 2023a). It is argued that ethics and sustainability are two sides of the same coin. The FRBS is built on hegemonic ties, which conflict with the ethics of private property and sustainable economic growth and development.

The article is organized as follows. Section 2 overviews recent studies on fractional reserve and banking system ethics. After Section 3 presents the ethical framework of private property and its relationship to sustainability, Section 4 discusses the main economic, legal, and ethical factors behind the FRBS. Section 5 discusses some modern ethical dilemmas around the FRBS, such as “full” deposit availability, maturity mismatching, and hybrid contracts, outlining the pathways for policy analysis and political reform consistent with the ethics of private property. Section 6 concludes.

2. Literature Review

Under a fractional-reserve banking system (FRBS), banks are not required to hold 100% of their clients' deposits in their reserves. Central banks define the reserve requirement, i.e., the reserve percentage that banks must hold of deposits to meet repayment demands. Suppose that client A deposits ten monetary units in a bank account. If the reserve ratio is 10%, banks can lend up to 90% of their clients' deposits. If this is the case, the bank lends up to nine monetary units of client A's deposit to client B. How does the FRBS impact economic performance? Two opposing approaches to the FRBS dominate in the monetary economics literature.

On the one hand, Keynesian and monetarist macroeconomics argue that the FRBS is economically sustainable (Friedman and Schwartz 1986; Bibow 2002; Lavoie and Seccareccia 2004). The cash ratio ensures a high probability of depositors receiving their cash on demand even when their deposit is not complete and safe, generating a credit expansion process (well-known as bank multiplier) and increasing consumption levels (Sawyer 2006). As consumption is crucial in calculating the gross domestic product (GDP), credit expansion would promote sustainable economic performance. Paradoxically, Keynesian and monetarist followers allude to the need for a rational and coercively institutionalized monetary policy through central banks. The lender of last resort must regulate the quantity of money in circulation and credit in the economy, smoothing fiat inflation and business cycles to promote sustained economic growth and development (Dosi et al. 2010; Dalziel 2002).

How to explain the FRBS sustainability and simultaneously require a central bank as a lender of last resort? Answering this question leads them to redefine the concepts of savings and credit expansion in Keynesian terms (Arena 1999). Saving occurs instantly from the moment the new fiduciary money is created, as its initial holder could spend it on consumer goods and not spend it. Credit expansion does not generate business cycles if it accommodates a previous increase in the demand for fiduciary media. The central bank cannot achieve low inflation and full employment in the short-term. Raising interest rates to reduce inflation has economic activity and employment costs. However, the central bank can achieve both objectives long-term if it directs a responsible and credible monetary policy. Once low and stable inflation is reached, the FRBS lays the foundation for sustained economic growth and development.

On the other hand, Austrian macroeconomics argues that the FRBS is economically unsustainable, laying the basis for fiat inflation and business cycles (Huerta de Soto 2020; Garrison 2001; Lachmann 1973). By lending the money deposited, the bank allows two or more people at the same time to have virtual availability of the same money, which generates fiat inflation. If the recipients of the loans deposit their money in a bank, this process is repeated $m = 1/c$, where m is the bank multiplier, and $1/c$ is the inverse of the

banking reserve ratio. As the monetary base does not match the monetary aggregates (M1, M2, M3...), the banks cannot face a massive withdrawal of deposits. Moreover, central banks cannot coordinate money supply and demand arrangements. Central bankers must first know and articulate: (1) the past, present, and future subjective valuations and intertemporal rate of preference of all individuals; (2) changes in the endowments of assets, capital accumulation, amortization rates, and the technology of all present and future firms; and (3) control inflation expectations (Boettke 1997). The central banks will make systematic estimation errors in manipulating the money supply. This results in the issuance of fiat money and distorts the production structure. The creation of fiat money and credit expansion supposes an increase in the money supply, reducing the purchasing power of money and expropriating the value of citizens' monetary units in a diluted and almost imperceptible way (Boettke and Newman 2017; Garrison 2006). It is antithetical to affirm that such expropriation is a saving. Therefore, the FRBS forces a monetary expansion or contraction of the money supply through quantitative models and shallow assumptions, distorting the intertemporal allocation of resources and triggering recurrent boom cycles, financial crises, and economic recession (Espinosa 2023a).

3. Ethical Framework

The review of the FRBS literature leaves numerous open questions for researchers in social sciences and, especially, economics. Why are there two opposing approaches to the FRBS? What are their epistemological and ethical foundations? What does empirical evidence show? In a nutshell, how ethical and sustainable is the FRBS? The following clarifies that private property is the key to recognizing the ethical statements of the FRBS and their relationship to sustainable economic growth and development. The ethics of private property is used, i.e., the principle that every individual has a natural right to possess and dispose of their being and private property attained in a free society based on contractual ties. This analysis emerges from the pattern predictions on the sustainability of the different institutional arrangements of social organizations.

3.1. Ethics of Private Property

The ethics of private property lies in the “non-aggression axiom” where no person or group may commit aggression against another person or someone else's property. As Rothbard (2002, p. 27) states, aggression, a synonym for coercion, is “the initiation of the use or threat of physical violence against the person or property of anyone else”. Aggression is, therefore, synonymous with invasion and confiscation of others' property. If the ethical principle is that no person can commit aggression against another, the ethics of private property is the only foundation of a free society based on contractual ties. The systematic breaking of the non-aggression axiom of others' private property can conduct to institutionalize theft, vandalism, murder, fraud, or censorship (Huerta de Soto 2010). Two ideas are essential to reach this conclusion. First, the validity of propositions only appears to the extent that individuals can attain propositional exchanges through argumentation. Other animals cannot produce and exchange propositions that claim validity. Denying this assertion indicates self-contradiction because an individual cannot argue that he cannot argue, either openly or as an internal thought. It must be assumed that any ethical proposal requires validation by argumentative means. An ethical proposition loses validity if it is logically inconsistent with argumentative validity.

Second, private property rights must be justified a priori. Anyone trying to explain any norm must have presupposed the exclusive right to control their body as a valid norm to say, “I propose this or that”. Anyone who disputes this right would be caught in self-contradiction because arguing for it would imply accepting the same norm he is discussing. No one can “propose anything and expect the other party to convince himself of the validity of this proposition or else deny it and propose something else unless his and his opponent's right to exclusive control over their respective bodies and standing rooms were already presupposed and assumed to be valid” (Hoppe 1993, p. 386). If individuals

do not have the right to their bodies and occupied spaces, the problem of reasoning human propositions and actions would not exist. The validity of argumentation constitutes the prior recognition, implicitly or explicitly, of the private property right of human beings. The principle of private property rights indicates that every human being is the owner of his person, therefore, of his work and, by extension, any property that he has created, acquired through contractual ties, or collected without prior use and owner.

Consider the consequences of denying private property rights. Suppose a person A does not own his body, the means appropriated and created with his intellect, and the economic goods acquired by original appropriation or contracts. In that case, only two possibilities remain: (1) a class of individuals have a right to the body of A, along with the appropriate means, created or acquired by A; or (2) all individuals are communal owners. The first alternative attributes A as an infrahuman condition and, therefore, A lacks private property rights, and the ruling class can live parasitically on A. However, A is, in fact, a human being, so the first alternative must be rejected because it consists of arbitrarily perpetrated aggression, therefore, inconsistent with argumentative validity. The second is the communist alternative, which lies in a double logical difficulty: (1) the problem that every individual must own a part of everyone else when each one cannot own himself; and (2) in the absence of private property rights, no one would be able to act, and the human species would perish. How could anyone consent without being the sole owner of their own body? An individual first needs the approval of others to express himself, but those others could not consent without first having theirs, and so on. Any communist attempt will automatically turn into a class government, which will control the property of others, returning to the first alternative (Moreno-Casas et al. 2022). The terms “social property” or “communal property” can be better understood as “property of the political oligarchy”. The political leaders of the governing body would decide who should have private property rights and to what extent it is “reasonable” for government goals. While slavery consists of confiscating 100% of the private property of the governed, only the ethics of private property can be justified argumentatively because the reality of proposing them falsifies the alternative proposals.

Finally, the ethics of private property and civil liberties are intimately intertwined. Private property rights are a precondition for freedom of expression, association, religion, and legal equality. Arguing requires one person’s exclusive control (private property) over scarce resources (e.g., body, brain, and vocal cords) to express a thought, associate, and develop beliefs, which is equally valid for all human beings with the limit of not breaking with the axiom of non-aggression. Arguing such things presupposes private property rights before any social agreement (otherwise, no one could make this proposition). It is impossible to deny this without falling into self-contradiction.

3.2. Ethics and Sustainability

The recognition of private property rights as paramount for the entrepreneurial market process indicates that the only way to prosper is through the division of knowledge, specialization, and contractual ties (Kirzner 2017). The exchanges in the market process are mutually beneficial a priori because an individual subjectively values more what he receives than what he gives in exchange and vice versa. Both parties increased their subjective well-being after making the exchange. However, either party could have used their private property in another way, a posteriori in experimentation and learning (Espinosa 2023b). “In a system where the knowledge of the relevant facts is dispersed among many people, prices can act to coordinate the separate actions of different people in the same way as subjective values help the individual to coordinate the parts of his plan” (Hayek 1945, p. 526). The price system is “a mechanism for communicating information if the goal is to understand its actual function, a function that, of course, it performs less perfectly as prices grow more rigid” (Hayek 1945, p. 526).

As economic science is value-free (*wertfrei*), logical-deductive economic reasoning can build unbiased, ethical positions. The ethics of private property is entirely related

to economic sustainability. Specifically, sustainable economic growth and development indicate the coordinating trend between supply and demand to solve human problems. While a human problem worth solving is a subjective appraisal continually created in individuals' minds (a prior self-recognition of private property), the market process facilitates the transmission and coordination of that information through the price system as well as humanly possible (a previous recognition of the others' private property) (Bylund and Packard 2022). It follows that the ethics of private property is simultaneously a necessary and sufficient condition for sustainable economic growth and development. It is required because the absence of private property rights makes coordination between supply and demand for solutions to human problems impossible. It is also a sufficient condition because an institutional environment of secure private property rights promotes the accumulation of capital, the expansion of markets, and the increase in the standard of living. In contrast, institutional coercion is ethically reprehensible because it prevents human beings from developing what is essential to them: their innate ability to create and conceive new ends and means and act to attain their own goals.

4. An Ethical Approach to the Fractional-Reserve Banking System

As the ethical foundation of the market economy, the ethics of private property brings to light three key neglected steps for the FRBS analysis and policy reform:

1. The economic analysis of the origin of money as an evolutionary institution helps identify the role of governments and bankers in the emergence of the FRBS and fiat money.
2. Emphasizing the legal aspects of money production contrast, the main features of free-market and monopolistic monetary institutions, especially on legal inequality and sustainability issues.
3. These findings connect with the ethics of the private property approach to identify how the FRBS fosters fiat inflation and business cycles in an economically unsustainable and ethically reprehensible process.

It is shown how the ethics of private property allows appraising the discrepancy between the ethical principles and the FRBS's performance, providing an objective and scientifically unified treatment to the problems of sustainable banking and finance.

4.1. Breach of Private Property: Natural Money versus Paper Money

The economic differences between natural and paper money (better known as fiat money) are more readily understood when studying the origin of money. In civilization's annals, exchanges were directly based on barter (Menger 1976). There are only exchanges in the barter when the parties have an opposite inequality of subjective evaluations and if both realize it. The double coincidence of the problem of the needs explains why barter restricted trade to subsistence levels: (1) A wants a good from B, but B does not want the goods offered by A; (2) A wants a good but does not know anyone who offers it and who, moreover, wishes to exchange with him; and (3) A and B know each other and want to exchange, but the transaction costs are very high, and the exchange does not occur.

Money emerges spontaneously throughout a complex evolutionary process driven by many human beings seeking to attain their goals (Menger 1892). This process involves selecting the goods that change hands most frequently as the medium of exchange and payment. Individuals realized that specific commodities were common and generally accepted as a means of exchange and payment (e.g., salt, wheat, cocoa, fish, meat, bronze, silver, and gold). The main features of money are the medium of exchange, store of value, and unit of account. Money overcomes the double coincidence of needs problems, multiplying potential exchanges and facilitating other social institutions' spontaneous emergence and complexity (e.g., language, law, morality, market) (Hodgson 2006; see also Hodgson 2019). Money is the sine qua non-evolutionary social institution facilitating economic growth and development.

As international trade increased, gold (large transactions) and silver (small transactions) became the money of choice for agents (also known as commodity money) (Salerno 2010; Watson 1967). The development of banking activities is ancient and emerged practically with the appearance of money from the dawn of commerce and the first steps in the division of labor. Private banks appeared to perform deposit (i.e., a contract by which someone agrees to keep something on behalf of another person) and loans operations (i.e., a contract by which an individual decides to repay the money that has been loaned to him with interest) according to the commodities' *tantumdem*, holding a reserve coefficient of 100%. Starting in the 4th century B.C., Greek public banks emerged strongly with the aim of managing deposits, loans, tax collection, and coin minting (Harris 2008; Holt 2021). Public and private bankers realized that clients did not simultaneously withdraw their deposits and could over-issue banknotes, obtaining additional profits. The governments steadily needed additional income to finance public spending, especially war-related activities. The fractional-reserve banking system emerged as the temptation to appropriate depositors' money, breaching private property rights, consolidated in the 13th century in Mediterranean Europe (Usher 1943).

Commodity money was heavy, making it challenging to handle. The transport of commodity money also had a high risk of being stolen. Governments and bankers altered commodity money by mixing it with other metals to increase the money supply fraudulently (Clapham 1970; Fahey 1944; Friedman 1986). In the 11th century, paper money appeared under the Mongol emperor Kublai Khan, where each bank issued its banknotes. Paper money was certified as banknotes on depositing commodity money in each bank vault, assimilating to what we know today as a check. Without legal responsibility to hold a reserve coefficient of 100%, governments and bankers utilized the FRBS to over-issue banknotes to expand credit artificially. As a result, two or more people simultaneously have virtual availability of the same stock of gold or silver through banknotes (Rothbard 1999). Although some banks respected the *tantumdem* and a reserve coefficient of 100%, history shows how the fractional reserve banking system gradually positioned itself globally (Huerta de Soto 2020). Initially, bankers used part of the clients' deposits (fractional reserves), over-issuing banknotes as credit expansion. Inflation was also fueled by the arrival in Europe of precious metals from America, yielding artificial economic growth (boom) and the inevitable financial crisis and economic recession (bust).

Hülsmann (2008, p. 74) explains that by 1500, the total money stock in Europe was about 3500 tons of gold and 37,500 tons of silver. Over the next 150 years, Spain imported 181 tons of gold and 16,886 tons of silver from its mines in South America (all other producers paled compared to these figures). An essential part of these Spanish imports was re-exported to the Far and Middle East. The famous "gold and silver inflation" of the 16th and 17th centuries increased the European money supply by no more than 50%, according to some estimators; according to others, by as much as 500%. However, this occurred over 150 years. The average growth rate of the money supply is between 0.3% and 3.3% per year. By contrast, in the United States and the European Union, the stock of "base money" (paper banknotes plus central bank accounts) has increased between 5 and 10% annually over the past decade. As will be seen, the breach of private property rights has severe economic, legal, and ethical effects.

4.2. Legal Inequality: Market Economy versus Legal Monopoly

The banking system of a free-market economy operates with a 100% reserve of deposits, securing clients' private property rights and economic sustainability (Bagus et al. 2013). Banks are commercial companies that offer financial operations with money from shareholders and clients. Predominantly, banks provide loan services (credits, investments, or currency exchange) and deposit services (guarding and custody of people's money). On the one hand, a loan contract (*praestarium*) means that a person (lender) waives the availability of monetary units (savings stock) in favor of a financial institution (borrower) for use during the time agreed with the obligation to repay the total sum plus interest. On

the other hand, a deposit contract (depositum) is a contract made in good faith by which one person—the depositor—entrusts to another—the depositary—a movable good for that person to guard, protect, and return at any moment the depositor should ask for it (Huerta de Soto 2020). While a loan contract transfers the availability of money during an agreed period, a deposit contract does not transmit the availability of the funds. In short, a deposit and a loan are mutually exclusive.

Alternatively, the fractional-reserve banking system consists of a legal monopoly: a legal privilege granting banks exclusivity to dominate a specific good or industry with an obligatory demand (Bagus and Howden 2012, 2016). The FRBS' legal monopoly dominates the money-minting and credit expansion from each bank's paper money issued. In particular, England's Bank Charter Act (BCA) of 19 July 1844, has conditioned the entire world's financial and economic institutional change (Whale 1944; Hayek 1984). After years of debate between banking and currency school theorists about the link between the FRBS and business cycles, the BCA successfully included the currency school idea that business cycles are caused by credit expansions orchestrated by governments and bankers. The FRBS facilitated the issuance of paper money for an amount far more significant than the gold deposited initially in its vaults. Although the BCA was the first and a positive step in securing private property rights, bankers continued to hold fractional reserves, not in paper money, because the BCA prohibits it, but in client deposits. In other words, the banks reoriented their activity from over-issuing banknotes to issuing sight deposits without the backing of 100% reserves, which is the same business from an economic point of view.

The FRBS is an outstanding example of legal inequality because not maintaining a 100% reserve on deposits implies transgressing the private property rights of depositors, not counterfeiting, as occurs with excessive banknotes, but misappropriation. Misappropriation consists of taking possession of another's property for profit when such property was legally held by possessory titles other than ownership (see Kirzner 1989).

The Bank Charter Act originated the rent-seeking or corruption effect due to the legal privilege of capitalizing on abnormal profits. The FRBS's economic unsustainability periodically called the government for bank bailouts (Rothbard 1963). The central banks were created as the lender of last resort to rescue the banks and allow the creation of the necessary liquidity in times of crisis. Even the 17th and 18th-century Scottish banks, hailed as examples of ostensibly successful FRBS, were not free and pyramided credit onto the Bank of England, defaulting on credit boom and bust in a long series of boom–bust cycles between 1760 and 1845 (see Rothbard 1988). Accordingly, government and central bankers replaced the gold standard with a purely fiduciary system and legal tender laws, introducing them worldwide.

4.3. Dynamic Unsustainability: Inflation and Business Cycles

The legal foundation of the FRBS seems unjustifiable from the perspective of general principles of law (Hülsmann 2003). The misappropriation of the funds deposited in custody and the issuance of certificates of deposit in an amount more significant than the money deposited tend to breach private property rights. A contract that needs money to be in two places simultaneously to be fulfilled—deposited in the bank so that it can be withdrawn at any time and invested in a business to earn additional profits—is ontologically unfulfillable and, therefore, null (Bolton and Dewatripont 2004). Any custodian of a fungible asset, except bankers, who do not always maintain 100% of the tandem, commits misappropriation. The supposed “depositors will not be a joint demand who will claim all their money simultaneously” is incorrect. The bank panic (better known as a bank run) can emerge in political and economic crises due to high confiscation risks: the possibility that people will be deprived of their property. For example, a confiscation risk arises when customers judge that the bank will not return their money. A kind of competition is generated where people rush to be the first to withdraw their money before the bank runs out of resources. Some recent cases were the bank runs in Argentina in 2001, Greece in 2010, and Venezuela in 2020

due to widespread fear that the government would steal bank deposits (Cortés Conde 2003; Rady 2012; Pittaluga et al. 2021).

The inconsistency of the ethics of private property and confiscation risks inherent in the FRBS is manifested in two central phenomena in a macroeconomics study: fiat inflation and business cycles (Bagus et al. 2014a). First, inflation is the loss of the purchasing power of money in which money supply exceeds money demand because:

1. Money supply increases.
2. Money demand decreases.
3. Both at the same time.

Inflation can be natural or fiat, generating different effects on economic performance (Bernholz 2003). On the one hand, natural inflation implies an increase in the money supply in the context of commodity money. This type of inflation is not harmful because the money supply under, for example, gold standard depends on the profitability of mining gold, considering the expectations about its industrial and monetary use. If the supply of money exceeds the demand for money, the fall in the price of gold will reduce its mining profitability until it coordinates supply and demand.

On the other hand, fiat inflation is politically induced through monetary issuance or credit expansion, both directed by governments and central banks as an additional public finance strategy. Money supply and demand coordination is impossible if the money price is politically biased and market price signals are distorted. Newly created money is injected into specific economic places and slowly spreads into individuals' cash balances, distorting the relative price structure. Seigniorage is the inflationary tax, i.e., a breach of property rights, that generates income redistribution from the last recipients of newly created money (ordinary citizens) to the first recipients (governments, the banking system, and specific industries). Fiat inflation causes a policy-induced loss of purchasing power of money, so it will motivate to consume and spend money instead of saving it. If money is going to be worthless in the future, citizens and investors will prefer to spend it now, which reduces the country's relative wealth. It is evident that natural inflation is entirely consistent with the ethics of private property, but fiat inflation entails confiscation risks of private property rights.

Second, business cycles can also be natural or politically induced (Bagus et al. 2014b; Hülsmann 1998). On the one hand, changes in market trends are typical of a dyadic economy, depending on subjective judgments in identifying and solving increasingly complex human problems. On the other hand, the boom and bust theory explains how the FRBS induces unsustainable business cycles from credit expansion in the direction of intertemporal discoordination (Hogan and White 2021; Hülsmann 2008). The interest rate is the price of time, which includes individuals' time preferences. A low-interest rate indicates a propensity to save (increase future consumption), and a high-interest rate reflects a tendency to dissave (increase present consumption). A low-interest rate suggests entrepreneurs should invest in long-term, capital-intensive projects to coordinate consumers' propensity toward increased future consumption (Garrison 2001).

If the central bank increases the supply of funds loanable through newly created money, reducing the interest rate or both, the interest rate is reduced "as if" it had increased genuine savings, which it has not. Without a shift in time preferences toward higher savings, there are no additional resources to sustain the policy-induced boom. The change in the interest rate signal and the availability of resources are at odds with each other. With a lower interest rate, people will save less and spend more on consumer goods. Meanwhile, favorable credit conditions encourage the start of long-term investment projects while the resources necessary to carry them out are consumed. The central bank's credit expansion causes a gap between saving and investment, resulting in overconsumption and malinvestment.

As Figure 1a shows, banks A and B face a prisoner's dilemma: if banks operate with fractional reserves, they will earn large profits in the short run through more loanable funds to expand credit at lower rates. The best response of banks A and B is to act with a fractional reserve (Expand, Expand). Figure 1b shows that firms A and B also face the

prisoner's dilemma: the best response of specific industries is to demand cheap credit; otherwise, others will benefit from profitable long-term investment projects (Demand, Demand). Banks, firms, and households profited from the credit expansion in the short run, initiating the boom phase.

		Bank B	
		Expands	Does not expand
Bank A	Expands	Large profit for both (in the short run)	Failure of A/ Survival of B
	Does not expand	Failure of B/Survival of A	Survival of both (reduced profit)

(a)

		Firm B	
		Demand	Does not demand
Firm A	Demand	Large profit for both (in the short run)	Failure of A/ Survival of B
	Does not demand	Failure of B/Survival of A	Survival of both (reduced profit)

(b)

Figure 1. The FRBS process illustrated with the prisoner's dilemma: (a) Decision of banks to act with fractional reserve (i.e., expand credit or not); (b) Decision of firms and households to accept the newly created fiat money (i.e., demand cheap credit or not). Own elaboration.

In Figure 1a,b, it can be considered efficient for an individual bank or firm that acts recklessly by unilaterally overexpanding to fail and for a bank or firm that works prudently by restricting credit expansion to survive and prosper in the long run. Thus, the expansive strategy is defective, and the non-expansive strategy is sustainable in the short- and long-term.

Suppose banks continuously expand credit and firms and households demand them. In that case, consumers' time preferences have remained unchanged, implying fiat inflation and discoordination between supply and demand for solutions to human problems. Investment projects with credit expansion become bankrupt in the long run due to a lack of demand. While an economic crisis emerges when firms have difficulty repaying loans and the financial system becomes insolvent (firms do not have enough reserves to sustain their business), an economic recession appears when economic activity declines and unemployment rises. Figure 1a,b show how the FRBS drives unsustainable financial performance, distorting the price system and leading economic agents to make systematic estimation errors.

Consider the claim that lack of credit and restrictions on practicing FRBS can accelerate financial crises and economic recession, such as in the 1929 Great Depression or the 2008 Subprime Crisis. In that case, promoting the FRBS would be ethical to avoid the consequences of the bust on growth and employment (Van den Hauwe 2016). However, this statement neglects that FRBS is the cause of the artificial boom and bust cycle through intertemporal discoordination. Additionally, there are two ways to postpone the bust. First, successively increasing the rate of credit expansion at the cost of deepening the effects of the crisis and recession in the long-term. When the creation of a new supply of credit stops or slows down, there will be stagflation (that is, accelerating inflation coexisting with high unemployment rates). Second, further injection of cheap credit will cultivate hyperinflation risks, the destruction of the monetary system, and a bank run.

5. Discussion and Policy Implications

This section discusses the above findings' theoretical and practical implications, applying them to modern ethical dilemmas around the FRBS, such as "full" deposit availability,

maturity mismatching, and hybrid contracts. It outlines paths for analyzing policies and political reform.

5.1. Theoretical Implications

The ethics of private property clarify that ethics and sustainability are two sides of the same coin; if it is ethical, it is sustainable. If it is not ethical, it is unsustainable. As seen above, three reasons can be outlined to explain why the FRBS does not align with ethics and sustainability:

1. The economic argument indicated that FRBS means breaching private property rights, distorting the price system, and generating a discoordination of money supply and demand.
2. The legal argument states that the FRBS arises from a legal monopoly granted by governments to profit from cheap credit, deficit spending, and, above all, the inflation tax.
3. The ethical argument pointed to income redistribution through FRBS in favor of governments, central banks, and newly created money-receiving industries and against the rest of society that must pay the costs of fiat inflation and politically induced business cycles.

The FRBS needs to be consistent with sustainable economic growth and development. While depositors can demand all their money simultaneously in a banking panic situation, the excess of the monetary aggregate over the monetary base troubles economic performance. The misappropriation of deposits (in breach of clients' private property rights) generates recurring politically induced boom and bust business cycles. Firms tend to invest in artificially profitable projects in the long-term, and simultaneously, households increase current consumption. While the boom indicates that firms and households act on huge profit promises, the bust suggests the illusion of these profits. Unlike firms and households, bank debt enjoys the legal privilege of refinancing guaranteed by the central bank and bailout guaranteed by the public treasury, which feeds the FRBS's structural irresponsibility and un-sustainability.

Following the principle of effective demand or Keynes' Law, an artificial increase in consumption and deficit spending seems socially beneficial (White 2023; Haberler 1936). An increase in effective demand increases the gross domestic product (GDP) in the short-term. It thus increases disposable income, favoring a new rise in consumption and deficit spending ad infinitum. The fatal error of FRBS is overlooking that what matters is whether the GDP grows in the short-term and, most importantly, whether GDP growth is politically induced. If GDP growth is politically induced, it is neither ethical nor sustainable because it is based on confiscation risks of private property rights. In contrast, economic growth will be ethical and sustainable in the long-term if GDP growth is driven by genuine saving and entrepreneurship in an institutional environment of secure private property (Espinosa et al. 2021). Only in the latter case can it be said that a country is developing, effectively coordinating supply and demand for solutions to human problems.

5.2. Policy Implications

There has long been a four-way economic debate on the sustainability of the banking system (Huerta de Soto 2020). Figure 2 classifies the main banking systems into four quadrants according to whether they operate with fractional reserves or have a central bank. What is essential here is to interpret the sustainability of each banking system analyzed from the private property ethics approach.

		Central Bank	
		Yes	No
Fractional Reserve	Yes	FRBS	FRFBS
	No	100 CBS	100 FBS

Figure 2. Banking systems in the economic literature. Own elaboration.

The upper left quadrant represents the fractional-reserve banking system (FRBS) with a central bank as a lender of last resort. This banking system prevails worldwide (Taylor 2012). However, it was argued above that it is inconsistent with the ethics of private property. It is built on a legal privilege to the banking system, reinforcing the inter-temporal discoordination and irresponsibility of the fractional reserve.

The lower left quadrant corresponds to the private banking system with a 100% reserve and a central bank (100 CBS) (Cochran and Call 1998). Suppose the central bank lends money to banks or injects new money into the economic system through massive open market purchases. In that case, it will distort the stock market's performance, the rate of return, and, indirectly, the interest rate on the credit market. These outcomes will inevitably occur even if a 100% reserve ratio is required from the banks. There will be a tendency to generate inter-temporal discoordination in each stage of the production structure.

The upper right quadrant denotes the fractional-reserve free banking system without a central bank (FRFBS). The free-market processes will discipline private bank fractional reserve distortions (Albinowski 2022; Rothbard 1963). The vigilant attitude of clients regarding the activity and solvency of their banks, the constant reconsideration of contracts and trust, and the effect of interbank clearinghouses can spontaneously stop some banks' initiatives to expand credit. However, the disciplinary effect of the market is ex-post. The FRBS, by definition, breaches the ethics of private property, which tends to produce a tragedy of the commons (Moreno-Casas and Bagus 2021). If deposits are treated as "social property," the prisoner dilemma showed the powerful incentive for banks to initiate a joint policy of credit expansion, protecting each other from insolvency and guaranteeing high profits. Banks expand credit, and their actions' costs fall on the rest of the economic agents. The FRBS's unsustainability explains the trend toward bank mergers and, most importantly, their calls for the authorities to create a central bank to give them financial backing (Block and Davidson 2011). It became the first fractional reserve central banking case with all the economic, legal, and ethical effects already clarified.

Finally, the lower right quadrant corresponds to the 100% reserve-free banking system without a central bank (100 FBS). It consists of banks that must keep all their client's demand deposits in reserves. Under the 100% reserve system, it will generally be the client who pays the bank for the deposit service. The main implication of 100% reserve banking is that artificial credit expansion disappears. Banks will not be allowed to create money as with the fractional reserve. This implication is paramount because banks are prevented from expanding the money supply and generating business cycles. Another importance of the 100% reserve is preventing bank runs. Since demand deposits are always available, the banks can return the deposits if there is a massive withdrawal of funds. This system is the only one consistent with the ethics of private property and sustainable banking and finance (Hülsmann 2008; Salerno 2010).

A policy reform pathway consists of three phases that logically follow the ethics of private property and "full" deposit availability: financial markets should be based on private property rights. First, currency competition means repealing the compulsory tender laws that oblige individuals to accept fiat money. It grants freedom of choice by avoiding central control over the issue and price of money. Second, repealing banking legislation to end banks' monopoly privilege requires a 100% reserve for demand deposits according to private property rights. The central bank's function as a lender of last resort is unjustified. The last phase then involves repealing the central banks and the other organisms dedicated to commanding the financial and banking markets.

In the absence of money and credit political control, the price of competing currencies will depend on the supply and demand arrangements of the market. These three phases will lead to the end of politically induced fiat inflation and business cycles, promoting a trend toward sustained economic growth and development. However, Moreno-Casas and Bagus (2021) clarify that more than having a 100% reserve is required. It is also necessary for governments and central banks not to bail out banks when they have rollover problems or fail. Market changes result in price adjustments according to the economic agents'

subjective values, such as discovering a mine of the commodity used as money, changes in the monetary standard, and natural disasters. In contrast, political changes force the 100% reserve-free banking system toward a central bank fractional-reserve system according to the governing body's subjective values, such as institutional coercion to manipulate the price of money and credit.

The ethical case for the 100 FBS has two main criticisms. One of the criticisms of "full" deposit availability is that since there is no bank multiplier, the stock of loanable funds will decrease, generating economic crises. It would be ethical for banks to use deposits to make loans. This criticism is unfounded because the banks would only lose the legal possibility of creating credit *ex nihilo*, not backed by increased genuine savings. It would be impossible for the banking system to expand credit artificially and the money supply, generating recurrent boom and bust cycles. Citizens will avoid all the costs of politically induced fiat inflation and business cycles that impoverish them. However, a wide range of intermediation contracts will be open to the banking business, such as services related to the safekeeping and custody of deposits, various financial operations, and the capture of genuine savings to pay for the granting of credits to achieve investments. Suppose the government's goal is to increase credit by 100 FBS. In that case, policymakers should reduce confiscation risks (e.g., taxes, regulations, public order) as much as possible to promote citizens' genuine savings and entrepreneurship ([Espinosa 2023b](#)).

In this sense, maturity mismatching (as a method to channel short-term savings into longer-duration wealth-creating investment projects) is ethical and permissible in a free market because the voluntary loan contract implies the transfer of availability of the fungible asset ([Bagus et al. 2018](#)). Suppose bank A lends for two years from the money saved by client A to invest in a project that takes four years to mature. After two years, client A receives his money back plus interest and can increase his consumption or savings. Now, client B can take the role of saver and give the loan for two years to the bank in exchange for repayment plus interest. Bank A can complete the project's financing without distorting the production structure or generating fiat inflation and business cycles. Although error risks in estimating maturity mismatching are possible, banking competition, contractual clauses, and a non-intervened price system will help coordinate credit supply and demand. Thanks to maturity mismatching, society is sustainably enriched.

Another criticism of full deposit availability is that the 100 FBS entails institutional coercion contrary to the principles of a free society based on contractual ties ([Bagus et al. 2017](#)). This criticism is also unfounded because the requirement of a 100% reserve ratio for deposits is the natural application of the ethics of private property and the fundamental principles of law against misappropriation. The free market does not mean the freedom to commit fraud or any other form of theft. Therefore, the idea of hybrid contracts melding attributes of deposits and loans is inconsistent with the ethics of private property: the fungible good's availability cannot be transferred and not transferred simultaneously. Hybrid contracts only make sense in the FRBS, where deposits are treated as loans. However, an individual can achieve compensation and performance changes concerning availability (liquidity) simply by combining deposit and loan alternatives. Any individual can choose what part of his money he wants to keep as a deposit and what part he wants to lend and invest without putting the sustainability of economic growth and development at risk.

6. Conclusions

This article explored economic, legal, and ethical factors from the ethics of private property. The research revealed that ethics and sustainability are two sides of the same coin. The results support the claims of Austrian macroeconomics, which can be grouped into three: (1) the economic argument indicated that the FRBS means breaching private property rights, distorting the price system, and generating a discoordination of money supply and demand; (2) the legal argument stated that the FRBS arises from a legal monopoly granted by governments to profit from cheap credit, deficit spending, and, above all, the inflation tax; and (3) the ethical argument pointed to income redistribution through the FRBS in

favor of governments, central banks, and newly created money-receiving industries and against the rest of society that must pay the costs of fiat inflation and politically induced business cycles. It also highlighted the need to rethink the practical implications of the banking system from the ethics of private property, indicating that the 100% reserve-free banking system (100 FBS) is the only one consistent with ethics and economic sustainability. It warns of the significance of ethics in outlining a policy reform proposal and addresses the main criticisms of “full” deposit availability.

This study provides novel research avenues for scholars interested in the ethical foundations of the financial and banking system and its implications for policy reform. It might be fruitful to address the ethics of private property from a multidisciplinary perspective. The different economic, philosophical, and historical approaches can be applied to question the validity of the private property of human beings, strengthening the analysis of politically induced errors in the financial and banking system.

Another concern is that applying the 100 FBS supposes a previous change of mind towards respect for private property and entrepreneurial freedom, legitimizing political reforms to end fiat inflation and boom and bust cycles. While this article explained the link between ethics and 100 FBS, evaluating marketing boards to spread the values of freedom and responsibility might be worthwhile to operate the banking reform outlined. The current structure of the article was not intended to capture the ethics of political decision-making on the FRBS, but further research can expand it in this direction.

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