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Free Software, Business Capital, and Institutional Change: A Veblenian Analysis of the Software Industry

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Abstract: Free software, unlike proprietary software under exclusive copyright control, exemplifies a form of productive and innovative activity that is based upon mutual sharing of technological knowledge. Free software engineers, who get connected through various software-development projects, voluntarily contribute their time and skills to produce computer programs which, they insist, should be free for anyone to use, modify, and distribute. This paper argues that Thorstein Veblen's socio-economic theory – in particular his conceptions of capital, technological knowledge and institutional change – offers a fruitful framework to analyze the emergence of free software as an economic and social phenomenon. From the Veblenian perspective, the free software movement argues that the technological knowledge in the software industry should freely be available to society as a part of its common stock of knowledge. In other words, they are against the use of copyright law as a predatory strategy by software corporations, while the current technological conditions in the software industry allow for an institutional arrangement of production and innovation based on cooperative habits of thought.

Keywords: copyright law, free software, open-source software, software industry, Thorstein Veblen

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It is a truism by now to say that the world economy has been undergoing profound transformations due to the advances made in information technologies. Various terms have been used to designate this change – to emphasize that something new is happening – such as information economy, knowledge economy, post-industrial economy, and so on. One of the main themes underpinning these and similar terms is the idea that we are witnessing a change where the economy of the industrial era –

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i.e., the economy of heavy machinery, electric power, manual labor, coal and steel – has given way to a "new economy," in which competency in the use of knowledge (summed up by the term "human capital") constitutes the fundamental aspect of all productive processes in society. According to this view, the *new economy* is *post*-industrial in the sense that knowledge now has "replace[d] both labor and capital as the main factor of production," just as Drucker (1968) and Bell (1973) described decades ago in the early years of the information revolution (Dyer-Whiteford 1999, 31).[1]

Yet, this characterization is quite problematic, not only because it is rather vague (one wonders, for instance, whether there really is a difference between such key terms as "information economy" and "knowledge economy") but mainly because it misrepresents, I would argue, the nature of the change. The emphasis on knowledge and its use as the defining element of the *new economy*, the idea that it is the knowledge content and intensity of goods and services which separates the post-industrial era from the industrial one, does not do justice to the historical fact that technological development cannot be separated from human knowledge in general.[2]

The last observation is the key point in Thorstein Veblen's analysis of technological knowledge. For Veblen, in *any* period of its history, a human society has recourse to a common stock of technological knowledge, "knowledge of ways and means" together with the "matter-of-fact knowledge" of materials used in the procurement of livelihood (Veblen 1908a, 518). This "immaterial equipment" of society develops and passes on from generation to generation cumulatively, and as such it is not the product of a single generation. Instead, it belongs to the "cultural" life history of the society as a whole (Veblen 1914, see Lower 1987). The "material equipment" of society, on the other hand, (material means of production, "capital goods"), becomes serviceable to society only insofar as it is used to engross and put into use this immaterial stock of technological knowledge, and is nothing but raw materials without such knowledge. In the "machine industry," Veblen remarks, the ownership of the material equipment necessitates large financial resources, and this had been a decisive factor, according to Veblen, in the institutional change from the handicraft era to business capitalism (Veblen 1908a). In other words, the high cost of the material equipment after the industrial revolution put the industrial state of arts largely out of reach of the handicraft producer, and led to the emergence of business as the dominant economic institution in society. In this "business economy," Veblen observes, the ownership of the industrial equipment – which is simply an investment of monetary wealth, of "capital," for business people (Veblen 1908b) – brings with it the control of society's technological stock of knowledge by business interests (Veblen 1908a).

This paper aims to put into a theoretical perspective a particular development in the so-called *new economy* by using Veblen's account of technological knowledge, business capital, and evolutionary institutional change. The free software movement – "free as in free speech not as in free beer," meaning that free software is a matter of freedom, not price (Stallman 2002) – has exemplified the possibility of technological development outside the proprietary culture of the business system (see, for example,

Chopra and Dexter 2007; Moglen 1999; Williams 2002). Free software engineers, who voluntarily contribute their time and skills within a network of decentralized software-development projects, insist that software should be free in the sense that users should have the freedom to use, distribute, and modify it as they see fit. They see this freedom as important not only for the development of sophisticated computer programs, but also for the cause of maintaining a free culture (Lessig 2004). From a Veblenian perspective, they argue that this stock of technological knowledge should freely be available to society to make use of and further develop. The free software movement resists, therefore, the lobbying strategy used by dominant corporations to widen the scope of copyright law and to implement "end-user license agreements," which strictly inhibit users' freedom.

Similar to the case of the machine industry, the high cost of mainframe computers in the early days of the software industry necessitated big financial resources for the advancement of software technology. The software industry initially developed, therefore, alongside the hardware industry, mainly with the support of universities, government institutions, and investments made by business interests (see Langlois 1992). But what has changed in the software industry is that the necessary material equipment to engross and use, *a la* Veblen, the existing stock of technological knowledge is widely disbursed today throughout society (Benkler 2006; Cohen 2010) – all you need is a PC, Internet connection, and your skills. This potentially allows society to use, build upon, and advance its software technology without the involvement of business capital. As the material means get fragmented and decentralized, dominant corporations in the software industry try to retain their control over technological knowledge by enforcing property rights over this knowledge – over the immaterial equipment of society – through the enactment of strict copyright laws. It is this tendency toward absolute "business ownership and control of technological knowledge" that the free software movement struggles against.[3]

Free Software: Free as in Free Speech

It all began in 1980 when Richard Stallman, now the founder of the Free Software Foundation, wanted to fix the malfunctioning laser-printer at the Massachusetts Institute of Technology (MIT) Artificial Intelligence Lab, where he worked as a software programmer. When he asked someone for the "source code" of the program running the printer, he was, to his surprise, refused because the software had been released under a nondisclosure agreement.[4]

Since its early inception it was part of the hacker culture to share software (see Chopra and Dexter 2007; Söderberg 2008).[5] This was the method that the software community employed to develop, use, and improve a variety of computer programs. When someone found a problem, a "bug," he/she would fix it, and then make the new version of the program available to the community so that others could further develop it. And this was true not only for those working at universities or other public institutions. Even private hardware manufacturers made the programs that they

developed freely available to their own advantage, so that hackers would use them, report bugs, and even make further improvements on the programs (Stallman 2002; Williams 2002). There had always been "proprietary software" around – that is, software you are not allowed to share or have access to its source code due to copyright restrictions – but the norm in the programming community was that software was free for anyone to use, improve, and distribute. This, however, started to change in the late 1970s and early 1980s when the software industry gradually established itself as a business separate from the hardware industry (see Campbell-Kelly 1995; Langlois 1992), which Stallman had to learn the hard way.

A computer program, a software, is an ensemble of instructions that tell a machine how to do certain tasks.[6] The source code of a program is the higher-level set of instructions written in programming languages such as Java, C, Python etc. A machine cannot read the source code; it is in a human-readable form. The source code needs to be transformed, therefore, into "binary code," comprised of nothing but endless 0s and 1s. It is the binary code, i.e. the machine language, that computers can understand.

For a programmer to be able to make modifications to a software he/she needs to have access to the source code. This is because it is practically impossible for a human being to change a program according to his/her intentions using the binary code, which includes a series of millions of 0s and 1s. Stallman's request for the source code was, therefore, very legitimate from the perspective of a software engineer, whose only intention was to improve a computer program, as he had always been accustomed to do. His request, however, was no longer acceptable for business interests. Believing that there was something fundamentally wrong with the way things had been changing in the software community, Stallman decided to develop an "operating system," the main software necessary to run a computer. Moreover, he wanted this operating system to be compatible with Unix (a widely used operating system at that time) so that Unix-users could easily switch to it. He called his system GNU, which stands for "GNU is Not Unix" as a recursive acronym, and made it available to others with the intention of "creating a new software-sharing community" (Stallman 2002, 21). As the number of those who contributed to the project grew, Stallman and other voluntary participants decided to establish the Free Software Foundation in 1985 to get funding to further improve the GNU system. In this process, they did not develop everything from scratch, however. They used available non-proprietary software for various components of the GNU system, including the Unix-compatible kernel "Linux," which was developed by the programmer Linus Torvalds, when he was a college student in 1991. This is how the GNU/Linux operating system was born as a free software – software free for anyone to use, modify, and share.[7]

The word "free" in the term "free software" has nothing to do with price. It is about users' freedom to use, modify, and redistribute the program in any way they like. To distinguish between these two different meanings of "free" in the English language, one referring to price and the other to freedom, the free software movement uses the motto "free as in free speech not as in free beer." That means "free software"

refers not to those computer programs which are available "free of charge," but to those whose users have the "freedom" to modify and share it without any restrictions. A proprietary software, for instance, may be given away at no charge (like "free beer") as a part of the marketing strategies of a software corporation. This, however, does not make it free software, because copyright laws today do not allow the users of a proprietary software to further develop and share it. And reversely, if a software is distributed for a fee, it is still counted as free software as long as its users are not prevented by copyright restrictions from modifying and sharing it (Stallman 2002). Being free of charge, therefore, is neither a necessary nor a sufficient condition for a computer program to be free software, according to the Free Software Foundation.

Because of the ambiguity that the two different meanings of "free" creates, there have been some proposals for an alternative name such as "liberated" or "open" software, but those supporting free software have found none of them satisfactory (Stallman 2002). This is mainly because they did not want the term to lose its connotation of freedom, which they highly value. For its supporters, in other words, free software is not only a development strategy to produce and improve computer programs. It is also a "social movement" which aims to emphasize, first, that our freedom to use software as we see fit is essential for a free society and a culture of sharing, second, that there are threats to this freedom in the form of strict copyright enforcements, and, finally, that we can and should protect this freedom against these threats (Stallman 2002).

In the words of the Free Software Foundation, a software is free if you, as a user, have the following freedoms:

- Freedom 0: The freedom to run the program, for any purpose.
- Freedom 1: The freedom to study how the program works, and adapt it to your needs. (Access to the source code is a precondition for this.)
- Freedom 2: The freedom to redistribute copies so you can help your neighbor.
- Freedom 3: The freedom to improve the program, and release your improvements to the public, so that the whole community benefits. (Access to the source code is a precondition for this.) (Stallman 2002, 43)

The gist of these four freedoms is that you should be free to use the program in any way you like, as well as "to redistribute copies, either with or without modifications, either gratis or charging a fee for distribution, to anyone anywhere" (Stallman 2002, 43). You should not need to ask or pay for permission to have these freedoms. Nor should you be required to let anyone know in case you have made modifications to the program and published the new version.

There are a couple of salient points in these definitions that deserve re-emphasis. First, for Freedom 1 and Freedom 3 to be effective and meaningful, the source code needs to be made available both for modified and unmodified versions. Second, these definitions do not imply that free software is non-commercial. You can charge

whatever price you like for the software – this is a relation between you and the market. In fact, the freedom to sell a software product is also protected as part of the bundle of freedoms that you are entitled to, with the proviso that you cannot deprive others from these freedoms. There is, therefore, an exception for a particular case where there might be a limit on the price you charge. This arises when the source code is sold for a fee. In this case, without a limit on the price for the source code, companies could "set a fee too large for anyone to pay – such as a billion dollars – and thus pretend to release source code while in truth concealing it" (Stallman 2002, 67). In other words, when the source code of a computer program is distributed for a fee, the price charged should not be so as to render Freedom 1 and Freedom 3 ineffective. This is one of the measures that the free software community takes to ensure that these freedoms are protected.

The problem in general about "selling a free software," or as the Free Software Foundation would rather say, "distributing a free software for a fee," is a notorious one. As mentioned above, the freedoms that define free software have nothing to say against its commercialization. As a matter of fact, the free software movement encourages its participants to make money out of free software so that they can financially support themselves and perhaps also the Free Software Foundation (Stallman 2002). But, of course, the question one immediately asks is, "How is it possible to make a living as a free software engineer if people can get a copy of the program simply from their friends?" It should be stated that even though the definition of free software does not involve any reference to its commercial life, it does have consequences on the marketability of free software. Söderberg (2008) observes, for example, that the four freedoms above essentially limit the commodification of free software and put it basically out of the market mechanism. Similarly, Willinsky (2005) asserts that free software is practically like "free beer," which makes it "free as in free speech AND as in free beer."

Needless to say, the free software movement is aware of the consequences which their definition of free software brings for its marketability. They still think, however, that it is possible to get paid as a free software engineer, "just not paid as much as," in the proprietary software business (Stallman 2002, 38). The main idea they put forward is that it is not necessary to sell *the right to use a computer program* to make a living in the software industry. So, revenues could be based on various "support services" related to free software "rather than on selling licenses or source code" (Fugetta 2003, 78). These services would include technical support, training, customized software development for specific purposes, and porting of software onto a new hardware of a hardware manufacturer – namely, all those services which add value to a software package and which necessitate the skills of a software engineer (see Rosen et al. 2003; Stallman 2002). Two possibilities are open to free software engineers in this regard: Either the services related to free software could be charged for directly, or, if free software is distributed for a fee, the fee would include these services as a part of the software package. It should also be noted in passing that in the software industry recently, there has indeed arisen a new "business model" based on non-proprietary software (Fugetta 2003). Companies such as *Red Hat*, *Debian*, and

S.u.S.E. sell different versions of the GNU/Linux operating system (Maher 2000) for the pure sake of making profits in the "free software business."

Another important aspect of free software concerns its protection. The free software community simply wants to prevent others from making proprietary software out of free software. To this end, the community employs an ingenious legal device called "copyleft," which uses copyright law but turns it on its head. That is to say, instead of putting free software into the "public domain," they state that it is copyrighted; and they further add distribution terms which say that if you redistribute a free software – with or without modifications, with or without a fee – you must pass on all those freedoms that define free software. In short, the redistributed version must be as free as the initial one. Otherwise, copyright law will be violated (Lessig 2002). This ensures that free software does not turn into proprietary software and that, consequently, every user has the same freedoms. For the free software movement, therefore, the objective to produce free software involves – as its corollary – protecting it against business interests that might find it profitable to release their modified versions under proprietary terms. This protection is also important for programmers who are employed by private corporations and who also would like to contribute to the proliferation of free software. Without copyleft, corporations may claim copyright over the programs that their employees have developed using free software components. But the protection that copyleft offers leaves no room for business interests to produce proprietary software from free software.

In the GNU project copyleft is implemented through the GNU General Public License (GPL). Even though different software-development projects may use different licenses, the Free Software Foundation accepts them as free software licenses as long as they protect the fundamental freedoms as defined above. But one of the topics of intense debate in the free software community has been whether the criteria of the Free Software Foundation are not too strict. It has been argued that these criteria, which are essential, according to the Foundation, to protect free software, de-motivate some programmers and private companies who otherwise would have supported the movement. As a result, in 1998 a group of people from the free software community established the Open Source Initiative as a more "business friendly" approach to non-proprietary software development (Fitzgerald 2006, 590). They argued, furthermore, that the use of the term "open source" would also solve the problem associated with the ambiguity of the word "free" (Chopra and Dexter 2007, 15).

The fundamental difference between the free software and open source software movements lies in their philosophy, in the way they think about and answer the question, "Why should the source code be available for anyone to look at and develop?" For the free software movement, the answer involves an ethical dimension. Namely, free software is important not only to produce better software, but also because it respects users' freedom, which, they think, is part of the freedoms that a free society should embody (Stallman 2002). For the open source people, on the other hand, the issue is a practical one: The source code should be non-proprietary simply as a software-development strategy, so that many different software engineers could contribute to its betterment (see Raymond 1999). This difference in philosophy and

ethical attitude does not produce, however, two completely different classes of software. Most of the computer programs released and developed under open source licenses are accepted as free software by the Free Software Foundation (Stallman 2002). But one important difference concerns the so-called "viral clause" (Söderberg 2008), the restriction in the GPL which says that if a computer program contains lines of code from a free software, that computer program must also be licensed as free software. Open source licenses, on the other hand, "allow" derivates to be proprietary, which has been a leading factor for business firms such as IBM to "go open source." So, if a software is released under a license without the viral clause, it is not accepted as free software by the Foundation. This, together with the philosophical differences between the two movements, is the main reason why the Free Software Foundation does not accept the term "open source." Neither do they adapt such terms as FOSS (Free and Open Source Software) or FLOSS (Free/Libre and Open Source Software), urging people to use the term "free software" instead.

The freedoms that the free software community supports and the critique that they direct at proprietary software are intimately related to copyright law, in particular to the question, "What is it that copyright law protects?" In answering this question, the free software movement develops a critique of current copyright legislation around two main points: First, they maintain that, contrary to what the corporate world would like us to believe, copyright is not a "natural right" that the creators of intellectual property have of themselves. Rather, it is a right granted by the society for its own benefit. In other words, through copyright law the public foregoes some of its freedom to use and build upon the products of creative activity in order to give creators an incentive to produce more (Stallman 2002). As a support to their argument they emphasize that legal code, in its various traditions, has never accepted intellectual property on par with property in physical items, and so has always imposed limits on its duration. Intellectual property in this sense is not property as the term is commonly understood. They are, therefore, against the use of the term intellectual "property" when referring to the products of creative endeavors (Halbert 2005). They think this usage helps the supporters of proprietary software as a discursive device to impose their own terms on society, just like the use of the words "piracy" and "theft" for copyright infringements.

As a second point, and in relation to this, they criticize the understanding of copyright as seeking to establish a "balance" between society's interest and that of the creators of copyrighted items. They maintain that parties in this relation do not stand in symmetrical positions to each other. The state, using the legal framework, acts on the behalf of the public. And in all acts of the state, when, for example, the state spends taxpayers' money to build roads and bridges, the public interest comes before the private interest. It follows, then, that in the case of the copyright act, too, where the state spends citizens' freedom, the same principle should hold, and perhaps even with more force (Stallman 2002). The free software supporters argue, however, that entertainment and software industries have succeeded in prioritizing their interests over the common good through such recent legislations as the "Digital Millennium Copyright Act" (DMCA), passed in the United States in 1998, which increases the

restrictions in copyright law for the users of digitized products; the "Copyright Term Extension Act" (CTEA), passed also in the United States in 1998, which extends copyright terms by 20 years; and the Agreement on "Trade Related Aspects of Intellectual Property Rights" (TRIPS), signed in 1994 and implemented through the World Trade Organization (WTO), which aims to shape the copyright laws of developing countries in the spirit of DMCA and CTEA.[8]

To summarize, based on these two main arguments, the free software movement concludes that current copyright legislation on digital items clearly works to the detriment of the "public interest." For software in particular, they argue the public interest is harmed because copyright law today inhibits technological development by concealing the source code from potential developers, and also because, from an ethical perspective, proprietary software conflicts with the ideals of a free society. In the reminder of the paper, I shall elaborate on what the Veblenian theoretical framework has to contribute to this debate on copyright law. [9] Then, I shall analyze, from a Veblenian perspective, the rise of free software as a new economic and social phenomenon.

Copyright Law in the Software Industry and Veblen's Theory of Capital

The free software movement poses two related theoretical problems for economists and for social scientists in general. First, what are the theoretical underpinnings of the argument of the free software movement against current copyright legislation? And second, how is it that a productive practice which is based on a culture of sharing, collaboration, and communal ownership of resources has emerged in the midst of an economy that is largely driven by investment for profit by the business enterprise? In this section, I develop an answer to the first question using Veblen's theory of capital as the main theoretical framework.

Veblen's theory of capital, as he expounds in his *The Theory of Business Enterprise* (Veblen [1904] 1932), and further refines in two articles entitled "On the Nature of Capital" (Veblen 1908a, 1908b), comprises, I argue, two main propositions:

> *Proposition 1*: "Capital goods," that is the material contrivances of the production process, are not in themselves productive. Their productivity depends on the stock of technological knowledge which society has access to and which is the cumulative result of the historical life process and experience of the society.
>
> *Proposition 2*: The pecuniary return on "capital," which is itself a pecuniary fund of invested wealth, depends on differential advantages of ownership in the realm of production (tangible assets) and in the realm of distribution (intangible assets). And, the value of capital (the value of tangible and intangible assets) is equal to the capitalized value of the expected stream of this pecuniary return.

The first proposition puts forward a particular conception of technology for capital theory, and for economic analysis in general, that differs significantly from both John Bates Clark's "marginal productivity theory" (Clark [1899] 2005) and Eugene von Böhm-Bawerk's theory of "round-about methods of production" (von Böhm-Bawerk [1889] 1959), two dominant theories of capital in Veblen's time.[10] It is important to note that whatever differences there may be between these two economists in their theories of capital, they both adhere to an exogenous conception of technology (McCormick 2002). Namely, even though both Clark and Böhm-Bawerk acknowledge the role of technology in the productivity of capital, they do not incorporate technological knowledge as a constituent element of the definition of capital. For Veblen, on the other hand, the material means of production (the material equipment of society) do not have an "economic" existence independent of society's technological stock of knowledge (its immaterial equipment). To say that these material contrivances of production are capital goods as an economic category means, for Veblen, that "they have been brought within the sweep of the community's knowledge of ways and means" (Veblen 1908a, 522). This is evident, according to Veblen, in that many resources of production that men found in nature and made use of as technology developed were "useless, economically non-existent, on the early levels of culture, because of what men in that time [had] not yet learned" (532).

Veblen maintains that in those early stages of culture, the possession of the material means to make use of the then existing technological knowledge "is matter of slight consequence" (Veblen 1908a, 523). In other words, the ownership of primitive capital goods, which are rather easily available, does not confer any differential advantage in the economic realm. The institution of property, therefore, does not come to dominate the economy, and the use of the knowledge of ways and means by the common man is not hindered by property relations. In cases where production necessitates some large material equipment, such as a stock of domestic animals or a cultivated land of vegetables, these items are owned and used collectively. Whatever notion of ownership prevails in early human societies, it is largely "vague and uncertain" (523). This state of affairs characterizes, for Veblen, the peaceable culture (as opposed to the predatory one) where the "instinct of workmanship" (Veblen [1914] 1918) is the main motive that organizes man's economic life.

The situation changes, Veblen explains, as the stock of technological knowledge increases in later stages of human culture. First, the increase in technology gives rise to a surplus above the subsistence level. Second, the material means to engross society's stock of knowledge come to be so large that it practically becomes impossible for the common man to have access to them. Under these conditions, the ownership of material equipment necessary to engross society's immaterial equipment provides a differential advantage, and thus property relations arise (1908a, 524). This is how, according to Veblen, the instinct of predation/acquisition dominates the instinct of workmanship and the transition is made from the peaceful primitive stage to the predatory cultural era in human history (Edgell 1975). It is worth emphasizing that it is within this general theoretical discussion that Veblen links the rise of the institution of property to technological change. The increase in technological

knowledge creates the "conditions of possibility" for the motives of predation and exploit to dominate the propensities of workmanship.

Veblen uses the same theoretical framework for the analysis of the modern period starting with handicraft production. The material equipment necessary for the industry in the handicraft era was again largely within the reach of the common man. That is to say, "a man with a modicum of diligence, initiative, and thrift might make his way in a tolerable fashion without special advantages in the way of prescriptive right or accumulated means" (Veblen 1908a, 532). Such material conditions of economic life gave rise to a certain system of thought in the course of the eighteenth century known as the doctrine of "natural liberty." The early theoreticians of the liberal tradition, including classical economists, thought that within an economic system of competition "equality before the law, barring property rights, would mean equal opportunity" (533). However, as this "preconception" of liberal thinking and classical economics (Veblen 1899) was establishing itself in the realm of thought, the technological situation after the industrial revolution was already changing its material basis. With the industrial revolution, it became virtually impossible for the common man to own the material equipment of such a large magnitude as was now required by the new technology:

> On its technological side the characteristic trait of this capitalism is that the current pursuit of industry requires a larger unit of material equipment than one individual can compass by his own labor, and larger than one person can make use of alone. (Veblen 1908a, 534)

Under capitalism, therefore, industry requires large units of material equipment which in turn require large sums of accumulated wealth, "business capital" (Veblen [1904] 1932). These particular conditions after the industrial revolution explain for Veblen the rise of the business enterprise as the dominant institution of economic life, whereby the businessmen's "*pecuniary* mastery of the material means" takes precedence over the workmen's "*technological* mastery of the ways of industry" (Veblen [1914] 1918, 229, emphasis added). The dominance of "business" over "industry" in the famous Veblenian dichotomy is in that sense historically specific and defines modern capitalism in Veblen's theoretical framework.

This brings us to the second proposition about the pecuniary nature of capital (as opposed to capital goods) and the theoretical explanation of the pecuniary return to capital. In modern capitalism, Veblen maintains, the increased productivity of capital goods due to the technological stock of knowledge, together with the necessity of large monetary sums to possess them, creates a differential advantage to their ownership, upon which the business enterprise capitalizes. From the perspective of the business enterprise, the ownership of the industrial equipment entails investment of pecuniary wealth (investment of capital), the value of which is determined by its expected earning capacity based on the capitalized differential advantage (Veblen 1908b). Veblen differentiates between two categories of capital: "Tangible assets" are the material means of production in so far as the business enterprise expects a

pecuniary return to their ownership. Their value as capital is based on this expected return, which bears a relation to their productivity as capital goods in the production process (Veblen 1908b, 105). "Intangible assets" refers to any differential advantage that affects the distribution of total output to the benefit of the business enterprise, such as good-will, monopoly power, "freezing out of rival concerns," any legislation (for example, patents and copyrights) and "habits of life" in favor of the business (107, 116). Intangible assets are capitalized on the basis of their income-yielding capacity which arises due to the differential advantage that their ownership brings in the realm of distribution. One important difference, therefore, between the tangible and intangible assets is that, whereas the former have a relation to the "material serviceability" of capital goods to the community (106), the latter do not necessarily involve such a relation and, in fact, generally are disserviceable to society (116).

As Gagnon (2007) observes, by linking capital's income-yielding capacity to the capitalization of differential advantages in production and distribution, Veblen's theory of capital introduces, in its particular way, the concept of power into economic analysis. This power arises in that the organization of man's economic life around business principles entails the control of society's common stock of technological knowledge by business concerns. Through the business ownership of the material equipment, the technological knowledge of society becomes subservient to the pecuniary concerns of the business enterprise. But in addition to this, the business enterprise, in fact, aims to capitalize upon any differential advantage through the ownership of intangible assets such as patents and copyrights. Veblen's theory of capital leads, therefore, to the conclusion that, in an economy based on business principles, "knowledge" is capitalized through the ownership of tangible and intangible assets and so becomes the basis of business profits. The dominant position of business as an economic institution is predicated, in other words, on its ability under capitalism to engross and capitalize upon society's technological knowledge.

Copyright Law: What Is at Stake?

The question remains as to how to think about the *new economy* from this perspective opened up by Veblen's theory of capital? How, in particular, to use his theoretical structure, which he developed to analyze the industrial capitalism of the late nineteenth and early twentieth centuries, for an analysis of copyright in the software industry? Gallaway and Kinnear (2004) assert that institutional economics is "particularly well equipped to handle" the issues about copyright in digitized information because it can show how "[f]irms' ceremonial values" manifest themselves "in their rent-seeking attempts to defend and expand the outdated system of copyrights" (471-472). In a similar vein, Adkisson (2004) reminds us that "ceremonial deference to market-based solutions to social problems threatens to elevate intellectual property rights to a ceremonial status beyond their instrumental potential" (460). Veblen's theory of capital adds an important dimension to these institutionalist analyses, which employ the "ceremonial-instrumental" dichotomy of the "Veblen-Ayres tradition" (Waller 1982), by showing how the ceremonial call by business

interests for stricter copyright laws is related to the dependence of business profits upon the control of society's technological knowledge through business capital.

From the perspective of Veblen's theory of business capital, the fundamental change in post-industrial economy is that information technologies seriously undermine today the privileged position of business interests to engross and use technological knowledge. To explicate, in the case of the software industry in particular, the structure of capital goods necessary to produce and distribute software is widely fragmented throughout society. Therefore, anyone with necessary skills and with access to the Internet and a PC can use and build upon the technological knowledge in the software industry. In the Veblenian terminology, this amounts to saying that software engineers with access to the necessary material equipment do not need business capital to advance software technology as a part of society's common stock of technological knowledge. This condition creates a major obstacle for business interests to capitalize upon the differential advantage that the ownership of material equipment is supposed to bring. Free software, in other words, is generating a digital economy (in the production, distribution, and consumption of software) that can resist the power of business capital to control and profit upon society's technological knowledge. It is this economy about which Microsoft argues that it is "destroying the global software industry" (Moglen 2003, 1). What is happening, however, from the Veblenian point of view is that free software "frees" the software industry from the monopoly of business capital over the use of technological knowledge.

In his analysis of industrial capitalism, one of the fundamental contributions Veblen made was his ability to dissect the two separate parts of the very same process – "industrial system" on the one hand, and "business principles," on the other (Veblen [1904] 1932). He saw that these two distinct, yet entangled, facets of industrial capitalism have, in fact, different logics in the sense that they are based on different propensities and aptitudes of human nature (Veblen [1914] 1918). Whereas industry is associated with the instinct of workmanship, which "proceeds on the accumulated knowledge" of society and "turns it to account in dealing with the material means of life" (39), business is connected to the predatory inclinations of human nature which, under capitalism, take the form of the acquisition of "pecuniary gain" (185). This separation, which Veblen's insight allowed him to describe in theoretical analysis, in thought, is taking place today in reality, in front of our very eyes. Free software engineers, freely building upon each others' contributions, are advancing software technology with the objective of producing quality software open for everyone to use and share. The free software movement, as seen from a Veblenian perspective, illustrates, therefore, a new organization of productive and innovative activity, where the workmanlike propensities of software engineers could operate outside of the acquisitive culture created by proprietary software business.

The acquisitive aspect of business principles steps in, however, in the call by business interests for the enlargement of the scope of copyrights today. This response from the business community, which the Free Software Foundation is at pains to argue against, is quite understandable within the Veblenian theoretical structure. As the power of business concerns to capitalize upon society's stock of knowledge

decreases, to the extent that the material equipment in the software industry becomes fragmented and decentralized, they are increasingly trying to turn this technological knowledge into an intangible asset through the differential advantage that copyright law creates. This implies that, contrary to what the corporate world would like us to believe, copyright today does not simply function as an incentive mechanism to create. It has rather become a part of the strategies of business concerns to capitalize upon man's workmanlike propensities and upon the technological knowledge these propensities create as a part of society's common stock of knowledge. Veblen's understanding of technological knowledge as the "cumulative result of the cultural life history of society" is directly relevant here because, as Söderberg (2002) observes, the "knowledge that capital claims as intellectual property is often appropriated from communities in the first place, whether it is software made by hackers or crops that has been cultivated by generations of farmers."

The free software movement is right, therefore, in pointing towards the problems that strict copyright legislations are bound to create for the free use and development of technological knowledge in the software industry. However, their main entry point into the analysis of copyright law, that is, the clash between "private and public interests," does not allow them to pose the problem in reference to the institutional structure of the capitalist business economy. In the Veblenian analysis, on the other hand, what the free software movement calls "private interest" is properly described as "business principles," or rather "business interests" as the embodiment of these principles. So, expressed in the Veblenian language, the clash that defines the problem about copyright is the one between "business principles and the community." This clash arises because it is an element of these principles "to turn community's technological proficiency to the community's detriment" whenever necessary in the pursuit for business profits (Veblen 1908b, 111). Analogous to our analysis of copyrights, Veblen makes the following observation about patents in the industry:

> The invention or innovation covered by the patent is a contribution to the common stock of technological proficiency. . . . But, whether the innovation is useful or not, the patent right, as an asset, has no (immediate) usefulness at large, since its essence is the restriction of the usufruct of the innovation to the patentee. Immediately and directly the patent right must be considered a detriment to the community at large, since its purport is to prevent the community from making use of the patented innovation. (Veblen 1908b, 115-116, footnote 1)

The Veblenian theoretical structure, by showing that profits in the proprietary software business rest upon the exclusive control of society's technological knowledge, explains why corporations such as Microsoft are pressing for strict copyright laws today. But in addition to this, the Veblenian analysis of the software industry also illuminates why some other corporations, such as IBM and Oracle, have chosen to support non-propriety software (see Fitzgerald 2006; Lerner and Tirole 2002;

Samuelson 2006; West and Dedrick 2001). To elaborate further on this point, one should keep in mind that the free software movement – however much it relies on different principles – exists within a "business ecology." It has relations with the business community in many different ways; not only, for example, when they sell free software services/packages to corporations in different industries, but also when business concerns would like to make an investment in free software. As a general principle, the free software movement has nothing against the commercial interests in free software. They even acknowledge their contribution to the proliferation of free software, wishing them "success," as long as business concerns "respect users' freedom" (Stallman 2002, 24). But this attitude does not capture the possibility that business interests may use free software to create differential advantages, in the Veblenian sense, upon which to capitalize, while not violating free software licenses as defined by the Free Software Foundation.

I am referring to the case where business concerns could contribute to the proliferation of a free software "platform" such as GNU/Linux, in complete accordance with copyleft, but at the same time produce proprietary software applications that work on this platform. In other words, a business corporation could use a free software environment, against its dominant rivals in the industry, to "lock-in" users to its own proprietary software products by making these products compatible with free software platforms.[11] This is indeed what companies such as IBM and Oracle have been doing recently as a "business strategy" against proprietary software corporations such as Microsoft (Lerner and Tirole 2002). By directing the labor of their own employees to the development of the GNU/Linux system, these companies aim to contribute to the quality of this system, and to its proliferation among personal and corporate users, so that they could increase the marketability of their licensed products running on GNU/Linux. IBM, for instance, as the major proprietary software corporation supporting non-proprietary software, "makes about a quarter of its overall revenues and a much higher proportion of its profits from developing and licensing *proprietary software*" (Samuelson 2006, 1, emphasis added) – apart from its other undertakings in free software support services and hardware manufacturing.

The software business, therefore, has a peculiarity in that, whereas some major players are arguing for strict copyright regulation, others are trying to profit upon non-proprietary software. These two seemingly contradictory attitudes of business concerns in the software industry have a common explanation in the Veblenian theoretical structure. They both derive from business concerns' main objective to capitalize upon a differential advantage, which, as discussed above, is the main source of profits in a business economy according to Veblen. The differential advantage, for a dominant corporation like Microsoft, may depend upon the control of technological knowledge through copyright laws. For some others, it may derive from their ability in using free software platforms to tie consumers to their own software products, as IBM illustrates. In any case, the different strategies of business concerns in the software industry become theoretically meaningful to the same extent within the Veblenian framework.

The contribution of Veblen's institutionalist approach to the analysis of the software industry is not limited to the debate on copyright that free software has engendered, or to the explanation of differences in business strategies in this industry. Another important question is the emergence of free software itself as a new socio-economic phenomenon. This issue concerns the so-called "motivations," or "incentives," of software engineers in producing free software: Why would a software engineer contribute to free software given that the financial return to his laboring time will not be as much as in the proprietary software business? In the final section below, I shall take up this question using Veblen's general theory of institutional change in its relation to his conception of human instincts and his theory of capital.

Free Software and Veblen's Theory of Institutional Change

The question above, "What *motivates* the free software engineers?" is, in fact, not the proper way to formulate the theoretical problem in the Veblenian institutionalist framework. This is because Veblen explains human behavior with recourse to "innate propensities" of human nature (i.e., instincts), together with socially learned and transmitted "habits of life and thought" (Veblen [1914] 1918). He conceives, in other words, "the individual in both biological and socio-economic terms" (Cordes 2005, 2). In this section, I propose a Veblenian way of thinking about the emergence of free software which, I argue, explains the cooperative behavior observed in free software projects. To this end, I shall first briefly talk about the constituent elements of Veblen's theory of institutional change and how Veblen brings these elements together in his evolutionary approach (for a detailed discussion, see Edgell 1975, Hodgson 1992 and Rutherford 1998). Then, I shall use this theoretical framework to provide a Veblenian account of the cooperative practices of free software engineers from the perspective of Veblen's evolutionary theory of institutional change.

To start with, instincts and habits, as two main elements of human behavior according to Veblen, stand in a particular relation to each other in his analysis. For Veblen, instinctive dispositions of human nature assign a purpose, an objective end, to human action – akin to "motives" in psychology (see Batson and Shaw 1991); but they leave "the sequence of acts by which this end is to be approached somewhat a matter of open alternatives" (Veblen [1914] 1918, 38). Instincts, in other words, do not determine how the objective end that they assign for human action is to be achieved. This, Veblen argues, creates an open field for "socially accustomed and accepted patterns of behavior," for "habits," to exert their influence on human action:

> [T]he manner, and in a great degree the measure, in which the instinctive ends of life are worked out under any given cultural situation is somewhat closely conditioned by these elements of habit, which so fall into shape as an accepted scheme of life. (Veblen [1914] 1918, 7)

Individuals, in other words, under the teleological guidance of their instincts, do not act in a social vacuum. Society's values, customs, norms, etc. – what Veblen calls the elements of habit – have their influences on the behavior of the individual by providing socially accepted ways to accomplish an instinctively given end.

The "elements of habits," moreover, have a particular importance in Veblen's theoretical structure in that it is through these "habits of thought" that he explains the rise of "institutions" – as another important aspect of his general socio-economic theory (Veblen [1914] 1918). Institutions, according to Veblen, are "*settled* habits of thought common to the generality of men" (Veblen 1909, 626, emphasis added), meaning that patterns of thought and behavior are transmitted from one generation to another in a process of social learning, and thus acquire stability and consistency throughout society. Institutions embody, in other words, commonly held habits of thought and behavior, which "are supported by social sanction, may become established in law, and are also passed on through socialization" (Rutherford 1998, 467). It is in this process of social transmission and normalization, Veblen maintains, that habitual patterns take "an institutional character and force" (Veblen [1914] 1918, 7).

Having explained institutions as being derived from established habits of thought and behavior, Veblen finally defines his concept of "cultural era" in reference to the totality of institutions and the "material and technical conditions" at a given historical time. "Culture," therefore, is a generic concept in the Veblenian framework, denoting the matrix of social institutions within a historically specific material and technical environment. Brette (2003) contends indeed that "the concept of culture is fundamental in Veblen's system as it expresses the organic nature of the institutional complex" (464). At this general level of analysis, Veblen divides human history into four general cultural eras: the peaceful culture of savagery, the predatory culture afterwards characterized by the rise of private property, the handicraft cultural era and, lastly, the acquisitive business culture created by the machine industry (Veblen [1914] 1918; see Brette 2003; Edgell 1975).[12]

This short exposition of how the main elements of Veblen's general theoretical framework (instincts, habits, institutions, material and technical conditions, and culture) relate to each other is crucial in order to understand his theory of "institutional change." Under any given cultural condition, Veblen's account of institutional change may be summarized as follows: A technological change, the introduction of a new technology, for example, creates a concomitant change in the material and technological environment. Then, the community, in its economic dealings with this environment, undergoes a process of "adaptation" to these new conditions – a term Veblen borrows from evolutionary theory (see Hodgson 1992). This is an "adaptation of *habits of thought* to changing circumstances" (Rutherford 1998, 468, emphasis added), which, if persistent, will lead to the replacement of the "established habits" and, ultimately, also of the "institutions" (Cordes 2005, 3).

In Veblen, therefore, we find a theoretical thesis stating that changes in the material and technological environment lead to changes in "habits of thought and institutions," which he likens to the process of adaptation as it is theorized in

evolutionary biology (see, in particular, Veblen [1899] 1994, [1914] 1918).[13] Hodgson (1992) puts it succinctly when he says that in Veblen's theory of institutional change "institutions and habits of thought are *units of selection* in an evolutionary process (294, emphasis added). They are units of selection in the sense that technological developments bring about evolutionary social change as certain habits of thought and institutions are "selected," or favored, in the process of adaptation to the new material and technological conditions. Veblen hereby theorizes not where the social evolution will exactly lead to – as in the teleological theories of social change (Brette 2003) – but rather the "mechanism" of change, that is, how social evolution takes place in response to the changes in material and technological conditions. Let us finally observe that, for Veblen, this process of institutional change is not the result of purposeful or calculative behavior, but is the "unintended" result of "habituation that occurs through the *conditioning* influence of the new material circumstances" (Rutherford 1998, 469, emphasis original).

In this process, what has changed is not the instinctive endowment of the human kind. As Veblen remarks, alterations in the genetic make-up of man is the result of biological evolution which, for the purposes of social inquiry, could be taken as stable (Veblen [1914] 1918). The relevant question, therefore, is, "On *which* persistent instinctive dispositions will the adaptation of the habits of thought be based under the new material and technological environment?" For example, business-like habits of thought, which are predicated on the "acquisitive propensities" of human nature, proliferated as an adaptation to the rise of the machine industry. This adaptation, in other words, favored the acquisitive propensities to the detriment of the instinct of workmanship of the handicraft era. The task that confronts us here then is to lay bare which instinctive propensities of human nature are coming to the fore in the adaptation of habits to the advances made in "information technologies." And also, what sorts of new habits and institutions are arising as a result of this adaptation to these new material and technological conditions? As Veblen maintains:

> A genetic inquiry into institutions will address itself to the growth of habits and conventions [in the process of their adaptation], as conditioned by the material environment and by the innate and persistent propensities of human nature. (Veblen [1914] 1918, 2)

Drawing upon our discussion earlier on Veblen's theory of capital, we can observe that developments in information technologies have created new "material and technological" conditions in the software industry today, which are characterized by the fact that the "material equipment" in this industry is generally accessible throughout society. To this we should also add that digital technology renders copying and distributing a computer program almost costless. In the light of Veblen's theory of institutional change, we should expect a process of adaptation to take place (in the habits of thought and behavior among software engineers) to these new material and technological conditions in the software industry. Thus, I would like to argue that free software, as an economic and social phenomenon, has emerged as the result of this

process of "Veblenian adaptation," a process whereby workmanlike habits of thought have been "favored" (in the evolutionary sense of the term), and established themselves among software engineers. In other words, accessibility of the means of production and the low cost of copying and distributing a computer program have created the material and technological conditions amenable to the proliferation of habits of thought based on the instinct of workmanship. We can conclude, therefore, that, whereas the rise of industrial technology replaced the peaceful workmanship culture of the handicraft era with the acquisitive business culture (Veblen 1908a), advances made in digital technology have led to the predominance of workmanlike habits of thought in the software industry. So, from an institutionalist point of view, it is this Veblenian adaptation to the new technological environment that sustains free software as a new "institutional" organization of productive and innovative activity. This, I would like to emphasize, confirms Veblen's insight about the dependence of institutional change upon the mutual play between "human instincts, habits, and technological change."

Cooperative Behavior and Veblen's Theory of Human Instincts

If we go back to the question we posed at the beginning of this section, Veblen's socio-economic theory explains the behavior of free software engineers with respect to an institutional change, where the instinct of workmanship plays the prominent role in the process of the Veblenian adaptation of habits. But, why is it that the instinct of workmanship has this prominent role? What is it that makes it so essential in a Veblenian analysis of technology and institutional change? This particular instinct, as an element of Veblen's conception of human nature, is indeed distinguished from other instinctive propensities in his theoretical framework. The instinct of workmanship is the one and only instinctive disposition which introduces the factor of "intelligence" in human endeavor (Veblen [1914] 1918). In other words, in the process whereby man attempts to achieve the objectives as assigned by various instincts, it is through the instinct of workmanship that intelligence directs and shapes human action towards these objectives.

Veblen has a "functional" definition of intelligence in that intelligence concerns how to achieve the teleological ends in the "best way possible." That is to say, the instinct of workmanship is about "practical expedients, ways and means, devices and contrivances of efficiency and economy" (Veblen [1914] 1918, 33); it is about finding the most efficient and effective way whenever human action is directed at a particular purpose.[14] Given Veblen's understanding of technology as society's "common stock of knowledge of ways and means" (Veblen 1908a), it follows that his conception of technology could theoretically be traced back to the "instinct of workmanship" in Veblen's formulation. Society's state of technological knowledge is associated, in other words, with the workmanlike propensities of its many generations (Veblen [1914] 1918).

This, without a doubt, places the instinct of workmanship to a key position in Veblen's analysis of technology and institutional change. However, this does not

mean, according to Veblen, in a reductionist sense, that technological progress is "an outcome of the sense of workmanship alone" (40), as other instinctive dispositions will also have their effects "on the conduct and aims of the workman" (40). Thus, he allows for the possibility that other instinctive dispositions may have favorable or unfavorable effects on technological development. The acquisitive instinct, for instance, may harm the process of technological development by giving rise to habits of thought that impede the development of technological knowledge, as the debate on copyright exemplifies in the case of acquisitive business principles.

In addition to the instinct of workmanship and the acquisitive/predatory instinct, Veblen defines two other basic instinctive dispositions of human nature: The "parental bent", the propensity to care for others, and the "idle curiosity," the disposition of man to understand things for the pure sake of knowledge (Veblen [1914] 1918, see Edgell 1975, Adkisson 2004). The parental bent "has a much wider bearing than simply the welfare of one's own children" (Veblen [1914] 1918, 26). It concerns the general sentiment in human beings to have a concern about "community's future welfare" (27). Idle curiosity, on the other hand, is about the instinctive propensity "by force of which men, more or less insistently, want to know things" (85). In technological development, Veblen argues, these two instinctive dispositions complement the instinct of workmanship in their own ways: The parental bent through the "sentimental approval of economy and efficiency for the common good" (27) and the idle curiosity by contributing to the "available knowledge" in society, i.e., society's common stock of technological knowledge, and thus by serving "the ends of workmanship" (88). Brette (2003) observes that "[i]f the instinct of workmanship is the main determinant of technological progress ... the other two original instincts of mankind indirectly contribute to it" (474, endnote 4).

In order to arrive at a complete analysis of the cooperative habits of thought characterizing the free software movement, let me finally argue that the parental bent and idle curiosity accompany the instinct of workmanship in the free development of software technology. In the story about the printer above, when Richard Stallman asked for the source code of the program, or when the free software movement in general argues that non-proprietary software development produces better software, this attitude could be interpreted, in the Veblenian analysis, as deriving from the workmanship propensities of human nature. This is because what is at stake here is finding practically the most efficient way to solve a problem, or to contribute to the betterment of software technology in general. Their ethical position, however, in the instance when they say you should be able to share copies of software so that "you can help your neighbor," is related, according to a Veblenian account, to the parental bent. Moreover, when the free software movement argues that free software engineers will continue developing software, even if financial returns to free software may be rather low, because they love programming or because they enjoy trying to understand where a "bug" in the source code could be (Stallman 2002), a Veblenian perspective would read idle curiosity into this attitude.

To sum up, free software, as an institutionalized phenomenon in the software industry, is explained in the Veblenian analysis with respect to the rise of

workmanlike habits of thought in the process of adaptation to new material and technological conditions. This institutional change, moreover, is complemented with other habits of thought based on the parental bent and idle curiosity. In other words, just like the instinct of workmanship, which is the main instinctive disposition, according to Veblen, responsible for technological development, these two other instincts of human nature are also favored in the new material and technological environment in the software industry. So, different habits of thought, based on different instinctive propensities, but supported by the same material and technological conditions, come together to give rise to free software as a new institutional phenomenon.

Hacker Culture: The Past and the Future of Free Software

Finally, what can we say about the future of this phenomenon? Will it survive, or even grow further, as a cooperative way to develop software technology? Or, should we expect it to be encroached upon by the acquisitive principles of business at the end? An inquiry into these questions should start from the simple observation that free software does not have an existence totally independent from the business culture; free software engineers do participate in the business economy to make a living. Hence, the relevant question concerns the relative autonomy of free software: Can we say that the free software movement has an autonomous cooperative culture of its own, which could protect itself from the acquisitive business culture as theorized by Veblen?

To answer this question, I would like to refer, first, to Veblen's concept of "culture," or "cultural condition" (Veblen [1914] 1918). Veblen defines this concept at the most general level of abstraction in his theoretical structure, when he divides human history into four broad cultural eras, starting from savagery up until the business culture. In other words, Veblen sees the evolution of human societies in history as a process of "cultural evolution" (see Cordes 2005; Edgell 1975; Lower 1987). He even argues that "an evolutionary economics must be the theory of a process of *cultural* growth as determined by the economic interest" (Veblen 1898, 393, emphasis added). So, for example, in his analysis of the rise of business capitalism after the handicraft era, Veblen does not study "business" only as an economic institution in itself. Rather, he wants to explain how a new general cultural situation, the business culture, had emerged with corresponding habits and institutions that were conditioned by the existing technological environment.

In a Veblenian discussion on free software, we should also note, therefore, that a particular literature has looked upon the free software movement as a part of a general cultural condition: the "hacker culture" (see, for example, Chopra and Dexter 2007; Coleman 2004, 2009; Söderberg 2008). This (sub)culture dates back to late 1950s and early 1960s, when a software-developing community started to emerge at computer labs and clubs on various university campuses throughout the United States. The word "hacker" referred then, not to those who crack computers or break into digital security systems, but to "those who share a love of programming, an

activity seen to fuse artistic creation and expression with technological innovation" (Coleman 2001, 28). In the literature on the subject, moreover, the hacker culture is generally characterized by hostility to secrecy, resistance to any sort of monopolized power, support to free sharing of information, and the joy of programming (see in particular Busch and Palmas 2006; Levy 1984; Thomas 2002). Levy (1984), for example, enumerates the following aspects of what he calls "hacker ethic" as defining and characterizing the hacker culture (44-45):

1. Access to computers – and anything which might teach you something about the way the world works – should be unlimited and total. Always yield to the Hands-On Imperative!
2. All information should be free.
3. Mistrust authority – promote decentralization.
4. Hackers should be judged by their hacking, not bogus criteria such as age, race, class or position.
5. You can create art and beauty on a computer.
6. Computers can change your life for the better.

Thus, looked at from this perspective, free software appears to be an institutional arrangement of a general cultural milieu which contains and supports it. In other words, the ideals of the free software movement (the way they think about free information and decentralization) could be traced back to the defining elements of the hacker culture. Chopra and Dexter (2007) observe that "[e]arly hacker culture and the contemporary free software movement are thus part of a narrative continuum about taking control of technology and preserving user autonomy" (9). This continuum explains why free software engineers today still call themselves "hackers" in the original meaning of the term (Stallman 2002, 17). It should also be emphasized, finally, that even the use of recursive acronyms such as GNU (GNU is Not Unix") is a hacker tradition (19).

As far as this discussion bears on Veblen's general socio-economic theory, one can argue that the hacker culture refers to a "cultural situation" (Veblen [1914] 1918) in the software community with the accompanying habits of thought and behavior under certain technological conditions. In other words, similarly to the relation that Veblen establishes between the "business culture and industrial technology," the hacker culture is associated with the technological conditions made possible by information technologies. That does not necessarily mean that the hacker culture will, sooner or later, replace the business culture as the new cultural era in the Veblenian historiography. But it does mean that a new cultural situation, even if surrounded by the business culture, has been able to establish itself and create an institutional arrangement with profound effects on productive and innovative activity in the software industry. Therefore, when I argued earlier that free software engineers contribute to the development of society's technological knowledge outside of the business culture, this was an incomplete characterization. They develop technology

within a "peaceful" cultural condition – as opposed to a "predatory/acquisitive one" – (Edgell 1975; Veblen 1908) which is peculiar to the software community and has arisen under the new material and technological conditions in the software industry.[15]

Whether or not this peaceful culture of sharing will survive, and perhaps even spread to other areas of society, depends upon the extent to which the acquisitive business culture will find a way to strengthen its stance.[16] As the discussion so far illustrates, the existence of cooperative habits of thought based on the instinct of workmanship, parental bent, and idle curiosity does not mean that information technologies have completely done away with the acquisitive instinct of human nature. For this reason, even though information technologies have created the conditions favorable to the proliferation of cooperative habits of thought, the acquisitive instinct may always step in and have negative consequences for the cooperative culture of the free software movement. Such a possibility could arise, for example, through the effect of copyright laws on human behavior. Adkisson (2004) argues that intellectual property rights create a social environment which rewards and favors the acquisitive instinct, and, consequently, the behavior patterns towards pure monetary gain (463). It follows, therefore, that in a society with strong intellectual property rights – in a society, in other words, which sees creative work first and foremost as a private "property" – innovators may have a tendency to create innovation only for the purpose of acquiring more wealth.

From this argument we can further deduce that the increase in the scope of copyright legislation in the software industry may lead to the dominance of the acquisitive instinct, and hence to the eventual decay of the culture of sharing characterizing the free software movement. This is only a theoretical possibility for today, but one that should be emphasized because this is where the struggle against strict copyright implementation manifests its importance for the future of free software. The tension between cooperative vs. acquisitive habits and institutions in the software industry signifies, in fact, as Veblen remarks, the tension between "the habits of thought generated by the new material conditions and the habits and institutions more appropriate to an earlier period of cultural development" (Edgell 1975, 272-273). How this tension is resolved will determine whether the software technology will be available in the future for anyone to freely use and develop, or whether it will be controlled under strong copyright laws and become solely a means to pecuniary gain to the detriment of society.

Concluding Remarks

Developments in information technologies have created a new space of power struggle in the software industry centered on the free use and development of technological knowledge. Whereas in the industrial economy the ownership of the material equipment, the "hardware" (Chopra and Dexter 2007), had directly brought with it the control over industrial technology, in the digital economy technological knowledge itself has become an object for power struggle. This is so mainly because, as illustrated by the free software movement, information technologies allow today for

the collaborative advancement and use of technological knowledge in digital industries. In this paper, I have argued that Veblen's theory of institutional change and his analyses of technological knowledge and capital offer a powerful theoretical framework to understand the emergence of free software, as well as the salient elements of the debates and issues about copyright law in the software industry.

To conclude, even though it obviously would not be correct to say that the *new economy* operates outside of the business principles, it should be observed that the digital economy allows more and more people to engage in creative and productive activities without the involvement of business capital. This phenomenon threatens the strict capital-wage labor relation of industrial capitalism by opening up an escape from this relation. The proliferation of cooperative productive practices and the increase in the number of self-employed people in digital industries (software engineers, self-publishing authors and artists, self-recording musicians, etc.) show that the *new economy* possesses the potential to diminish the power and the scope of the capital-labor relation as defined by Marx. According to the Veblenian theoretical framework, what is happening in the digital economy is nothing less than an institutional change engendered by the new technological environment, a change that allows individuals to use humanity's technological knowledge outside the economy of business capital. The term "free" in free software also means in this sense "free from business capital" and, therefore, has a wider meaning and significance for our social and economic existence.

Notes

1. Dyer-Whiteford (1999) cites, among others, Peter Drucker's *The Age of Discontinuity* (1968) and Daniel Bell's *The Coming of Post-Industrial Society* (1973) as two influential works that laid down the main lines of the literature on post-industrial society and economy. He argues, however, that this literature had a political aspect to it in the sense that it initially arose (and was hailed) as a part of the attempts, supported by various U.S. "think-tanks and sponsored research projects" (29), to account for the domestic and international upheavals in the late 1960s. These turmoils were explained away, according to Dyer-Whiteford, as signifying nothing but the rise of a "radically new social order" (29), the post-industrial society, where the distinction between labor and capital would be blurred through the emergence of a new class based on "knowledge rather that property" (Bell 1973, 374; cited in Dyer-Whiteford 1999, 31). This, together with the post-industrial prosperity, would put an end, according to Bell, to the crises and conflicts that characterized the previous industrial society (Dyer-Whiteford 1999, 30).
2. Gagnon (2007) makes this point clear when he says: "[W]hat is really new in the New Economy? If one answers that knowledge now plays an important economic role, it would mean that knowledge did not play that role before" (593).
3. In addition to their effects on the software industry, advances made in digital technology allow musicians today to self-record their own music and release it to the public over the Internet. In a similar way, a growing number of authors choose to publish their work online without the need to use a traditional publishing company (see Benkler 2006). These examples illustrate that the ability of business capital to profit upon creative human endeavor is diminishing not only in the software industry, but also in all such industries where creative works could be produced and distributed in digital form.
4. That someone was one of the members of the team developing software for the private manufacturer of the laser-printer (Stallman 2002). See Williams (2002) for Stallman's own account of how decisive this event was in shaping his ideas and course of action.

5. Before the term "hacker" acquired the meaning of security breaker in the mass media and daily language, it meant someone who would work on difficult problems and find solutions for the sake of having pleasure (Stallman 2002). I shall have more to say below on hacker culture.
6. Punch cards used in the nineteenth century to control textile looms and player pianos (auto pianos) are the first examples of software (punch cards were also used in the early days of digital computers). Technically, software refers to those components of a computer system which, unlike the "hardware," can be modified – hence, the name soft. But even in the 1960s there were programs which were encoded in the electronic parts of the hardware and which were, therefore, not changeable. It became customary to refer to such programs as "firmware." As Moglen (1999) observes, whether a program is a software or a firmware depends, in fact, on the technical competency of the user. For many PC users today what is generally called software is actually firmware, because they do not have the necessary skills to modify a computer program. But the problem that the free software community aims to draw our attention to is that corporations producing proprietary software would like all software to be firmware for anyone, both for technically skilled and unskilled.
7. The GNU/Linux system contains today billions of lines of code as a result of the collaborative effort of voluntary participants. It is surely very important as a free operating system, which is the main platform for applications (software designed for specific tasks such as text-editors, spreadsheet programs, etc.) to communicate with the computer. But there are other free software, too, such as the web browser "Mozilla Firefox" which is widely used today as an alternative to proprietary web browsers; or the "Apache" web server software which is developed by the programmers organized around the Apache Software Foundation and which is installed in almost 70 percent of all web servers in the world today (Benkler 2006). For a list of some major free software projects, see www.fsf.org/campaigns/priority-projects/ (accessed June 22, 2011).
8. In order to understand more thoroughly what exactly has changed both locally and internationally in copyright law, it might be useful to look briefly at its history. The first "copyright" act was the "Statute of Anne" that was passed by the British Parliament in 1710 (Lessig 2004). The Statute of Anne gave publishers a copyright term of fourteen years which could be renewed once if the author was alive. (Currently in the United States, for example, a copyright term extends for the lifetime of the author plus 70 years). After the copyright term expired, the work would enter the "public domain," meaning that it would become freely available for anyone to copy and re-publish. It should be emphasized that the first copyright act gave publishers an exclusive right only to copy and publish a particular work. It did not involve any restrictions for the public as to how the work was to be *used* after the purchase. But even this right would last only for a limited time.
9. Before embarking on a Veblenian analysis of copyright law, let me observe that the principle of "the priority of public interest over private interest" could also be used in favor of strict copyright legislation. As a matter of fact, it has been one of the pillars of liberal economic theory to argue that, barring certain cases, public interest is best served through private interest. So, based on the liberal creed it could in principle be maintained that current legislation on copyright, by protecting private intellectual property, serves the common good. On the other hand, a particular stream of literature, employing the public-private dichotomy of the classical liberal tradition, has maintained that copyright law today clearly works to the detriment of the public interest (see, for example, Benkler 2006 and Halbert 2005). This liberal critique of current copyright expansion does not use the "economic" discourse of efficiency, but organizes its argument around the effects of copyright law on the so-called "public domain," understood as a commons under the ownership of the community as a whole (Halbert 2005). The critique mainly argues that copyright legislation should also see to it that a vibrant public domain of culture and ideas is preserved for individuals to freely draw from. This is important, the argument goes, not only for the principles of democracy (in and of itself, and as a means to these principles) but also for creative thinking and innovation (see Benkler 2006). The recent enlargement of the scope of copyright, which brings with it the shrinkage of the public domain, is seen, therefore, as detrimental to the interest of the general public.
10. See Veblen (1908c) for a thorough critique of Clark's capital theory, which became an inseparable part of mainstream economics in the twentieth century.
11. When I say above that the position of the free software movement toward business concerns does not capture this possibility of "lock-in," I surely do not mean to imply that the movement is oblivious

to this situation. They are against it, as they are against proprietary software in general. But what I would like to argue is that the way they think about "business" leaves open a possibility for business strategies not necessarily in line with their ideals.

12. Our analysis of copyright law in the previous section was essentially done in reference to the business culture, as the problem then specifically concerned "business" as an economic institution. This section, on the other hand, operates at a higher level of analysis, because it deals with human behavior in the context of Veblen's general theory of social change from one cultural situation to another.
13. Rutherford (1998) contents that "the exact nature" of this process of adaptation remains under-theorized in Veblen's analysis (467). In particular, he argues that the analogy to natural selection, which Veblen seems to emphasize (see, for example, Veblen [1899] 1994), is not satisfactory because the adaptation of habits in society does not work in the same way as the adaptation of biological organisms to their environment. Without delving into the issue of the merits or demerits of Veblen's use of natural selection, let me briefly state that I am of the opinion that an analysis purely based on the analogy to natural selection cannot explain the emergence of free software. So, I agree with Rutherford at least in that the analysis of "Veblenian adaptation" awaits further theoretical work.
14. Veblen rejects hereby the dichotomy between "instincts vs. intelligence" and argues that it is "a remnant of an earlier theoretical position, according to which all the functions of intelligence were referred to a distinct *immaterial entity*" (Veblen [1914] 1918, 30, footnote 1, emphasis added). In a critique of Descartes' duality between mind and body, therefore, he further observes that "[i]f all such preconceptions of a substantial dichotomy between physiological and psychological activity be abandoned it becomes a matter of course that intellectual functions themselves take effect only on the initiative of the instinctive dispositions and under their surveillance, and the antithesis between instinct and intelligence will consequently fall away" (30, footnote 1).
15. Veblen had thought, in a rather optimistic way, that as the machine industry developed, habits of thought based on the instinct of workmanship would gain dominance among mechanical engineers so that they would even constitute a revolutionary class against the acquisitive business culture (Veblen [1921] 2001). Even though the engineers of the machine industry did not live up to Veblen's expectations, free software engineers, at least partly, confirm Veblen's prediction today under the conditions created by information technologies.
16. One should observe, furthermore, that as more and more people worldwide get access to a PC and the Internet, habits of sharing are emerging not only in the software community, but also in the use and distribution of any item in digitized from.

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