PROPERTY RIGHTS AND TIME PREFERENCE

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> Students of history may see mirrored in the charts and tables of interest rates over long periods the rise and fall of nations and civilizations, the exertions and the tragedies of war, and the enjoyments and the abuses of peace. They may be able to trace in these fluctuations the progress of knowledge and of technology, the successes or failures of political forms, the long, hard, and never-ending struggle of democracy with the rule of the elite, the difference between law imposed and law accepted.
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> Homer and Sylla (1996, p. 3)

Time preference, one of the fundamental concepts of economics, is the ratio between the present values of present and future goods. Mises (1949, pp. 526–32) holds that time preference is the only reason interest is paid on loans, calling the pure time preference component originary interest. Empirically observable interest rates also include an entrepreneurial component, reflecting a subjective assessment of the uncertainty of repayment, and a price premium component, reflecting anticipated future changes in the values of the goods in which repayment is to be made, including loss of purchasing power of the monetary unit. Interestingly, the price premium component of the interest rate can be negative.

As property rights became more secure through the evolution of governmental and legal institutions, individuals' subjective time preference should have decreased. This observation reinforces the subjectivist interpretation of economic phenomena. Not only are individual time preference rates subjective and unique (Smith 1988, p. 5), but the level of security of a particular individual's property rights may vary significantly across individuals in the same society. Furthermore, the relative importance individuals attach to property rights is entirely subjective, and may also vary significantly across individuals.

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Security of property rights may also affect assessments of the entrepreneurial component of the interest rate. Lenders attempt to offset potential impact of anticipated future government-sponsored repudiation or default through charging a higher interest rate. Since they cannot know with certainty when systematic default will occur, they attempt to maintain their income stream as long as possible by continuing to make loans.

Similarly, security of property rights may also affect assessments of the price premium component of the interest rate. If the monetary authority brings about either a lessening of the purchasing power of the monetary commodity, or a change in the value of the repayment good, and if lenders anticipate these changes, lenders accordingly adjust the interest rates they charge.

It seems clear, however, that property-right security, and physical security generally, also change originary interest, that is, the rate of time preference. Lenders may charge higher interest in response to heightened expectations of government sponsored loan default. As described above, this is an increase in the entrepreneurial component of the interest rate. A contrasting situation occurs when lenders expect expropriation of property apart from repudiation of loans. Then lenders will charge higher interest to compensate for their increased insecurity in the future enjoyment of their property.[1] In the face of an anticipated future degradation in property rights, the present value of future goods falls, and thus time preference rises, because individuals can no longer value as highly as before their enjoyment of the less certain future good.

Property rights emerge with the evolution of civilization, government, and law, which remove some of the uncertainty facing the process of production (Menger 1976, p. 70). The principal and irreducible source of this uncertainty, which is invariant to any institutional arrangement, is the fact that production takes place over time (p. 68). Nevertheless, government has emerged as the greatest single threat to property rights. Though subjective, time preference must have generally been extremely high in primitive, noncapital-using

[1]Lower time preference is generally associated with greater predictability in the external environment, which can come either from changes in the external environment, or from the individual gaining knowledge and experience about the external environment—that is, time preference can be influenced by both internal and external factors. Time preference falls whenever the environment changes, or is expected to change, in a slower or more predictable manner. Governments prevent this by impeding the exercise of property rights, or by changing rules more frequently. This observation argues for the superiority of common law and other spontaneously evolved institutions over positive legislation (Rizzo 1985; Mulligan 2004, 2005).

It could be argued that lowered security, whether physical security or property-right security, attenuates the subjective perception of time passing. Mises (1949, p. 486) cautions that time preference does not depend on psychological factors. If it did, risk-loving individuals could have negative time preference!

societies.[2] Only as individuals come to value and recognize property rights can they exercise entrepreneurial awareness for and implement more productive, roundabout, capital-using production methods.[3] The liberal order of Hayek's Great Society generally lowers individual time preferences by providing individuals the opportunity to discover and exploit roundabout means of production, which cannot be relied on in the absence of secure rights to own, use, dispose of, and transfer, land, capital, and one's own labor services, including embodied entrepreneurial talent and human capital (see, e.g., Smith 1988, pp. 132–35).

Once governmental institutions become sufficiently evolved and sophisticated to require ongoing revenue, the very institutions which formerly provided increasing security for property rights begin to act to destroy and subvert those rights. Populations which secured for themselves the blessings of the liberal order tend to break apart into competing interest groups seeking to monopolize the government's seemingly unlimited rent-extraction

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[2]Time preference is a marginal phenomenon, in the sense it refers to the alternative between a marginal addition to wealth, income, or consumption received either now or sometime in the future. Cash flow and subsistence considerations ensure that a person with zero income and savings would display higher time preference than the same person with greater-than-subsistence-level resources, and that the person's time preference would fall, continuously if not necessarily proportionally, as resources rise farther above subsistence levels. Thus, time preference was higher in primitive societies, and falls as civilization progresses.

[3]Lack of secure and transferable property rights prevents third world nations from accumulating wealth and productive capital (de Soto 1989). The cause of this may be laid at the feet of the developed world. In an attempt to get the U.S.S.R. to participate in the Bretton Woods organizations, the World Bank expressly pledged to ignore the political character of prospective borrowers, including the security of property rights in a borrowing country; "expropriation is the right of any country" (World Bank 1976, p. 13). With such a hostile attitude toward private property, it is small wonder the World Bank never successfully served as a conduit for private capital into the developing world.

This attitude toward individual rights, that they are privileges granted by, and only exercised at the sufferance of, the government, is highly reminiscent of the *droit administratif*. A.V. Dicey (1915, pp. 213–67) suggests the tradition of French and continental administrative law or *droit administratif* is fundamentally opposed to the Anglo-American concept of the rule of law. Government officials, and the government itself, do not enjoy a privileged position under the rule of law, but they do under *droit administratif*. An extreme view would be that under *droit administratif*, the government is above the law.

Dicey notes *droit administratif* possesses many advantages, especially from the point of view of administrative efficiency. This legal philosophy is especially compatible with that of development planning, which assumes that the international development lenders' staffs of technocrats are better able to direct a country's economic progress than the uncoordinated activity of that nation's citizens. The possibility is not conceived of, that the international technocrats and the developing nation's citizens might have different preferences. Because Anglo-American common law is not a planned order, it is fundamentally at variance, not only with the philosophy of legal positivism (Rizzo 1985), but also with the imperatives of development planning or central economic planning.

authority (Smith 1988, p. 134). The transition from a feudal to an industrial economy, and especially the realization of political liberalism, markedly improves the protection afforded to individual rights, including property rights.

However, the liberal order faces a tendency to devolve into outright socialism, or at least into welfare statism, through the inexorable political economy of the democratic process. Both these later outgrowths of the liberal order always attack or erode property rights. Thus general time preferences should fall to a minimum as the liberal order triumphs over the feudal status society, but then rise again as the liberal order decays into socialism or the mixed economy.

The well-known problem of the commons can be described as a failure of institutional structure which imposes higher time preference on individuals.[4] The free or below-cost provision of a public good results in individual users making more intensive use of the low cost public good. The fact that such highly intensive use causes perceptible degradation and shortening of the expected useful life of the public good, leads users to try and extract as much value added as possible from the public good resulting in even more rapid and complete destruction of the public resource. Artificially imposing higher time preferences creates incentives for collectively undesirable behavior (Smith 1988, pp. 86–87). The free rider problem results when provision of public goods is substituted for established customary security of property rights.

Similarly, in the transition economies of the former Soviet Union, where state-owned property has been privatized but the government has imposed a moratorium on the transfer of ownership, owners attempt to extract value by using the resource so intensively they degrade its value. Since they cannot sell the property anyway, there is no incentive to preserve the resource, only maximize its immediate yield. This tendency is aggravated by the significant possibility of future nationalization. In the Ukraine, agricultural land is being abandoned as owners are unable and unwilling to invest in improvements and complementary capital equipment.[5] Overwork of agricultural land in the short run results in soil exhaustion, abandonment to nature, and in extreme cases, total loss of topsoil (Krasnozhon 2005).

The remainder of this paper is organized as follows: "Subjectivity of Time Preference and Property Rights" discusses the extent to which both time preference and the importance individuals attach to property rights are idiosyncratic and subjective, and develops implications of these features. In this

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[4]I am indebted to Roy Cordato for suggesting this illustration. See Hardin and Baden (1977), Olsen (1993), Hoppe (2001, p. 17).

[5]Thanks are due to Leonid Krasnozhon for this example. An excellent general discussion of property rights in Imperial Russia and under communism is given by Pipes (1999, pp. 159–216).

section, both theoretical and operational-empirical definitions are presented. "Government and the Right to Own Property" presents the theory from constitutional political economy explaining why the development of government facilitates property accumulation, economic development, and technological progress. The literature suggests that societies where property rights are best respected gain survival advantages over, and are emulated by, other societies. Thus government self-interest motivates its protection of property rights. "Property Rights in More Advanced Societies" develops the seemingly conflicting theory from constitutional political economy which explains why government becomes the principal abrogator of property rights. Interest group politics lead to wealth and income redistribution as governmental authorities maneuver to remain in office and expand their power. "Inflation and Property Rights" discusses inflation as a particularly insidious form of expropriation and demonstrates how it raises time preference. "Time Preference and Interest Rates: The Pure Time Preference Theory" presents this distinctively Austrian theory of interest and illustrates how arbitrage arrives at market interest rates even though individual time preference rates are subjective. "Property Rights and the Term Structure of Interest Rates" discusses the implications of changes in property right security, and the accompanying changes in time preference, for the five theories of interest rate term structure. Concluding comments are presented in the "Conclusion."

Subjectivity of Time Preference and Property Rights

The Austrian School's subjectivity and methodological individualism provide a distinctive view of time preference and property rights security. The seminal writings on time preference are cited by Hoppe (2001, p. 1): Jevons (1965), Mises (1949, chaps. 18 and 19), Böhm-Bawerk (1959), Strigl (2001), Fetter (1902, 1914a, 1914b, 1914c, 1977), and Rothbard (1962). "What restricts the amount of saving and investment is time preference" (Mises 1949, pp. 483, 491). For each individual, the division of real income into consumption and saving is determined by his subjective time preference. Total saving is the sum of each individual's saving determined by their time preference. Some save larger portions of their income, indicating lower rates of time preference, compared with those who save less and consume relatively more. If an individual's time preference were zero, all the individual's income would be saved and available for investment. If an individual's time preference were infinite, no income would be saved. Total investment is the portion of total saving which is used to purchase additions to the capital stock, or makes some other contribution to bringing production forward to final consumption. Investment cannot exceed saving, but saving must generally exceed investment. An efficiency argument is called on to equate the two, insofar as that uninvested savings forgo interest income. Nevertheless it remains clear that some saving remains uninvested. Individual savers reasonably forgo investment if they perceive the risk to outweigh

expected benefits. Because each individual is unique, each person has a unique time preference (Smith 1988, p. 5), limiting the extent to which an overall rate of time preference can be defined.

Time preference can be defined in the context of the individual's choice between two payments, a fixed payment offered today, and a variable payment offered in one year. Time preference ensures the individual will prefer receiving payment today if the payments are equal, and that he or she must be offered a larger payment in the future to willingly forgo payment for one year. As larger and larger percent increases are added to the proposed future payment, the individual will eventually accept a sufficiently larger future payment in place of the present payment. The percent increase in the future payment, for which an individual is indifferent between the present and future payments, is the individual's rate of time preference. This is equivalent to Mises's definition[6] as the ratio between the present values of present and future goods.

Clearly this rate of time preference, as defined above, may be different for each individual, and almost certainly varies significantly across individuals. The common conjecture is that time preference is generally highest for the extremely young and the extremely old, but much lower for the middle-aged. Children have high time preference because of their limited cognitive development (Hoppe 2001, p. 4; Mischel 1958, 1961a, 1961b.) Time preference is thought to be especially high for the poor, borrowers, and the young. A person just informed of a terminal illness, leaving him with a very brief life expectancy, is presumed to experience an abrupt increase in time preference.[7]

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[6]Mises's definition:

> Originary interest is the ratio of the value assigned to want-satisfaction in the immediate future and the value assigned to want-satisfaction in remote periods of the future. It manifests itself in the market economy in the discount of future goods as against present goods. It is a ratio of commodity prices, not a price in itself. There prevails a tendency toward the equalization of this ratio for all commodities. In the imaginary construction of the evenly rotating economy the rate of originary interest is the same for all commodities. (1949, p. 526)

[7]Just as the subjectivity of irreconcilable eyewitness accounts is termed the Rashomon effect, from Akira Kurosawa's (1910–1998) 1950 film based on the short stories of Ryunosuke Akutagawa (1892–1927), any abrupt increase in time preference attributable to suddenly lowered life expectancy may properly be called the Ikiru effect, from Kurosawa's 1952 film of that title ("to live,") from an original script by Kurosawa, Shinobu Hashimoto, and Hideo Uguni. The great Takashi Shimura (1905–1982) portrays municipal bureaucrat Kanji Watanabe, who, when he first learns of his illness, embarks on an extravagant but ultimately unsatisfying round of conspicuous consumption. The character finds personal redemption through seeing a stalled urban renewal project to fruition. Shimura also starred in *Rashomon*, *Seven Samurai*, and *Godzilla*.

Also, a single individual may easily provide different answers when asked about the amount that must be added to small payments to render the chooser indifferent between present and future receipts, versus large payments. For example, the same person may require $2.00 in one year to forgo a $1.00 payment today, but only require $1,100,000 in one year to forgo a $1,000,000 payment today. Given the possibility of a magnitude-inconsistent response, can we say whether the individual's time preference is 100 percent or 10 percent?

For an individual who gives even slightly magnitude-inconsistent answers over a range of different payment sizes, the intuitive definition of time preference suggested above is thrown into considerable doubt. While the preceding proposed definition makes obvious intuitive sense, time preference measurement may be particularly difficult to operationalize, even at the individual level. It may be necessary to specify the size of the present payment when citing such measured time preferences. A further problem is that survey responses do not necessarily reflect actual behavior and thus can be misleading. Clearly, experimental economists can offer actual choices between small present and future payments, but not large ones.

In addition to the potential problem of magnitude-inconsistency, individuals may also exhibit time-inconsistency if the compound annual percent increases they require to postpone payment either increase or decrease as the time period increases. This phenomenon would have profound implications for theories of term structure. Time-inconsistency is manifested when a person desires, or claims to desire, different returns over different time horizons. An individual may require $1.10 in one year to part with $1.00 today, suggesting their time preference is 10 percent, but may require only $2.00 in ten years, suggesting their time preference diminishes as the horizon is extended farther into the future. Or they may require $3.00 in ten years, suggesting their time preference increases as the horizon is extended. The only payment in ten years consistent with a 10 percent time preference rate is $2.59. Any higher or lower payment indicates time-inconsistency.

The two kinds of behavioral inconsistency are akin to the behavior observed with respect to risk aversion. Risk-averse individuals buy insurance, but some also buy lottery tickets, suggesting they are risk-loving. Though both transactions have negative expected payoffs, the desire for low-value high-risk assets, and higher-value low-risk assets can only be reconciled through a particular preference configuration (Arrow and Fisher 1974).

Mises (1949, p. 527) describes similar behavior displayed by millenarian Christians anticipating the imminent end of the world. Festinger, Reichen, and Schlacter (1956) similarly document millenarian and messianic cults. Their principal subject was a contemporary UFO cult which prophesied the end of the world. It might be objected that the suggestion that people with lower life expectancies, that is, the aged, terminally ill, or those engaged in risky professions, have higher time preference or lower time horizons violates *ceteris paribus*, but a *ceteris paribus* condition cannot be applied across different individuals with subjective preferences.

Even if it can be generally established that magnitude-inconsistency and time-inconsistency are not serious difficulties for most economic agents, the difficulty remains that each individual's time preference is a unique aspect of his character (Smith 1988, p. 5). The market interest rate prevailing in each credit market is reached through arbitrage among many individuals.[8] On one side are individuals with high time preference, the borrowers who receive a consumer surplus equal to the maximum interest rate they would willingly pay, representing their time preference, minus the lower market interest rate they are required to pay. On the other side are individuals with low time preference, the lenders who receive a producer surplus equal to the market interest rate they receive from the borrowers, minus the minimum interest rate they would be willing to accept, their time preference. Hoppe (2001, pp. 3–5) notes time preference is determined by "external, biological, personal, and social or institutional" factors.[9]

The value individuals place on property rights is similarly idiosyncratic. One person may value an object or a tract of land far more than its accepted market value and far more than anyone else. Since market exchange tends to move goods to the person who values them most highly, this state of affairs cannot be considered in any way exceptional. Anyone knowingly possessing goods which he can exchange for goods possessing, for him, a higher subjective use value, will necessarily do so (Menger 1976, pp. 228–30).[10] One source

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[8]Economic experiments measuring individual time preference rates must be designed to isolate the individual from credit markets external to the experiment. In the real world, an individual with a 3 percent time preference and knowing access to a 10 percent market return, would always require at least the 10 percent return to defer a payment.

[9]An example of time preference subjectivity and the way time preference responds to revised expectations will be familiar to college teachers. College athletes who expect to compete professionally after college often experience a drastic lowering of time preference once they realize their expectations will not be realized, responding by reallocating their effort toward academics and longer-term career building. Professional athletes returning to complete their degrees are often more serious about their studies than before. This is akin to the Ikiru effect (note 7 above) responding to lowered life expectancy, but in reverse, and results from a sudden realization of lowered shelf life as a professional athlete. Similarly, college teachers will deplore the shortsightedness of athletes who seem to attach too much importance to athletic, as opposed to academic performance. Because the NCAA limits participation to four years, athletes' expected future life as students greatly exceeds their expected future life as athletes, and their decision to put more present effort into athletics and less into academics may be perfectly rational, however short-sighted.

[10]Thus property owners whose land is confiscated by the state through eminent domain often suffer real injury in spite of a "just and previous indemnity." The protections offered by Articles 17 of both the (French) Universal Declaration of the Rights of Man and of the Citizen (1789) and the UN Universal Declaration of Human Rights (1948) are similarly deficient because there is no good way the state can coerce its citizens. The comparable, though more limited, protection in the U.S. Constitution is the Fifth Amendment's taking clause, "nor shall private property be taken for public use, without just compensation." The Declaration of the Rights of Man's guarantee of a "just and previous indemnity"

of entrepreneurial opportunity comes from the fact that our knowledge of these opportunities for exchange is always limited.

Clearly, no respondent should ever knowingly accept a return below the best return available on the loanable funds market. Lenders compete to offer borrowers lower interest rates while borrowers compete to offer lenders higher interest rates, resulting in the substitution of an objective, observable, exchange-value-determined, market interest rate, for the subjective, unobservable, individual, rate of time preference. The prevalence of a market rate of interest must be counted among the spontaneously-evolved institutions Menger (1985, pp. 155–59) cites.

The level of security afforded to the free exercise of one's property rights may objectively vary among individuals. The law may discriminate among classes of citizens, often based on economic distinctions as well as racial, national, or religious ones. A landholder working a tract on the periphery of a settlement may objectively be more exposed to enemy attack or pillage than one whose land is more centrally located.[11]

In addition to objective differences in property rights there are also subjective differences. Different individuals attach different values to the same level of security of property rights. A socialist and a libertarian do not attach the same significance to the fact their property may be free from expropriation by the government, or theft by private criminals. The socialist might advocate expropriation, and celebrate if it happens. Generally, the level of security afforded to property rights in a particular society is valued differently by different individuals.

The kinds of property individuals choose as stores of value may influence, and in turn be influenced by, their rate of time preference (Smith 1988, pp. 134–35). Individuals with high time preference are more likely to amass

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can be criticized on two counts: if the indemnity offered is too small to effect voluntary transfer by the owner, eminent domain becomes necessary and the owner is clearly injured (though of course the injury is desirable if the owner is characterized as a Marxian class enemy); if the indemnity is sufficient to effect voluntary transfer, eminent domain is not called for, and the indemnity cannot be considered "just" by the other citizens who pay for it in the form of higher taxes. The French Declaration should be applauded for requiring a "previous indemnity," which seems far superior to a promised future indemnification which may never actually materialize. Having to pay anything at the time of seizure, even significantly less than accepted market value, serves as a valuable check on indiscriminate government seizure. Bowing to modernity, the UN Declaration omits this protection. Robespierre found Article 17 so restrictive, he was moved to attack the very institution of private property in his famous address of April 24, 1793 (Jaume 1989, pp. 254-61). I am indebted to Walker Todd for this insight.

[11]Kurosawa's *Seven Samurai* (1954) dramatizes this phenomenon. In order to defend a farm village from a much larger force of bandits, the leader Kambei, played by Shimura, makes the strategic decision to abandon several outlying houses, at great cost to their owners. His force is too small to extend its defensive area to include the outlying houses, a perfect illustration of resource scarcity and the economizing response it requires.

portable hoards of liquid cash, jewels, precious metals, and human capital, while those with lower time preference will hold more of their savings in land and illiquid, long-lived, physical capital. Once one's wealth is tied up in long-lived assets, one's time preference is likely to remain relatively low, until and unless the assets are destroyed or lost.[12] Holders of highly liquid assets are freer to relocate in response to threats, but must remain vigilant to take advantage of this flexibility.

Government and the Right to Own Property

Individuals may expand wealth through production or plunder (Bastiat 1950) and thus have comparative advantage in either violence or production. Comparative advantage in violence may consist in nothing more than comparative disadvantage in production. These comparative advantages did not emerge until wealth began to accumulate. Individuals with comparative advantage in violence involve productive individuals in protection schemes, thus becoming the rulers of their primitive society. In this context, rulers often achieved legitimacy by confirming accepted rules of conduct, a process which facilitated cooperation in production and enhanced the ruler's wealth.

The ruler's time horizon will be longer, the more secure against competitive threats to his monopoly on violence. Thus enlightened, or at least educable, rulers realized early on they could both enhance the wealth-creating potential of the society they presided over, and maximize the security of their rule against internal and external threats, by enforcing secure property rights, and lowering taxation. In contrast, an insecure ruler with short time horizon will try to transfer wealth rapidly from subjects.[13] The archetypal contrast is

[12]Certainly low time preference/long time horizon will influence an individual to acquire long-lived, less liquid assets in the first place, but mere acquisition of long-lived assets, for example, by accident or through inheritance, may impose lower time preference on the beneficiary. A lottery winner who receives a highly liquid asset often squanders it quickly, but individuals given less liquid benefits, for example, recipients of encumbered trust funds or annuities, likely exhibit more responsible behavior.

[13]Hoppe (2001, pp. 15–39) argues for the superiority of monarchy over democracy in terms of preserving private property. Hereditary monarchs tend to have lower time preference because the instrument of state coercion and the revenue streams it generates are the sovereign's personal property, which they can pass on to their heirs. Democratic rulers have higher time preference simply because the most the democratic order can offer them is temporary exercise of state coercion and temporary use of the revenue stream. Democratic rulers must rush to use up whatever coerced revenue they can extract while they remain in office, and cannot transfer future revenue to their heirs. The incentives facing democratic legislators are to avoid passing on residual resources to the opposition party which eventually succeeds them. Furthermore, because state coercion is not property and cannot be transferred in a democracy, the economic calculation necessary for efficiency is rendered impossible (Ibid, p. 24; see also Rothbard 1977, pp. 172–84 and Hoppe 1989, chap. 9). In Hoppe's view the rulers' high or low time preference strongly influences the time preference of the ruled.

between the secure English King Henry II and his far less secure son John (Mulligan 2004, pp. 49–57). Rulers face strong incentives to protect their own income, and their citizens' persons, productive activity, and property (Holcombe 1994, pp. 8–9). One reason why rulers are motivated to protect their citizens is because the rulers' income comes from taxation of the citizens.

Property accumulation can proceed unimpeded in the absence of any coercive power. Coercion and violence seem to be necessary outlets or professional occupations for those less admirable individuals with comparative disadvantage in production. Wealth seems desired generally for the direct satisfaction of individuals' wants, but also, in a secondary manner, seems desired to elicit the admiration of others for the possessor. Thus individuals with comparative disadvantage in production are motivated to use their comparative advantage in violence to extract wealth from those with comparative advantage in wealth creation.

The comparative advantage in violence can be thought of as a comparative advantage in wealth extraction. It seems best from the producers' perspective to be subject to no coercive power whatever. However, given the presence of some level of coercion, which seems to follow necessarily from the fact that some individuals must have comparative disadvantage in production and therefore comparative advantage in violence, producers must prefer coercion which protects their property, however imperfectly, to coercion which aims only at destroying it.

> When a strong coercive power exists, economic success requires that property rights be recognized and supported by that power—that is the essence of a protection racket. State recognition of property rights is required to achieve the most efficient use of resources then, but only because the state is a threat to those rights. But if states did not exist, property rights still would. After all, property rights arise in customary law communities without state backing. (Benson 1999, p. 153)[14]

Means of employing violence and coercion seem to have evolved early, which promoted the production and accumulation of wealth. Wealth producers benefit from the protection of the less productive providers of protection services, who receive their income as payment from the wealth producers under their protection. Coercive agents who extracted the most wealth immediately, leaving none for the future, quickly drove to bankruptcy the societies they ostensibly protected. Unless they could spread their plunder in an ever-widening circle, they ultimately had to run out of individuals from whom they could extract wealth. "Where nothing has first been produced, nothing can be expropriated, and where everything has been expropriated, all future production will come to a shrieking halt" (Hoppe 2001, p. 19).

Coercive agents who exercised moderation and allowed the wealth producers to retain the maximum proportion of the wealth they created found the producers they protected created wealth more rapidly, and the coercive agents

[14]See also, Ellickson (1993); Bailey (1992); and Benson (1991, 1992, 1994).

enjoyed a share of the growing surplus. They succeeded along with the society they protected and whose growth their lenient and liberal treatment encouraged.

In an environment where property rights are insecure, either due to high likelihood of government expropriation, or high risk of external conquest, individuals will have short time horizons and high time preference. Thus reputation and repeated-deal arrangements are less valuable, social sanctions such as ostracism are less effective, and acceptance and implementation of moral norms less pervasive. In this insecure environment "crimes," such as vigilantism, unlicensed gun possession, and construction of unlicensed castles, are often "undertaken to exercise social control" (Ellickson 1991, p. 213; Acheson 1988; de Soto 1989).

Banfield (1974, pp. 61–62) considers time preference the principal underlying distinction between upper and lower classes. The upper class has property and low time preference, which results in higher economic productivity, educational attainment, and the amassing of greater wealth. The lower class has little or no property and high time preference, resulting in lower economic productivity, educational attainment, and wealth accumulation. It also accounts for a higher incidence of criminality. Criminals have high time preference and prefer the immediate reward of a crime even at the risk of a delayed and uncertain punishment. Differences in time preference also illuminate class mobility. High time preference upper-class individuals are likely to squander their wealth on immediate gratification and descend into the lower class,[15] whereas low time preference lower-class individuals are likely, through thrift and industry, to delay gratification and rise into the upper class. Exceptionally poor countries which have realized high savings rates have experienced phenomenal economic growth, particularly Korea and postwar Japan. Poor countries which have not protected private property have low savings rates and stagnant or even retrogressive economies. If savings are invariably confiscated, there can be no benefit from delaying gratification.

The progress of civilization is a process of capital accumulation and the substitution of voluntary exchange for coercion and violence (Elias 1978; Hoppe 2001, p. 6). Hoppe (2001, p. 7) likens the lowering of social time preference which accompanies the transition from barbarism to civilization to the lowering of individual time preference which accompanies the transition from childhood to adulthood. Actual or supposed social degeneration can lead to individuals raising their time preference, a phenomenon which can be compared to the transition from adulthood to old age, the Ikiru effect (see note 7). A perception of social degeneration can become a self-fulfilling prophecy, if

[15]William Hogarth's *A Rake's Progress* (1735), a cycle of eight oil paintings and engravings sold by subscription is only one literary example. Stravinsky's opera *The Rake's Progress* (1951), with libretto by W.H. Auden and Chester Kallman, premiered in Venice in 1951. In Charlotte Brontë's *Jane Eyre* (1847), Jane's cousin inherits great wealth and similarly squanders it.

individuals adopt an attitude of *après nous le déluge*, attempting to consume all resources immediately.

The time preference of one individual can influence the time preference of others (Rothbard 1962, pp. 147–59, 1977; Hoppe 1989, 1993, 2001, pp. 6–7). As low time preference individuals save and effect capital accumulation, making the structure of production more productive and roundabout, the marginal utility of present goods tends to fall relative to future goods. This tends to lower everyone's time preference *ceteris paribus*, though some will still have higher or lower time preference. In addition, as capital accumulates through the saving of low time preference individuals, the relative scarcity of labor increases, and wage rates rise *ceteris paribus*. The higher wage rate tends to raise the supply of present goods and lower the time preference of previous nonsavers. As wealth and income increase, life expectancy rises, increasing the marginal utility of future goods over present goods, and lowering individual time preference *ceteris paribus*.

Hoppe (2001, pp. 11–14) suggests that crime has at most a transitory impact on time preference. However, any increase in the perceived incidence or expected risk of criminal expropriation, can hardly be different from a higher incidence of government expropriation. Hoppe emphasizes the difference that loss to criminals is not considered legitimate and protective measures aimed at minimizing or eliminating criminal losses are generally permitted and considered legitimate, whereas loss to the state is considered legitimate (permitted "under the law") and that countermeasures against the state are generally criminalized and not generally recognized as legitimate, often even by the victims of state coercion. These differences Hoppe emphasizes must be acknowledged, but it is argued here that they have little practical impact. This is because, though a higher risk of crime can be offset by safeguards, caretaking, and insurance (Tullock 1967), while a higher likelihood or degree of state coercion cannot, the costs of implementing safeguards, caretaking, and insurance, all necessarily detract from the funds available for investment. This results in a permanently lowered capital stock, much like that which results from state coercion.

A further argument for the systematic impact of crime on time preference is that higher crime rates generally seem to result from short-sighted public policy initiatives, measures of confiscatory government coercion, which increase time preference, systematically influencing citizens to resort to crime. Hoppe's analysis seems flawless with regard to individual crimes considered as more or less isolated events, and Hoppe is correct to point out that government is far more effective an expropriator of wealth than any other criminal class. If the government expropriates significantly more than all individual criminals considered together, the government does more to impede the process of capital accumulation and the progress of civilization.

Though crime is only one of many high time preference behaviors, others include risk-taking, incivility, insensitivity, unreliability, untrustworthyness, rebellious behavior, self-destructive behavior, sexual libertinism, certain eating

disorders, and extreme sports (quite a mixed bag, many of which include some kinds of criminalized behavior as extremes). The systematic relationship between criminality per se and high time preference is well documented (Banfield 1974, pp. 140–41, 1977; Wilson and Herrnstein 1985, pp. 49–56; Hoppe 2001, p. 31, 31n).

Hoppe (2001) notes taxes were relatively low in medieval times, and that low tax rates continued until after the Industrial Revolution (Cipolla 1980). Interest rates, indicators of the social rate of time preference arrived at through arbitrage between low time preference savers and high time preference borrowers, had fallen to approximately 2 percent between 1900–1914, and have risen systematically since the beginning of World War I (Rothbard 1983, 1992; Homer and Sylla 1996, pp. 553–58; Hoppe 2001, pp. 27–28, 27n).

Property Rights in More Advanced Societies

In more advanced societies, groups that gain political influence, for example, by gaining wealth or threatening political disruption, may persuade rulers to recognize their property claims. However, these groups often demand wealth transfers undermining others' property rights. As Benson (1999, p. 152) observes, the "more secure the sovereign feels, the longer his time horizon tends to be, and this in turn implies more secure private property rights." This provides an incentive for cooperation and the basis for a symbiotic relationship between ruler and ruled (Holcombe 1994, p. 171). Advanced societies exist in a tension between incentives to enforce property rights to enhance wealth creation and the sovereign's income, and conflicting incentives to extract rents from one group to support another. The groups that benefit from rent extraction contribute to maintaining the sovereign's security.

Market participants may support a coercive police authority because they seek to reduce transaction costs impeding coordination, or as a response to uncertainty. This leads to joint production of extortion, where victims of a protection scheme invite, accept, support, and legitimize the protection scheme, because it serves their actual needs. The Mafia simultaneously extorts wealth from victims, and promotes wealth creation by (a) protecting victims from outside threats and (b) enforcing their contracts (Gambetta 1993). When the government obtains a monopoly on protection service provision, citizens face incentives to engage in "political" means of wealth enhancement as opposed to "economic" means of wealth production through cooperation (Oppenheimer 1914). Market participants also compete to benefit from state's rent-extraction authority.

Homer and Sylla (1996, pp. 64, 136–43) document a characteristic U curve for interest rates over the course of a society's evolution and decay. Interest rates initially fall as a society becomes more secure and time preference falls. The golden age occurs in a "bowl" of low interest rates during which time preference is a minimum. However, low nominal interest rates can also be brought about by credit expansion. Thus it is more correct to say that lower

time preference or lower originary interest indicates a golden age, because these would be less influenced by inflation, except to the extent high inflation imposes high time preference. When the society is in decline, either beset from internal or external sources of insecurity, time preference and interest rates both rise. Smith (1988, p. 134) associates a rise in political activism with increased time preference. In his view, the increased "primacy of the political" constitutes a drive for more immediate gratification. Smith (1988, p. 135) also notes an accompanying tendency to supplant property rights with human rights which can still be supported by moderate statists advocating some level of expropriation. In analyzing modern interest rates, Homer and Sylla note that there is no guarantee that the rise in interest rates attributable to social and moral degeneration must be irreversible.

The characteristic U curve can be observed in U.S. corporate bond interest rates. Moody's Aaa corporate bond rate fell from the end of World War I to the mid-1940s. After World War II, these nominal interest rates rose until approximately 1980. Since the high inflation of the 1970s, nominal interest rates have generally fallen, suggesting we are approaching the trough of another bowl. It appears that more advanced industrial societies are characterized by a repeated U due to cyclical increases and declines in property right security. It is clearly observed that interest rates spike periodically throughout the nineteenth century at short periods of high inflation, and remain high over periods of sustained inflation. Raising taxes has a similar effect. An increase in time preference due to the Civil War income tax is masked in interest rate series by the exceptionally high war and postwar inflation.

Although coercive government action impairs property right security in myriad ways, the most important, least discriminating, instruments are inflation and taxation. Inflation and taxation have not always risen together, but it seems clear that high inflation always causes high nominal interest rates. Some of this increase in interest rates caused by inflation is due to an increase in the price premium component, but because inflation raises the ratio between the present values of present and future goods, it also raises originary interest, that is, the rate of time preference. In addition to inflation, greater expropriation through taxation similarly increases time preference. As the rate of taxation on interest income rises, the incentive to save falls.

Income tax progressivity mitigates the impact of increased taxation on time preference, because individuals living nearest subsistence levels, who tend to have the highest time preference out of necessity, generally pay little or no income tax. In contrast, inflation and all other regressive or flat taxes, profoundly affect time preferences, most particularly in the lower tail of the income distribution. Reimposition of the income tax in 1913 must have had very little impact initially because the maximum tax rate of 7 percent applied only to income over $500,000.00.

In 1916 the highest marginal tax rate was raised to 15 percent on income over $2,000,000. In 1917 it was raised to 67 percent on the same bracket

(Sagoo 2005, pp. 98–115). These unprecedented tax increases must have had profound impacts on time preference and savings behavior.

Tax rates were lowered over the 1920s, though the impact this relief should have brought about in lowering time preferences would have been offset by the Federal Reserve System's expansionary monetary policy. Taxes were raised in the early thirties and remained high until the Economic Recovery Tax Act of 1981. Rates were further lowered by the Tax Reform Act of 1986 and the Omnibus Budget Reconciliation Act of 1993. Because these tax cuts were implemented in a lower inflation environment, perceptible reductions in individual time preferences should be expected throughout most of the 1980s and 1990s.

Initially, interest rates fall as property rights become increasingly secure. This leads to complacency, which results in less intense attention to property rights security, causing the interest rate to increase. This may take the form of higher taxes, selective or general expropriation, or inflation. The decay of property rights seems to generally reach a crisis, after which taxes are lowered, expropriations discontinued, inflation falls, etc., followed by a new round of increasing complacency.

The liberal order successfully overthrew a status order but replaced it with a democratic ideal of unlimited majority rule. Although there are clear ideological limits on majority rule, these limits have not been successfully applied. Two of the most despicable tyrants in human history, Hitler and Mussolini, were democratically elected. The liberal order, as implemented, has failed to impose the same limits of the rule of law which were traditionally applied to the monarchical rulers of the *ancien régime* (de Jouvenel 1957, p. 193). The rule given in the Universal Declaration of the Rights of Man (1789) prohibiting the initiation of force,[16] is not generally applied to the state, and lamentably it has become widely accepted that the state may legitimately initiate force against the individual for myriad special purposes, or if the victims are Marxian class enemies. The state has always presented the individual with the greatest threat of force; in comparison, the threat of force from other individuals is almost insignificant.

Böhm-Bawerk suggested the cultural level of a nation is mirrored by its interest rates, and asserted that interest rates were inversely proportional to a

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[16]Article 4:

> Liberty consists in being able to do everything which does not harm others. Thus the exercise of natural rights of every man has no other limits than those which assure to other members of society the enjoyment of those same rights. These limits can only be determined by law.

The corresponding passage from the UN Universal Declaration of Human Rights is Article 29, section (2), which unfortunately omits the implied prohibition of the initiation of force:

> In the exercise of his rights and freedoms, everyone shall be subject only to such limitations as are determined by law solely for the purpose of securing due recognition and respect for the rights and freedoms of others and of meeting the just requirements of morality, public order and the general welfare in a democratic society.

people's intelligence and moral strength (Schumpeter 1951, p. 182). This view fails to take account of policy-induced reductions in interest rates, spurred by expansionary monetary policy intended to stimulate investment and expenditure. Böhm-Bawerk (1959, vol. II, pp. 97–101; vol. III, p. 196) also failed to recognize time as a productive resource, complementary to all other resources used to produce consumable goods. Kirzner (1996, p. 6) distinguishes interest from a productivity return.

Inflation and Property Rights

Expropriation can take the form of taxation, inflation or liquidity creation, or of government regulation which restrict owners' ability to use their property to satisfy their wants (Hoppe 2001, p. 13). Expropriation can be implemented against real property or land, movables or chattels, money income or wealth, and even against human capital or entrepreneurial talent insofar as the state can regulate individual behavior, or simply tax the income stream made possible by human capital or talent. Inflation accomplishes the same end, but is a particularly indiscriminate form of expropriation. Inflation or liquidity creation compels citizens to act in many ways as if their time preference was much higher, even though it sometimes accompanies a negative real interest rate.

In modern times inflation supersedes all other methods in importance. The higher the rate of inflation, the less secure property rights become. Thus, the higher the rate of inflation, the higher the rate of nominal interest, to the point where the real interest rate is often negative during periods of high inflation, because they are related by the following conventional definitions of the *ex ante* and *ex post* real interest rate, the Fisher (1896)[17] equation:

(1) [*ex ante* real interest rate] $r = n - p^{*exp}$

(2) [*ex post* real interest rate] $r = n - p^{*}$

where r is the real interest rate, n is the observable nominal interest rate, and p* is the inflation rate or rate of change of the price level. p* cannot be observed before the fact, and the inflation premium built into a loan is thought to embody the lender's unobservable expectation of how much the price level will rise during the performance period of the loan. This is subjective in reality, as well as unique to each borrower. Furthermore, competition ensures that borrowers will seek to borrow first from those lenders charging the lowest inflation premia. Thus, it would seem arbitrage contributes

[17]See Rothbard's (2004, pp. 831–43) critique of the Fisher equation. Rothbard points out, among other things, that if prices were expected to fall sufficiently, no borrowing should be possible.

much more to arriving at a single market interest rate than any hypothesized uniformity of expectations.

The higher the rate of inflation, the more the demand for loanable funds shifts to early maturities, and the more the supply shifts to longer maturities. Thus, the increased demand for short-term loanable funds, which constitutes a lowered demand for short-term bonds, lowers the price of short-term bonds, increasing their yield. Similarly, the increased supply of long-term funds constitutes an increased demand for long-term bonds and increases the price of long-term bonds, lowering their yield. This results in the inverted yield curve which is characteristic of periods of high inflation.

Time Preference and Interest Rates: The Pure Time Preference Theory

Carl Menger's radical subjectivism resulted in the construction of a theory of interest which does not depend on objective resource productivity. Menger (1871, p. 70) notes that the uncertainty facing the production process decreases with the progress of civilization. Progressive adoption of roundabout methods of production enables entrepreneurial planners to alleviate material scarcity, but the use of more time-intensive means of production is necessarily limited because "satisfaction of earlier needs must necessarily precede attention to later ones . . . attainment of well-being in a nearer period is, as a rule, a prerequisite of well-being in a later period" (Menger 1871, p. 153).[18] Precisely because we can make use of the greater time available between the present and the remote future, our most urgent attention and anxiety focuses on the present and the immediate future. After its introduction by Menger, the pure time preference theory (PTPT)[19] of interest was subsequently developed by Frank Fetter (1902, 1914a, 1914b, 1914c, 1977) and Ludwig von Mises (1980). Fetter's (1902) initial work on interest was a critique of Böhm-Bawerk's use of the productivity theory of interest. Fetter (1914a, 1914b, 1914c) later developed the pure time preference theory while criticizing Fisher's use of the productivity theory. As Kirzner (1996) notes, the pure time preference theory played no role in the Cambridge capital controversy, and subsequently has often been dismissed as absurd. Knight's (1921, pp. 130–36) dismissive view was highly influential.

A simple illustration demonstrates why interest is attributable exclusively to time preference. Suppose a machine costs $100,000 and produces $10,000 value added each year, at current and expected future market prices. Suppose

[18]Menger's argument suggests the analogy of a business firm which can never gain access to a future stream of expected profits if it is unable to avoid near-term insolvency by maintaining a positive cash flow. The short-term requirement is the precondition for the long-term benefit.

[19]The expression "pure time preference theory" was introduced by Kirzner (1996, pp. 134-54). Initially the need to distinguish an Austrian theory of the interest rate from non-Austrian theories was far from evident.

for simplicity that both the machine and the technology are infinitely-lived, and price expectations are static. Clearly this machine yields a perpetual 10 percent return, and that this 10 percent return is a characteristic of the machine and its operation in the production process, given the postulated price of $100,000 and the postulated $10,000 value added.[20] However, suppose the permanently prevailing market interest rate is only 3 percent. Then the machine should be more desirable, and its market price should be bid up. In fact, we can see that the market price of the machine should be bid up to the price that would reduce the perpetual return to 3 percent, namely $333,333.33.[21]

Until the price of this machine is bid up to that level, opportunity for arbitrage persists. Thus, the objective productivity of capital or other resources can play no role in determining the market interest rate, because of the role the objective productivity plays in determining the value of the object at a point in time. Only time preference *and unrealized arbitrage opportunities* can relate values of goods across time periods. The market for capital equipment should be indistinguishable from the market for government bonds, which clearly perform no productive services.

Hayek's theory of production structure is occasionally criticized based on higher objective returns to some forms of capital, and that in any case higher returns should be sought by entrepreneurs. The interest rate which is proportional to the slope of the hypotenuse of the Hayekian triangle, it is objected, can only be a marginal interest rate. Most investment projects yield higher returns, because entrepreneurs rank prospective investment projects from those with the highest expected return, which are funded first, to those with the lowest expected return, which are funded last, and then only if the expected return at least matches the prevailing market interest rate at which funds can be borrowed to finance investment.

This objection, that objective returns can be higher than a prevailing market interest rate, seems to be answered by the arbitrage argument. If a resource yields a higher than market return, like a government bond, its value should be expected to be bid higher, thus lowering the yield.

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[20]The marginal physical product (MPP) is an objective characteristic of the machine. The value added or marginal revenue product (MRP) of the MPP is an objective characteristic of the machine in that it is an objective exchange value arrived at through arbitrage among differing subjective use-values. Future expectations of how the MRP will evolve over time are similarly unique and subjective. The higher an individual's estimate of the future MRP stream, the higher price they will offer to buy the machine, the lower the estimate, the lower the asking price required to sell the machine. The value the machine adds is objective only under the restrictive assumption of uniform expectations, as use-value is inherently subjective. I am indebted to Joseph Salerno for suggesting this interpretation.

[21]In this example, the return on capital before arbitrage is 3.33 times the market interest rate. Since the value of the capital is the present value of the income stream it provides, arbitrage opportunities persist until the price of the capital is bid up by the same multiple, 3.33.

Property Rights and the Term Structure of Interest Rates

Modern finance advances five theories of term structure, the relationship between average annual return and the time to maturity at any point in time (Thomas 1997, pp. 138–54; Van Horne 1978, pp. 83–100). These are the pure expectations theory, the liquidity premium theory, the segmented markets theory, the preferred habitat theory, and the Cox-Ingersoll-Ross (1985) theory. Each will be discussed in turn below, along with the implications of changes in time preference, which changes along with the security afforded to property rights.

1. Pure Expectations Theory

The pure expectations theory (Fisher 1896; Lutz 1940) is based on four assumptions: (1) investors desire maximum returns over each relevant time horizon; (2) they regard various maturities as perfect substitutes; (3) transactions costs are zero or negligible; and (4) investors act on their expectations. Under these assumptions, the term structure of interest rates reflects only expectations about future returns. This term structure would be assured by arbitrage across maturities, assuming zero transactions costs.

In this kind of interest rate environment, any change in property rights security would change investors' time horizon. Higher time preference and lower time horizons would result from less secure property rights. This would impose increased transactions costs. Thus, any loss of property rights security would increase long-term yields, resulting in a more steeply upward-sloping yield curve whenever time preference increases. This insight offers no testable hypothesis because the pure expectations theory does not predict any particular shape for the yield curve, and the modification to the pure expectations theory proposed here predicts a more steeply upward-sloping yield curve whenever time preference increases, but not any particular shape. Although the pure expectations theory does not predict any particular configuration for the yield curve, it is unambiguous that loss of property rights, or any other increase in time preference, rotates the yield curve counter-clockwise, while reductions in time preference rotate the curve clockwise.

2. Liquidity Premium Theory

The liquidity premium theory (Hicks 1946, pp. 146–47) is based on the insight that longer-term bonds entail greater market risk and therefore must offer a higher yield than a succession of rolled-over short term bonds with equivalent expected yields. Holders of longer-term bonds must be compensated for their loss of liquidity, and because they are exposed to market risk over a longer time period. This implies a more steeply ascending, or less steeply descending, yield curve than the pure expectations theory.

Here, a loss of property rights implies greater market risk and transactions costs, and the impact of higher time preference is amplified. When

property rights are impaired, the yield curve rotates counter-clockwise as in the pure expectations theory, but the effect is more pronounced because the curve starts out steeper.

3. Segmented Markets Theory

The segmented markets theory (Culbertson 1957) is based on the presumption that institutions and investors match maturities of assets with liabilities. It assumes little or no scope for substitution among maturities. Thus the U.S. Treasury should dominate the bond market and determine the yield curve. Loss of property rights security increases time preference, increasing demand for, and lowering the yield of, short-term bonds. This lowers the demand for long-term bonds, raising their yields. The segmented markets theory explains why the yield curve can be inverted or U-shaped. Again, the yield curve should be flatter the more secure are property rights, and any loss of property rights rotates the curve counter-clockwise.

4. Preferred Habitat Theory

The preferred habitat theory (Modigliani and Sutch 1966) relaxes the segmented market assumption of no substitution among maturities. It assumes institutions and investors have strong preferences for particular maturities, but can be persuaded to stray out of their preferred maturity or habitat by sufficiently attractive yields on instruments of other maturities. An environment which would create an inverted or U-shaped yield curve under the assumptions of the segmented markets theory would, at most, create a less extreme configuration under the preferred habitat theory. Arbitrage among maturities which are not so much rigidly segmented but more realistically are preferred by savers and borrowers lessens the extreme differences among interest rates the loan market arrives at for different maturities. Once again, loss of property rights security increases time preference, raising demand for short-term bonds and lowering their yields, unless long-term bonds pay a sufficient premium. This significant difference between preferred habitat theory and the other theories of term structure suggests the possibility of a testable hypothesis.

5. Cox-Ingersoll-Ross (CIR) Theory

Cox, Ingersoll, and Ross (1985) build a stochastic calculus model of a continuous-time competitive economy in which individuals maximize the utility expected from consuming a single good. The representative agent chooses the optimal level of consumption, the optimal level of savings to be invested in production, and the optimal level of saving to be invested in government bonds. The representative agent can also invest remaining savings at a riskless short-term interest rate or borrow at the same rate.

Changing the rate of time preference by changing the level of property rights security seems to have the same impact of rotating the yield curve. In the CIR model, bond prices are an increasing function of the covariance of the

interest rate with wealth. If this covariance is high, bond prices tend to rise (since interest rates fall) when wealth falls, and tend to fall (since interest rates rise) when wealth rises. The representative agent wants to hold bonds because they offer some protection from market uncertainty. Property rights security would impact the kind and extent of uncertainty to which agents are exposed; more secure property rights would reduce uncertainty, lessening the advantage of holding bonds.

The CIR model also yields the result that bond prices are an increasing concave function of interest rate variance. If a higher interest rate variance reflects greater uncertainty, risk-averse investors would tend to value bonds more highly the more uncertain the environment they face, lowering their yields.

Because the first four theories of term structure successively build on one another, strong linkages between time preference and property rights can be demonstrated in each theory. The Cox-Ingersoll-Ross theory inhabits a different level of mathematical formalism, and offers stronger implications about the interest rate environment, but appears consistent with the general conclusion that the less secure are property rights, the higher are interest rates generally, and the steeper is the yield curve.

In each theory of term structure, public choice suggests democratic politicians face incentives to effect a counter-clockwise rotation of the yield curve. This redistributes wealth and income away from low time-preference individuals toward high time-preference individuals. The political process simultaneously rewards high time-preference individuals as it manufactures more of them. In addition, it is clear democratically elected rulers, to the extent their term in office is or may be limited, share the high time preferences they reward.

Established theories of term structure suggest no requirement that time preference be either magnitude-consistent or time-consistent, or that they be equal between two individuals. Market interest rates result from arbitrage between high time preference individuals who desire to borrow and are willing to pay relatively higher rates of interest, and low time preference individuals who are willing to lend and will accept relatively low rates. Individuals' time-inconsistency must play a role in determining different interest rates for different maturities, as in the segmented markets theory of term structure. However, much like the preferred habitat theory, individuals must be expected to stray from their preferred maturity if other maturities offer more attractive interest rates—either sufficiently lower for borrowers, or sufficiently higher for lenders. Arbitrage tends to minimize differences in interest rates for different maturities.

> There prevails a tendency toward the equalization of this ratio [the rate of time preference, which Mises calls originary interest] for all commodities. In the imaginary construction of the evenly rotating economy the rate of originary interest [that is, the rate of time preference] is the same for all commodities. (Mises 1949, p. 526)

Conclusion

Though time preference is necessarily subjective, it should be influenced by objective external factors such as property rights security. Any decrease in security of property rights should raise time preference, perhaps most dramatically in those who own the most property, or in the case of discriminatory legislation, those whose property rights are systematically degraded. This should be observed in an increase in interest rates, as those whose time preference has increased should seek to borrow more and lend less, driving up prevailing market rates. Any improvement in property rights security should be observed in a lowering of interest rates, as those whose time preference has gone down, should seek to borrow less and save more, lowering the market rate.

In contrast to the formerly ascendant Marxian view which associated collective ownership with a higher state of civilization, the enhancement of property rights proceeds with the evolution of civilization and government. As individuals come to value and recognize property rights, they become free to implement more productive, roundabout, capital-using production methods. Roundabout means of production cannot be relied on in the absence of secure property rights.

However, once capital-using society evolves to a state where the government becomes dominated by self-seeking bureaucrats and politicians, the liberal order seems inevitably to break apart into competing interest groups seeking to monopolize the government's unlimited rent-extraction authority. The liberal order evolves through the inexorable political economy of the democratic process into outright socialism, or at least into welfare statism. These two decadent forms of liberalism mistakenly attack private property, failing to recognize that private property is a necessary precondition for the liberal order. Thus general time preferences fall to a minimum as the liberal order triumphs over the feudal status society, but then rise again as the liberal order decays into socialism or the mixed economy. In a sufficiently advanced and complex society, the interest rate moves in a cyclical pattern tracing the ebb and flow of higher and lower time preference and more or less secure property rights.

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