

Patent as credit

When intellectual property becomes speculative

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Intellectual properties, the various kinds of which are known as patents, copyright and trademarks, could be regarded as central techniques of accumulation in contemporary capitalism, if immaterial knowledge is indeed what now crucially drives accumulation in a 'knowledge economy' or 'creative industries'.¹ In such a process of value generation and accumulation, it is precisely the law of intellectual property that allows certain kinds of knowledge to be repackaged and transformed into units of appropriation, transfer and commodification. But how exactly does this process occur?

The conversion of knowledge into an object of property right, sometimes also portrayed as forming part of an 'intellectual commons', requires several steps of legal abstraction and socio-economic associations to make it into something that is believed to be of value, to be desired and accumulated. It would not therefore be accurate to talk of a straightforward appropriation of creativity, knowledge or inventions through intellectual property law. It is not possible to patent common knowledge, creativity or tradition. But if these can be incorporated and transformed into particular techno-scientific singularities, then the patent law can transmute them into market commodities. What can be legally appropriated is not, for example, 'common sense' or the discovery of chewing peppermint for fresh breath, but a specific form and material embodiment of that knowledge and usage. The discovery of peppermint leaves could not be patented, but the molecular forms of the peppermint essence and its synthetic chemical copies, which can then be used (in legal parlance, 'materially embodied') in chewing gums and pastilles, would count as patentable inventions.² Legal doctrines and technicalities make that transformation from a 'common sense' invention into a proprietary invention possible. That is why the internal legal mechanisms deserve better scrutiny.

Critical accounts of intellectual property regimes often conflate these different senses of

what constitutes an obvious invention or common knowledge in contrast to a patentable invention or copyrightable original work. However, their strengths are in witnessing the anomalies and injustices caused by the patent system, concerning such issues as bio-piracy and access to knowledge.³ They also include analyses of the international political economy of intellectual property, which is inequitably skewed by disproportionately pushing singular national and commercial interests at the expense of others.⁴ These accounts can be characterized as critiques of the social effects of intellectual property law; they are necessary and valuable. But my analytical focus here is different. In this article I want to understand why intellectual property is being pushed so strongly as 'rights' by certain interests, and what makes it valuable, particularly when so many of the patents turn out to be useless. The obvious simplistic answer to the question is that intellectual property rights are akin to property rights in things that can be owned, traded and enforced. They are commodities and that is what makes them valuable. However, I suspect that the more complete answer lies in the exact mechanisms of intellectual property valorization because the value of intangible properties relates to processes of their materialization, perhaps much more so than in the case of real property, such as land. A different kind of critique needs to include a better explanation of the linkage of intangible properties to the process of accumulation and capitalization within the so-called 'knowledge economy' through abstract quantification and material market practices.

A good number of mainly quantitative analyses of intellectual property rights (particularly of patents) exist in mainstream economics and law and economics scholarship, as well as in economic history. They mainly examine the effect of patent monopolies on venture capital financing, knowledge diffusion, rate of innovation and competition.⁵ The more quantitative analyses also include studies on patent pricing and on the modelling of their value for

the overall economy based on different yardsticks of measurement.⁶ One common characteristic uniting mainstream law and economics scholars and some of the most trenchant critics of intellectual property is that they seem to understand law with a capital 'L': law is portrayed as a given factum and blackboxed as something immutable. In contrast, there is a dearth of critical and nuanced analyses of the ways in which intellectual properties become integrated into the neoliberal capitalist 'knowledge economy' – which is surprising in light of the sustained discussion elsewhere of the notions of immaterial labour and cognitive economy.⁷ In the context of universities, Gert Raunig has offered a methodical analysis of the meaning of creativity and education within the cognitive economy and the logical consequences for any eventual space of critical action.⁸ To the best of my knowledge, we lack a comparable analysis of intellectual properties as highly specific legal forms within the cognitive and financialized economy. A careful analysis of intellectual properties requires a precise understanding of the legal narrative forms (in the context of patent law they are: invention, novelty, utility and inventiveness) and the mundane technicalities (timing of filing, administrative procedures, documentary workflow and classification, litigation strategies) because it is through these everyday practices that works, inventions and signs are stabilized into economic and financial commodities rather than through high-profile court cases. Also, beyond specific topical settings, such an analysis would need to elucidate the more general processes by which these divergent intangible properties are attached to and transformed into capital relations. So when it is claimed that intellectual properties are the key drivers of current capital accumulation in the post-industrial 'knowledge economy', the following elements need to be unpacked in order to grasp relations between law and economy: the internal legal self-understanding of intellectual property as an economic unit, its abstraction into measurable, quantitative value, as well as the material practices enabling and stabilizing such an abstraction. The value of intangible property is measured, and there are different ways of producing such measures. It is worth finding out more about these. This means that we need to look into financial accounting principles as well as the material valuation practices through which economic and financial value is attached to intellectual property.⁹

This article offers a brief overview of a larger project in which I study the different material and semantic

practices that define and give rise to a patent's value. I am interested in how patents are accounted for and how they are valued as economic units. What is a patent worth? And what drives its value? Patents are interesting legal forms, in that they embody a double abstraction: the abstraction of knowledge into a legal property object and the abstraction of such property objects into calculable exchangeable commodities. Here I present three various operative modes of patents: patents as property in the inventive labour model; patents as currency of credence; and patents as investment assets or as securities. Intellectual property rights, as with 'real' property rights, are never absolute, and what makes their study so interesting is seeing how they acquire their various values and what kind of links and associations can make property rights more or less solid or unstable.

The traditional patent labour model

One source of the stability of the patent regime, which grants twenty years' monopoly for an invention, has been the labour theory of value, which has served as the dominant justification of patent rights, at least in the modern patent system. It claims that inventive labour should be rewarded, and that such rewards would encourage the production of more inventions. This may include invention in application-driven technological fields, as well as in more cerebral academic sciences. Interestingly, the scientific or academic economy of credit and the traditional patent law justification narrative of inventive labour mesh well with one another. It is worth revisiting some of the explanations of science as an economy itself.

Bourdieu characterized academic science as a system of symbolic and real capital accumulation and investment in which the value of the capital is determined by the definition and constant realization of the very market by scientists themselves.¹⁰ Whereas Bourdieu emphasized the accumulation of credit as the main driving force of academic science, Latour and Woolgar went further with their characterization of scientific activity as a capitalistic circulation of credit.¹¹ In their account, scientists do not only seek credits as rewards in order to accumulate surplus and increase their overall stock of intellectual capital; intellectual and monetary capital accumulations go hand in hand because of the circular nature of the credit economy in which it is imperative that the surplus credit is reinvested in the means of production in order to produce more knowledge. In such a conception, knowledge production is the very return

on investment. Latour and Woolgar compare scientists to corporations and their CVs to balance sheets of all investments to date. Scientific credit does not only form a reward for past achievement but, crucially, lends credibility in their ability to do well in the future, sending out the message: 'I am not risky! I am a worthy investment!' Credit and credibility come to be equivalent to reward and recognition in the form of more funding to produce more research, or in the form of patents which are useful for attracting further funding, grants, equipment, workers for research or production. These, in turn, in an ideal scenario, produce more data, arguments, articles, recognition, credit, more investments, more returns, and so on. As Latour and Woolgar put it:

it would be wrong to regard the receipt of reward as the ultimate objective of scientific activity. In fact, the receipt of reward is just one small portion of a large cycle of credibility investment. The essential feature of this cycle is the gain of credibility which enables reinvestment and the further gain of credibility. Consequently, there is no ultimate objective to scientific investment other than the continual redeployment of accumulated resources. It is in this sense that *we liken scientists' credibility to a cycle of capital investment*. ... Credibility ... concerns scientists' abilities actually to do science. ... The notion of credibility can thus apply both to the very substance of scientific production (facts) and to the influence of external factors, such as money and institutions.¹²

Woolgar and Latour argue that the objective of science's credit circulation is to speed up the cycle of information production as a whole, based on the ability of the scientists to produce as much credible facts as fast and intensely as possible: 'The relationship between scientists is more like that between small corporations than that between a grocer and his customer. Corporations measure their success by looking at the growth of their operations and the intensity of the circulation of capital.'¹³ On this view, scientific activity is as fast and intense as the virtual marketplace of speculative capitalism.¹⁴ What is at stake is not the commodity or its consumption, but the mobility of investment and capital.

Latour and Woolgar's analysis was prescient concerning the way today's scientific credits have become increasingly dependent on the general ability to attract funding for large-scale international projects and the vicious or virtuous cycle of academic and scientific evaluations as a mode of specific forms of knowledge production. But the question still remains: how does credibility accrue? Who evaluates

who or what is credible? Traditionally, academics have performed mutual evaluations of credibility.¹⁵ Now patents also perform the evaluative function of accreditation by signalling credibility and investability, especially with regard to scientific inventions which take a long time to develop, by granting the option to exercise monopoly rights over an invention when necessary.

What does such an accreditation process entail? Patent examiners evaluate the invention according to patent law criteria (novelty, industrial application, inventive step) rather than explicitly dealing with questions of scientific credit in terms of recognition or reputation. What is important at this point is that patent law juxtaposes or adds legal credibility to scientific credit: the scientific author and the inventor exist side by side. There is no transformation taking place, but rather an addition: patent law evaluates the inventiveness of the object of property right, without necessarily engaging in exercises of scientific verification. Crucially, this means that legal accreditation of credibility does not invalidate the scientific economy of credit, but operates adjacent to it. Patent law acts as another genre of credit.¹⁶

So far it looks as if scientific credit is the currency of the knowledge economy, whereas a patent is, at least from the *ex post facto* point of view of patent law doctrine, the legal reward for such inventive intellectual labour expended. But this labour theory of value, which underlies the main justification for patent law, serves as a poor and extremely misleading explanation for the process by which a patent is credited with value. The Lockean precept of modern patent law rationale is well known: a patent right is meant to reward inventions, which have been made by mixing 'labour' with 'nature', and such rewards will encourage more inventive activity, which will benefit the public. This labour theory of value narrative in patent law, however, is incongruent with the differentiation between inventor and patentee. The inventor is named, but if the invention was devised in an employment relationship the patent right goes to the employer.¹⁷ The patentee, according to patent law, would not need to have expended a single minute of labour. Hence there are separate attributions of inventorship (to inventor) and ownership (to patentee). Accordingly, it makes more sense to understand patent law not as rewarding inventive labour, but rather as providing capital and encouraging further investment for producing more inventions.

Perhaps even more so than in the context of property of land, the property rights of the patent holder

are justified on the grounds that the inventive activity is a process which takes much investment of time, money and labour rather than the product of the 'pure' labour of an inventive genius. Seen from such a perspective, a patent right seems like a reward for acting despite the inherent uncertainty of scientific experiments and expending time, labour and money. Patents are portrayed as a high reward for a high risk taken. This is also the argument of biotechnological and pharmaceutical companies, which emphasize the risky nature of research and development investments that may lead to no profitable product. Leaving the question of the economic merits of these arguments to one side, I wish here to question the process by which the characterization of inventive activity as an investment has acquired such a level of taken-for-grantedness. The de facto prioritization of investment over labour not only highlights the inappropriateness of the Lockean labour theory of value underlying the justification of modern patent law, but also significantly obfuscates the importance of diverse fundings and investments in the making of an invention. These can be of a financial nature, such as loans, capital raising, grants and funding, endowments and gifts. But investments can also denote the transmission of non-financial or non-monetary knowledges, or know-hows: works of predecessors in one's technical field, years of education, passed-down and acquired skills, technical facility, and so on. These kinds of investment are not considered when assessing a patent application.

The patentee is seldom identical with the inventors, the latter being mostly waged employees, who are nowadays lucky to be named at all, as they form parts of long global chains of production in which scientific labourers are separated into different categories with significantly differing rights and degrees of precariousness.¹⁸ Maurizio Lazzarato had written that 'immaterial labor produces first and foremost a social relation – it produces not only commodities, but also the capital relation.'¹⁹ This observation is mirrored in Edelman's depiction of the subject of 'creative process' in film copyright: 'the effective subject in the 'creative process' is ultimately vested in the producer, property right through the creative act is secured in the interest of the capital advanced. ... The product, property by right of creative subjective activity, remains with the true productive power, capital.'²⁰ Patent law attributes intellectual property ownership to the patentee, as inventive labour becomes secondary for the determination of patent ownership. It thereby gives rise to the subject of the

patentee as the investor and producer of knowledge to whom interest – in the form of the patent right – is owed. As Hardt and Negri write, 'it is not sufficient to pose the economic structure of labour as the source of a cultural superstructure of value; this notion of base and superstructure must be overturned. If labour is the basis of value, then value is equally the basis of labour.'²¹ The specific form of patent law's separation between inventor and patentee points to the roots of patent value in the separation of labour and capital within the scientific credit economy, as well as giving rise to it by extending the circulation of scientific credits to other economic spheres. This spillover effect from law into the economy is sketched out below.

Patents as fiat currency of credence

What is common to Latour and Woolgar's as well as Bourdieu's accounts of the scientific economy of credit is that the community of scientists has normally determined the value of scientific credit itself.²² Regardless of the question of whether the system of such scientific credits works well or not, it evolved as a reciprocal system of trust and accountability based on the accumulation or loss of reputation and recognition, with the consequences of diminished resources and lack of information output.²³ Such a reciprocal scientific credit economy loses its evaluative monopoly when there is a separate accreditation system of credibility in place, such as patents. The scientific community retains its relevance as the arbiter of scientific truth value; however, patents are now also regarded as a currency of scientific credit, as witnessed by the category of patents in scientists' CVs. The monopoly of twenty years that a patent affords has the effect of truncating knowledge production into a different temporal horizon: decisions on how much investment one can risk fall differently if one thinks that a patent can help to recoup the expenses. The patent right acts as a temporal bracket in which the unencumbered property right in the form of a monopoly can be exploited. Ultimately, it affords different calculations of investment and return. This has the effect of enlarging the scientific economy of credit *to other kinds and forms of credits* beyond the traditional evaluation and accumulation of credit for securing academic funding, grants and career progression.

Most significantly, such a credit afforded through patents enables strategic and financial interests and expectations to be formed around the property right. First of all, a patent right collates the non-monetary



credits of science into property claims about the invention that can be sold, bought, exchanged. That would be the main characterization of patents as commodifications of knowledge. However, what is perhaps even more interesting than the fact of commoditization is the way in which patents as legal forms attach some kind of economic credibility to scientific credit. Scientific credibility and financial creditability become closely enjoined. Much of the value of patents lies in their ability to signal a certain propriety of the scientific product, to circulate scientific credit for commercial exchange, and to signal creditworthiness in order to raise more capital, especially in industries such as biotechnology, where the product development time is lengthy, often exceeding ten years, and in which patent applications and patents are seen as crucial requirements for investors, especially in the early funding rounds.²⁴ This accords with Latour and Woolgar's point about the circular aim of scientific credit: that is, the ability to accrue more capital to maximize and accelerate more knowledge circulation. Patents, in this mode of value, function as signs of credit.

An interview with an entrepreneur who was also a medical doctor and who had just obtained a patent on her/his biotechnological diagnostic device confirmed

this analysis: 'In our industry, if you want to raise more money in order to get to be able to reach the production stage, a patent is an essential stamp of approval or a quality badge in order to show investors, those of less sophisticated kinds, that you are a credible company to invest more money in.'²⁵ The more sophisticated investors will still appreciate a patent as a non-monetary security, a kind of collateral, and ultimately as a potential to increase the return on their investment,²⁶ but 'they will assess the strength of your patent protection on the basis of what they know about your competitors and other venture capitalists' investments.' Interestingly, s/he said that even though the product may need more strengthening with subsequent patents, the initial patent will establish his/her company in the market and establish a better bargaining position when negotiating with competitors and manufacturers of components necessary for the end product to take off. In this light, even patents that are of low quality or credibility can act as 'trump cards' or 'wild options' in licensing negotiations with producers and competitors.

The legal accreditation of scientific credits thus influences the ease with which the increasingly common figure of scientist-entrepreneurs can raise further funds.²⁷ Individual patents in this sense

resemble a *fiat* currency. The belief in their value enacts their value. Processes of intellectual and financial capital accumulation are connected to investments, which would in other circumstances normally carry risk warnings: 'The value of an investment and any income from it may fall as well as rise and is not guaranteed. You may get back less than you invest.' 'Past performance is not a guide to future performance.' The legal veneer of credibility makes investments and involvement with patented inventions less speculative. Equally, good scientific credentials count for much in the radically uncertain environment of venture capital. In such an entanglement, the initial scientific credit of recognition becomes so closely enmeshed with the legal reward of proprietary rights that both recognition and reward become hard to distinguish from one another in the hybrid legal–scientific–financial circulation of investment and return. Edelmann proposed two theses about copyright law in the context of cinematic works, which also applies to the effects of patent law in relation to the scientific economies of credit: 'first, the law fixes and assures the realization as a natural given of the sphere of circulation, and second, in the same moment it makes production possible. The law lives off its contradiction.'²⁸ Patents appear as natural properties as well as conscious legal creations, which drive and continue the circulation and accumulation of further scientific, legal and monetary credits. They act as currencies of scientific credit held for the purpose of attracting more investment for a policy, fulfilling signalling and credential functions, as well as representing collateral assets to secure financing.

Patents as financial assets and securities

Although individual patents might be best understood as speculative, singular credence goods or as currencies operating in an economy of singularities, not dissimilar to the definition of a singular commodity as advanced by Lucien Karpik,²⁹ patents now also often come in bundles. Patents are traded, accumulated, purchased and sold not only individually, but as portfolios.

According to my interviewee, who was a licence negotiator for a very large medical diagnostic company, companies with strong patent portfolios often decide to 'give away' their proprietary right by not enforcing it in anticipation of future value accumulation through inventions which smaller companies may later come up with and which may be useful to them. In other words, patent values are measured as the calculation of a return on investment expected

in the future, and aggregation of patents is seen as a more valuable whole than the mere sum of its parts.

The value of patent portfolios is also reflected in various financial entities and companies which do not pursue single patents but accumulate them or acquire them as a bundle. There are various forms of what are colloquially called 'patent trolls', or more technically Non-Practising Entities, which acquire patents for inventions that they have not invented. Perhaps the rise of Non-Practising Entities is the logical extension of the separation between inventorship and ownership in patent law. It is worth noting that, despite the widespread uniform condemnation they receive as enemies of innovation, they have varying strategies of involvement in the actual businesses. The range is broad, from Non-Practising Entities purchasing patents only in order to litigate or settle and extract licence payments, to more hands-on companies that aggregate different businesses and companies, all of which are based on either purchased patents or exclusive licences of promising technologies. One has to be careful not to ascribe too much value to litigation: when litigation is taken as a measure of patent value, there are significant variations in litigation rates and patterns across different industries, with contradictory findings in the area of biotechnology and pharmaceuticals. Patent values are also very much dependent on the maturity of a technology.³⁰ However, another study of litigation patterns also seems to indicate that the financially most valuable patents are the most litigated. These are likely to be software and telecommunication patents the value of which are signalled *in advance* of the litigation, different from the patent values which crystallize in the process of litigation.³¹ The salient finding of the study is that these are disproportionately held in the hands of Non-Practising Entities. How is patent value constituted in such a constellation when original patent value is centred on an already existing market – for example, the mobile phone market – but further mined through third-party ownership and aggressive litigation strategy?

Non-Practising Entities are not normal business operations in the sense of growing the businesses and expanding research activities on the basis of their patent monopolies. Rather, their aim is to pursue profit by either licences or outright sale of the business. The core of these business models is patents, because patents provide the investment security that the technologies around which the business is built will be relatively protected for a certain period of time. What becomes clear in such a business model

is that the actual contents of individual patents and their potential are only relevant as long as the patents are well networked; that is, if they are relevant to many scientific, technological, machinic processes and possess many points of contact to other research activities. The value of patents is, then, not necessarily their inventive potential or usefulness, but the scale and reach of their connectivity. Connectivity, in turn, could be valued, for example, by a patent's web of licences or technological interdependency among different actors.

In light of the increasing accumulation of patents as portfolios by Non-Practising Entities, the legal academic Michael Risch suggests thinking of patents as securities.³² Offering both a description of current developments in intellectual asset management and a business prescription (arguing that patent aggregation is beneficial for an efficient market), Risch's analysis conceives patents as even more fully disconnected and disembodied from their inventive object and originary scientific labour. It is arguably in this sense that patents act most immaterially as currencies in the capitalist economy of intellectual credit circulation. This deserves closer scrutiny.

Securities are defined broadly in the US Securities Act of 1933 as

any note, stock, treasury stock, security future, bond, debenture, evidence of indebtedness, certificate of interest or participation in any profit-sharing agreement, ... investment contract, ... fractional undivided interest in oil, gas, or other mineral rights, any put, call, straddle, option, or privilege on any security, ... or warrant or right to subscribe to or purchase, any of the foregoing.

The same definition of security is applied regardless of the object of property rights, be it land or patent portfolios. In the United States, courts use the *Howey* test as the generally accepted starting point to determine whether an arrangement constitutes the sale of a security and thereby defines whether something is a security or not.³³ In *Howey*, investors had bought an interest in land which was connected to a contract that envisaged the cultivation of oranges on the land. The contract entailed a recognition that the investors were entitled to a part of the profits which would result from the sale of oranges. The US Supreme Court held that this was an investment contract within the 1933 Act:

The respondent companies are offering something more than fee simple interests in land, something different from a farm or orchard coupled with management services. They are offering an

opportunity to contribute money and to share in the profits of a large citrus fruit enterprise managed and partly owned by respondents.³⁴

As Risch points out, the Court identified the factors that define such a contract: (1) an investment of money with the expectation of profit, (2) in a common enterprise, (3) coming solely from the efforts of a promoter or third party. Hence 'the statutory plan is apparently designed to regulate interests which secure capital for a venture, from investors, in exchange for a "piece of the action"', as a former Securities and Exchange commission attorney explained.³⁵ But perhaps Risch crystallizes the speculative essence of security best in this observation: 'The essence of security is any investment in a forward-looking venture in which the profit comes from the work of others.'³⁶

In light of *Howey*, when thinking about the meaning of patents as securities there is another important step in the transformation from the status of a patent as a property or as a currency into a security. One is the recognition that being granted a patent does not in itself create a security; patents are turned into securities only when third-party capital interests are attached to it, such as investments in relation to a venture. This results in a paradox: the creation of security causes fundamental insecurity to property as identity, as traditionally understood in Hegel or Marx. I understand property here both as a legal form creating rights and obligations, and as referring to the object of property rights, which might be tangible or intangible. Security, according to the legal definition, only exists when future expectations in a property are created, but also they must be unrelated to the property. These expectations are different from interests arising from labour or possession. This twin bind of security/insecurity is most acutely expressed in the US Supreme Court's statement: 'If [the investment contract] test be satisfied, it is immaterial whether the enterprise is speculative or non-speculative or whether there is a sale of property with or without intrinsic value.'³⁷ For a security to exist, it is irrelevant whether patents may incorporate intrinsic values, such as the usefulness of the actual invention over which a patent right was granted, the level of inventiveness, the process of an invention's material making, or the different kinds of labour invested in the invention. Patented inventions, in their transformation into speculative securities, have ultimately become decoupled from their material embodiments and property interests.

Entangled credits

In the preceding analysis, I have tried to explain patent value as an entangled interplay of different modes of credit operating at different levels simultaneously. These adjacent articulations of patent value do not proceed in a linear temporal fashion, but rather operate concurrently across different knowledge industries in a striated way. Although the enduring patent-law narrative of reward and incentives for inventive labour might indicate otherwise, it is the increasing securitization of patents as financial assets which is the most interesting and disconcerting development in the progressing abstraction of patentable knowledge into speculative futures and option.

The performativity of patents as economic units of analysis meant that I needed to take economic scholarship seriously as an important site in which patent value has become articulated and stabilized by methods of quantification. Despite my theoretical divergence from the economic and dominant legal scholarship on patents, it was interesting to observe its mode of thinking and its focus on certain issues and not others. What is clear, however, is that the mainstream economic and legal analyses of patents and other forms of intellectual property do not address the broader interrelations and linkages between legal discourse, the scientific economy and the financial market, which would be well worth understanding better if immaterial knowledge is indeed driving the 'knowledge economy'. Among many intellectual property scholars, there seems to be a belief that the invisible hand also steers the market of intangibles, provided law is designed in a balanced way.

Amidst this entangled and complicated portrayal of the multilayered credit economies underlying patent value, I wonder what it is that drives the value in this process. Capital? Knowledge? Future – of what? Latour and Woolgar have argued that it is the internal logic of information as capital acting as driver. They conceived the value of information being determined by demand and supply. Scarcity would increase the value of knowledge, analogical to pricing dynamics. Highly valued knowledge would produce more knowledge by attracting more funds, more connections, which are also valued, and so on. This portrayal seems to correspond to Lazzarato's description of the production process of social communication, in which '*the process of the production of communication tends to become immediately the process of valorization*'.³⁸ However, for Lazzarato, it is

immaterial labour, superseding the division between material and intellectual labour in the Bakhtinian sense, which fuels the capitalist knowledge economy. Differently, Edelman observed about the nature of French copyrights in the film industry that '[t]he law will state what we would never have hoped it could state – the true creative subject is capital.'³⁹ Without denying the continued existence of non-monetary economic relations in sciences and the role of immaterial labour in the creation of economic value and social relations, to a certain extent, I believe that Edelman's statement applies most appositely to contemporary patent law's accreditation of the patent holder at the expense of the scientific labourer and the intellectual quests of sciences. The true creative subject of patent law seems to be credit, with its double connotation of recognition and indebtedness, as well as with a view to its future value as speculative surplus to be reinvested and circulated. Patents as legal forms of e/valuations enact, but also contain, the coalescence of inherent scientific and financial uncertainties within a property right. The effect by which the scientific author-inventor and her/his labour become eclipsed by the investor-patentee (who provides the capital for the often waged or financed work to be carried out in the first place) is already inherent in patent law's epistemological foundations embodying different notions of credit as reward and recognition. Paradoxically credit and credibility do not only delimit future potentialities by reference to the past, but simultaneously enact more speculative futures by patents' increasing transformation from property into security.

Notes

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1. 'Knowledge economy' is a term popularized by Peter Drucker, *The Age of Discontinuity* (Harper & Row, New York, 1969), which is originally attributed to Fritz Machlup's book, *The Production and Distribution of Knowledge in the United States* (Princeton University Press, Princeton NJ, 1962), in which knowledge is stipulated as an economic unit of study.
2. This is applicable in the context of the European patent law framework to the doctrinal requirements of novelty, inventive step, industrial application and sufficient disclosure.
3. Vandana Shiva, *Biopiracy, The Plunder of Nature and Knowledge*, South End Press, Cambridge MA, 1999. On the access to knowledge movement and its genealogy, see Amy Kapczynski and Gaele Krikorian, eds, *Access to Knowledge in the Age of Intellectual Property*, Zone Books, New York, 2010.
4. This has been well documented by the NGO, Knowledge Ecology International: www.keionline.org.
5. Examples of the law and economics approach to the study of patents include: John R. Allison et al., 'Valuable Patents',

- University of California at Berkeley, School of Law Public Law and Legal Theory Research Paper Series, Research Paper No. 133, 2003, <http://ssrn.com/abstract=426020>; Sivaramjani Thambisetty, 'Patents as Credence Goods', *Oxford Journal of Legal Studies*, vol. 27, no. 4, 2007, pp. 707–40. There has also been considerable focus on the effects of patents on financing and competition, especially for early-stage venture capital financing; see, for example, Suzanne Scotchmer, 'Licensing, Joint Ventures, and Competition Policy,' in *Innovation and Incentives*, MIT Press, Cambridge MA, 2004.
6. Mark Schankerman and Ariel Pakes, 'Estimates of the Value of Patent Rights in European Countries during the Post-1950 Period', *Economic Journal* 96, 1986, p. 1052. For a good example of the different ways of valuing patents, see PatVal-EU Project, *The Value of European Patents: Evidence from a Survey of European Inventors. Final report*, 2005, http://ec.europa.eu/invest-in-research/pdf/download_en/patval_mainreportandannexes.pdf.
 7. Maurizio Lazzarato and Antonio Negri, 'Travail immatériel et subjectivité', *Futur Antérieur* 6, 1991; Maurizio Lazzarato, 'Immaterial Labour', in Paolo Virno and Michael Hardt, eds, *Radical Thought In Italy: A Potential Politics*, University of Minnesota Press, Minneapolis, 2006, pp. 134–46. See also the series of articles published in the conjunction of the research stream on cognitive capitalism, immaterial labour and general intellect in *Historical Materialism* 15, 2007.
 8. Gert Raunig, *Factories of Knowledge. Industries of Creativity*, Semiotext(e), New York, 2013.
 9. On the performative turn in valuation studies, see Claes-Fredrik Helgesson and Fabian Muniesa, 'For What It's Worth: An Introduction to Valuation Studies', *Valuation Studies*, vol. 1, no. 1, 2013, pp. 1–10.
 10. Pierre Bourdieu, 'The Specificity of the Scientific Field and the Social Conditions of the Progress of Reason', *Social Science Information* 14, 1975, pp. 19–47.
 11. Bruno Latour and Steve Woolgar, *Laboratory Life: The Construction of Scientific Facts*, Princeton University Press, Princeton NJ, 1979.
 12. *Ibid.*, pp. 197–8; emphasis added.
 13. *Ibid.*, p. 207.
 14. Manuel de Landa, *Intensive Science and Virtual Philosophy*, Continuum, London, 2002.
 15. Warren O. Hagstrom, *The Scientific Community*, Basic Books, New York, 1965; Pierre Bourdieu, *Homo Academicus*, Stanford University Press, Stanford CA, 1988.
 16. I am referring to Mary Poovey's study of how the notion of credit was crafted and sustained through different literary genres that were closely linked to emerging economic discourses: *Genres of the Credit Economy: Mediating Value in Eighteenth and Nineteenth Century Britain*, University of Chicago Press, Chicago, 2008.
 17. On the history of the transfer of ownership of intellectual property from employee to employer, see Catherine Fisk, *Working Knowledge: Employee Innovation and the Rise of Corporate Intellectual Property, 1800–1930*, University of North Carolina Press, Chapel Hill NC, 2009.
 18. Hallam Stevens, 'On the Means of Bio-production: Bioinformatics and How to Make Knowledge in a High-throughput Genomics Laboratory', *Biosocieties*, vol. 6, no. 2, 2011, pp. 217–42.
 19. Lazzarato, 'Immaterial Labour', p. 137.
 20. Bernard Edelman, *Ownership of the Image: Elements of a Marxist Theory of Law*, Routledge & Kegan Paul, London, 1979, p. 15.
 21. Michael Hardt and Antonio Negri, *The Labour of Dionysus: A Critique of the State Form*, University of Minnesota Press, Minneapolis, 1994.
 22. Corynne MacSherry, 'Uncommon Controversies', in Mario Biagioli and Peter Gallison, eds, *Scientific Authorship: Credit and IP in Science*, Routledge, London and New York, 2003, 225–50.
 23. On the development of experimental setting among gentlemen peers at the Royal Society as the norm of scientific knowledge production, see Simon Schaffer and Steven Shapin, *Leviathan and the Air-Pump*, Princeton University Press, Princeton NJ, 1985. Differently from Schaffer and Shapin, Barbara A. Shapiro traces the origins of the notion of facticity to English common law procedures which were adopted in the natural science context at the Royal Society: *A Culture of Fact: England 1550–1720*, Cornell University Press, Ithaca NY and London, 2003.
 24. Caroline Haeussler et al., 'To Be Financed or Not... The Role of Patents for Venture Capital Financing', Government and the Efficiency of Economic Systems Discussion Paper No. 253, 2009, www.sfbtr15.de/uploads/media/253.pdf; Sebastian Hoenen et al., 'Do Patents Increase Venture Capital Funding between Rounds of Financing?', manuscript presented to Patent Statistics for Decision Makers 2012 Knowledge Assets and Economic Growth, OECD, Paris, 28–29 November 2012, www.oecd.org/site/stipatents/5-3-Patents-signal.pdf.
 25. My informant is both a biotech start-up entrepreneur and works in her/his 'normal' job as a licence negotiator for a very large medical diagnostic company, which is itself part of a very large multinational conglomerate (market cap of above US\$250 billion). S/he occupies an interestingly hybrid position at the intersections of three vectors: (i) medical expertise as a trained doctor and subsequently in business studies and finance; (ii) working at both a large medical diagnostic company and a small biotech start-up; and (iii) a patent applicant, named inventor, not patent holder. Interviews conducted 7 December 2013; 22 March and 16 May 2014. As it is difficult to obtain information about licence values, agreements and strategies, I traded the potential for more information and ease of conversation against specific analyses which could have been perhaps better afforded by associating her/his name with specific functions and localization in which my informant was an actor.
 26. Bruno Amable, Jean-Bernard Chatelain and Kirsten Ralf, 'Patents as Collateral', 2010, <http://ssrn.com/abstract=2227111> or <http://dx.doi.org/10.2139/ssrn.2227111>.
 27. On the increasingly complicated entanglements of science and entrepreneurship in the figure of the scientist-entrepreneur, see Steven Shapin, *The Scientific Life: A Moral History of a Late Modern Vocation*, University of Chicago Press, Chicago, 2008, chs 7 and 8.
 28. Edelman, *Ownership of the Image*, p. 92.
 29. Lucien Karpik, *Valuing the Unique: The Economics of Singularities*, Princeton University Press, Princeton NJ, 2010.
 30. John Allison et al., 'Valuable Patents'.
 31. John Allison, Mark Lemley and Joshua Walker, 'Extreme Value or Trolls on Top? The Characteristics of the Most Litigated Patents', *University of Pennsylvania Law Review*, vol. 158, no. 1, 2009.
 32. Michael Risch, 'Patent Portfolio as Securities', *Duke Law Journal* 63, 2013, pp. 89–154.
 33. *SEC. v. W.J. Howey Co.*, 328 U.S. 293 (1946).
 34. *Ibid.*, p. 299.
 35. John G. Sobieski, 'What is a Security?', *Mercer Law Review* 25, 1974, p. 385, quoted by Risch, 'Patent Portfolio as Securities', p. 108.
 36. *Ibid.*, pp. 298–9.
 37. *SEC. v. W.J. Howey Co.*, p. 301.
 38. Lazzarato, 'Immaterial Labour', p. 143.
 39. Edelman, *Ownership of the Image*, p. 57.