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THE LAW AND ECONOMICS OF CREATIVITY IN THE WORKPLACE

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Abstract

Technological and legal developments led to the rise of employed creativity in the last quarter of the nineteenth century. The new class of employers claimed the rights in the creative products produced by artists and inventors employed by it and after a short struggle its demands were satisfied: by and large the law acknowledges the rights of employers in creative products produced by workers (employees and contractors), just as it acknowledges the rights of employers in any other products. This legal victory, although took place almost a century ago, is still fiercely debated among scholars and participants in creative industries. In the past century, thousands of disputes between employers and workers over rights in creative products were brought before the courts and inspired voluminous commentary on the topic. Nonetheless, the study of the nature and structure of the law that allocates the rights between employers and workers has generally been neglected. This paper studies the organization of creativity at the workplace, presents a general framework for understanding the present allocation rules, evaluates these rules, and offers simple guidelines for designing better rules, when needed. The paper also examines the myths of the starving artist and the hero inventor and their inputs into the production of creative products. The paper concludes that the differences between the production of creative products and non-creative products do not call for unique allocation rules for the creative production. More specifically, I argue that the distinctive properties of creative workers and the characteristics of their employment do not justify workers' ownership.

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The Law and Economics of Creativity at the Workplace

Barak Y. Orbach

"Behold the turtle. He makes progress only when his neck is out. Let the creative employee stick out his neck."[1]

I. Introduction

Christopher Lydon was a longtime host of the popular radio talk show, *The Connection*, aired by the Boston public station WBUR-FM. Mr. Lydon sought to own equity in the show he developed and popularized and consequently lost his job as he agreed to nothing else, including fat salary increases.[2] The fate of Petr Taborsky was no less cruel. He ended up behind bars following an unfortunate dispute over the ownership in a breakthrough innovation he developed as an undergraduate student at the University of South Florida.[3] Lydon and Taborsky are members of the big community of creative workers, whose talent brought them nothing but agony and trouble. In the history of the legal fights over the rights in creative products, however, there are also stories about

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[1] GERARD I. NIERENBERG, FUNDAMENTALS OF NEGOTIATIONS 107 (1973).

[2] Felicity Barringer, *Public Radio at Center of Ownership Debate*, NY Times, Mar. 5, 2001.

[3] Seth Shulman, *A Researcher's Conviction*, TECH. REV., Feb. 1997, at 23-24, *Board of Regents of the State of Florida v. Petr Taborsky*, 648 So. 2d 748 (1994).

creative workers who had more luck and retained the rights in their work products. For example, the widows of Laurel and Hardy, acting as the sole beneficiaries of the famous comedians, won a dispute with the former employer of their late husbands over the rights to use Laurel's and Hardy's names and characters.[4] Recently, in *New York Times v. Tasini*[5] the Supreme Court held that the rights in works created by freelancers to be published by others were vested in the freelancers and publishers could not license freelancers' works to electronic databases without the freelancers' permission.[6]

Demands of workers for rights in their work products may astonish industrialists and blue-collar workers who never question the rights of employers in products produced by workers compensated for their labor. Creative workers, nevertheless, argue that their unique inputs should entitle them to rights in their work products and so for more than a century the allocation of rights in creative products has been inspiring bitter disputes. In this struggle, the employers are the winners even though workers have scored some tactical victories on certain issues: the law that governs the allocation of rights in creative products produced at the workplace (the ***law of creativity at the workplace***) favors employers and with several exceptions vest the rights in them.

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[4] *Price v. Hal Roach Studios, Inc.*, 400 F. Supp. 836 (S.D.N.Y. 1975). The litigation was initiated by a third party that wished to acquire exclusive rights in the characters of Laurel and Hardy.

[5] *New York Times v. Tasini*, 121 S.Ct. 2381 (2001) (hereinafter: *Tasini*).

[6] For further discussion on the *Tasini* decision and its implication, *see* sections III.C.2 and III.C.4 below.

Most legal scholars who took sides in the battles over the allocation of rights in creative products joined the workers' camp;[7] perhaps because they were used to owning the copyrights in their products (publications)[8] and perhaps because they had in mind romantic images of starving artists and hero inventors. Other scholars were more practical and wrote guidebooks for employers to instruct them on how to stimulate creative workers and at the same time protect themselves from demands of workers for rights in products.[9] Ironically, the latter group of scholars was motivated by potential earnings from their books, which could accrue because academic employers typically do not claim rights in publications of their intellectual employees.

The existence of the debate over the allocation of rights between creative workers and employers, or in short ***the debate over creativity at the workplace***, is not surprising, as the applicable laws constitute unstable mixtures of conflicting bodies of laws. On the

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[7] *See*, *e.g.*, Henrik D. Parker, *Reform for Rights of Employed Inventors*, 57 S. Cal. L. Rev. 603 (1984); Steven Cherensky, *A Penny for Their Thoughts: Employee-Inventors, Preinvention Assignment Agreements, Property, and Personhood*, 81 CAL. L. REV. 595 (1993); Ann Bartow, *Inventors of the World, Unite! A Call for Collective Action by Employee-Inventors*, 37 SANTA CLARA L. REV. 673 (1997); F. Jay Dougherty, *Not a Spike Lee Joint? Issues in the Authorship of Motion Pictures Under U.S. Copyright Law*, 49 UCLA L. REV. 225 (2001).

[8] Generally, in the United States university members retain the copyrights in their products, whereas ownership of patents in faculty's products goes to the university. *See*, *e.g.*, Pat K. Chew, *Faculty-Generated Inventions: Who Owns the Golden Egg?*, 1992 WIS. L. REV. 259 (1992); Kenneth W. Dam, *Intellectual Property and the Academic Enterprise*, CHICAGO OLIN WORKING PAPER NO. 68 (2nd Ser., 1999); HARVARD UNIVERSITY, STATEMENT OF POLICY IN REGARD TO INVENTIONS, PATENTS, AND COPYRIGHTS § 4 (1998):

> "Except as qualified below, a member of the University is entitled to ownership of copyright and royalties or other income derived from works, including books, films, cassettes, software, works of arts, or other materials."

[9] *See*, *e.g.*, THOMAS A. STEWART, INTELLECTUAL CAPITAL: THE NEW WEALTH OF ORGANIZATIONS (1998); HARVARD BUSINESS REVIEW ON KNOWLEDGE MANAGEMENT (1998); JAY LIEBOWITZ ED., KNOWLEDGE MANAGEMENT HANDBOOK (1999); THOMAS H. DAVENPORT AND LAURENCE PRUSAK, WORKING KNOWLEDGE: HOW ORGANIZATIONS MANAGE WHAT THEY KNOW (2000); DARYL MOREY ET AL. EDS., KNOWLEDGE MANAGEMENT (2001).

one hand, the rhetoric of the intellectual-property laws generally honors the individual creative genius, and on the other hand, the laws of master and servant are rather skeptical of the rights of hired parties in products produced by them.[10] Moreover, the practical importance of the issues at stake fuels the fires even further since the disputed rights are related to the major assets of so many companies today, knowledge and human capital, and their implications extend to productivity at the macro level.

What surprises in the debate over creativity at the workplace is that so much has been written on the effects of the law on creative production, while so little attention has been given to the properties of creative production. By and large, scholars assume that the allocation of rights has this effect or another on creative productivity and based on their assumptions construct theories and arguments typically against the present law. Few have addressed the nature of the connection between the allocation of rights and creative productivity, and fewer still have mounted empirical evidence for the hypothesized connections. It would be fair to state that the existing literature offers personal reflections on the resulting allocation of rights rather than systematic evaluations of the law in light of its interplay with actual creativity. No less surprising is the neglect of the structure of the law. Although vigorously disputed throughout the twentieth century and still contested today, the law of creativity at the workplace has not been thoroughly analyzed. More specifically, the allocation rules of certain branches of the law have not been studied and the existing studies examine the allocation rules of each

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[10] Catherine L. Fisk, *Removing the 'Fuel of Interest from the Fire of Genius': Law and the Employee-Inventor, 1830-1930*, 65 U. CHI. L. REV. 1127, 1128 (1998).

branch of the law separately rather than conceptualizing them into one analytical framework. This paper comes to address this lack of treatment.

The paper offers a framework for understanding the law of creativity at the workplace and seeks when, if at all, the creative worker needs help to stick her neck out to enrich society with her creativity. I study the organization of employed creativity and the allocation of rights between workers and employers in creative products. My inquiry into the structure of the law of creativity at the workplace exposes several weaknesses of the law, most of which were missed by previous studies, and I suggest certain changes that would create a more coherent and workable framework of allocation rules.

The plan of the paper is as follows. Part II briefly presents the history of employed creativity in order to put the debate in its historical context and to understand the economic causes that led to the rise of employed creativity. Part III offers a general framework for understanding the present law of creativity at the workplace and examines the specific applications of this framework under each of the branches of the law. Part IV studies the properties of creative production and suggests certain modifications to the existing allocation rules. This part also examines the myths of the starving artist and the hero inventor and asks what is needed to motivate them to promote the progress of science and useful arts. Part V concludes and offers simple guidelines for designing improved allocation rules.

II. A Concise Overview of the History of Employed Creativity

The debate over creativity at the workplace ignited in the late nineteenth century although its fuel, employed creativity, had existed many centuries before the fire started. This discrepancy calls for some explanation, as with the exception of Catherine's Fisk's insightful papers,[11] it is neglected in literature on the debate. Professor Fisk studied the emergence of the law of creativity at the workplace in the nineteenth century and her writing is undoubtedly among the most important contributions to the literature on the debate over creativity at the workplace. This part provides a broad overview of the history of employed creativity, with an emphasis on the era in which the debate was born. My goal here is to put the debate in its historical context and to shed some light on the forces that set the fire.

The history of employed creativity can be divided roughly into three major eras: *(i)* the governance of employed creativity, from the early days of human history until 1600; *(ii)* the rise of independent creative individuals, from 1600 to 1875; and *(iii)* the (second) rise of employed creativity, from 1875 and on. Some of the central aspects of the organizational changes of employed creativity in the latter two periods (or more specifically between 1790 and 1910) have been studied by Kenneth Sokoloff, Naomi

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[11] Fisk, *Removing the Fuel of Interest from the Fire of Genius*, *supra* note 10; Catherine L. Fisk, *Working Knowledge: Trade Secrets, Restrictive Covenants in Employment, and the Rise of Corporate Intellectual Property, 1800-1920*, 52 HASTINGS L. J. 441 (2001); Catherine L. Fisk, *Authors at Work: The Origins of the Work-for-Hire Doctrine*, LOYOLA-LA PUBLIC LAW RESEARCH PAPER NO. 2001-21 (2002).

Lamoreaux, and Zorina Khan. This part of the paper greatly relies on their empirical findings and links them to the debate over creativity at the workplace.

A. The First Reign of Employed Creativity

During the first era of employed creativity, in the days before the institutions of intellectual property were formed, creative individuals had almost no choice but to search for patrons who would sponsor their work, as only a few of them could earn their bread from commercializing their creative products.[12] Leonardo da Vinci, for example, had offered his talents as an inventor, sculptor, and artist to the Duke of Milan who eventually became da Vinci's employer, probably because da Vinci could "supply infinite means of attack and defense" and in constructing buildings, sculpting, and painting he "[could] do as much as anyone else, whoever he [might] be."[13] Employed creativity, therefore, was the norm in those days.

B. The Rise of Independent Creative Individuals

Upon the formation of intellectual-property institutions in Europe, and later on in the United States, many creative individuals replaced employment by the church and

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[12] *See*, *e.g.*, Peter Tschmuck, *The Court's System of Incentives and the Socio-Economic Status of Court Musicians in the Late 16th Century*, 25 J. CULTURAL ECON. 47 (2001). For lively studies of the market structure of that era in the Netherlands *see* Lorne Campbell, *The Art Market in the Southern Netherlands in the Fifteenth Century*, 118 BURLINGTON MAGAZINE 188 (1976); MARTIN WARNKE, THE COURT ARTIST : ON THE ANCESTRY OF THE MODERN ARTIST (David McLintock trans., 1993)

[13] ERIK BRUUM ED., THE FORBES BOOK OF GREAT BUSINESS LETTERS 218-219 (2001).

nobility for independent entrepreneurial careers.[14] This era marked the rise of independent creative individuals.[15] No less important, in light of the outside opportunities that creative individuals had in this era, the patterns of employed creativity changed and freelance employment became more common than in earlier days.

Parallel to the rise of independent creative individuals in the second era of employed creativity, the general creative productivity soared and climaxed during the Industrial Revolution (1750-1830).[16] It was a period of growth that offered many business opportunities to creative entrepreneurs. Several recent studies provide compelling evidence that at least in certain industries, such as music composition and

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[14] For studies of this transition in the arts *see* ANDREW MARTINDALE, THE RISE OF THE ARTIST IN THE MIDDLE AGES AND EARLY RENAISSANCE (1972); F.M. Scherer, *The Evolution of Free-Lance Music Composition, 1650-1900*, 25 J. CULTURAL ECON. 307 (2001).

[15] Traditionally it was assumed that in this era the markets for creative products functioned poorly and consequently the potential commercial success of creative activities was very limited. Recent studies refute this assumption, at least with respect to the late eighteenth and early nineteenth centuries. *See* Kenneth L. Sokoloff, *Inventive Activity in Early Industrial America: Evidence from Patent Records, 1790-1846*, 4 J. ECON. HIST. 813 (1988); B. Zorina Khan, *Property Rights and Patent Litigation in Early Nineteenth Century America*, 55 J. ECON. HIST. 58 (1995); B. Zorina Khan and Kenneth L. Sokoloff, *"Schemes of Practical Utility:" Entrepreneurship and Innovations among "Great Inventors" in the United States, 1790-1865*, 53 J. ECON. HIST. 289 (1993); Naomi R. Lamoreaux and Kenneth L. Sokoloff, *Inventors, Firms and the Market for Technology in the Late Nineteenth and Early Twentieth Century United States*, in LEARNING BY DOING IN FIRMS, MARKETS, AND NATIONS (Naomi R. Lamoreaux et al. eds., 1999); B. ZORINA KHAN, 'THE FUEL OF INTEREST': PATENTS AND COPYRIGHTS IN AMERICAN ECONOMIC DEVELOPMENT (forthcoming, 2002).

[16] *See, e.g.*, JOEL MOKYR, THE LEVER OF RICHES: TECHNOLOGICAL CREATIVITY AND ECONOMIC PROGRESS 78-112 (1990)

opera,[17] the decline of employed creativity and increased productivity were related; however, this observation should be viewed with some caution. The important lesson from this era and the right interpretation of those findings are that market-oriented creative production tends to be more prosperous than creativity under patronage.[18]

C. The (Second) Rise of Employed Creativity

The third era of employed creativity commenced with the Second Industrial Revolution in the last quarter of the nineteenth century, which marked the second rise of employed creativity. From the managerial perspective the technological developments in transportation and communication created a fertile climate for mass production,[19] which in turn led to the integration of creative activities within firms as it offered substantial

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[17] There is much writing on the positive effects of the transition from the patronage system to a market-oriented system in music composition and opera. The first works on this topic are: John Rosselli, *From Princely Service to the Open Market: Singers of Italian Opera and Their Patrons*, 1 CAMBRIDGE OPERA J. 1 (1989); Tia Denora, *Musical Patronage and Social Change in Beethoven's Vienna*, 97 AM. J. SOC. 310 (1991); Willam Baumol and Hilda Baumol, *On the Economics of Musical Composition in Mozart's Vienna*, 18 J. CULTURAL ECON. 171 (1994). The paper of the Baumols became very influential and inspired many other empirical works. *See, e.g.*, F.M. Scherer, *The Evolution of Free-Lance Music Composition, supra* note 14; Timothy King, *Patronage and Market in the Creation of Opera Before the Institution of Intellectual Property*, 25 J. CULTURAL ECON. 21 (2001) (The author argues that patronage was superior to the market, but his definition of patronage is a pattern of freelance).

[18] *See, e.g.*, Sokoloff, *Inventive Activity in Early Industrial America*, *supra* note 14; Khan and Sokoloff, *Schemes of Practical Utility*, *supra* note 14.

[19] The best study that has yet appeared on the Second Industrial Revolution is ALFRED D. CHANDLER, JR., THE VISIBLE HAND: THE MANAGERIAL REVOLUTION IN AMERICAN BUSINESS (1977). A thorough analysis of the legal changes that facilitated and followed the Second Industrial Revolution in the United States can be found in HERBERT HOVENKAMP, ENTERPRISE AND AMERICAN LAW, 1836-1937 (1991). Hovenkamp overlooked the changes in the law of creativity at the workplace.

efficiencies.[20] To be sure, the foregoing organizational changes were not particular to industrial R&D and applied also to many artistic markets, the most prominent of which was the fledgling motion-picture industry.[21] In other artistic markets, such as writing, sculpting, and painting, creative individuals often kept their independence in the sense that they were not salaried employees; however, in practice their freedom became rather limited in light of the increasing power of market intermediaries (agents, galleries, publishers, etc.) with whom they had to align in order to sell their creative products.[22]

Much of the aforementioned organizational changes of the third era of employed creativity is explained by the soaring technological complexities that necessitated

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[20] For thorough studies of the integration of creative activities within firms in this era *see* S.C. GILFILLAN, THE SOCIOLOGY OF INVENTION (1935); SAMUEL HABER, EFFICIENCY AND UPLIFT: SCIENTIFIC MANAGEMENT IN THE PROGRESSIVE ERA 1890-1920 (1964); ALEXANDRA OLESON AND JOHN VOSS EDS., THE ORGANIZATION OF KNOWLEDGE IN MODERN AMERICA, 1860-1920 (1979); DAVID F. NOBLE, AMERICA BY DESIGN: SCIENCE, TECHNOLOGY, AND THE RISE OF CORPORATE CAPITALISM (1977). For concrete studies of leading creative organization in the early days of this era *see* LEONARD S. REICH, THE MAKING OF AMERICAN INDUSTRIAL RESEARCH: SCIENCE AND BUSINESS AT GE AND BELL, 1876-1926 (1985); DAVID A. HOUNSHELL AND JOHN KENLY SMITH, SCIENCE AND CORPORATE STRATEGY: DU PONT R&D, 1902-1980 (1988); MARGARET B. W. GRAHAM AND BETTYE H. PRUITT, R&D FOR INDUSTRY: A CENTURY OF TECHNICAL INNOVATION AT ALCOA (1990). *See* also John Nader, *The Rise of an Inventive Profession: Learning Effects in the Midwestern Harvester Industry, 1850-1890*, 54 J. ECON. HIST. 397 (1994).

Many economic historians believe that the first industry to apply the economic advantages of organized creativity was the German dyestuffs industry, the studies of which indeed provide inspiring insights into the second rise of employed creativity. *See* John J. Beer, *Coal Dye Manufacture and the Origins of the Modern Industrial Research Laboratory*, 49 ISIS 123 (1958); Georg Meyer-Thurow, *The Industrialization of Invention: A Case Study From the German Chemical Industry*, 73 ISIS 363 (1982); Ernst Homburg, *The Emergence of Research Laboratories in the Dyestuffs Industry, 1870-1900*, 25 BRIT. J. FOR HIST. OF SCI. 91 (1992); Ulrich Marsch, *Strategies for Success: Research Organization in German Chemical Companies and IG Farben Until 1936*, 12 HIST. & TECH. 23 (1994).

[21] For rise of the motion-picture studios *see* TERRY RAMSAYE, A MILLION AND ONE NIGHTS: A HISTORY OF THE MOTION PICTURE THROUGH 1925 (1926); CHARLES MUSSER, THE EMERGENCE OF CINEMA: THE AMERICAN SCREEN TO 1907 (1990); EILEEN BOWSER, THE TRANSFORMATION OF CINEMA, 1907-1915 (1990); RICHARD KOSZARSKI, AN EVENING'S ENTERTAINMENT: THE AGE OF THE SILENT FEATURE PICTURE, 1915-1928 (1990).

[22] For the most comprehensive study of the structure of artistic industries *see* RICHARD E. CAVES, CREATIVE INDUSTRIES: CONTRACTS BETWEEN ART AND COMMERCE (2000).

specialization and division of creative labor, the rising costs of creative activities, the increasing informational problems associated with trade in creative products, and the greater financial risks in undertaking creative activities.[23] These causes are crucial to the understanding of the law of creativity at the workplace and will be discussed throughout this paper.

The integration of creative activities, as Professors Lamoreaux and Sokoloff pointed out, required "firms … to learn how to manage creative individuals so as to elicit their loyalty and enhance their productivity. Entrepreneurially oriented [creative individuals] initially moved in and out of employment positions and, even worse from the standpoint of firms, often tried to exploit personally [creative products] that they came up with on company time. Firms had to learn how to tighten their contractual relations with [employed creative individuals] and also how to convince them that advancement within the enterprise was an attractive alternative to self-employment."[24]

Indeed, there is abundant anecdotal evidence that the integration of creative activities within firms was slow and was accompanied by many doubts and struggles that

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[23] *See* generally Lamoreaux and Sokoloff, *Inventors, Firms and the Market for Technology*, *supra* note 14; Lamoreaux and Sokoloff, *Inventive Activity and the Market for Technology in the United States, 1840-1920*, NBER WORKING PAPER NO. 7107 (1999). NATHAN ROSENBERG, EXPLORING THE BLACK BOX: TECHNOLOGY, ECONOMICS, AND HISTORY (1994); For informational problems *see* David C. Mowery, *The Boundaries of the U.S. Firm in R&D*, in COORDINATION AND INFORMATION: HISTORICAL PERSPECTIVES ON THE ORGANIZATION OF ENTERPRISE 149 (Naomi R. Lamoreaux and Daniel M. G. Raff eds., 1995). Also *see* on this issue Richard E. Caves, Harold Crookell and J. Peter Killing, *The Imperfect Market for Technology Licenses*, 45 OXFORD BULL. ECON. & STAT. 249 (1983); Richard Zeckhauser, *The Challenge of Contracting for Technological Information*, 93 PROC. OF THE NAT'L ACAD. OF SCI. 12743 (1996).

[24] Lamoreaux and Sokoloff, *Inventors, Firms and the Market for Technology*, *supra* note 14.

impeded progress.[25] It was a long process of learning how to organize creative activities that was coupled with various difficulties in adding assignment clauses[26] to employment contracts and that gave rise to tensions and disputes between management and creative employees.[27] This was the birth of the debate over creativity at the workplace.[28]

Reported cases of disputes between employers and employees over the rights in creative products can be traced already to before the estimated birth date of the debate, in the second quarter of the nineteenth century. The case law created by the decisions in these cases generally honored the individual genius and in the absence of an agreement to the contrary usually vested the rights in the hired party. By the last quarter of the nineteenth century the courts began to attend more to the nature of the employment

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[25] The long-time head of Bell Telephone Company's patent department, one of the revolutionizing companies in in-house R&D, wrote in an 1885 letter to the company's general manager:

> "I am fully convinced that it has never, is not now, and never will pay commercially, to keep an establishment of professional inventors, or of men whose chief business it is to invent; or a corps of electricians who are assumed or expected as a part of their duty, to invent new and valuable telephones or telephonic appliances, in their employee."

Cited by Lamoreaux and Sokoloff, *Inventors, Firms and the Market for Technology*, *supra* note 14. For a thorough study of the integration of creative activities within Bell *see* REICH, THE MAKING OF AMERICAN INDUSTRIAL RESEARCH, *supra* note 20. For the managerial impediments to integrate creative activities and motivate employees in other companies in the late nineteenth century *see* NOBLE, AMERICA BY DESIGN, *supra* note 20, 100-101; H.I. DUTTON, THE PATENT SYSTEM AND INVENTIVE ACTIVITY DURING THE INDUSTRIAL REVOLUTION 122-149 (1984); GEORGE WISE, WILLIS R. WHITNEY, GENERAL ELECTRIC, AND THE ORIGINS OF U.S. INDUSTRIAL RESEARCH 69-70 (1985). Further references for studies that provide such evidence can be found in Lamoreaux and Sokoloff, *Inventors, Firms and the Market for Technology*, *supra* note 14.

[26] Assignment clauses are contractual provisions by which employees assign the rights in their future inventions and works to employers.

[27] Lamoreaux and Sokoloff, *Inventors, Firms and the Market for Technology*, *supra* note 14; Fisk, *Removing the Fuel of Interest from the Fire of Genius*, *supra* note 10; Fisk, *Working Knowledge*, *supra* note 11.

[28] For early writing on the debate *see* Dwight B. Cheever, *The Rights of Employer and Employee to Inventions Made by Either During the Relationship*, 1 MICH. L REV. 384 (1903); EDWIN J. PRINDLE, PATENTS AS A FACTOR IN MANUFACTURING 84-102 (1908).

relationships, thereby starting to shape the present law of creativity at the workplace. From that period of time the inclination of the courts in favor of the individual genius was reversed and gradually changed in favor of employers.[29]

The distributional consequences of the second rise of employed creativity can be easily grasped by examining the transformation of the distribution of intellectual-property rights that has become more concentrated in corporations (*i.e.*, hiring parties), rather than in individuals.[30] In the 1870's more than *85%* of the patents issued by the United States Patent office went to individuals, this share went down to slightly more than *70%* in 1910, *42%* in 1936, down to *14%* in 2000 (*see Figure 1* below).[31] By the nature of things, statistics on the distribution of rights are available only for patents, as there are no legal registration requirements for copyrights and trade secrets. Yet, it is widely believed

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[29] Professor Fisk's contribution to the literature on the debate over creativity at the workplace is in studying this transformation of the law of creativity at the workplace. Fisk, *Removing the Fuel of Interest from the Fire of Genius*, *supra* note 10; Fisk, *Working Knowledge*, *supra* note 11; Fisk, *Authors at Work*, *supra* note 11.

[30] The distribution of intellectual-property rights between corporations and individual offers only a rough indication for the characteristics of the allocation of rights between hired and hiring parties. The major causes for biases of this distinction are: a hiring party might be an individual, intellectual-property rights might be assigned to corporations to which the creative individual is associated, and intellectual-property rights might be assigned by arms-length transactions and not by the virtue of employment relations. Lamoreaux and Sokoloff analyzed some of the trends of these biases in the years 1840-1920. The important inference of their analysis is that the biases sharply decreased over time. Lamoreaux and Sokoloff, *Inventors, Firms and the Market for Technology*, *supra* note 14; Lamoreaux and Sokoloff, *Inventive Activity and the Market for Technology in the United States, 1840-1920*, *supra* note 23

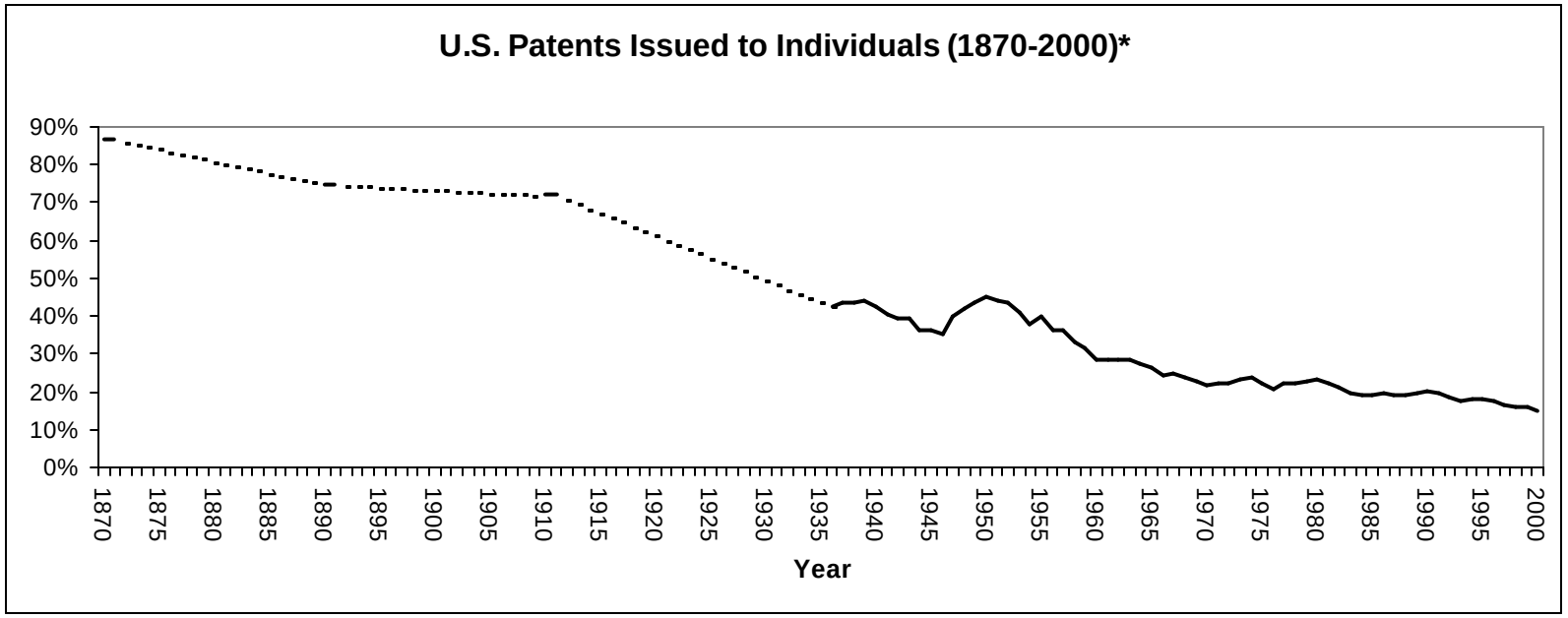
[31] This decline is more moderate when patents issued to foreign government, corporations, and individuals are excluded.

that the distributive trend is generally the same, albeit more moderate in copyrighted works of art.[32]

There is still much to study about the history and development of employed creativity and the extremely abbreviated story told in this part does not presume to summarize all the known aspects of this history or to offer new ones. All it asks is to illustrate that the history of employed creativity is intimately related to the allocation of rights at the workplace. It would be shown in this paper that the economic causes that brought to the second rise of employed creativity are crucial to the understanding of the desirable allocation rights.

[32] Note that the distribution of rights between individuals and corporations suggests nothing about the relative quality of creative products owned by individuals, vis-à-vis, by corporations. In terms of utilizing and commercializing creative products, there is extensive evidence that the relative financial strength of corporations provides them with a qualitative advantage over individuals at least in industrial R&D, and motion-picture production.

Figure 1[33]



* The statistics for the years 1870-1935 are based on estimations made by Lamoreaux and Sokoloff for the years 1870, 1890, and 1910. These statistics roughly correspond the findings of David Noble for this period of time.[34]

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[33] Data sources: Lamoreaux and Sokoloff, *Inventors, Firms and the Market for Technology*, *supra* note 14; Pasquale Joseph Fredrico, Distribution of Patents Issued to Corporations (1957); Pasquale Joseph Fredrico, Corporation Patents – Statistics of Ownership, in THE ENCYCLOPEDIA OF PATENT PRACTICE AND MANAGEMENT OF INNOVATION 178-185 (1974); U.S. Patent and Trademark Office, *All Technologies Report, 1963-1999* (Mar., 2000); U.S. Patent and Trademark Office, *Historic All Technologies Report, 1963-1999* (Mar., 2000).

[34] According to Noble *12%* of the patent issued in 1885 went to corporations. DAVID F. NOBLE, AMERICA BY DESIGN, *supra* note 20.

III. The Legal Framework: A New Look at the Intellectual-Property Allocation Rules

A. Generalizing Allocation Rules for the Different Branches of the Law

The law of creativity at the workplace comprises two sets of branches, each of them encompasses allocation rules of three distinctive branches of law. The primary set, on which this paper is focused, consists of the allocation rules of copyright, patent, and trade secret laws. The secondary set consists of the allocation rules of trademark, trade names, and publicity right laws.

My ranking of the sets, as primary and secondary, is based solely on the complexity of their allocation rules: the rules of the primary set are intricate and sometimes blurry, whereas the rules of the secondary set are quite straightforward because of the unique properties of its underlying rights.

The complexity of the allocation rules and its resulting uncertainty around the precise application of the rules are a perpetual intensifying factor in the debate over creativity at the workplace as the logic of the rules is sometimes concealed and it is difficult to reach an agreement on re-allocation of rights. By the same token, the complexity and the uncertainty are the main cause for the quarrels and disputes that come before the courts and the debates among scholars. Complexity, therefore, has made the primary set extremely prominent in the debate over creativity at the workplace and

almost negated the weight of the secondary set in this debate. For this reason and for the sake of simplicity, unless otherwise specified, from now on the term *the law of creativity at the workplace* refers only to the allocation rules of copyright, patent, and trade secret laws.

This part of the paper studies the allocation rules of the law of creativity at the workplace. The next section introduces a general framework of allocation rules for the primary and secondary sets. Due to the complexities of the framework for the primary set, its applications are discussed in detail in Sections III.C.-III.F.

B. The Allocation Rules and the Rule of Relative Contributions

1. Copyrights, Patents, and Trade Secrets

Three branches of law govern the law of creativity at the workplace: copyrights, patents, and trade secrets. None of them provides clear allocation rules and there is much uncertainty regarding their applications. Moreover, the allocation rules of these branches sometimes move in different directions as they have evolved in separate paths and have been shaped in light of the distinctive properties characterizing the information protected

by each one of them.[35] Nevertheless, because the allocation rules intertwine at several crossroads, it is possible to depict a general, albeit not perfect, framework of allocation rules for the primary branches. I will start with the generic framework that applies to bilateral relations between a hiring party and a hired party. Extending this framework, I will then discuss the rules for multilateral relations of more than one hiring or hired party.

a) Bilateral Relations

A peculiar characteristic of the law of creativity at the workplace is that the importance of multilateral relationships is overlooked although, as discussed above, the law developed in light of the emergence of the organization of creative activities in setups of multiple players. This fixation on bilateral relations reflects a fundamental flaw of those who for no ground insist to believe in the solitude of the individual genius.[36] It was this mistaken belief that have shaped the allocation rules such that the rules for multilateral relations are an extension of the rules for bilateral relations, rather the deriving the latter from the former. For this reason my analysis here begins with the rules for bilateral relations.

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[35] An important comparison, although somewhat outdated in certain aspects, between the allocation rules under each of the three branches can be found in Stedman's study from 1971. John C. Stedman, *Employer-Employee Relations*, in FREDRIK NEUMEYER, THE EMPLOYED INVENTOR IN THE UNITED STATES: R&D POLICIES, LAW, AND PRACTICE 29-84 (1971). For the evolution of the major branches of the law of creativity of the workplace *see* Fisk, *Removing the Fuel of Interest from the Fire of Genius*, *supra* note 10; Fisk, *Working Knowledge*, *supra* note 11; Fisk, *Authors at Work*, *supra* note 11.

[36] For excellent critic against this view ROGER BURLINGAME, INVENTORS BEHIND THE INVENTOR (1947); JACK STILLINGER, MULTIPLE AUTHORSHIP AND THE MYTH OF SOLITARY GENIUS (1991). *See* also Peter Jaszi, *On the Author Effect: Contemporary Copyright and Collective Creativity*, 10 CARDOZO ARTS & ENT. L.J. 293 (1992).

Inasmuch as a crude brush can draw common guiding lines along the various doctrines of the law of creativity at the workplace, these consist of four categories of situations with respective allocations rules:

(i) where a contract settles the allocation of rights between *X* and *Y* – its provisions are honored by the courts;[37]

(ii) where *X* hires *Y* to undertake creative tasks – it is assumed that they implicitly agreed that *X* would retain the rights in the resulting products;[38]

(iii) In certain, defined circumstances where the contract is silent with respect to the assignment of rights and the contributions of the parties to the final product are identifiable – the rights are shared or divided between the parties; and

(iv) unless otherwise specified in categories *(i)-(iii)*, the hired party, *Y*, retains the rights in the product she conceived and perfected.

These four categories portray two separate worlds: one is governed by contractual arrangements (category *(i)*) and the other is governed by default rules (categories *(ii)-(iv)*). Accordingly, the core issues in the debate over creativity at the workplace are the limits to the freedom to assign rights in creative products, and the clarity and completeness of the default rules.

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[37] The only comprehensive study of pre-invention assignments practices in technological industries is Neumeyer's study from 1971. NEUMEYER, THE EMPLOYED INVENTOR IN THE UNITED STATES, *ibid*. *See* also J. ROGER O'MEARA, EMPLOYEE PATENT AND SECRECY AGREEMENTS (1965). Pre-creation assignment practices in artistic industries have been studied recently by Richard Caves. RICHARD E. CAVES, CREATIVE INDUSTRIES, *supra* note 22.

[38] *See* Fisk, *ibid*; BORGE VARMER, WORKS MADE FOR HIRE AND ON COMMISSION, Study No. 13 in Studies Prepared for the Subcommittee on Patents, Trademarks, and Copyrights of the Senate Committee on the Judiciary, 86th Cong., 2d Sess. (1958).

Later in this Part I present the present limits to the freedom to assign rights in creative products. The question of what should the limits be is discussed in Part IV of this paper.

As for the default rules, their completeness is provided by the residual nature of the fourth category. Their clarity, however, is a different story. The rules are subject to much uncertainty with respect to their scope and applicability, which in many cases makes them poor substitutes for contractual arrangements and complicates litigation that follows contractual gaps.

Borderline cases, where there is uncertainty regarding which allocation rule applies, are typically decided by *the rule of relative contributions: the rights are granted to the hired creative individual only if her relative contribution to the product was significantly greater than that of the hiring party.*[39]

Contributions of the hired party, for the purpose of this rule, are only those which are uncompensated and do not include contributions that are within the purview of her contractual obligations to the hiring party, including work hours. Contributions of the hiring party, on the other hand, are broadly defined and include any resources that were funded by the employer and were used for the production of the product. For example,

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[39] To a large extent, this rule coincides with the theory of Professors Aghion and Tirole. Philippe Aghion and Jean Tirole, *The Management of Innovation*, 109 Q. J. ECON. 1185 (1994). Their model is an extension of Professors Gorssman and Hart's classic article on the cost of ownership. Sanford J. Grossman and Oliver D. Hart, *The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration*, 94 J. OF POL ECON. 691 (1986).

office supplies, computer time, and assistance of other employees are regarded as contributions of the hiring party.

To be sure, this rule cannot be found in courts' decisions or scholarly writing,[40] although as illustrated in the subsequent Sections, it fashions a simple framework for understanding the law of creativity at the workplace.

b) Multilateral Relations

(i) Multilateral Relations of Multiple Hired Parties. Multilateral relations of multiple hired parties differ in their allocation rules from bilateral relations only when several parties are hired to undertake creative tasks and the allocation of rights in the resulted product are not contractually settled among all parties. In all other situations, the allocation rules of bilateral relations (categories *(i)*, *(iii)*, and *(iv)*) apply. Under the aforementioned circumstances, disputes are resolved by the rule of relative contributions that is even more favorable for the hiring party than it is in bilateral relations.

The intuition here is as follows: the more individuals engage in creative tasks, the smaller the relative contribution of each one is, as the burden of the work is distributed

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[40] Other forms of the idea, especially more general ones, have been examined. *See, e.g., Shapiro, Bernstein & Co. v. Bryan*, 123 F.2d 697 (2nd Cir. 1941) (Judge Learned Hand refused to decide a copyright dispute according to the relative contributions of the employee and employer); H.R. 3285, 98th Cong., 1st Sess. § 414-437 (1983) (a 1983 bill of Representative Kastenmeier proposed to use a test of comparative contributions to determine the compensation for inventions); Stedman, *Employer-Employee Relations*, *supra* note 37 (highlighting "the complexities of multiple contributions" as a factor of allocation); Peter Jaszi, *On the Author Effect: Contemporary Copyright and Collective Creativity*, in THE CONSTRUCTION OF AUTHORSHIP: TEXTUAL APPROPRIATION IN LAW AND LITERATURE 29, 34 (Martha Woodmansee and Peter Jaszi, eds., 1994) ("[I]t is the employer's contribution as the 'motivating factor' behind the work behind that work … that matters, rather than the mere drudgery of the employee.")

among them. At the same time, with the decrease of the relative contribution of each hired party, the contribution of the hiring party in recruiting, monitoring, and paying the hired parties goes up. Moreover, with respect to each hired party the rule of relative contributions credits the hiring party with the contributions of all other hired parties and as a result in such cases it is much harder for a hired party to pass the threshold of the rule. The reasoning behind the application of the rule of relative contributions for this setup is analyzed in Subsection IV.E.2.a) below.

Again, although much of the debate over creativity at the workplace is primarily focused on bilateral relations, in many industries the setup of multilateral relations of multiple hired parties is far more prevalent than the bilateral one. Hence, it is important to keep in mind that much of the case law and the literature on the issue are concerned with situations that do not necessarily best characterize the common organization of creativity at the workplace.

(ii) Multilateral Relations with Multiple Hiring Parties. Hypothetically, a creative servant might work for more than one master on the same product, which would be subject to dispute among the masters. I could not find reported cases of such circumstances and thus it is unclear how the courts would settle them.[41]

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[41] In *Food Lion, Inc. v. Capital Cities/ABC, Inc.*, two employees of ABC were sent to work for a grocery store chain, Food Lion, to find evidence of unsanitary practices in the handling of meat. To avoid the broadcast of the incriminating evidence, Food Lion claimed ownership in copyrights in the videotapes as the employer of the two. The court held that the videotaping was not within the scope of the employment at Food Lion and, therefore, rejected Food Lion claims for any rights in the videotapes. *Food Lion, Inc. v. Capital Cities/ABC, Inc.*, 984 F.Supp. 923 (M.D.N.C. 1997); 946 F.Supp. 420 (M.D.N.C. 1996).

2. Trademarks, Trade Names, and Publicity Rights

a) The Nature of the Protected Information

The secondary branches of the law of creativity at the workplace protect information that identifies a human being, a character, a firm, an object, a concept, or a trait.[42] Examples for such information are the brands Coke, Kleenex, Post It Notes, and Xerox, the characters of Chaplin's Little Tramp and the Marx Brothers,[43] and a human-cannonball act, in which a person is shot from a cannon.[44] The protection of the identifying feature in this type of information might be based on various theories of intellectual property, torts, constitutional law, and equity; however, the exact grounds of these theories and their scope are not necessary to the discussion here.

The identifying feature in the information protected by the secondary branches means that the public recognizes what stands behind it. For this reason, generic

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[42] For trademarks and trade names *see, e.g.*, Ralph H. Folsom and Larry L. Teply, *Trademarked Generic Words*, 89 YALE L. J. 1323 (1980); William M. Landes and Richard A. Posner, *Trademark Law: Economic Perspective*, 30 J. L. & ECON. 265 (1987); Nicholas S. Economides, *The Economics of Trademarks*, 78 TRADEMARK REP. 523 (1988). Very little, if at all, has been written on publicity rights from the economic perspective. *See Zacchini v. Scripps-Howard Broadcasting Co.*, 97 S.Ct. 2849, 2857-2858 (1977) ("The protection of [the] right of publicity provides an economic incentive for him to make the investment required to produce a performance of interest to the public"); *Cardtoons, L.C. v. Major League Baseball Players Association*, 95 F.3d 959 (10th Cir. 1996); *Matthews v. Wozencraft*, 15 F.3d 432, 437-438 (5th Cir. 1994) ("Without the artificial scarcity created by the protection of one's likeness, that likeness would be exploited commercially until the marginal value of its use is zero.") *See* also Melville B. Nimmer, *The Right of Publicity*, 19 LAW & CONTEMP. PROBS. 203, 216 (1954) (defining the right of publicity as "the right of each person to control and profit from the publicity values which he has created or purchased.")

[43] *Chaplin v. Amador*, 269 P. 544 (Cal. Dist. Ct. App. 1928); *Groucho Marx Prods., Inc., v. Day & Night Co., Inc.*, 523 F.Supp. 485 (S.D.N.Y. 1981). *See* also Robert M. Jarvis, *Babe Ruth as Legal Hero*, 22 FLORIDA STATE U. L. REV. 885 (1995).

[44] *Zacchini v. Scripps-Howard Broadcasting Co.*, *ibid*.

information that is not perceived by the public as associated with a specific entity or trait is not protected.[45] For example, attempts to acquire rights in the terms "shredded wheat," "light beer," "air shuttle," "chocolate fudge," and "You Have Mail" failed because these terms were not suggestive, descriptive, or fanciful.[46]

By the same token, the identifying feature implies that a party may lose its rights when a "substantial majority of the public" does not know anymore the original significance of the information and it becomes generic. For this reason, King-Seeley Thermos lost its trademark "Thermos," du Pont lost its lucrative "Cellophane," Haughton Elevator Company lost "Escalator," Bayer lost "Aspirin," and the list goes on.[47] Similarly, as the heirs of the actor Bela Lugosi (Count Dracula) and the silent-motion-picture star Rudolph Valentino found out,[48] publicity rights may not survive the death of their holder if she did not exercise them during her lifetime and then the protected information becomes "generic" and passes into the public domain.[49]

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[45] *See* Landes and Posner, *Trademark Law: Economic Perspective*, *supra* note 42; Economides, *The Economics of Trademarks*, *supra* note 42.

[46] *Kellogg Co. v. National Biscuit Co.*, 59 S.Ct. 109 (1938) (shredded wheat); *Miller Brewing Co. v. Falstaff Brewing Corp.*, 655 F.2d 5 (1st Cit. 1981) (light beer); *Eastern Air Lines, Inc. v. New York Air Lines, Inc.*, 559 F.Supp. 1270 (S.D.N.Y. 1983) (air shuttle); *A.J. Canfield Co. v. Honickman*, 808 F.2d 291 (3rd Cir. 1986) (chocolate fudge); *America Online, Inc. v. AT & T Corp.*, 243 F.3d 812 (4th Cir. 2001) (You Have Mail).

[47] *King-Seeley Thermos Co. v. Aladdin Industries, Inc.*, 321 F.2d 577 (2nd Cir. 1963); *DuPont Cellophane Co. v. Waxed Products Co.*, 85 F.2d 75 (2nd Cir. 1936); *Haughton Elevator Company v. Seeberger*, 85 U.S.P.Q. 80 (1950); *Bayer Co. v. United Drug Co.*, 272 F. 505 (S.D.N.Y. 1921).

[48] *Lugosi v. Universal Pictures*, 25 Cal. 3d 813 (1979); *Gugilielmi v. Spelling-Goldberg Production*, 25 Cal. 3d 860 (1979).

[49] For a good discussion on the publicity rights of deceased celebrities *see* Joseph J. Beard, Casting Call at Forest Lawn: The Digital Resurrection of Deceased Entertainers – A 21st Century Challenge for Intellectual Property Law, 41 J. COPYRIGHT SOCT'Y U.S.A 19 (1993).

b) The Allocation Rule

The allocation rule that governs the secondary branches is an immediate derivative of the nature of the protected information: in general, rights are granted to the party that is the first to possess (*i.e.*, use) the information as the protected information is assumed to be associated by the public with this party.

For example, when a hired artist creates mascots or icons to advertise the hiring party or designs a mark in the course of her employment and the hiring party uses it, the hiring party retains the rights in the symbols unless otherwise agreed.[50] However, when the hired party is the first to use her work she retains the rights in it.[51] The same applies for publicity rights with respect to the name, face, and likeness of a character. For example, mannerism and phrases of an employed entertainer were held to be owned by her as she was the one who developed them and was first to use them.[52] Similarly, the rights of mortal employees against unauthorized appropriation of their names by their

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[50] *See, e.g., Outcalt v. New York Herald*, 146 F. 205 (C.C.S.D.N.Y. 1906) (granting the rights in comic characters to the hiring party); *Grant v. Kellogg Co.*, 58 F.Supp. 48 (D.C.N.Y. 1944) (granting the rights in mascots to the hiring party); *Scranton Plastic Laminating, Inc. v. Mason*, 187 U.S.P.Q. 487 (T.T.A.B. 1986). *See* also Vanessa O'connell and Suzanne Vranica, *Sale of Mascot of Failed Pets.com Raises Questions of Ad Ownership*, WALL ST. J., Nov. 10, 2000 (discussing the practice of corporate ownership of mascots and icons created by artists and advertising agencies).

[51] *See, e.g., Fisher v. Star Co.,* 132 N.E 133 (N.Y. 1921) (the court granted a creator of fictional characters an injunction against the re-use of the characters by a newspaper in which it was published because the creator created the characters and published them before it was employed by that publication); *City of Newark v. Beasley*, 883 F.Supp. 3 (D.N.J 1995) (rejecting employer's claims for ownership in trademarks and servicemarks created by an employee because the latter was the first to use them in connection with his employer and in connection with the sale to other parties).

[52] *See, e.g., Score, Inc. v. Cap Cities/ABC, Inc.*, 724 F. Supp. 194 (S.D.N.Y. 1989); *KGB, Inc. v. Giannoulas*, 164 Cal. Rptr. 571 (4th Dist. 1980). *See* also *Price v. Hal Roach Studios, Inc.*, *supra* note 4.

employers have been acknowledged by a number of courts.[53] In comparison, when the hiring party makes substantial investments in the development and commercialization of a character it may own the rights in that character. Example for such a case is the character of Freddy Krueger, the vicious killer from *Nightmare on Elm Street*.[54]

Very little has been written on the allocation rule of the secondary branches and it does not come before the courts often.[55] This lack of attention, however, seems to emanate from the simplicity of the rule and its sound logic. I will follow my predecessors and will add no more on this issue.

C. Copyright Law

1. Overview

When a product is copyrightable, the allocation of rights between the hiring party and the hired creative individual(s) is governed by the *work made for hire* doctrine, under which an employer may be considered the author of a work and the owner of the rights therein. The work-made-for-hire doctrine was first noted by the Supreme Court in 1903

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[53] *See, e.g., Zim v. Western Public Co.* 573 F.2d 1318 (5th Cir. 1978); *Bond v. Sterling, Inc.*, 997 F.Supp. 306 (N.D.N.Y. 1998).

[54] *New Line Cinema Corp. v. Bertlesman Music Group, Inc.*, 693 F.Supp. 1517 (S.D.N.Y. 1988).

[55] The references in the literature to the allocation rule of the secondary branches are rather descriptive and brief. *See*, e.g., Note, *The Protection Afforded Literary and Cartoon characters Through Trademark, Unfair Competition, and Copyright*, 68 HARV. L. REV. 349, 361-362 (1954); JANE M. GAINES, CONTESTED CULTURE: THE IMAGE, THE VOICE, AND THE LAW (1991); J. THOMAS MCCARTHY, MCCARTHY ON TRADEMARKS AND UNFAIR COMPETITION (4th ed.) § 16:36.

in *Bleistein v. Donaldson Lithographing Co.*,[56] where Justice Holmes stated in dicta that an employer owned the copyright to illustrations created by an employee in the course of his employment.[57] A few years later, the Copyright Act of 1909 codified the doctrine, and it was later refined by the 1976 Copyright Act pursuant to judicial experience, commentary inputs, and lobbying by various interested groups.[58]

Unfortunately, the efforts to codify the work-made-for-hire doctrine increased the uncertainty about how to apply the allocation rules, due to the blurry distinction that the structure and legislative history of the 1976 Copyright Act drew between "employees" and "contractors." In this sense, the 1976 copyright allocation rules failed to accomplish their alleged objective as default rules that save transaction costs by reducing the need to

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[56] 188 U.S. 239 (1903).

[57] For the history of the doctrine *see* Fisk, *Authors at Work*, *supra* note 11; Peter Jaszi, *Toward a Theory of Copyright: The Metamorphoses of "Authorship,"* 1991 DUKE L. J. 455 (1991).

[58] *See* COPYRIGHT LAW REVISION, Hearing before the Comm. on Judiciary, 94th Cong. 1st Sess. (1976); Jessica D. Litman, *Copyright, Compromise, and Legislative History*, 72 CORNELL L. REV. 857, 900-903 (1987).

specify standard terms,[59] and exposed parties with incomplete contracts to costly litigation.[60]

This section presents the copyright allocation rules using the general framework introduced above. The next subsection summarizes the copyright allocation rules for employees and contractors. Subsection III.C.3. briefly presents how the courts addressed the distinction between employees and contractors, and Subsection III.C.4. discusses major exceptions to the copyright allocation rules.

2. The Basic Allocation Rules

(a) Assignment Agreements. Under the first category of situations, where hired and hiring parties agree on the allocation of the rights in a product produced by the hired party, the ownership can be assigned to the hiring party, but not the authorship. As the author of a work, a hired party has a time period of five years to terminate any

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[59] *See* Statement of Paul Goldstein, before the Subcommittee on Courts and Intellectual Property of the Committee on the Judiciary, U.S. House of Representatives, May 25, 2000 <<http://www.house.gov/judiciary/gold0525.htm>>:

> "The economic rationale for the 1976 Copyright Act's work for hire provisions is rooted in the well-documented problem of transaction costs… If it were necessary for an employer to negotiate an assignment of copyright with each of dozens, or even hundreds, of employees each time they joined to create a copyrighted work, time and energy that could be better spent on creating new works would instead be devoted to the wasteful task of negotiating, drafting and executing contracts… The solution is to vest copyright initially in the employer; …however, this is only a default solution, and in the relatively unusual case where the parties agree that the employee should own the rights in the work, they may transfer the rights accordingly."

[60] This outcome may be interpreted as a variance of the Ayres-Gertner approach to default rules as penalty rules that are designed to induce parties to negotiate certain aspects in their relationship in advance. Ian Ayres and Robert Gertner, *Filling Gaps in Incomplete Contracts: An Economic Theory of Default Rules*, 99 YALE L. J. 8 (1989).

assignment of rights.[61] This time period starts "at the end of thirty-five years from the date of execution of the [assignment]; or, if the [assignment] covers the right of publication of the work, the period begins at the end of thirty-five years from the date of publication of the work … or at the end of forty years from the date of execution of the [assignment], whichever term ends earlier."[62]

(b) Employees and Contractors Who Are Hired to Be Creative. Under the second category of situations, the rights in a product are vested in the hiring party if the product is a work made for hire. An employee's product is a work made for hire if it was "prepared by [her] within the scope of … her employment,"[63] where the scope of employment cannot be extended in contract to include all the works created by the employee regardless of their connection to the employee's tasks.[64] In comparison, a contractor's product is a work made for hire only if it was "specially ordered or commissioned," one of nine enumerated types of work,[65] and meets certain formal

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[61] *See* Subsection III.F.2. below.

[62] 17 U.S.C. §203(a)(3). For implications of the author's right to terminate the grant in the motion-picture industry, *see* Michael H. Davis, *The Screenwriters Indestructible Right to Terminate Her Assignment of Copyright: Once a Story is "Pitched," a Studio Can Never Obtain All Copyrights in the Story*, 18 CARDOZO ARTS & ENT. L.J. 93 (2000).

[63] 17 U.S.C. § 101.

[64] *See, e.g., City of Newark v. Beasley*, 883 F.Supp. 3 (D.N.J 1995) (a provision requiring the employee to "devote [her] entire time to the service of the [employer]" was held as not permitting the employer to claim rights in work created by the employee during leisure hours).

[65] 17 U.S.C. § 101:

> "[A] contribution to a collective work, … a part of a motion picture or other audiovisual work, as a translation, … a supplementary work, … a compilation, … an instructional text, … a test, … answer material for a test, or … an atlas."

See also Corey Field, *Their Master's Voice?*, 48 J. COPYRIGHT SOC'Y U.S.A. 145-189 (2000) (discussing the short-lived tenth category of sound recordings).

requirements.[66] Thus, in the absence of an agreement to the contrary, a contractor retains the rights in a work she was hired to create and was paid for.

The foregoing differences between the allocation rules for employees and contractors have significant practical consequences that, as discussed below, do not necessarily have profound justifications. For example, a safety coordinator who, as part of his job, took photographs on the site of the 1995 bombing in Oklahoma City did not retain ownership in the photographs.[67] In contrast, a free-lance photographer who was invited to shoot exclusive photographs of Prince Charles, Princess Diana, and their infant son, Prince William, was found to be the owner of the rights in the photographs.[68] Both individuals carried out the same task for another, but nevertheless one of them retained the rights in the product of his efforts and the other one was denied ownership in the product of his efforts.

(c) Identifiable Contributions. Under copyright law there are two allocation rules for situations in which the contributions of the parties are identifiable: division of rights in collective works and sharing rights in joint works.

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[66] The parties must expressly agree in a written instrument signed by them that the work shall be considered a work made for hire. U.S.C. § 101.

[67] At the heart of this case there was a photograph of a firefighter cradling an injured infant that was later on the cover of Newsweek. Another photographer who also captured the "firefighter and baby" scene in a photograph was later awarded the Pulitzer Prize for this photograph. *Oklahoma Natural Gas Company v. LaRue*, 156 F.3d 1244 (10th Cir. (Okla.), 1998).

[68] *Sygma Photo News, Inc. v. Globe Intern., Inc*., 616 F.Supp. 1153, 1156 (D.C.N.Y. 1985).

(i) Division of Rights. Division of rights is one of the major innovations introduced by the 1976 Act, which rejected the doctrine of indivisibility,[69] recasting the copyright as a bundle of discrete, exclusive rights.[70] The application of this legislative innovation to the copyright allocation rules is limited to collective works, the contributions of which constitute "separate and independent works in themselves."[71] In such works, the rights in the collective work are vested in the hiring party, whereas the rights in each contribution are vested in its author, *i.e.*, the contractor who prepared it.[72] Notwithstanding, "the parties [may] expressly agree in a written instrument signed by them that the work shall be considered a work made for hire,"[73] thereby assigning authorship and ownership to the hiring party. Absent such an agreement, "the owner of copyright in the collective work is presumed to have acquired only the privilege of reproducing and distributing the contribution as part of that particular collective work, any revision of that collective work, and any later collective work in the same series."[74]

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[69] The doctrine of indivisibility prevented an author from assigning only limited publication rights to the publisher of a collective work while holding back all other rights.

[70] 107 U.S.C. § 106. For a broader analysis of the divisibility of copyrights and earlier history of this legislative innovation, *see* H.R. 8177, 68th Cong. 1st Sess. § 45(b) (1924) (Dallinger Bill, proposing among other things "split copyright"); ABRAHAM L. KAMISTEIN, DIVISIBILITY OF COPYRIGHT (General revision of the Copyright Law, Study No. 4, 1958). *See* also Herbert Tenzer, *Divisibility of Copyrights: A Bill of Rights For Authors*. 14 CAL. W. L. REV. 590 (1979). *See* also VARMER, WORKS MADE FOR HIRE AND ON COMMISSION, *supra* note 38, at 26.

[71] 17 U.S.C. § 101:

> "A "collective work" is a work, such as a periodical issue, anthology, or encyclopedia, in which a number of contributions, constituting separate and independent works in themselves, are assembled into a collective whole."

[72] 17 U.S.C. § 201.

[73] 17 U.S.C. § 101.

[74] 17 U.S.C. § 201(c).

Simply put, the copyright division rule applies to setups of multilateral relations of multiple contractors, in which it grants each of the contractors the rights in her contribution and confers upon the hiring party the rights in the collection of the contributions. Two related matters that the copyright division rule raises are noteworthy. First, the fact that each contributor retains the rights in her contribution and yet a residual asset is left for the hiring party illustrates one aspect of the value that is created by the hiring party, which may increase with the number of hired parties.[75] Second, the operation of the copyright division rule for collective works is by switching the beneficiary party in circumstances of contractual gaps – from the hiring party to the hired party – and, therefore, the rule motivates hiring parties to draft more complete contracts.[76]

To see how the new copyright division rule is functioning I will discuss here two of its important applications: scholarly publications and placement of contributions in electronic databases.

Scholarly publications exemplify the effect of the division rule on contractual completeness. For scholars who live by the rule of "publish or perish"[77] the new division rule is rather important, for now they hold some rights in their contributions to scholastic journals and books and absent contractual restrictions they are free to reproduce their contributions. In practice, however, contracts between publishers and writers are

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[75] *See* Subsection III.B.1.b) above.

[76] *See supra* note 60 and accompanying text.

[77] For the value of academic publications in the pre-1976 era, *see* Howard P. Tuckman and Jack Leahey, *What Is an Article Worth?*, 83 J. OF POL. ECON. 951 (1975).

typically explicit on this point, thereby sometimes restricting the rights to reproduce works.

Placement of contributions in electronic databases, such as Lexis/Nexis and Westlaw, offers an example to a contractual gap that was neglected for a few years by many publishers. The crux of the matter, which will be perceived as anachronistic in a very few years, is whether publishers need the contributors' consent in order to license their contributions to electronic databases.

In *Tasini,* licensing practices of The New York Times and two other periodicals (collectively, the Publishers) were challenged by freelance authors who claimed that their copyrights were infringed upon when their works were licensed to database companies (the Electronic Publishers). The Publishers and Electronic Publishers, in response, relied on the aforementioned privilege of reproducing and distributing contributions as part of a particular collective work[78] and tried to establish their argument by the fact that the freelancers' contributions were placed in the databases along with all other articles from the periodicals in which their works appeared. The Supreme Court, divided seven to two, held that the Publishers were not sheltered by this privilege as the databases reproduced and distributed each contribution alone and not "as part of [the] particular collective work to which the author contributed." The dissent reasoned its siding with the Publishers and the Electronic Publishers by the view that the placement of the contributions in databases constituted a "revision" of the particular collective works; however, the minority seemed

[78] *Supra* note 74 and accompanying text.

to be influenced by the defendants' warning regarding the harmful "effect [that the majority's decision would] have on the availability of comprehensive digital databases."[79] As discussed below,[80] the minority's concern reflects the overstated traditional concerns regarding divisibility of rights,[81] which is rather outdated in this context and more importantly was rejected when the doctrine of indivisibility was abolished.[82] Notwithstanding, had the dissent analyzed the economic relationships between the Publishers and the freelancers, its reasoning might have been more persuading.

(ii) Sharing Rights. Hired and hiring parties may share the rights in a "joint work," where the hiring party made copyrightable contributions to the work and the parties had "the intention that their contributions [would merge] into inseparable or interdependent parts of a unitary whole."[83] Under such circumstances, the parties share tenancy in common, so that each party holds an undivided interest in the whole work regardless of her individual contribution.[84] This form of ownership sharing

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[79] *Ibid*, at 2402.

[80] *See* accompanying text to *infra* notes 106-109.

[81] *See, e.g., Schiller & Schmidt, Inc. v. Nordisco Corp.*, 969 F.2d 410, 413 (7th Cir. 1992) (J. Posner).

[82] *See* also *Greenberg v. National Geographic Society*, 244 F.3d 1267 (11th Cir. 2001) (Held that a searchable electronic database of the magazine's past issues was not "revision," within meaning of exception allowing publisher to reuse copyrighted photographs which had appeared in past issues).

[83] 17 U.S.C. § 101. *See* George D. Cary, *Joint Ownership of Copyrights, Copyright Law Revision Study* No. 12, Senate Subcomm. on Patents, Trademarks, and Copyrights, Comm. on the Judiciary, 86th Cong., 2d Sess. 83, (Comm.Print 1960); Julie Katzman, *Joint Authorship of Commissioned Works*, COLUM L. REV. 867-896 (1989); F. Jay, Dougherty, *Not a Spike Lee Joint? Issues in the Authorship of Motion Pictures Under U.S. Copyright Law*, 49 UCLA L. REV. 225 (2001).

[84] M. NIMMER & D. NIMMER, NIMMER ON COPYRIGHT, § 6.08.

was originated in the common law of the days before the work-made-for-hire doctrine[85] and is plagued with a common-pool problem:[86] without cooperation among the parties, they are likely to overuse (*e.g.*, over-license) their rights. Indeed, although joint works are prevalent in various forms of organization of creative activities (*e.g.*, co-authorship), they are rarely observed in circumstances where one of the parties is a hiring party that designs and controls the organization of the production.[87]

3. Who is Considered an Employee?

It is hard to find sound justifications for allocation rules that are based solely on the legal classification of the hired party[88] and the extensive literature on the work-made-for-hire doctrine does not achieve much in dissolving the puzzling legal distinction between employees and contractors. The courts, aware of this difficulty, chose broad interpretations of the term "employee" in order to generate more similar outcomes for

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[85] *Levy v. Rutley*, 6 L.R. 523 (C.P.1871); *Edward B. Marks Music Corp. v. Jerry Vogel Music Co.*, 140 F.2d 266, 267 (2d Cir.1944) (J. Hand discussing the origins of this rule).

[86] *See* generally Garrett Hardin, *The Tragedy of Commons*, 162 SCI. 1243 (1968).

[87] *See Thompson v. Larson*, 147 F.3d 195 (2nd Cir. 1998) (the hired party's claim for joint ownership was denied due to a lack of intent on behalf of the hiring party).

[88] *See, e.g.*, VARMER, WORKS MADE FOR HIRE AND ON COMMISSION, *supra* note 38, at 27-28; *Brattleboro Publishing Co. v. Winmill Publishing Corp.*, 369 F.2d 565, 568 (2d Cir. 1966) ("[There is] no sound reason why these same principles regarding works created by a salaried employee are not applicable when the parties bear the relationship of employer and independent contractor.")

both groups of hired individuals.[89] My argument here is that in order to do so, these courts used, albeit implicitly, the rule of relative contributions.

Prior to the 1976 Act, the distinction between employees and contractors had no significant effect and the "instance and expense" test was used to determine the allocation of copyright ownership between a "seller" (the hired party) and a "buyer" (the hiring party).[90] This test consisted of various factors designed to compare the contribution of the hiring party with the uncompensated contribution of the hired party, as the rule of relative contributions would dictate. The terms "seller" and "buyer" emphasized the idea that a hired party transferred her rights in consideration for compensation and her exact legal status did not matter. For example, it was held that "where the photographer takes the portrait for the sitter under employment by the latter, it is the implied agreement that the property in the portrait is in the sitter."[91] In the same fashion, the terms "seller" and

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[89] *See, e.g., Easter Seal Society for Crippled Children v. Playboy Enterprises*, 815 F.2d 323, 331 (5th Cir. 1987):

> "It doesn't matter whether the seller is a formal employee or an independent contractor. If the work was undertaken at the instance and expense of the buyer, and if the buyer had the right to control the work, regardless of whether or not the right was exercised, then the seller was a (legal) employee within the meaning of § 101(1)."

[90] *Yardley v. Houghton Mifflin Co.*, 108 F.2d 28 (2d Cir.1939), *cert. denied*, 309 U.S. 686, 60 S.Ct. 891 (1940); *Brattleboro Publishing Co. v. Winmill Publishing Corp.*, *supra* note 88; *Grant v. Kellogg Co.*, 58 F. Supp. 48, 51 (1944) ("[T]he art work .. is personal property, transferrable by sale and delivery, and there is no distinction in that respect between it and property of any other description."); *Dielman v. White*, 102 F. 892, 894 (C.C.D. Mass. 1900) ("If a patron gives commission to an artist, there appears … a very strong implication that the work of art commissioned is to belong unreservedly and without limitation to the patron.")

[91] *Altman v. New Haven Union Co.*, 254 Fed. 113, 118 (D.C. Conn. 1918). Most of the early cases of commissioned works dealt with rights in photographs taken by professional photographers. Varmer reports that until 1958 no reported court decisions were found involving commissioned work other than photographs and works of art. VARMER, WORKS MADE FOR HIRE AND ON COMMISSION, *supra* note 38, at 27. *See* also R. Scott Miller, Jr., *Photography and the Work-Made-for-Hire Doctrine*, 1 TEXAS WESLEYAN L. REV. 81 (1994).

"buyer" accented the fact that there were limits to what the hired party transferred to the hiring party through the contract between them. As one court said: "no one sells or mortgages all the products of his brain to his employer by the mere fact of employment."[92]

The 1976 Act created the distinction between the terms "employee" and "contractor" but offered no definition for either of them,[93] and their shaping was left for the courts in determining which allocation rule applies. In *Community for Creative Non-Violence v. Reid*,[94] which is still the leading case on this issue, the Supreme Court ruled that the term "employee" does not refer only to "formal, salaried employees"[95] and should be understood in light of the general common law of agency, by "consider[ing] the hiring party's right to control the manner and means by which the product is accomplished."[96] To assist in this examination, the court provided a non-exhaustive list of twelve factors:[97] five of which compare the relative contributions of the parties, two factors indirectly refer to the contribution of the hiring party, and the last five are formal legal criteria that classify hired parties.

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[92] *Public Affairs Associates, Inc. v. Rickover*, 177 F.Supp 601, 604 (D.D.C. 1959), *rev'd on other grounds*, 284 F.2d 262 (D.C. Cir. 1960), *vacated for insufficient record*, 369 U.S. 111 (1962).

[93] The reason for this only partial statutory treatment was a lack of agreement between competing interest groups. *See* Jessica D. Litman, *Copyright, Compromise, and Legislative History*, 72 CORNELL L. REV. 857 (1987). *See* also I.T. Hardy, *Copyright Law's Concept of Employment – What Congress Really Intended*, 35 J. COPYRIGHT SOC'Y U.S.A. 210 (1988).

[94] 490 U.S. 730 (1989) (hereinafter: *Reid*).

[95] *Reid*, at 743.

[96] *Reid*, at 751.

[97] *Reid*, at 751-752.

The *Reid* Court's Suggested Factors		
Relative contributions	*Proxies for the hiring party's relative contribution*	*Formal classifications*
– the skill required – the source of the instrumentalities and tools; – the location of the work; – the extent of the hired party's discretion over when and how long to work; and – the hired party's role in hiring and paying assistants.	– Whether the work is part of the regular business of the hiring party; and – Whether the hiring party is in business.	– The duration of the relationship between the parties; – Whether the hiring party has the right to assign additional projects to the hired party; – The method of payment; – The provision of employee benefits; and – The tax treatment of the hired party.

With respect to the factors, which are related to the relative contributions of the parties, it is noteworthy that the *Reid* court failed to recognize the distinction between compensated and uncompensated contributions of the hired party, perhaps because of the fact that Mr. Reid himself was not compensated for his services that he had volunteered to donate.[98] This mistake was crucial as it overlooked an important contribution of the hiring party; the compensation to the hired party. Hence, the court's oversight that had no practical implications in the *Reid* case undermined the grounds underneath any comparison between the contributions of the parties.

As to the formal factors, practically they were the primary addition of the 1976 Act to the tests used to determine the allocation of rights before the 1976 Act went into

[98] *Cf. Town of Clarkstown v. Reeder*, 566 F.Supp. 137 (S.D.N.Y. 1983) (held that a volunteer worker might be considered an employee for purposes of the copyright laws since compensation is not a determinative factor in evaluating one's employment status).

effect. The advantage of these factors is in simplifying the inquiry into the question of how to allocate the rights: because the allocation rules are relatively clear when the status of the hired party is provided, the more weight is given to formal factors, the easier is it to answer the question. On the other hand, the formal factors say very little about the production process, so their effect on the allocation of rights is rather arbitrary.

Lower courts that followed the *Reid* decision slightly refined its test and made it more workable by emphasizing the importance of several factors over others,[99] and specifically stressing the weight of the hiring party's right to control the manner and means of creation.[100]

To summarize, the outcome of the post-1976 developments is that the weight the courts gave to the relative contributions of the parties is smaller in comparison to the era before the 1976 Act, although it is still significant. In this respect, the 1976 Act presumably reduced some of the transaction costs involved in deciding on the allocation of rights[101] as it shifts some of the weight to formal factors.

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[99] *See, e.g., Aymes v. Bonelli*, 980 F.2d 857 (2nd Cir. 1992) (emphasizing (1) the hiring party's right to control the manner and means of creation; (2) the skill required; (3) the provision of employee benefits; (4) the tax treatment of the hired party; and (5) whether the hiring party has the right to assign additional projects to the hired party); *Innovative Networks, Inc. v Satellite Airlines Ticketing Centers, Inc*., 871 F.Supp. 709 (S.D.N.Y. 1995). *See* generally Scott K. Zesch, *Annotation, Application Of "Works For Hire" Doctrine Under Copyright Act Of 1976*, 131 ALR 301 (1996).

[100] *Innovative Networks, ibid* (describing this factor as "paramount").

[101] *See* Statement of Paul Goldstein, *supra* note 59.

4. Exceptions

Even where the copyright allocation rules are clear, some deviations from them can be found. Two prominent examples are the "teacher exception" and the "better-exploiter" argument.

The "teacher exception," according to which the copyrights in publications are vested in the scholars and teachers who wrote them and not in their employers, follows the common market practice. As Judge Posner put it:[102]

> "[V]irtually no one question[s] that the academic author [is] entitled to copyright his writings. Although college and university teachers do academic writing as a part of their employment responsibilities and use their employer's paper, copier, secretarial staff, and (often) computer facilities in that writing, the universal assumption and practice was that (in the absence of an explicit agreement as to who had the right to copyright) the right to copyright such writing belonged to the teacher rather than to the college or university."

Naturally, this exception is very popular in academic circles, if not unquestionable.[103] Nevertheless, despite the popularity of the teacher exception, its grounds should be examined more thoroughly; especially in light of the fact the there is

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[102] *Hays v. Sony Corp. of Am.*, 847 F.2d 412, 416 (7th Cir. 1988).

[103] *See*, generally, Rochelle Cooper Dreyfuss, *The Creative Employee and the Copyright Act of 1976*, 54 U. CHI. L. REV. 590 (1987).

no exception for teachers' inventions.[104] This investigation is beyond the scope of this paper.[105]

The better-exploiter argument is used to justify deviations from the copyright allocation rules by advocating for vesting the rights in a product in the party who is in a better position to exploit them.[106] This party is typically the hiring party, but not always.

To illustrate one venue in which the better-exploiter argument was raised (and rejected), consider the copyright division rule for collective works that grants the rights in contributions to the contributors and the rights in a collective work to the hiring party. The assumption behind this allocation rule is that the contributors (*i.e.*, the hired parties) are the better exploiters of their contributions, whereas the hiring party is the better exploiter of the work as a whole. In *Tasini*, the Publishers and the Electronic Publishers voiced the better-exploiter argument and claimed an exception to the copyright division rule by threatening that it was required to avoid "gaping holes in the electronic record of history." Dismissing this argument, the majority opinion contested its economic logic, contending that where there is a demand, it will be satisfied by the creation of adequate

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[104] Sunil R. Kulkarni, *All Professors Create Equally: Why Faculty Should Have Complete Control Over The Intellectual Property Rights in Their Creations*, 47 HASTINGS L J. 221 (1995); Chew, *Faculty-Generated Inventions*, *supra* note 8; Steven Bachrach et. al, *Who Should Own Scientific Papers*, 281 SCI. 1459 (1998).

[105] For a recent, comprehensive study of the ownership in academic work *see* CORYNNE MCSHERRY, WHO OWNS ACADEMIC WORK? BATTLING FOR CONTROL OF INTELLECTUAL PROPERTY (2001). For a good analysis of copyright relations between universities and its professors *see Williams v. Weisser*, 78 Cal. Rptr. 542 (1969).

[106] *See* I. Trotter Hardy, *An Economic Understanding of Copyright's Work-Made-for-Hire Doctrine*, 21 INTELL. PROP. L. REV. 349 (1989) (reprinted from 12 COLUM.-VLA J.L. & ARTS 181 (1988)) (attempting to rationalize the copyright law of hired creativity by the better-exploiter argument).

market mechanisms (such as copyright clearinghouses),[107] so that there is no need for legal intervention to allocate the rights to the better exploiter.[108]

Indeed, the better-exploiter argument is plagued with serious conceptual weaknesses; however, the most fundamental of which is not its inferiority in perfecting exploitation of works compared with the power of the market forces in such perfection. Rather, the principal fallacy of the argument is that it undermines the basic economic philosophy underlying the intellectual-property laws according to which the best way to motivate creative efforts is to secure the returns on works and inventions for those who invest in their creation.[109] *Ex ante*, participants in creative activities might not know who would be the better exploiter and, therefore, this exception could deter them from investing in such activities. Additionally, while the argument invites more litigation as each party has incentives to argue that she is the better exploiter, it is unclear how the courts could or should resolve such disputes since very often there is uncertainty as to who would be the better exploiter in the long run.

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[107] *See* generally Stanley M. Besen, *An Economic Analysis of Copyright Collectives*, 78 VIRGINIA L. REV. 383-419 (1992). Examples of copyright clearinghouses can be found at: <<http://www.copyright.com>>; <<http://www.icopyright.com>>. For a general discussion regarding market mechanisms to solve collective-action problem *see* MANCUR OLSON, THE LOGIC OF COLLECTIVE ACTION: PUBLIC GOODS AND THE THEORY OF GROUPS (1965); ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION (1990).

[108] *Tasini*, *supra* note 5, 2393. It should be noted that the court's ruling was tailored to the specific circumstances of the case and the court did not address the general issue, although such an application was straightforward.

D. Patent Law

Unlike copyright law, the patent law of creativity at the workplace is relatively clear[110] and has also been studied in a much more systematical manner.[111] Since there is no need to clarify these rules, the matter that is discussed in this section is only the applicability of the general framework to the patent allocation rules. The desirability of these rules is examined in Part IV below.

1. The Basic Allocation Rules

The four categories of allocation rules presented above, are well embedded in patent law:[112] (a) the parties are generally free to assign rights in advance and the courts strictly enforce assignment agreements; (b) the hiring party retains the rights whenever the inventor is hired to invent; (c) certain rights are shared where the inventor was not hired to invent, but her invention was created while using hiring party's resources; and

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[109] *See, e.g., Mazer v. Stein*, 347 U.S. 201, 219 (1954):

> "The economic philosophy behind the clause empowering Congress to grant patents and copyrights is the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare through the talents of authors and inventors… Sacrificial days devoted to such creative activities deserve rewards commensurate with the services rendered."

[110] The leading cases on this issue are *Standard Parts Co. v. Peck*, 44 S.Ct. 239 (1924) and *United States v. Dubilier Condenser Corp.*, 289 U.S. 178 (1933) (hereinafter: *Dubilier*). *See* also *Atena-Standard Eng. Co. v. Rowland*, 228 U.S.P.Q. 292 (1985).

[111] JASPAR SILVA COSTA, LAW OF INVENTING IN EMPLOYMENT (1953); Robert P. Merges, *The Law and Economics of Employee Inventions*, 13 HARV. J.L. & TECH. 1 (1999).

[112] *See* Merges, *The Law and Economics of Employee Inventions*, *ibid*, at 5-10.

(d) the hired inventor retains the rights when her invention is unrelated to her duties and created without use of the hiring party's resources.

(a) Assignment Agreements. Under patent law there are almost no restraints on the freedom to assign rights in future inventions. Pre-invention assignment contracts, in which employees commit to assign titles in future inventions to their employers, are common in many industries as employers wish to avoid litigation and as they often enjoy advantageous bargaining power that allows them to acquire more extensive rights than provided for by the default rules.

Pre-invention assignment agreements are rather controversial because of the well-founded concerns that they would also stretch to activities beyond the scope of employment, be extended to employees who were not hired to invent, and last after the termination of the employment relationship.[113] Nevertheless, assignment contracts are strictly enforced by the courts,[114] unless the hired party shows that the assignment is egregiously unreasonable or is contrary to public policy.[115] For example, a provision in an employment agreement whereby the employee assigns her employer patent rights to inventions she conceived during her employment would not be invalidated as entered into

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[113] The provisions that extend the assignment obligation beyond employment relationships are commonly known as "*trailer clauses*." *See* generally COSTA, LAW OF INVENTING IN EMPLOYMENT, *supra* note 111, at 112-126; Marc B. Hershovitz, *Unhitching the Trailer Clause: The Rights of Inventive Employees and their Employers*, 3 J. INTELL. PROP. L. 187 (1995).

[114] *See* Edward L. Raymond, Jr., *Annotation, Construction and Effect of Provision of Employment Contract Giving Employer Right to Inventions Made by Employer*, 66 ALR 4th 1135 (1988). *See* also *Dubilier, ibid*, at 187 ("an agreement to assign [patent] when issued, if valid as a contract, will be specifically enforced.").

[115] Raymond, *Construction and Effect of Provision of Employment Contract*, *Ibid*.

under duress merely because the employee was threatened to be fired if she did not sign it.[116] However, an agreement to assign all future inventions whether made during or after employment would be invalidated as contrary to public policy.[117]

Further protection to employees from coercive assignment contracts is provided by state laws and federal regulation. Eight states limited the validity of employers' ownership claims over employees' inventions that are not related to their work[118] and the federal government issued policy guidelines concerning inventions made by government employees.[119] The specific details of this protecting intervention are beyond the scope of this paper.

(b) Employees and Contractors Who Are Hired to Invent. When an individual is hired to invent and there is no express agreement regarding the allocation of rights, it is assumed that there is an implied contract that assigns the property rights to the hiring

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[116] *Harsco Corp. v. Zlotnicki*, 779 F.2d 906 (1985).

[117] *See, e.g., Guth v. Minnesota Mining & Mfg. Co.*, 72 F.2d 385 (7th Cir. 1934); *Aspinwall Mfg. Co. v. Gill*, 32 F. 697 (C.C.D. N.J. 1887); *See* also Harold M. Knoth, *Assignment of Future Inventions*, 27 CHI.-KENT L. REV. 295 (1949).

[118] Cal. Lab. Code § 2870 (West 1989) (enacted 1979); Del. Code Ann. tit. 19, § 805 (1995) (enacted 1984); 765 Ill. Comp. Stat. 1060/2 (West 1998) (enacted 1983); Kan. Stat. Ann. §§ 44-130 (1993) (enacted 1986); Minn. Stat. § 181.78 (1998) (enacted 1977); N.C. Gen. Stat. §§ 66-57.1 to 66-57.2 (1992) (enacted 1981); Utah Code Ann. § 34-39-3 (1997) (enacted 1989); Wash. Rev. Code § 49.44.140 (1990) (enacted 1979).

[119] *Uniform Patent Policy for Domestic Rights in Inventions Made by Government Employees*, 37 C.F.R. §§ 501.1-501.10 (1995). Under these guidelines the federal government obtains the entire domestic right, title and interest in an invention made by any federal government employee if the invention is: (1) made during working hours, (2) made with government resources including money, facilities, materials, information or other government employees' time, or (3) one that bears a direct relation to, or is made in consequence of the official duties of the employee-inventor. However, should the government not plan to file a patent application or promote the invention's commercialization, the government is required to allow the inventor to retain title. If the contribution of the government is inadequate to warrant an assignment of the invention under the three criteria, the government retains a shop right. *See* also U.S. ATTORNEY GENERAL, INVESTIGATION OF GOVERNMENT PATENT PRACTICES AND POLICIES (1947).

party.[120] It is noteworthy that this allocation rule has evolved from an opposite direction to that of the respective copyright rule: in patented products the rights of a hiring party were first acknowledged where a contractor, rather than an employee, conceived the invention.[121] It was only in the 1920's, pursuant to the Supreme Court's decision in *Standard Parts Co. v. Peck*,[122] that this category was expanded to include all types of inventors who were hired to engage in creative tasks,[123] including inventors who were hired to undertake undefined creative tasks (*e.g.*, general R&D employees).

(c) Identifiable Contributions. Under patent law, a hired party, who was not hired to invent, shares with the employer the rights in an invention that was conceived and perfected while using some of the employer's resources.[124] In such situations, the employee retains title, whereas the employer receives a royalty-free, nonexclusive, nontransferable right to use the invention in its business. This right is commonly known

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[120] Merges, *The Law and Economics of Employee Inventions*, *supra* note 111, at 5-6.

[121] *See* the leading case of that era, *Dalzell v. Dueber Watch-Case Mfg. Co.*, 13 S.Ct. 886, 888 (1893):
> "But a manufacturing corporation which has employed a skilled workman, for a stated compensation, to take charge of its works, and to devote his time and services to devising and making improvements in articles there manufactured, is not entitled to a conveyance of patents obtained for inventions made by him while so employed, in the absence of express agreement to that effect."

[122] 44 S.Ct. 239 (1924). For a comprehensive study of this trend, *see* Fisk, *Removing the Fuel of Interest from the Fire of Genius*, *supra* note 10, at 1164-1180.

[123] Until the mid 1930's there was some confusion in applying this rule by the courts. But since then the rule has not been disputed. *See*, *e.g.*, *Dubilier*, *supra* note 110, at 187:
> "[I]f the employment be general, albeit it covers a field of labor and effort in the performance of which the employee conceived the invention for which he obtained a patent, the contract is not so broadly construed as to require an assignment of the patent."

[124] *See* generally C.T. Drechsler, *Annotation: Application and Effect of "Shop Right Rule" or License Giving Employer Limited Rights in Employees' Inventions and Discoveries*, 61 ALR 2nd 356 (1958).

as a "shop right."[125] An "employee" for the purposes of this category is broadly defined so that problems of the sort arising under copyright law are avoided. For example, M&M/Mars retained shop rights in an improved pump for spraying chocolate to create M&M candies, designed by a mechanical engineer who was employed in the M&M plant by a third party that provided consulting services to M&M/Mars through its employees.[126]

The reasoning of the shop-right rule goes beyond the fairness of rewarding the employer for its financial contribution to the invention. By limiting its application to inventions that are related to the employer's business[127] this rule implicitly relies on the general assumption that the working environment contributed to the conception and perfection of the invention. Thus, if an employee were to steal tools and materials with which she would then invent the super-widget, the employer that produced bathroom tiles would be denied any shop right, although financially it "contributed" to the creation of the invention. The foregoing reasoning is the link to the presumption that the parties' rights "spring from the contract of employment"[128] or from the equity doctrine of estoppel.[129]

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[125] Fisk, *Removing the Fuel of Interest from the Fire of Genius*, *supra* note 10, 1142-1164 (surveying the evolution of the shop right until the 1930's and its justification by the contribution of the employer); Scott P. Sandrock, *The Evolution and Modern Application of the Shop Right Rule*, 39 BUS. LAW. 953 (1983) (studying the modern application of the shop right rule).

[126] *Crowe v. M&M/Mars*, 242 NJ Super 592 (1990).

[127] *Dubilier*.

[128] *Dubilier*, at 187.

[129] See, *e.g.*, Weingand v. Dover Mfg. Co., 292 F. 255 (N.D. Ohio 1923).

2. The Rule of Relative Contributions

In light of the clear definitions of patent law, the rule of relative contributions is triggered only in hard cases.[130] Consider, for example, a borderline case between the third and the fourth categories, where the hiring party's contribution is trivial compared with that of the hired party, it might then be argued that the situation falls outside the boundaries of the third category so that the hired party is entitled to exclusive rights in her invention.[131] While not stated (yet) by any court, the less extensive the use of the hiring party's resources is, the less likely the court would be inclined to acknowledge the

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[130] *See* Frank Prager, *Agawam v. Jordon, Annotated*, 22 J. PAT. OFF. SOC'Y 737 (1940); *Agawam Woolen Co. v. Jordon*, 74 U.S. 583 (1868) (An employee's contribution to the perfection of the employer's invention is not sufficient to deprive the employer of exclusive rights in the perfected invention, unless the employee's contribution amounts to a complete invention); *Collar Co. v. Van Dusen*, 90 U.S. (7 Wall.) 530, 563-564 (1874) (ancillary discoveries of an assistant belong to the employer, who conceived the original principle, unless they "constitute the whole substance of the improvement"); *Mayview Corp. v. Rodstein*, 620 F.2d 1347 (C.A. Cal., 1980); *Hobbs v. United States Atomic Energy Commission*, 451 F.2d 849, 865 (5th Cir.1971) (emphasis in original):

> "Persons employed, as much as employers, are entitled to their own independent inventions, but where the employer has conceived the plan of an invention and is engaged in experiments to perfect it, no suggestions from an *employe[e]*, not amounting to a new method or arrangement, which, in itself is a complete invention, is sufficient to deprive the employer of the exclusive property in the perfected improvement. But where the suggestions go to make up a complete and perfect machine, embracing the substance of all that is embodied in the patent subsequently issued to the party to whom the suggestions were made, the patent is invalid, because the real invention or discovery belonged to another."

[131] In the past, any use of the employer's resources imparted shop rights to the employer and the extent of use had no impact. See COSTA, LAW OF INVENTING IN EMPLOYMENT, *supra* note 111, at 12-13.

its rights in the invention.[132] At the extreme, when the hiring party's contribution is very small compared with that of the hired party it would be denied even shop rights.

The case of Richard Dewey[133] illustrates the application of the rule of relative contributions at its extreme. Mr. Dewey was a welder at American Stair Glide, a manufacturer of elevator chairs for persons who could not climb stairs. In light of the personal injuries of its customers, American Stair Glide tried to develop a safety device for its chairs and for this purpose consulted with a number of firms; none of them, however, succeeded in devising a satisfactory solution. Eager to solve this problem himself, Dewey used some scrap metal and company tools, and abiding by his foreman's instructions confined his adventure to his lunchtime. He was successful. Even though Dewey's employer endorsed his invention and made some contribution to its perfection, it was denied shop rights as the court determined that the contribution was only of trifling value.

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[132] *See*, e.g., *Callahan v. Capron Co*., 280 F. 254, 255 (D.C. 1922) ("While the material supplied by the defendant was of slight value, yet there is evidence that a substantial amount of the [employee's] own time, as well as the time of a skilled tool maker, was devoted to this work at the expense of the defendant."); *Consolidated Vultee Aircraft Corp. v. Maurice A. Garbell, Inc.*, 204 F.2d 946 (9th Cir. 1953) (discussing the amount of money necessary to create a shop right in an employee's invention); *Aero Bolt & Screw Co. v Iaia*, 5 Cal Rptr 53 (2nd Dist.1960) (Shop right was denied because employee used only a trifling amount of the employer's resources).

[133] *Dewey v. American Stair Glide Corp*., 557 S.W.2d 643 (Mo. Ct. App. 1977).

E. Trade Secret Law

A trade secret is information that confers a competitive advantage upon its owner *if* kept in secret and *is* kept in secret.[134] Classic examples of creative products that are protected by trade secrets are the formula of Coca-Cola,[135] the Kentucky Fried Chicken

[134] Although most states have codified the common law of trade secrets, the general rules are substantially similar in all jurisdictions. The common definitions of the term "trade secret" are derived from the Restatement (First) of Torts § 757 (1939), the Restatement (Third) of Unfair Competition § 39 (1995), and the Uniform Trade Secrets Act of 1979 § 1(4) (14 U.L.A. 542 (1979)). The definitions are substantially equivalent.

The Restatement (First) of Torts	Restatement (Third) of Unfair Competition (1995)	The Uniform Trade Secrets Act
"[A]ny formula, pattern, device or compilation of information which is used in one's business and which gives him an opportunity to obtain an advantage over competitors who do not know or use it."	"[A]ny information that can be used in the operation of a business or other enterprise and that is sufficiently valuable and secret to afford an actual or potential economic advantage over others.	"[I]nformation including a formula, pattern, compilation, program, device, method, technique or process, that (i) derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use, and (ii) is the subject of efforts that are reasonable under the circumstances to maintain its secrecy."

See generally ROGER M. MILGRIM, MILGRIM ON TRADE SECRETS §§ 1.03-104 (the definition of trade secrets) and ch. 5 (the allocation rules of the trade secret law) (1996).

[135] *Coca-Cola Bottling Co. of Shreveport, Inc. v. Coca-Cola Co.*, 563 F.Supp. 1122, 1132 (D.Del.1983).

recipe,[136] photography development techniques of Kodak,[137] and chemical technologies of du Pont.[138]

The law of trade secrets favors by its very nature hiring parties as it is intended to protect information embodied in firms. Unlike the copyright and patent laws, it does not assume that creative products are produced by independent individuals.[139] Nonetheless, this focus on the information embodied in the firm sometimes shifts the rights from the entity of the firm to creative individuals who were hired to produce and develop this body of information. Pursuant to the "unfortunate intellectual detour"[140] of the Supreme Court of Pennsylvania in *Wexler v. Greenberg*,[141] several courts have decided that in the absence of a contrary agreement the rights in trade secrets go to the source of the information: the party that disclosed information to the other party, even if the discloser was hired by the other to invent or create.[142]

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[136] Mark Pendergrast, *How to Keep a Corporate Secret*, WALL ST. J., Feb. 20, 2000; << http://www.kfc.com/about/secret.htm>>.

[137] *Eastman Co. v. Reichenbach*, 20 N.Y.S. 110 (Sup. Ct. 1892).

[138] DAVID A. HOUNSHELL AND JOHN KENLY SMITH, SCIENCE AND CORPORATE STRATEGY: DU PONT R&D, 1902-1980 (1988); See also Fisk, *Working Knowledge*, *supra* note 11, at 524-535.

[139] See Edmund W. Kitch, *The Law and Economics of Rights in Valuable Information*, 9 J. LEGAL STUD. 683 (1980); Fisk, *Working Knowledge*, *ibid*.

[140] MILGRIM, MILGRIM ON TRADE SECRETS, § 5.02[3][e], at 5-52; *See Note, Trade Secrets: Trade Secret Developed By Employee in the Course of Authorized Research May Be Used in Competing with Former Employer*, 74 HARV. L. REV. 1473-1475 (1961).

[141] 399 Pa. 569 (1960).

[142] Other courts explicitly rejected the connection between the source of the information and the allocation of rights. *See*, e.g., *B.F. Goodrich v. Wohlgemuth*, 137 U.S.P.Q. 804 (1963); *Basic Chems., Inc. v. Benson*, 251 N.W.2d 220 (Iowa 1977); *J&K Computer Sys., Inc. v. Parrish*, 642 P.2d 732 (Utah 1982); *United Centrifugal Pumps v. Cusimano*, 9 U.S.P.Q.2d 1171 (W.D. Ark. 1988).

The foregoing confusion, as well as other judicial inconsistencies, result form the fact that there are no statutory trade-secret allocation rules, nor is there a well-established coherent body of cases that provides for such rules. The allocation rules that are applied in trade-secret disputes generally seem to match those of patent law[143] and can be justified by two major aspects of the interplay between patents and trade secrets: first, although not required, a trade secret may be patentable, and the decision whether to file for a patent or to protect the product with a trade secret derived from a wide array of strategic business considerations.[144] Second, a trade secret may protect an incoherent invention that may be patentable upon perfection. At least in these two cases a departure of the trade-secret allocation rules from those of patent law may have distorting effects on decisions to invest in inventions.[145] In the first case, a departure from the patent allocation rights inserts an arbitrary factor to the array of the strategic business considerations, and as any arbitrary factor it cannot improve managerial decisions. In the second case different regimes for protecting the process of inventing and the invention itself may erode the incentives to invest in creative activities because the hiring party might not be able to appropriate the returns on its investments in creative activities.

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[143] *Stedman, Employer-Employee Relations*, *supra* note 35, at 57-63; MILGRIM ON TRADE SECRETS, *supra* note 134, § 5.02[4][a], at 5-61.

[144] See Richard C. Levin et al., *Appropriating The Returns from Industrial Research and Development*, 3 BROOKINGS PAPERS ON ECON. ACTIVITY: MICROECONOMICS 781 (1987); Josh Lerner, *Patenting in the Shadow of Competitors*, 38 J.L. & ECON. 463 (1995) (studying the connection between litigation costs and patenting decisions of biotechnology firms); Wesley M. Cohen et al., *Protecting Their Intellectual Assets: Appropriability Conditions and Why U.S Manufacturing Firms Patent (or Not)*, NBER WORKING PAPER NO. W7552 (2000).

[145] *See, e.g., Kewanee Oil Co. v. Bircon Co.*, 94 S.Ct. 1879, 1887-1888 (1974).

Notwithstanding, the requisite secrecy of trade secrets raises practical difficulties in applying the traditional patent allocation rules. To illustrate, consider first an allocation rule that grants exclusive rights in a trade secret to one party. The problem then is to effectively enjoin the other party from using or disseminating the protected information. The root of this problem lies in that it is hard to detect violations of rights (misappropriations) as the nature of the protected information often permits its utilization while others cannot know with sufficient certainty that the information is in use. For example, a production procedure (*e.g.*, the Coca-Cola formula) can be kept in secret if it cannot be extracted by a study and examination of the product. Thus, if *X* retained exclusive rights in such a production procedure, it might not be able to verify that *Y* misappropriated it, even if *X* carefully examined *Y*'s products. Notwithstanding, there are mechanisms that can prevent other parties from benefiting from misappropriation of trade secrets and, therefore, may mitigate this type of problems. Common mechanisms of this kind are non-competition agreements and injunctions;[146] however, the courts limit the use

[146] Under the inevitably doctrine where a trade secret, especially of an advanced technological nature, is proven and there is a high degree of probability that the subsequent competitive employment will lead to their wrongful use or disclosure, an injunction against such competitive employment might be granted despite the absence of a covenant not to compete. MILGRIM ON TRADE SECRETS, supra note 134, § 5.02[3][d].

of these mechanisms because they raise antitrust and labor-mobility concerns.[147] In short, the effectiveness of allocation rules that grant exclusive rights in trade secrets to one party is limited to some extent.

Consider now the patent sharing rule that has been applied by several courts in trade-secret cases.[148] Under a sharing rule, the incentives of the parties to invest in preserving the requisite secrecy may diverge because of the different values of the rights for them. For example, the incentives of a shop-right holder to invest in preserving the secrecy may be lower than those of a trade-secret owner since the former does not internalize the full consequences of the loss of secrecy. As a result, because of the suboptimal incentives of the shop-right holder to invest in preserving the secrecy, a sharing rule might put at risk the competitive advantage of the trade-secret holder, thereby leading to the loss of the rights to the protection of the information by a trade secret. It follows that in practice sharing rules are not applicable to trade secrets.

To conclude, any allocation of rights in trade secrets between hiring and hired parties is inherently unstable because of enforcement problems. Yet, while allocation

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[147] See Harlan M. Blake, *Employee Agreements Not to Compete*, 73 HARV. L. REV. 625 (1960); Paul H. Rubin and Peter Shedd, *Human Capital and Covenants Not to Compete*, 10 J. LEGAL STUD. 93 (1981); Peter J. Whitmore, *A Statistical Analysis of Noncompetition Clauses in Employment Contracts*, 15 J. CORP. L. 483 (1990) Gillian Lester, *Restrictive Covenants, Employee Training, and the Limits of Transaction-Cost Analysis*, 76 IND. L.J. 49 (2001). *See* also *E.I. Du Pont de Nemours & Co. v. American Potash & Chem. Corp*, 200 A.2d 428, 437 (Del. Ch. 1964).

See also *Restatement (Third) of Unfair Competition* § 42, Comment d (1995) (information will not be regarded as former employer's trade secret if it is "so closely integrated with the employee's overall employment experience that protection would deprive the employee of the ability to obtain employment commensurate with the employee's general qualifications.")

[148] *See, e.g., Lariscey v. United States*, 949 F.2d 1137 (Fed. Cir. 1991).

rules that grant the rights to one party can be enforced by certain mechanisms, sharing rules are inadequate because there are no generic mechanisms to protect the shared rights.

F. Allocation Rules in Practice: Summary and Comparison

1. Comparative Summary of the Allocation Rules

The foregoing survey presented the specific applications of the general framework of allocation rules in each of the three major branches of the law of creativity at the workplace. This survey can be summarized as follows:

	Copyright Law	**Patent Law**	**Trade-Secret Law**
Clarity of the allocation rules	Some uncertainty regarding the scope of the term "employee"	Clear rules	Uncertainty regarding the rules and their applicability
Applied allocation rules			
- Assignment agreements	Strictly enforced, but the hired party may terminate the assignment after 35 years	Strictly enforced	Strictly enforced
- Product created by an employee within the scope of her employment	Employer's ownership	Employer's ownership	Employer's or employee's ownership
- Product made for order by a contractor	Contractor's ownership, unless otherwise agreed between the parties	Hiring party's ownership	Hiring party's or contractor's ownership
- Independent contributions of the hired and hiring parties	Dividing the rights in collective works and sharing the rights in joint works	Sharing some rights in inventions conceived by hired parties who were not hired to invent and who used the hiring party's resources	May share some rights in inventions conceived by hired parties who were not hired to invent and who used the hiring party's resources
- All other situations	Hired party's ownership	Hired party's ownership	Hired party's ownership

A quick glance at the table above suffices to see the need for clarification of the allocation rules of copyright and trade-secret laws and the need for exploring the causes for the considerable differences between the allocation rules of the three major branches of the law of creativity at the workplace. More specifically, the question is why and should the copyright and trade-secret allocation rules diverge from the patent allocation rules. My goal in next part this paper is to address these issues. To do so, however, I first summarize in this section the major differences across the allocation rules.

2. Copyright vs. Patent and Trade-Secret Rules

The copyright allocation rules diverge from the patent and trade-secret allocation rules systematically in favor of hired parties, or at least intend to incline in that direction. To start with, in two important contingencies the copyright allocation rules ignore the contribution of hiring parties, thereby favoring the hired parties. First, a contractor who is hired and paid to be creative gets the rights in products produced by her absent an agreement to the contrary. This rule consistently applies to products made for order by a single contractor and to collective works made by multiple contractors. Second, under copyright law when an employee or a contractor produces a product outside the purview of her work while using resources of the hiring party, she does not share the rights in that product with the hiring party. As discussed earlier, under patent and trade-secret laws the contribution of the hiring party in those two contingencies is an influential factor.

In addition to the statutory oversight of the hiring party's contribution, the courts are often vague or ambivalent with respect to the weight of that factor in copyright

cases;[149] therefore, again, placing hired parties in a better position than hired parties in patent and trade-secret cases.

The third and last advantage for hired parties under copyright law is somewhat perplexing. Under copyright law a hired party, whose product is not a work made for hire and who assigns the rights in her work to the hiring party, is entitled to terminate the assignment approximately thirty-five years after its execution notwithstanding any agreement to the contrary.[150] The Congress that enacted this reversion right justified it by the necessity of "safeguarding authors against unremunerative transfers … needed because of the unequal bargaining position of authors, resulting in part from the impossibility of determining a work's prior value until it has been exploited."[151] My analysis below shows that this unique copyright feature achieves nothing but crippling to some extent the market for creative activities and, therefore, although intends to improve the position of creative individuals the mere existence of this feature operates in the opposite direction.

Popular justifications to the copyright bias in favor of hired parties are the personal inputs needed in creating copyrigtable works and that the better-exploiter in copyrightable works is often the hired party. Both justifications are favored by many scholars who believe that aspects of their personhood are embedded in their works and that they are the best exploiters of their works. After all, nobody other than the scholastic

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[149] *See supra* note 98 and accompanying text.

[150] 17 U.S.C. § 203(a)(5). *See supra* note 62 and accompanying text.

author could develop (or recycle) better than her old published theories into modified to-be-published theories.[152]

The explanations of the personhood embodiment and better exploiter may hold water for certain copyrightable works, but they are rather shaky with respect to other copyrightable works while being valid for some inventions and trade secrets. The folly of applying the personhood argument to the workplace is analyzed in Section IV.C. below. Some of the flaws of the better-exploiter argument were already noted:[153] it undermines the economic philosophy underlying the intellectual-property laws, it relies on a wrong assumption that the better exploiter can be identified, and in a world of relatively low transaction costs it makes no difference as the market forces would perfect the exploitation of works. In addition, and no less important, the better-exploiter argument, as well as the personhood argument, can support only mandatory allocation rules. When the allocation rules are default rules and the hiring party enjoys excess bargaining power and is somewhat informed with respect to the law of creativity at the workplace, as often is the case, the hiring party has the power to force the hired party to assign the rights even if the latter is the better exploiter.

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[151] H.R. Rep. No. 94-1476, 94th Cong., 2d Sess. (1976), at 124.

[152] See, e.g., *Williams v. Weisser*, 78 Cal. Rptr. 542 (1969); *Hays v. Sony Corp. of Am.*, 847 F.2d 412, 416 (7th Cir. 1988) (J. Posner) ("A college or university … is poorly equipped to exploit their writings, whether through publication or otherwise").

[153] Subsection III.C.4. above.

3. The Unique Properties of Trade Secrets

The divergence of the trade-secret allocation rules from the general framework was already discussed above. Some of it emanates from the incoherent state statutes and case laws that have created and shaped the trade-secret allocation rules and some of it is an inevitable consequence of the nature of the protected information.

The importance of the discussion and analysis above is in the conclusion that generally sharing rules are poorly adequate for trade secrets. In the concluding part of the paper I express my view regarding the desirable allocation rules for this branch of the law given the inapplicability of the sharing rule and in light of the analysis of the organization of creative activities.

4. Open Questions

Despite the long history of the debate over creativity at the workplace, very little attention has been drawn to the structure of the allocation rules and its logic. My analysis so far offered a generic framework for allocation rules and examined the specific applications of this framework in each of the major branches of the law of creativity at the workplace. This analysis highlighted the major points in which the present law is ambiguous or unclear and compared the applications of the allocation rules of the three major branches of the law. The remainder of this paper is dedicated to an inquiry into the reasoning of the present allocation rules and their desirability compared with alternative allocation rules.

IV. The Organization of Creative Activities

Creative and non-creative activities may be carried out in various institutional forms, the pros and cons of which have always been disputed.[154] The debate over creativity at the workplace resonates, to some extent, these controversies as underlying it the fundamental question of whether the organization of creative production should differ from the general capitalistic form of production. Under the capitalistic organization of production, which dominates in most nations, the hiring party incurs the costs of production and in turn receives the *residual product*: the part of the earnings and property rights, which were created in the production process and were not used to cover its costs.

The critics of the law of creativity at the workplace do not criticize the capitalist system as a whole, but rather advocate that creative activities should be governed by a different system, under which the law intervenes in the organization of creative production to better protect the share of hired creators and inventors.

This part of the paper characterizes some of the major properties of creative activities and the players that are involved in these activities, and studies the organization of creative activities. The purpose of this investigation is to uncover whether creative activities have unique properties that call for allocation rules, which are different from

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[154] *See, e.g.*, KARL MARX, CAPITAL: A CRITIQUE OF POLITICAL ECONOMY, chs. 5-6 (Ben Fawkes trans., 1992); Stephen A. Marglin, *What Do Bosses Do? The Origins and Functions of Hierarchy in Capitalist Production*, 6 REV. OF RADICAL POL. ECON. 33 (1974); David S. Landes, *What Do Bosses Really Do?*, 45 J. ECON. HIST. 585 (1986); Oliver E. WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM chs. 9-10 (1985).

those for non-creative activities. This inquiry also provides simple guidelines for evaluating the law of creativity at the workplace and to refine it.

Section IV.A. discusses a few unique properties of creative activities. Section IV.B. introduces the players that take part in creative activities. Sections IV.C.- IV.D. address the question of whether the unique properties of creative activities and the players call for new allocation rules. Section IV.E. examines whether creative individuals are affected by incentives and whether employers are likely to provide adequate incentives.

A. Creative Activities and Creative Products

Creative activities are aimed at producing ideas, knowledge, or expressions that may materialize into a conceptual form, which is called here a ***creative product***. Creative activities are distinct from ***humdrum activities*** by necessitating some discretion, imagination, or improvisation, thereby making the engagement in creative activities *risky* by definition:[155] one cannot predict in advance the intellectual efforts required to accomplish her specific goal, the outcome of her endeavors, or the demand for the product of her efforts. Risk, however, is not a distinguishing property of creative activities as there are many humdrum activities that involve significant risks. For

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[155] Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in THE RATE AND DIRECTION OF INVENTIVE ACTIVITY 609-626, 616 (Richard Nelson ed., 1962); CAVES, CREATIVE INDUSTRIES, *supra* note 22, at 2-3 (2000); DAVID F. PRINDLE, RISKY BUSINESS: THE POLITICAL ECONOMY OF HOLLYWOOD (1993) (studying the uncertainty surrounding the demand for movies).

example, growing crops and fishing are risky since the ratio between the inputs and the outputs fluctuates significantly. Nonetheless, I start the inquiry into the properties of creative activities and their organization with the risk feature because, as discussed later on,[156] it plays a major role in the organization of creative activities and explains much of the law of creativity at the workplace.

Creative products do not always qualify for intellectual-property protection. The restaurant, for example, is a creative "invention" of the eighteenth century that could have never been protected by intellectual-property rights, even though it offered a creative solution for the ancient human desire to culturalize food consumption.[157] Thus, although the qualification of a product for intellectual-property protection indicates that its production involved some creative activities even if accidental,[158] the opposite is not true; the lack of qualification for intellectual-property protection cannot serve as evidence for the humdrum nature of the production process. Yet, since allocation of rights is possible only where there are rights to claim, the debate over creativity at the workplace is confined only to products protected by intellectual-property rights.

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[156] *See* Section IV.B. below.

[157] REBECCA L. SPANG, THE INVENTION OF THE RESTAURANT: PARIS AND MODERN GASTRONOMIC CULTURE (2000).

[158] Effort to create the preserved information is not a requirement for qualification for intellectual-property protection. *See, e.g.*, *Feist Publications, Inc. v. Rural Telephone Service Co.*, 111 S.Ct. 1282, 1289-1290, 1295-1296 (1991) (rejecting the "sweat and brow" doctrine in copyright); *In re Fine*, 837 F.2d 1071, 1075 (Fed. Cir. 1988) ("[O]ne skilled in the art might find it obvious to try the claimed invention. But whether a particular [invention] might be 'obvious to try' is not a legitimate test of patentability").

B. The Players

Earlier we saw that sometimes the law differentiates between various types of workers. This section introduces the players who are involved in creative activities and starts the examination of the logic behind the aforementioned legal distinctions.

Although the organization of production may involve many complex contractual relations among individuals and firms, all the players are grouped here into two sets: effort suppliers and capital suppliers. Effort suppliers are independent individuals, employees, and contractors, whereas capital suppliers are employers and financiers. The players may provide various inputs to the production process, but the *minimum* they provide is defined by their type: efforts by effort supplier and financial investments by capital suppliers.

1. Effort Suppliers

a) Independent Individuals

An ***independent individual*** initiates productive projects, executes them by herself, and sells the products on the market. Since an independent individual does not work for another, she herself accounts for all the profits and losses of her enterprise. For example, a shoeshiner who establishes a shoeshine practice is the only one to collect the gains (or to suffer the losses) from her business initiative. ***Independent creative individuals***

devote at least part of their practice to creative activities. Painters, sculptors,[159] and writers are common representatives of this group, and so are individual inventors to whom about *14%* of U.S. patents are granted annually.[160]

Independent individuals may be assisted by other effort suppliers and then they become employers. This type of independent individuals is discussed in Subsection IV.B.2. below.

b) Employees and Contractors

In contrast to independent individuals, ***employees*** and ***contractors*** perform tasks according to what is agreed upon in their contract with the hiring party, the ***employer*** (whose properties are studied in Subsection IV.B.2. below). Since employment and service contracts are freely negotiated and shaped by the parties, *there are no conclusive properties that distinguish employees from contractors and vice versa.* Nevertheless, each group can be generally characterized by certain common distinguishing characteristics,[161] which are often acknowledged by the courts[162] (a) an employee undertakes to perform any task that falls within the purview of her employment contract, whereas a contractor commits to carry out a specific defined set of tasks; (b) the only direct cost of production an employee incurs is her time, whereas a contractor might bear

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[159] The 1990 amendment to the Copyright Act protects certain visual-art works. *See infra* notes 209-211 and accompanying text.

[160] *See supra* note 31 and accompanying text.

[161] A masterful study of this characteristics can be found in WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM, *supra* note 154, chs. 9-10.

some of the direct production costs; (c) an employee is individual, whereas a contractor might be also a firm or might privately hire employees and contractors; (d) at least some portion of an employee's compensation (or benefits) is fixed regardless of her performance, while a contractor's compensation may depend entirely on his performance; and (e) as a result of (b), (d), and other factors such as vicarious liability, a contractor typically assumes more risk than an employee.

The first distinguishing property embodies two important contractual features: flexibility and continuity. Flexibility is the power of an employer to affect the manner in which a defined task is performed as well as to redefine the task, and continuity eliminates the need to renegotiate the terms for the performance of a new task upon the completion of a previous task. Generally, employee-employer relations are characterized with a higher flexibility and longer continuity than contractor-employer relations.[163] In other words, an employee typically provides services on a regular basis, under the control and direction of the employer and in exchange for compensation and other benefits, while the contractor provides services according to orders, with a lesser degree of control and direction and in exchange for an agreed commission.

The third distinguishing property (incorporation vs. private hiring of other individuals) is one facet of the second distinguishing property (incurring production costs). Yet, this property delivers an independent value by stressing the fact that a

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[162] *See, e.g.*, Subsection III.C.3. above.

[163] WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM, *supra* note 154, chs. 9-10.

contractor is not necessarily an individual. For example, the Philadelphia Orchestra was hired by Walt Disney to perform the Fantasia soundtrack[164] and James Earl Reid, the sculpture in *Community for Creative Non-Violence v. Reid*,[165] had assistants who worked with him on the disputed work. This type of contractors, ***employing contractors*** is very common in our world due to the complexities of modern creative activities.[166] Employing contractors make certain organizational decisions regarding staffing and compensation for their workers.[167] Nevertheless, this factor or others do not really discern employing contractors from individual contractors as it reflects the scale and complexity of the production process and is unrelated to the fundamental transaction between the contractor and the employer to deliver a product for an agreed price. Thus, the analysis of both types of contractors is similar.[168]

Finally, the fourth distinguishing property (fixed vs. pay-per-performance compensation) calls for some clarification in order to avoid confusion between contractors and independent individuals. Employees can easily be distinguished from

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[164] *Philadelphia Orchestra Ass'n v. Walt Disney Co.*, 821 F.Supp. 341 (E.D. Pa. 1993).

[165] *Supra* note 94.

[166] For the prevalence of employing contractors in arts *see* STILLINGER, MULTIPLE AUTHORSHIP AND THE MYTH OF SOLITARY GENIUS, *supra* note 36; Jaszi, *On the Author Effect*, *supra* note 36. For modern forms of creative employing contractors, *see* James Brian Quinn, *Outsourcing Innovation: The New Engine of Growth*, 41 MIT SLOAN MGMT. REV. 13 (2000); Thomas W. Malone and Robert J. Laubacher, *The Dawn of the E-Lance Economy*, HARV. BUS. REV. 145 (1998).

[167] An *inside contractor* is one example of an employing contractor. An inside contractor is hired by a firm that provides her with floor space and machinery. She organizes the production with these inputs by hiring workers, and in return receives compensation which is usually tied to her performance. John Buttrick, *The Inside Contracting System*, 12 J. ECON. HIST. 205 (1952); WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM, *supra* note 154, at 218.

[168] In *Reid*, the Supreme Court ruled correctly that the "hired party's role in hiring and paying assistants" is a relevant factor to determine whether she is a contractor. *Reid*, at 151-153.

independent individuals because of the fixed component of their income. The problem, therefore, might only arise in distinguishing between contractors and independent individuals. With some twist on Coase's *The Nature of the Firm*,[169] the pricing of a contractor's pay-per-performance compensation is 'internal' as it is set in a contract between the contractor and her employer, whereas the compensation pricing of an independent individual (or a firm) is 'external' as it is set by the market. That is, in the short run the contractor's compensation is less vulnerable to the market evaluation of her performance because the parties supersede the market mechanisms for trade in products in private pricing systems of their own. For example, a journalist who is paid *X* dollars per published article is a contractor, whereas a writer who is paid by a publisher a certain percentage of the profit on the sales of her book is an independent individual. An important implication of this difference between contractors and independent individuals is that for the same line of business the latter are generically exposed to higher risks than contractors.

Again, the foregoing distinguishing properties are roughly descriptive and in no way conclusive. The term ***worker*** henceforth refers to either an employee or a contractor in contexts in which there is no practical difference between the two.

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[169] Ronald Coase, *The Nature of the Firm*, 4 ECONOMICA 386 (1937).

c) Humdrum and Creative Workers

Workers may engage in creative activities in connection with their contract or practice or in no such connection. Their opportunities to pursue creative activities depend upon the nature of their practice and the amount of time that it allows them to devote to creativity. Put simply, in the labor markets creative opportunities are not distributed equally; some workers, such as the sweatshop workers in Chaplin's *Modern Times*, have less opportunities than others to undertake creative activities because their time is dedicated to repeated tedious tasks. Other workers, such as Hollywood screenwriters and university professors, are hired to be creative during their work hours and hence they enjoy better creative opportunities.[170] Note that in both examples "workers" could be either employees or contractors.

Based on the creative opportunities workers have, we can distinguish between ***humdrum workers*** and ***creative workers***. Humdrum workers are neither hired nor paid to engage in creative activities, but may still have some opportunities to do so if time allows. Humdrum workers of this kind, who exploit creative opportunities unrelated to their contractual relations with the employer, engage in creative activities as independent creative individuals. History provides many stories about such humdrum workers: a welder who solved a mechanical problem during his lunchtime;[171] a lawyer who wrote

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[170] Another dimension of time that affects creative opportunities is time pressure. Empirical evidence shows that time pressure lower the creative productivity of workers who are engaged in creative projects, *i.e.*, negatively related to creative opportunities. Jennifer S. Muller et al., *The Influence of Time Pressure on Creative Thinking in Organization*, HARVARD BUSINESS SCHOOL WORKING PAPER 01-023 (2000).

[171] *See* accompanying text to *supra* note 133.

poems during his leisure hours;[172] a technical assistant at the Swiss patent office who used his spare time to conduct research in theoretical physics;[173] a sales clerk with Sears Roebuck who developed an invaluable socket wrench for an easy removal of the sockets from the wrench during his off-duty time;[174] a lowly general laborer, whose duties included unloading trucks and sweeping floors, who invented a process for removing worms from pecans;[175] a frustrated patent analyzer who invented the technology that was used by Xerox for its photocopying machines,[176] and many others. Creative workers, on the other hand, commit themselves to provide creative services and they may also be required to undertake humdrum tasks. Professors and R&D scientists, for instance, are expected in addition to their research to teach or train students (or other workers) and to participate in administrative, operational or managerial activities.

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[172] The famous poet Wallace Stevens used his somewhat humdrum legal practice (livestock insurance) to attain the financial independence he needed for poetry. In fact, in favor of his legal practice he refused a Harvard professorship, which could allow him to concentrate on poetry. *See* TONY SHARPE, WALLACE STEVENS: A LITERARY LIFE (2000).

[173] Albert Einstein conducted some of his important investigations in theoretical physics at the time he worked as a technical assistant at the Swiss patent office. *See* DON HOWARD ET AL., EINSTEIN: THE FORMATIVE YEARS, 1879-1909 (2000).

[174] *Roberts v. Sears, Roebuck & Co.*, 573 F.2d 976 (7th Cir. 1978).

[175] *Wommack v. Durham Pecan Co., Inc*, 715 F.2d 962 (5th Cir. 1983)

[176] Chester Carlson, a patent analyzer at P.R Mallory & Co., an electrical parts maker, developed the electrophotography (dry photography) technology at the kitchen of his apartment. The Haloid Company bought from him a license to develop a dry copying machine in 1946. Haloid changed its name to Haloid Xerox in 1958 and changed again to Xerox in 1961. The rest of the story is well known. Xerox means dry in Greek. *See* IRA FLATOW, THEY ALL LAUGHED… FROM LIGHT BULBS TO LASERS: THE FASCINATING STORIES BEHIND THE GREAT INVENTIONS THAT HAVE CHANGED OUR LIVES 111-118 (1992).

d) Desirable Legal Implications

In most part the law of creativity at the workplace recognizes the foregoing distinctions and with some exceptions its allocation rules are derived from them. The three major branches of the law of creativity at the workplace distinguish between humdrum and creative workers by granting more rights to humdrum workers, while vesting the rights in most products produced by creative workers (*i.e.*, workers who are hired to be creative) in the employer. This general allocation rule follows, although not perfectly, the very intuitive law of life: you get what you pay for.[177] More specifically, the law of creativity at the workplace restricts the rights that employers can get in products produced by their humdrum workers to whom employers pay nothing for their creative endeavors. When a contract settles the allocation of rights, the law of creativity at the workplace protects the humdrum worker from certain coercive provisions that would force her to assign rights in products, which are unrelated to her work. In the same fashion, when the contract is silent about the allocation of rights, an employer does not acquire ownership in products produced by its humdrum workers who are not paid to be creative. However, as the foregoing law of life dictates, when the product is produced by a humdrum worker with the employer's resources, *i.e.*, its production is partially funded by the employer, the employer may retain some rights in the product.

Unlike the distinction between humdrum and creative workers, the distinction between employees and contractors entails no justification for differentiating allocation

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[177] For a classic article on this law of life *see* Steven Kerr, *On the Folly of Rewarding A, While Hoping for B*, 18 ACAD. MGT. J. 769 (1975).

rules, because employees and contractors normally have so much in common that economically they could not be separated into two distinctive groups.

The employee-contractor distinction, albeit recognized, has no practical consequences under patent and trade-secret laws. In contrast, under copyright law, absent agreement to the contrary creative contractors generally retain the rights in works they were hired and paid to produce. It follows that copyright law provides creative contractors with a set of rights, which is very similar to that of humdrum workers who create in their capacity as independent individuals. Namely, by granting creative contractors rights in works they are paid to produce, copyright law is inconsistent in applying the distinction between creative and humdrum workers and falls into the folly of rewarding creative contractors more than necessary (more than they pay for in leisure time and personal compromises).

At first glance, the alleged folly may seem conceptually wrong, as an employer could demand a contractor to assign the rights in prospective products, or alternatively to cut her compensation. However, this is not the only outcome in equilibrium: an employer, the business of which is not about creative products, is prone to fail to consider the allocation of rights at the time of entering into agreement with a contractor. This may happen because oftentimes the informed party who drafts the contract is the contractor, in favor of whom the discussed rules are. To illustrate, consider the circumstances in *Reid*,[178] the leading Supreme Court decision on the issue. Reid was a freelance artist who

[178] *Supra* note 94.

most likely was aware to some extent of the copyright allocation rules. In contrast, the employer was Community for Creative Non-Violence, a non-profit and unincorporated association, the representatives of which were less likely to be familiar with the law of creativity at the workplace. The parties did not sign a written agreement and neither party mentioned copyrights. Because the court held that Reid was a contractor, he was deemed to be the author and the owner of the copyrights in the subject matter sculpture although he was paid for his labor.

A corollary of the foregoing discussion is that at best the copyright default rules regarding contractors can be viewed as bad penalty rules. A good penalty rule would motivate an informed party to reveal information and to settle in the contract more contingencies than it would have settled otherwise. For example, a rule that vests the rights in the worker, if she is an employee, or to the employer if the worker is a contractor. Such a rule gives the rights to the party that is more likely to be uninformed with respect to allocation rules and the potential value of prospective products and, consequently, the more informed party would have to negotiate, thereby revealing some information. Copyright allocation rules, however, go in the opposite direction; they give the rights to the employer, if the worker is a creative employee, or to the worker if she is a contractor. More importantly, a 'good penalty rule' might be inferior to a default rule that strives to complete contractual gaps in a manner that the parties would have done had they negotiated the gap *ex ante.* In my conclusions to this paper I explain why penalty rules are inadequate for the law of creativity at the workplace.

2. Capital Suppliers

a) Employers

An ***employer*** has various interests in organizing production and, therefore, it hires employees and contractors to undertake productive and administrative tasks. Production organization for the purpose of this definition can be as simple as an order of a product from a contractor, or may involve more complex activities, such as a formation and management of a framework for commercializing creative products. For example, in *Reid*, Community for Creative Non-Violence as an employer ordered a sculpture from an artist, while in *Tasini* the New York Times as an employer gathered articles, columns, and other creative works and marketed them together with advertisements and valuable information (stock prices, weather forecast, etc.). Note that in both examples the employer was a necessary intermediary player, without which the creative product would not be created in the first place.

Employers are regarded in this paper as firms, the management of which chiefly engage in the organization of creative and humdrum activities and not involved directly in creative activities. This structure, although might characterize many employers, is not the only one. Independent creative individuals regularly hire creative workers on small and large scales; artists and inventors routinely hire assistants and apprentices and delegate to them certain tasks.[179] Thomas Alva Edison, for instance, holds the record of

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[179] BURLINGAME, INVENTORS BEHIND THE INVENTOR, *supra* note 36; STILLINGER, MULTIPLE AUTHORSHIP AND THE MYTH OF SOLITARY GENIUS, *supra* note 36; Jaszi, *On the Author Effect*, *supra* note 36.

1,093 U.S. patents granted to one individual, but many of his patents were issued for inventions of his employees or others.[180] Other examples of creative entrepreneurs of this kind are Guglielmo Marconi the inventor of wireless communication,[181] Henry Ford the automobile pioneer,[182] and William Gore the father of Gore-Tex products[183]

For the analysis here it makes no difference whether an employer's executives engage only in managerial tasks or also in creative activities, as the important characteristic of employers is the trade of compensation for efforts. Hence, the case of an independent individual who expands his business by hiring others to assist in his work is analyzed as the case of any other employer.

In organizing production, the trade of compensation for efforts is essentially a trade in risks: employers assume much of the risks in productive activities by compensating workers differently than what the market would have paid for the products produced by them. Put simply, employers insure workers to some extent against the risks

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[180] Some of Edison's inventions were conceived and perfected by his assistants although he was the one who was credited for them. For example, the kintetoscope – the first motion-picture projector – was invented by Edison's assistant William Dickson. Nevertheless, despite this historic fact it is still known as Edison's kinetoscope. *See*, PAUL ISRAEL, EDISON: A LIFE OF INVENTION, 277-302 (1998); DAVID ROBINSON, FROM PEEP SHOW TO PALACE 19-34 (1996). Similarly, a more advanced projector was invented by Thomas Armat but was patented and marketed under Edison's name due to the perception that Edison's brand on inventions entails higher profits.. ROBINSON, FROM PEEP SHOW TO PALACE, 59-61. Edison usually incorporated companies for the purpose of commercializing his inventions. For a concise chronology of the many companies he incorporated *see* <<http://edison.rutgers.edu/taep.htm>> (Thomas A. Edison Papers Project).

[181] Dugald C. Jackson, *Guglielmo Marconi*, 47 SCI. MONTHLY 144 (1938); GIANCARLO MASINI ET AL., MARCONI (1999).

[182] FORD R. BRYAN, BEYOND THE MODEL T: THE OTHER VENTURES OF HENRY FORD (1997); HENRY J. FORD AND SAMUEL CROWTHER, MY LIFE AND WORK (1922).

[183] IRA FLATOW, THEY ALL LAUGHED, *supra* note 176, at 143-146.

involved in their productive activities.[184] This insurance is, of course, not absolute as workers' compensation might be tied to their performance.[185] For example, journalists, who are paid by the article, are insured against the fluctuations in the demand for their articles and in the demand for newspaper editions; however, they are not insured against the risk that their articles would not be accepted for publication. Similarly, when a worker is compensated by stock options, her compensation is tied to the general performance of the employer and the risk of her productive activities is not totally eliminated.[186] In exchange for insuring workers, employers normally retain rights in the products produced by the workers, where the scope of the right is often related to the scope of the "insurance."[187] Profit sharing and stock options, for instance, are

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[184] *See*, generally, Robert Gibbons, *Incentives in Organizations*, 12 J. OF ECON. PERS. 115 (1998); James M. Malcolmson, *Individual Employment Contracts*, in HANDBOOK OF LABOR ECONOMICS, vol. 3, 2291 (Orley Ashenfelter and David Card eds., 1999); Canice Prendergast, *The Provision of Incentives in Frims*, 37 J. OF ECON. LIT. 7 (1999).

[185] *See* accompanying text to *supra* note 169.

[186] *See, e.g.*, Susan Pulliam, *The New Dot-Com Mantra: 'Just Pay Me in Cash, Please'*, WALL ST. J., Nov. 28, 2000 (discussing the recent trend in workers' willingness to be compensated by stock options).

[187] Following Frank Knight's pioneering book from 1921, allocation risks is recognized as one of the major characteristics of employment relationships. *See* FRANK H. KNIGHT, RISK, UNCERTAINTY AND PROFIT 270 (1921):

> "With human nature as we know it would be impractical or very unusual for one man to guarantee to another a definite result of the latter's action without being given power to direct his work. And on the other hand, the second party would not place himself under the direction of the first without such guarantee … The result of this manifold specialization of function is the enterprise and wage system of industry. Its existence in the world is the direct result of the fact of uncertainty."

compensation schemes under which employers hold partial rights in the products and normally workers are compensated less in cash.[188]

The pattern of trade of rights in products for insured income is general and applies to humdrum and creative industries. The economic logic of this trade, however, has a stronger grip in creative industries, as the risks in these industries are typically high.[189] Nevertheless, in the debate over creativity at the workplace this organizational feature of creative activities seems to be neglected: scholars who do not contest favoritism of employers by the default allocation rules for humdrum production fiercely criticize the law of creativity at the workplace.

b) Financiers

A ***financier*** is primarily interested in the returns on its investment in creative projects and its involvement in the organization of production, if such exists, is ancillary.[190] The financier does not insure creative individuals (or firms) against the risks in their activities, although its investments in their enterprises mitigate some of the risks to which they are exposed.

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[188] *See, e.g.*, Pulliam, *The New Dot-Com Mantra*, *ibid*. For empirical profit-sharing schemes *see* Robert Higgs, *Race, Tenure, and Resource Allocation in Southern Agriculture, 1910*, 33 J. ECON. HIST. 149 (1973); Lee Alston and Robert Higgs, *Contractual Mix in Southern Agriculture since the Civil War: Facts, Hypotheses, and Test*, 42 J. ECON. HIST. 327 (1982).

[189] *See* Subsection IV.A. above.

[190] For an interesting analysis of financiers in creative industries *see* Henry Hansmann and Reinier Kraakman, *Hand-Tying Contracts: Book Publishing, Venture Capital Financing, and Secured Debt*, 8 J. L. ECON. & ORG. 628 (1992).

A common species of contemporary financiers is the venture capitalist. A venture capitalist invests in young privately held companies for equity or equity-linked stakes and often acquires also some control in the project.[191] For example, Battelle Memorial Institute invested in 1944 *$3,000* in the creative research project of Chester Carlson on developing the technology for photocopying machines and in return it acquired control over the marketing of the prospective technology and secured *60%* of the profits, which over the years added up to about *$350* million.[192]

To be sure, a financier is not an employer that outsources the production of creative products to contractors; rather, a financier leaves the initiation of creative projects to others and selects certain ongoing creative initiatives to invest in with anticipation for returns on these investments. To illustrate, Battelle Memorial Institute was a financier because it invested in Carlson's ongoing research project. In contrast, the New York Times was the employer of Tasini and his colleagues and Community for Creative Non-Violence was the employer of Reid because they initiated the creative projects.

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[191] For theoretical analysis of venture capitalist *see* generally Anat R. Admati and Paul Pfleifederer, *Robust Financial Contracting and the Role of Venture Capitalists*, 49 J. OF FIN. 371 (1994); Eric Befglof, *A Control Theory of Venture Capital Finance*, 10 J. L. ECON. & ORG. 247 (1994); Josh Lerner, *Venture Capitalists and the Oversight of Private Firms*, 50 J. OF FIN. 301 (1995); Josh Lerner, *"Angel" Financing and Public Policy: An Overview*, 22 J. OF BANKING & FIN. 773 (1998); Thomas Hellmann, *The Allocation of Control Rights in Venture Capital Contracts*, 29 RAND J. OF ECON. 57 (1998). For a survey of the empirical literature, *see* Paul Gompers and Josh Lerner, *The Venture Capital Revolution*, 15 J. ECON. PERSP. 145 (2001).

[192] IRA FLATOW, THEY ALL LAUGHED, *supra* note 176, at 115.

c) Desirable Legal Implications

The distinction between employers and financiers justifies different default allocation rules for each of these groups of capital suppliers: employers should retain rights in products produced by their workers, whereas financiers' rights should be limited to their contractual arrangements with creative individuals (or firms). The logic behind this suggested distinction is straightforward. A financier invests capital in a creative project for promised interests that are secured in the contract between it and a creative individual or firm and, therefore, it is reasonable to assume that if the parties did not secure the interests of the financier in prospective creative products they intended not to do so. In contrast, an employer invests in organizing creative production with anticipation to retain the residual product, which is whatever is left after workers are paid for their labor as agreed upon between the parties.

Indeed, although the financier-employer distinction is not explicitly recognized by the case law, several courts followed it by referring to "the motivating factor in producing [creative products]," that justifies employers' ownership.[193] For example, Walt Disney retained the rights in the Fantasia soundtrack, performed by the Philadelphia Orchestra, because Disney had selected the music, provided the instruments and recording facilities, and controlled the recording process.[194] In contrast, the financier, who funded the early

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[193] *Playboy Enterprises, Inc. v. Dumas*, 53 F.3d 549, (CA2 N.Y. 1995); *Seigel v. National Periodical Publications*, 508 F.2d 909, 914 (2nd Cir. 1974). *See* also Peter Jaszi, *Toward a Theory of Copyright: The Metamorphoses of "Authorship,"* 1991 DUKE L. J. 455, 486 (1991) ("Ironically, [under the work-made-for-hire doctrine] the employers' claims are rationalized in terms of the romantic conception of "authorship" with its concomitant values of "originality" and "inspiration."")

[194] *Philadelphia Orchestra Ass'n v. Walt Disney Co.*, *supra* note 164.

recording sessions of George Thorogood and the Destroyers, was denied rights in the recordings because he "was a fan and friend who financed [the creative] effort, not the Archbishop of Salzburg commissioning works by Mozart."[195]

In conclusion, the foregoing characterization of the players and the analysis of their relationships suggest that the focus of the default rules should be on the distinctions between employers and financiers and between workers and independent individuals (firms), while attributing no meaning to the inconclusive distinction between employees and contractors. Furthermore, the analysis of the relationships between the players shows that desirable default rules would favor employers over creative workers and creative individuals (firms) over financiers.

C. Limited Specifiability, Discretionary Inputs, and Personhood

Creative human inputs are still vital in many production lines, among other reasons because certain production procedures are not specified well enough to be carried out without discretion and because the current state of artificial intelligence still cannot match human discretion.[196] More specifically, when the desirable product is ill-defined, as creative products are, its production procedures are too costly to be specified. Consider,

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[195] *Forward v. Thorogood*, 985 F.2d 604 (1st Cir. 1993).

[196] For the developments in creative machines, *see*; Selmer Bringsjord, *Chess is Too Easy*, 101 MIT'S TECH. REV. 23-28 (1998) (An artificial agent that can write short stories); Paul C. Judge, *Artificial Imagination: Companies Are Trying Out Software Designed to Spur Invention*, BUS. WK., Mar. 18, 1996, at 60; Katie Hafner, *Artificial Intelligence Hasn't Peaked (Yet)*, NY TIMES, Dec. 20, 2000; Eric Mjolsness and Dennis DeCoste, *Machine Learning for Science*, 293 SCI 2051 (2001).

for example, publications – one of the important products of academic institutions. A perfect definition of this product would include the very narrow topic, arguments, and conclusions. Stocks of this kind of definitions do not exist, so the writing process cannot yet be reduced into instructions (or algorithms) to be executed by humdrum workers (or machines). Consequently, deans have no choice but to hire creative academics. The impediment to defining production procedures is referred to here as ***limited specifiability***.

In economic literature, limited specifiability is one type of noncontractibility; an informational problem that inhibits the formation of complete contracts.[197] This problem, which cannot be overcome with reasonable investments, is recognized as one of the important causes for employing individuals within firms rather than dealing with individuals in arms-length transactions.[198] In the context of creative activities, this branch of economic theories of the nature of the firm explains why creative activities are integrated within firms,[199] and there are numerous studies that show the connection

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[197] *See* generally Eric Maskin and Jean Tirole, *Unforseen Contingencies and Incomplete Contracts*, 66 J. ECON. STUD. 83 (1999); Oliver Hart and John Moore, *Foundation of Incomplete Contracts*, 66 J. ECON. STUD. 115 (1999).

[198] The extensive literature on this topic laid the foundations for the understanding of the nature of the firm. *See*, *e.g.*, Coase, *The Nature of the Firm*, *supra* note 169; Armen A. Alchian and Harold Demsetz, *Production, Information Costs, and Economic Organization*, 62 AM. ECON. REV. 777 (1972); Benjamin Klein, Robert G. Crawford, and Armen A. Alchian, *Vertical Integration, Appropriable Rents, and the Competitive Contracting Process*, 21 J. L. & ECON. 297 (1978); Oliver E. Williamson, *Transactional-Cost Economics: The Governance of Contractual Relations*, 22 J. L. & ECON. 233 (1979); Grossman and Hart, *The Costs and Benefits of Ownership*, *supra* note 39.

[199] For an excellent theoretical application of these theories to the integration of creative activities within firms *see* Aghion and Tirole, *The Management of Innovation*, *supra* note 39.

between limited specifiability and the rise of employed creativity in the nineteenth century.[200]

The fact that limited specifiability may result from cost restraints, rather than knowledge or technological restraints is important. Employers may hire creative workers because the investments necessary to specify procedures for humdrum workers are too high or alternatively too many humdrum workers are needed to carry out the task. For example, until the eighteenth century it was often cheaper to commission a new composition than obtain a copy of an existing one.[201] It follows that for certain tasks creative labor may be a cheaper substitute for humdrum labor and then creative workers are hired for the cost savings they entail and not for their unique skills to produce products that no humdrum worker could produce.

Many contemporary experts depart from the traditional view regarding the uniqueness of creative thinking[202] and argue that creative thinking is only quantitatively and not qualitatively different from everyday thinking and, therefore, can be

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[200] *See, e.g.*, Mowery, *The Boundaries of the U.S. Firm in R&D*, *supra* note 23; Richard Zeckhauser, *The Challenge of Contracting for Technological Information*, *supra* note 23. Note that although this cause was an important one it was not the only one. *See supra* note 23 and accompanying text.

[201] ADAM CARSE, THE ORCHESTRA IN THE XVIIITH CENTURY 7 (1969). For a fascinating discussion on effects of printing on labor *see* CHARLES BABBAGE, ON THE ECONOMY OF MACHINERY AND MANUFACTURES, ch. 11 (4th ed., 1833).

[202] *See, e.g.*, ARTHUR KOESTLER, THE ACT OF CREATION (1964) (arguing that we creativity is enhanced by suspending rationality).

formulated.[203] In other words, according to this modern approach the choice between artificial agents and creative workers is in many contexts substantially the same as the choice between machines and humdrum workers in humdrum production lines: oftentimes workers are employed because the machines are too costly to manufacture.[204] Consider, for example, the willingness to pay a premium for certain handmade products, which is generally explained by the uniqueness of each item. Technically, this uniqueness could be achieved by machines, but then the costs of production would soar and, therefore, when the uniqueness of each item is sought, workers are employed. The

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[203] *See, e.g.*, Herbert Simon, *The Structure of Ill-Structured Problems*, 4 ARTIFICIAL INTELLIGENCE 181 (1973); DAVID N. PERKINS, THE MIND'S BEST WORK (1981) (arguing that formalization enhances creativity. One of the studies used to supports the argument was a survey of ads, 89% of the award-winning ads contained one of six regularities, or "creativity templates." Of these, about 25% could be schematically depicted as a simple template termed "Replacement."); ROBERT W. WEISBERG, BEYOND THE MYTH OF GENIUS (1993) (arguing that creative thinking is an extension of our normal mental capacity); Jacob Goldenberg et al., *Creative Sparks*, 285 SCI. 1495 (1999).

[204] Artists frequently use their works to discount the argument that their creative endeavors can be formulated. *See*, for example, Dire Straits, *Money for Nothing*, in BROTHERS IN ARMS (December, 1984):

> "See the little faggot with the earring and the make-up
> Yeah buddy that's his own hair
> That little faggot got his own jet airplane
> That little fagot he's a millionaire
> We gotta install microwave ovens
> Custom kitchen deliveries
> We gotta move these refrigerators
> We gotta move these color TV's
> I shoulda learned to play the guitar
> I shoulda learned to play them drums…
> Man we could have some fun…
> Money for nothin' and chicks for free."

point here is that *limited specifiability by itself is not a distinctive feature of creative activities that justifies special allocation rules*.[205]

My last point highlights the weakness of the popular attempts to apply personhood theories to the law of creativity at the workplace. Several scholars, who follow Hegelian and personhood theories, argue that limited specifiability does justify the allocation of some rights in creative products to the workers who were directly involved in their production, in order "to make possible, and protect, the constituting of autonomous personhood in [a creative] work."[206] When a worker provides discretionary inputs rather than carrying out meticulous instructions, so the argument goes, she should be entitled to some rights on top of her salary. In contrast, humdrum workers who discharge their duties "according to precise specifications [with] the repetitious performance of assigned tasks"[207] are entitled to their salary and no more. Congress considered and rejected this line of argument when enacted the Visual Artists Right

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[205] Special rights for creative workers presumably could justify similar rights for creative machines. For the legal status of creative machines, *see* Lawrence B. Solum, 70 N.C. L. REV. 1231 (1992) (discussing the issues surrounding the possible treatment of an artificial intelligence as a legal person). For general discussion regarding allocation of rights in creative products generated by creative machines, *see* Arthur R. Miller, *Copyright Protection for Computer Programs, Databases, and Computer-Generated Works*, 106 HARV. L. REV. 978 (1993); Pamela Samuelson, *Allocating Ownership Rights in Computer-Generated Works*, 47 U. PITT. L. REV. 1185 (1986); Ralph D. Clifford, *Intellectual Property in the Era of the Creative Computer Program: Will the True Creator Please Stand Up?*, 71 TULANE L. REV. 1675 (1997).

[206] Cherensky, *A Penny for Their Thoughts*, *supra* note 7, at 648. *See* also Peter Jaszi, *On the Author Effect: Contemporary Copyright and Collective Creativity*, 10 CARDOZO ARTS & ENT. L.J. 293 (1992); MARK ROSE, AUTHORS AND OWNERS: THE INVENTION OF COPYRIGHT, Ch. 7 (1993); For the general personhood justification for property rights, *see* Margaret J. Radin, *Property and Personhood*, 34 STAN. L. REV. 957 (1982); Justin Hughes, *The Philosophy of Intellectual Property*, 77 GEORGETOWN L.J. 287 (1988). For an attempt to reconcile the law of creativity at the workplace with personhood theories, *see* Justin Hughes, *The Personality Interests of Artists and Investors in Intellectual Property*, 16 CARDOZO ARTS & ENT. L.J. 81 (1998).

[207] Cherensky, *A Penny for Their Thoughts*, *supra* note 7, at 649.

Act[208] that provides "moral rights"[209] for defined types of works[210] and expressly exempts works made for hire from its scope.[211]

Indeed, even some proponents of the extension of the personhood argument to setups of employment relationships would agree that it is plagued with some weaknesses.[212] Essentially, the argument is based on the alleged distinctiveness of the discretionary inputs needed for creative activities while belittling, if not ignoring, the fact that creative discretionary inputs are also needed in many other jobs, such as managerial and marketing positions, which are no less indispensable in the production chain. Moreover, very often it is not easy to distinguish "creative workers" from other humdrum workers: does an R&D scientist have more personal stakes in a product than the CEO of the firm? Or, did Walt Disney have in his movies less personal stakes than the screenwriters, musicians, and graphic artists he employed?[213] If at all, the discretionary-input factor should draw the line not between employers and employees, but rather

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[208] 17 U.S.C. § 106A.

[209] Generally speaking, "moral rights" consists of the right to control the circumstances in which the work will be released to the public, the right to withdraw the work from circulation, the right to claim of attribution ('paternity right'), and the right to object to the distortion or mutilation of the work ('integrity right'). *See* Martin A. Roeder, *The Doctrine of Moral Right: A Study in the Law of Artists, Authors and Creators*, 53 HARV. L. REV. 554 (1940).

[210] The Act covers visual-art works that are produced in a limited edition of no more than 200 copies that are signed and consecutively numbered.

[211] Henry Hansmann and Marina Santilli, Authors' and Artists' Moral Rights: A Comparative Legal and Economic Analysis, 26 J. LEGAL STUD. 95, 134-135 (1997) (justifying the work-made-for-hire exception); William M. Landes, *What Has the Visual Arts Rights Act of 1990 Accomplished?*, 25 J. CULTURAL ECON. 283 (2001).

[212] Cherensky, *A Penny for Their Thoughts*, *supra* note 7, at 605-616 (discussing the professionalism of invention, teamwork, and "routinization of invention").

between employers and financiers, as the latter do not initiate the project for which the discretionary inputs are needed.

Furthermore, the personhood argument implicitly relies on the simplifying assumption that the type of legal protection granted to a creative product is determined exogenously and that deriving rights to creative individuals is a matter of a schematic function.[214] In practice, however, there are complex tradeoffs between different types of legal rights (particularly between trade secrets and patents),[215] which are subject to endogenous choice of application. Additionally and most importantly, it is virtually impossible to measure the relative 'personal stakes' of creative team members in a creative product, so that assigning respective rights to these individuals is unfeasible.[216] In this sense, the personhood argument is a symptom of the already noted myth of solitary genius and as such it is as unfounded as the myth itself.

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[213] In the case of the Fantasia soundtrack, the court stressed that "Walt Disney himself attended the recording and Disney employees were present during the Orchestra's practice sessions prior to recording." *Philadelphia Orchestra Ass'n*, *supra* note 164.

[214] *See, e.g.*, Hughes, *The Philosophy of Intellectual Property*, *supra* note 206, at 339-344 (discussing the problems with the "varying degrees of personality in intellectual property").

[215] Some aspects of these tradeoffs were noted earlier at *supra* notes 143-145 and accompanying text.

[216] It should be noted that the proponents of the personhood application do not ignore the fact that many creative activities are conducted in teams, but nevertheless they fail to address how to derive rights to team members, or alternatively to manage the rights collectively. *See, e.g.*, Cherensky, *A Penny for Their Thoughts*, *supra* note 7, at 605-616.

D. Creating by Learning

In the previous section I argued that the personal inputs of creative workers do not justify distinguishing them from humdrum workers in as far as the distinction is related to allocation rules. This section supports that argument with empirical evidence on specific aspects of creative productivity.

Psychologists and economists have long recognized that in humdrum production lines efficiency increases follow from direct experience with a particular task.[217] This phenomenon, commonly known as *learning by doing*, has been found in building aircrafts,[218] ships,[219] power plants,[220] semiconductors,[221] and many other products.

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[217] HERMANN EBBINGHAUS, MEMORY: A CONTRIBUTION TO EXPERIMENTAL PSYCHOLOGY (Henry A. Ruger and Clara E. Bussenius trans., 1964) (originally published in 1885); T.P. Wright, *Factors Affecting the Cost of Airplanes*, 3 J. OF THE AERONAUTICAL SCI. 122 (1936); Armen Alchian, *Reliability of Progress Curves in Airframe Production*, 31 ECONOMETRICA 679 (1963).

[218] Wright, *Factors Affecting the Cost of Airplanes*, *ibid*; Armen Alchian, *Reliability of Progress Curves in Airframe Production*, *ibid*; THOMAS R. GULLEDGE AND NORMAN KEITH WOMER, THE ECONOMICS OF MADE-TO-ORDER PRODUCTION (1986); C. Lanier Benkard, *Learning and Forgetting: The Dynamics of Aircraft Production*, 90 AM. ECON. REV. 1034 (2000). *See* generally LINDA ARGOTE, ORGANIZATIONAL LEARNING: CREATING, RETAINING AND TRANSFERRING KNOWLEDGE (1999).

[219] Leonard Rapping, *Learning and World War II Production Functions*, 47 REV. OF ECON. & STAT. 81 (1965); Linda Argote, Sara L. Beckman, and Dennis Epple, *The Persistence and Transfer of Learning in Industrial Settings*, 36 MGMT. SCI.. 140 (1990).

[220] Martin B. Zimmerman, *Learning Effects and the Commercialization of New Energy Technologies: The Case of Nuclear Power*, 13 BELL J. OF ECON. 297 (1982); Roland Sturm, *Nuclear Power in Eastern Europe: Learning or Forgetting Curves?*, 15 ENERGY ECON. 183 (1993).

[221] Herald Gruber, *The Learning Curve in the Production of Semiconductor Memory Chips*, 24 APPLIED ECON. 885 (1992); Douglas A. Irwin and Peter J. Klenow, *Learning-by-Doing Spillovers in the Semiconductor Industry*, 106 J. OF POL. ECON. 1201 (1994).

Learning by doing has also been found in activities that traditionally are not considered as humdrum, such as performing surgical procedures[222] and operating nuclear plants.[223]

The learning-by-doing phenomenon is not limited only to humdrum and semi-humdrum activities but also applies to "purely" creative ones. Its effects on creative productivity support the argument that the properties of creative activities do not justify unique allocation rules, as conceptually creative activities are characterized by regularities similar to humdrum activities. Furthermore, the study of the phenomenon highlights the contribution of employers to the creative productivity of their workers. This contribution has been neglected in the literature on creativity at the workplace.

1. The Humdrum Facet of Learning by Doing

At a first glance, the humdrum aspect of learning by doing is trivial: practice makes (closer to) perfect. A repetitious performance of an assigned task, such as typewriting[224] or pizza production,[225] decreases the time it takes to perform the task and reduces the number of errors. Not less intuitive is the role of employers in affecting the slope of their workers' learning curves and the workers' location on these curves: the rate of learning varies across humdrum workers according to their personal characteristics and

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[222] SF Kelsey, *Effect of Investigator Experience on Percutaneous Transluminal Coronary Angioplasty*, 53 AM. J. OF CARDIOLOGY 56C (1984).

[223] Paul L. Joskow and George A. Rozanski, *The Effects of Learning by Doing on Nuclear Plant Operating Reliability*, 61 REV. OF ECON. & STAT. 161 (1979).

[224] Louis L. Thurstone, *The Learning Curve Equation*, 26 PSYCHOL. MONOGRAPHS 1 (1919).

motivation and it is therefore in the interest of employers to invest in selecting workers and motivating them. This contribution of employers to creative productivity is not obvious and requires of employers efforts and resources, the investment of which makes some employers better than others in providing workers with means and incentives to expedite their learning process, just as some law schools are better than others in improving the learning process of their students.[226]

The humdrum facet of learning by doing, however, is not limited to humdrum activities. Every academic, just as any other creative individual, is familiar with the described phenomenon in her work: up to a certain age, productivity of creative individuals increases with experience.[227] Moreover, as in the case of learning by doing in humdrum activities, the rate of creative productivity was found directly related to the

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[225] Eric D. Darr et al., *The Acquisition, Transfer and Depreciation of Knowledge in Service Organizations: Productivity in Franchises*, 41 MGMT. SCI. 1750 (1995).

[226] For a comprehensive survey of the role of organizations in individual learning curves, *see* ARGOTE, ORGANIZATIONAL LEARNING, *supra* note 218. *See* also Boyan Jovanovic and Yaw Nyarko, *A Bayesian Learning Model Fitted to a Variety of Empirical Learning Curves*, BROOKINGS PAPERS ON ECONOMIC ACTIVITY: MICROECONOMICS 247 (1995).

[227] *See, e.g.*, Paul D. Allison and John A. Stewart, *Productivity Differences Among Scientists: Evidence from Accumulative Advantage*, 39 J. OF SOC. REV. 596 (1974) (studying the productivity curves of chemists, physicists, and mathematicians, and shows correlation between the career stage and the productivity); Arthur Diamond, *The Life-Cycle Research Productivity of Mathematicians and Scientists*, 41 J. OF GERONTOLOGY 520 (1986); Sharon G. Levin and; T.L. Powers, *Career research productivity patterns of marketing academicians*, 42 J. OF BUS. RES. 75 (1998); D.K. Simonton, *Talent and its Development: An Emergenic and Epigenetic Model*, 106 PSYCHOL. REV. 435-457 (1999); David W. Galenson, *The Careers of Modern Artists: Evidence from Auctions of Contemporary Art*, 24 J. OF CULTURAL ECON. 87 (2000); Geoffrey R. Lanyon and Lones Smith, *A Portrait of the Artist as a Young, Middle-Aged, and Elderly Man*, UNIVERSITY OF MICHIGAN, MIMEO (1999); David W. Galenson and Bruce A. Weinberg, *Age and the Quality of Work: The Case of Modern American Painters*, NBER WORKING PAPER NO. 7122 (1999); David W. Galenson and Robert Jensen, *Young Geniuses and Old Masters: The Life Cycles of Great Artists from Masaccio to Jasper Johns*, NBER WORKING PAPER NO. 8368 (2001).

means, rewards, and 'environmental stimulus' that their employer provides them with.[228] For example, several studies show that at least in the academic world, institutional affiliation is one of the major factors of creativity: the rates of productivity of academics change when they move between institutions of different "quality."[229] Put simply, the rates of productivity of creative and humdrum workers may differ in degree and magnitude, but to a large extent they are affected by the same factor – the employers' management of continuous activities. This observation in turn highlights the regularities of creative productivities and sheds some light on a neglected non-financial contribution of employers to creative productivity.

2. The Creative Facet of Learning by Doing

The creative facet of learning by doing explains why the continuous performance of tasks may stimulate creativity.[230] The intuition behind this facet is almost as straightforward as the intuition behind the humdrum facet of learning by doing:

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[228] *See, e.g.*, Barbara F. Reskin, *Scientific Productivity and the Reward Structure of Science*, 42 AM. SOC. REV. 491 (1977) (emphasizing the role of employers in the productivity pattern of chemists); Paul D. Allison and J. Scott Long, *Departmental Effects on Scientific Productivity*, 55 AM. SOC. REV. 469 (1990) (studying the relationship between productivity of academics and their employers); C.J. Bland and M.T. Ruffin, *Characteristics of a Productive Research Environment: Literature-Review*, 67 ACAD. MED. 385 (1992); Xavier Castañer and Lorenzo Campos, *The Determinants of Artistic Innovation: Bringing in the Role of Organizations*, 26 J. CULTURAL ECON. 29 (2002).

[229] *See, e.g.*, Allison and Long, *Departmental Effects on Scientific Productivity*, *supra* note 227; Bruce Keith and Nicholas Babchuk, *The Request for Institutional Recognition: A Longitudinal Analysis of Scholarly Productivity and Academic Prestige among Sociology Departments*, 76 SOC. FORCES 1495 (1998); J. Kasof, *Explaining Creativity: The Attributional Perspective*, 8 CREATIVITY RES. J. 311 (1998) (generalizing the argument to non-academic setups).

cumulative experience may inspire additional creativity and ignite new ideas regarding how to improve present technologies and practices. Anecdotal evidence for this aspect is abundant. For example, Peter Roberts, a sales clerk with Sears, Roebuck & Co., whose humdrum job inspired him to develop a socket wrench that would permit the easy removal of the sockets from the wrench;[231] Richard Dewey, the welder who solved a mechanical problem its employer faced;[232] and Elias Howe, Jr., the inventor of the sewing machine who also invented the first zipper.[233] More established evidence can be found in studies of the aircraft[234] and armory[235] industries.[236]

Unlike the case of the humdrum facet of learning by doing, the effects of the creative facet of learning by doing on humdrum and creative individuals are not the same. The production of a creative product by a humdrum worker who is touched by this facet is a discrete event that is unlikely to be repeated. In contrast, the inspiration of a creative individual affects her productivity rate. Roberts and Dewey were 'messengers' whose

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[230] *See* generally Kenneth Arrow, *The Economic Implications of Learning by Doing*, 29 REV. OF ECON. STUD. 155 (1962); Sherwin Rosen, *Learning by Experience as Joint Production*, 86 Q. J. OF ECON. 366 (1972); Wesley M. Cohen and Daniel A. Levinthal, *Innovation and Learning: The Two Faces of R&D*, 99 ECON. J. 569 (1989).

[231] *Roberts v. Sears, Roebuck & Co.*, *supra* note 174.

[232] *See* accompanying text to *supra* note 133.

[233] HENRY PETROSKI, INVENTION BY DESIGN: HOW ENGINEERS GET FROM THOUGHT TO THING 66-88 (1996).

[234] *See* references in *supra* note 218.

[235] Paul J. Uselding, *Technical Progress at the Springfield Armory, 1820-1850*, 9 EXPLORATIONS IN ECON. HIST. 291 (1972); Robert B. Gordon, *Material Evidence of Manufacturing Methods Used in 'Armory Practices,'* 14 INDUS. ARCHEOLOGY 22-35 (1988); Robert B. Gordon, *Who Turned the Mechanical Ideal into Mechanical Reality?*, 4 TECH. & CULTURE 744-778 (1988)

[236] For more casual evidence, *see* WILLIAM LAZONICK, COMPETITIVE ADVANTAGE ON THE SHOP FLOOR (1990).

only inventions were unexpected, whereas Howe was a professional inventor whose source of inspiration was his specialty in the clothing industry.

The foregoing differences between creative and humdrum workers provide another justification to the rights of employers in creative products produced by creative workers.[237] Because employers invest in creating inspiring environments for their creative workers and only for them,[238] the productivity of creative workers is, to a large extent, a product of their employers' endeavors and investments and as such it is not an independent "personal input" of any creative worker.[239] Again, we come to the conclusion that creative production lines are very similar to humdrum production lines and do not justify distinctive allocation rules. No less important, the same line of reasoning suggests that the rights in a creative product produced by a humdrum worker should go to the worker, as the employer neither paid for her labor nor invested in her creativity.

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[237] *See* also Subsection IV.B.1.d) above.

[238] *See, e.g.*, Amal Kumar Naj, *Creative Energy – GE's Latest Invention: A Way to Move Ideas from Lab to Market*, WALL ST. J., June 14, 1990, at A1; David Woodruff, *Fostering Creativity*, WALL ST. J., Nov. 26, 2001.

[239] Under certain circumstances employers might refrain from investing in increasing creative productivity. Fudenberg and Tirole study the strategic considerations of employers in advancing learning paths. They show that in concentrated markets employers have incentives to slow down the learning process for various reasons. Their theory has been followed by an extensive research of strategic incentives to slow down the learning process. This branch of the literature is beyond the scope of this paper. Drew Fudenberg and Jean Tirole, *Learning-by-Doing and Market Performance*, 14 BELL J. OF ECON. 522 (1983). *See* also Pankaj Ghemawat and A. Michael Spence, *Learning Curve Spillovers and Market Performance*, 100 Q. J. OF ECON. 839 (1985); Ronald S. Jarmin, *Learning by Doing and Competition in the Early Rayon Industry*, 25 RAND J. OF ECON. 441 (1994).

E. Incentives and the Progress of Science and Useful Arts

Incentives to workers can take many forms, including rights in products and profit sharing schemes. Because rights may function as stimuli for creative activities it is sometimes argued that entitlement of creative individuals to rights in products produced by them is crucial "to Promote the Progress of Science and useful Arts."[240] More moderate version of this argument is that employers do not provide employees with sufficient incentives either in the form of rights or in other forms and, therefore, legal intervention is warranted.[241]

In this section I discuss whether creative individuals are responsive to incentives, and whether employers are likely to provide adequate incentives to workers. It is submitted here that consistent with the conclusion of the previous section the existing evidence on incentives to creative individuals supports the superiority default rules in favor of employers over alternative rules. More specifically, it is shown that mandatory rules in favor of workers are likely to distort the allocation of resources invested in arts and sciences.

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[240] U.S. Const., Art. I, § 8, cl. 8.

[241] *See, e.g.*, Jay Dratler, Jr., *Incentives for People: The Forgotten Purpose of the Patent System*, 16 HARV. J. ON LEGIS. 129 (1979); Dreyfuss, *The Creative Employee and the Copyright Act of 1976*, *supra* note 103, at 590-591; Franklin D. Ubell, *Assignor Estoppel: A Wrong Turn from Lear*, J. PAT. & TRADEMARK OFF. SOC'Y, Jan. 1989, at 26, 30 ("The Constitution does not suggest promoting the progress of science and the useful arts by "securing to capitalists exclusive rights to the creations of inventors."" (citation omitted)). *See* also *Twentieth Century Music Corp. v. Aiken*, 422 U.S. 151, 156 (1975) ("The immediate effect of our copyright law is to secure a fair return for an 'author's' creative labor. But the ultimate aim is, by this incentive, to stimulate artistic creativity for the general public good.")

1. Do Incentives Matter?

a) The Question

The first question to address in studying the connection between allocation rules and "the Progress of Science and useful Arts" is whether hired creative individuals perform better when their compensation is closely related to their performance.

To answer this question I follow the distinction between intrinsic motivation (***"inner necessity"***) to perform of a task, and extrinsic incentives (***"incentives"***), which stem from an external reward.[242] Inasmuch as creative individuals are motivated by their inner necessity rather than by incentives, the allocation rules play no role in the progress of science and useful arts as proprietary rights do not induce creative individuals to exert more effort. On the contrary, allocating all the rights to employers would boost the production of creative goods, as for providing workers with creative opportunities and meager compensation employers could collect all the gains from creative products.

However, if creative individuals can be motivated by incentives, the profits from organizing creative activities by employers depend on the provision of such incentives. Then, the question is whether we should expect employers, although intending only their

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[242] *See*, generally, FREDRICK HERZBERG ET AL., THE MOTIVATION TO WORK (1959); E. Deci, *The Effects of Externally Mediated Rewards on Intrinsic Motivation*, 18 J. PERSONALITY & SOC. PSYCHOL. 105 (1971); David M. Kreps, *Intrinsic Motivation and Extrinsic Incentives*, 87 AM. ECON. REV. 359 (1997).

own gains, to be led by an invisible hand to promote the progress of science and useful arts.[243]

b) Incentives vs. Inner Necessity and Their Legal Implications

(1) Anecdotal Comments

The short answer to the question of whether incentives matter is that we know very little about what really motivates creative individuals. The prevalence of the romantic images of the starving artist[244] and the hero inventor[245] might indicate that many of us prefer to believe that our culture and science heroes engaged in creative activities for the sake of creativity. Had the starving artist and hero inventor been motivated by greed and the pursuit of money, they would have chosen a different profession. In accordance with view, when we think of creative individuals we usually think of Vincent

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[243] *Cf.* ADAM SMITH, AN INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS 477 (Edwin Cannan ed., 1976):

> "[Every individual] intends only his own gain, and he is in this, as in many other cases led by an invisible hand to promote an end which was no part of his intention."

[244] *See* STILLINGER, MULTIPLE AUTHORSHIP AND THE MYTH OF SOLITARY GENIUS, *supra* note 36; Jaszi, *On the Author Effect*, *supra* note 36; Randal K. Filer, *The "Starving Artist" – Myth or Reality? Earning of Artists in the United States*, 94 J. OF POL. ECON. 56-75 (1986) (showing with data from the 1980 census that contrary to the widely held beliefs, artists do not earn less than other workers of similar training and personal characteristics).

[245] *See, e.g.*, BURLINGAME, INVENTORS BEHIND THE INVENTOR, *supra* note 36, at 3:

> "When you say the word inventor to most Americans, a lot of pictures jump suddenly into their minds. They see Samuel Morse with his great white beard and his chest covered with medals standing by a telegraph key, ticking off the message "What Hath God Wrought." They see Robert Fulton watching his awkward little steamboat with great clouds of black smoke pouring out of it, crawling up the Hudson. They see Eli Whitney grinding away at his cotton gin and they see Edison standing stiffly by a large incandescent bulb, considerably bored by the crowd of admirers round him. Some Americans even see Henry Ford watching his cars roll twenty seconds apart off his assembly line at River Rouge.
> These are all pictures of popular Americans heroes. There is a regular parade of them before your mind's eye whenever anyone says the word inventor."

van Gogh who devoted his life to art although he saw no income from his paintings, Eli Whitney who invented the cotton gin and earned very little from his invention, and other creative individuals who lived in poverty. These images are so popular that there were even some economists who questioned the reasoning behind the constitutional philosophy according to which creative individuals are motivated by returns on their creative efforts.[246]

Romanticism aside, history often shows that many creative individuals, as most of the members of the homo race, love money and honor and, therefore, can be motivated by various incentives.

We know, for instance, that Wolfgang Amadeus Mozart, who was a 'greedy' (albeit genius) contractor, usually composed on commission or to advance his career, and seldom without a commercial incentive.[247] Or in his own words in a letter to his father from 1781: "Believe me, my sole purpose is to make as much money as possible; for after good health it is the best thing to have."[248] Charlie Chaplin was identified with the figure of the *Little Tramp* he created and developed, but nevertheless was a shrewd

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[246] FRANK W. TAUSSIG, INVENTORS AND MONEY-MAKERS: LECTURES ON SOME RELATIONS BETWEEN ECONOMICS AND PSYCHOLOGY 28 (1915) ("[In] the race of contrivers and inventors … pecuniary distress is chronic."); *See* Arnold Plant, *The Economic Aspects of Copyright in Books*, 1 (new series) ECONOMICA 167, 168-169 (1934) ("[T]here are authors – scholars as well as poets – who are prepared to pay good money to have their books published. It is conceivable that their output is in some cases quite unaffected by demand conditions: so long as they can go on paying they will go on writing and distributing their books.")

[247] Baumol and Baumol, *On the Economics of Musical Composition in Mozart's Vienna*, *supra* note 17, 175, 183-191 (1994). A good collection of essays that study, among other things, the business organization of Mozart can be found in JAMES M. MORRIS ED., ON MOZART (1994). For an analysis of business entrepreneurship of Mozart and other composers who lived between the seventeenth and nineteenth centuries *see* F.M. Scherer, *The Evolution of Free-Lance Music Composition*, *supra* note 14.

businessman, who in 1916 earned a $670,000 salary (which today would amount to $10,910,550), and in 1919 with a few other prominent actors of the time founded United Artists, a major production studio.[249] As Mozart, Chaplin was candid regarding his motives; when accepting his second honorary Academy Award in 1972, he remarked: "I went into the business for money and the art grew out of it. If people are disillusioned by that remark, I can't help it. It's the truth." Chaplin, however, was definitely not motivated only by money. United Artists was established first and foremost to secure artistic freedom and to escape from the exploiting star system, under which the artists were totally controlled by the studios. Furthermore, following the McCarthy witch hunt, Chaplin paid a painful price for his liberal political views that forced him into exile from the United States for more than twenty years.

Like for Mozart and Chaplin, pecuniary motivations played an important role for Thomas Alva Edison and Henry Ford, who were mentioned earlier. All these extraordinary individuals, however, were also motivated by factors other than money such as recognition, prestige, and ego. Interestingly, Mozart, Chaplin, Edison, and Ford chose to develop entrepreneurial careers, and I will touch on this point later.

The truth is that the vast majority of creative individuals are motivated by a wide array of factors,[250] and only a few are motivated solely by their inner-necessity or greed.

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[248] EMILY ANDERSON TRANS., THE LETTERS OF MOZART AND HIS FAMILY, vol. 3, at 1072 (1938).

[249] TINO BALIO, UNITED ARTISTS: THE COMPANY BUILT BY THE STARS (1976); TINO BALIO, UNITED ARTISTS: THE COMPANY THAT CHANGED THE FILM INDUSTRY (1987).

[250] *See, e.g.*, Peter Tschmuck, *The Court's System of Incentives*, *supra* note 12.

That is, although creative individuals care about the quality and features of their products, they are still affected by incentives, where incentives are rewards that compensate for more than is needed to produce creative products,[251] or to satisfy psychological needs. In comparison, humdrum workers, we would assume for the sake of simplicity, "wherever they work … demand a wage at least equal to what they earn in the outside market for [workers] of their type. They do not care who employs them or what task (within their competence) they are asked to undertake. They are just in it for the money."[252]

(2) Legal and Other Implications of Motivational Diversity

Three important inferences can be drawn from the existence of a multidimensional array of factors that motivates creative individuals. First, the non-pecuniary incentives and the inner-necessity motivation have negative effects on the monetary compensation of creative workers. Second, the optimization of incentives can be carried out only if the law is governed by default rules, rather than mandatory rules. Third, the inner-necessity motivation provides a justification for a sharing rule of the type of a shop right.

To see the negative income effect, consider first the tradeoff between pecuniary and non-pecuniary incentives. Workers who are motivated by pecuniary and non-pecuniary incentives have preferences over various types of rewards that can be converted into tradeoffs between the rewards, such as lower salaries for nicer offices. In the market for

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[251] Needless to say, all individuals, including creative ones, need minimum income to provide for their livelihood and to pay for their costs. As discussed earlier creative individuals may subject themselves to patrons in order to make their livelihood. *See* Subsection II.A. above.

[252] CAVES, CREATIVE INDUSTRIES, *supra* note 22, at 4.

biologists, for example, the salaries in firms that allow their employees to publish are on average *25%* lower than in other firms.[253] Hence, to the extent that employers can tailor packages of incentives they are likely to do so in a manner that would keep the workers motivated and at the same time cut their costs.[254] Put simply, because of the motivational diversity of creative workers, employers might be able pay creative workers less than they would have paid had the workers cared only about money. The possibility of designing incentive policies, in turn, facilitates cost savings for employers and thereby increasing the attractiveness of investment in creative activities. However, incentive design in the discussed manner is possible if the applicable allocation rules are default rules, rather than mandatory rules. When the allocation rules are mandatory, the flexibility of employers in designing incentive policies is limited.

We can now turn to examine the effects of the inner-necessity motivation. It is reasonable to assume that the inner-necessity motivation of creative workers is somewhat controlled. A creative individual who cannot obey any instructions other than of his inner voice, like Vincent van Gogh, is likely to be independent, as no employer would hire him. In more moderate situations, the inner-necessity motivation entails a negative income effect because a worker who is affected by her inner necessity would be reluctant, to some extent, to obey her employer's instructions that do not coincide with her inner voice and thus would be paid less than a disciplined worker. This logic follows a

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[253] Scott Stern, *Do Scientists Pay to Be Scientists?*, NBER WORKING PAPER NO. 7410 (1999).

[254] *See* generally Sherwin Rosen, *The Theory of Equalizing Differences*, in HANDBOOK OF LABOR ECONOMICS, vol. I, 641 (Orley Ashenfelter and Richard Layard eds., 1986).

fundamental economic wisdom: a committed player can do at least as well as without a commitment.[255] Employers, however, regularly hire creative individuals who follow their inner necessity either at the workplace or during their leisure time. A shop-right sharing rule might motivate certain employers to provide workers, who follow their inner necessity, with resources to experiment and try to produce creative products.

c) Evidence

There is ample evidence that humdrum workers, who are employed in monotonous jobs, are sensitive to incentives, and particularly to piece-rate compensation schemes.[256] Strong evidence also indicates that executives, like humdrum workers, perform better when their compensation is tied to their performance.[257] Moreover, there are some indications that the stock market responds favorably to the introduction of

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[255] Thomas C. Schelling, *Commitment*, in THE NEW PALGRAVE DICTIONARY OF ECONOMICS AND THE LAW, vol. I, 295-300 (Peter Newman ed., 1998); AVINASH K. DIXIT AND BARRY J. NALEBUFF, THINKING STRATEGICALLY: THE COMPETITIVE EDGE IN BUSINESS, POLITICS, AND EVERYDAY LIFE 142-167 (1991).

[256] *See, e.g.*, Beth J. Asch, *Do Incentives Matter? The Case of Navy Recruiters*, 43 IND. & LAB. REL. REV. 89S (1990); Rajiv D. Banker et al., *A Field Study of the Impact of a Performance-Based Incentive Plan*, 21 J. ACCT. & ECON. 195 (1996) (retail department stores); Richard B. Freeman and Morris M. Kleiner, *The Last American Shoe Manufacturers: Changing the Method of Pay to Survive Foreign Competition*, NBER WORKING PAPER NO. 6750 (1998); Sue Fernie and David Metcalf, *It's Not What You Pay It's the Way That You Pay It and That's What Gets Results: Jockeys' Pay and Performance* 13 LABOUR 385-411 (1999); Harry J. Paarsch and Bruce S. Shearer, *The Response of Worker Effort to Piece Rates: Evidence from the British Columbia Tree-Planting Industry*, 34 J. HUM. RESOURCES 643 (1999); Corinne Alexander et al., *Do Incentives Matter? Product Quality and Contract Incentives in Processing Tomatoes*, UNIVERSITY OF CALIFORNIA, BERKELEY, DEPARTMENT OF AGRICULTURAL AND RESOURCE ECONOMICS AND POLICY, Working Paper No. 882 (1999); Edward Lazear, *Performance Pay and Productivity* 90 AM. ECON. REV. 1346 (2000) (installation of auto windshields).

[257] *See, e.g.*, Lawrence Kahn and Peter Sherer, *Contingent Pay and Managerial Performance*, 43 INDUS. LAB. REL. REV. S107 (1990); Michael C. Jensen and Kevin J. Murphy, *Performance Pay and Top-Management Incentives*, 98 J. OF POL. ECON. 225 (1990); Michael C. Jensen and Kevin J. Murphy, *CEO Incentives: It's Not How Much You Pay, But How*, 3 HARV. BUS. REV. 138 (1990); George Baker et al., *The Internal Economics of the Firm: Evidence from Personnel Data*, 109 Q.J. ECON. 881 (1994).

sensitive pay-per-performance schemes.[258] However, evidence regarding the sensitivity of creative workers to compensation schemes, which are tied to performance, is still scarce and the existing evidence is not always conclusive. Notwithstanding, the existing evidence indicates that creative workers are affected by incentives, including monetary incentives.

(1) Arts

Although the arts comprise a significant area of economic activity, the study of the production of arts has been largely neglected by economists until recent years because of quantification problems and perhaps also because of the perception that this field is less serious.[259] It would be fair to state that the study of this field was left mostly to sociologists, whose primary interest was not quantification of incentives.[260] As a result, very little has been written about the motivations of artists and the evidence is mostly anecdotal.

The Bureau of Labor Statistics provides general information on occupational income. Because of the Bureau' broad classifications it is possible to extract from its surveys only limited relevant information about the income of employed creative

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[258] John Abowd, *Does Performance-Based Managerial Compensation Affect Corporate Performance*, 43 INDUS. LAB. REL. REV. S52 (1990); WATSON WYATT, WORKUSA 2000: EMPLOYEE COMMITMENT AND THE BOTTOM LINE (2000).

[259] David Thorsby, *The Production and Consumption of the Arts: A View of Cultural Economics*, 32 J. ECON. LIT 1 (1994). The pioneering work on the economics of arts is WILLAM J. BAUMOL AND WILLIAM G. BOWEN, PERFORMING ARTS, THE ECONOMIC DILEMMA: A STUDY OF PROBLEMS COMMON TO THEATER, OPERA, MUSIC AND DANCE (1967).

[260] Pierre-Michel Menger, *Artistic Labor Markets and Careers*, 25 ANN. REV. SOC. 541 (1999).

individuals. The available information sheds some light on the income of certain artistic occupations. The table below summarizes the 2000 National Compensation Survey of Occupational Wages.[261]

Industry		***Mean Hourly Earnings***	***Mean Weekly Hours***
All		***15.81***	***35.8***
White-Collar Occupations			
Lawyers and Judges		38.66	39.1
Lawyers and Judges	*Lawyers*	*38.70*	*39.1*
	Judges	*36.90*	*35.6*
Teachers (College and University)		36.82	32.5
Teachers (College and University)	*Economics Teachers*	*54.47*	*43.0*
	Medical Science Teachers	*53.93*	*35.0*
	Physics Teachers	*52.94*	*30.8*
	Law Teachers	*50.25*	*36.1*
	Engineering Teachers	*42.68*	*40.3*
	Political Science Teachers	*40.51*	*35.9*
	History Teachers	*39.69*	*32.3*
	Sociology Teachers	*39.49*	*36.0*
	Business, Commerce, and Marketing Teachers	*38.14*	*34.1*
	Chemistry Teachers	*37.48*	*38.4*
	Biological Science Teachers	*37.43*	*37.9*
	Mathematical Science Teachers	*37.32*	*34.2*
	Psychology Teachers	*34.69*	*32.7*
	Art, Drama, and Music Teachers	***30.80***	***32.0***
	Computer Science Teachers	*29.21*	*29.4*
	Social Work Teachers	*28.66*	*24.7*
	Foreign Language Teachers	*25.92*	*32.4*
Engineers, Architects, and Surveyors		30.27	40.6
Mathematical and Computer Scientists		29.26	39.6
Executives, Administrative, and Managerial		28.37	40.0
Health Related White-Collar Occupations		27.33	34.0
Health Related White-Collar Occupations	*Physicians*	*61.43*	*38.2*
	Optometrists	*39.30*	*37.1*
	Dentists	*34.81*	*26.3*
	Physicians' Assistants	*32.23*	*39.5*
	Pharmacists	*30.33*	*31.5*
	Speech Therapists	*26.62*	*35.2*
	Physical Therapists	*23.31*	*36.3*

[261] Source: U.S. DEPARTMENT OF LABOR, BUREAU OF LABOR STATISTICS, BULLETIN 2548 (NOV. 2001). Some of the occupational categories are detailed in order to avoid distortions of the presented data.

Industry		***Mean Hourly Earnings***	***Mean Weekly Hours***
Health Related White-Collar Occupations (Cont.)	*Occupational Therapists*	*23.19*	*32.3*
	Registered Nurses	*21.93*	*33.1*
	Respiratory Therapists	*18.66*	*35.7*
	Dietitians	*18.42*	*37.1*
Teachers (Except College and University)		27.17	34.7
Natural Scientists		26.95	39.6
Social Scientists and Urban Planners		26.89	36.6
Librarians, Archivists, and Curators		23.04	37.0
Writers, Authors, Entertainers, and Athletes		23.04	32.4
Writers, Authors, Entertainers, and Athletes	***Musicians and Composers***	***28.69***	***13.7***
	Fashion Designers	***27.04***	***N/A***
	Athletes	*25.24*	*24.0*
	Editors and Reporters	***24.71***	***39.0***
	Commercial and Industrial Designers	***24.55***	***N/A***
	Writers and Authors	***22.81***	***38.7***
	Painters, Sculptors, Craft Artists, and Artists Printmakers	***21.96***	***39.3***
	Actors	*19.99*	*N/A*
	Dancers	*18.38*	*21.3*
	Photographers	***18.20***	***39.4***
	Other Artists, Performers, and Related Workers	*14.06*	*N/A*
Technicians		18.81	19.18
Social, Recreation, and Religious Workers		15.09	15.14
Sales		13.40	33.0
Administrative Support		12.55	36.4
Blue Collar Occupations			
Precision Production, Craft, and Repair		17.01	39.6
Transportation and Material Moving		13.31	37.3
Machine Operators, Assemblers, and Inspectors		11.88	39.2
Handlers, Equipment Cleaners, Helpers, and Laborers		10.15	35.8
Service		9.59	10.56

Inasmuch as the figure of mean hourly earnings says something about occupational income, it is clear that on the list of white-collar occupations, artists are in the lower half, when occupations are ranked according to income. These findings hold also for musicians and composers as their mean weekly hours is very low, so that their weekly income from arts is low. A more elaborated analysis of artists' income levels in 1980 estimated the negative income effect at less than *10%*. This means that in 1980

artists earned *10%* less than other workers, when age, education, and experience are taken into account.[262]

A more subtle observation is the income difference between performing artists and artistic creative workers. The major income of most performing artists is from live performance and, therefore, these artists are not creative workers, as defined in this paper, because their products are *generally* not protected by intellectual-property rights, as they are not fixed in a tangible medium.[263] Accordingly, live performing artists should be beyond the scope of the debate over creativity at the workplace. The table above specifies six occupations of artistic creative workers: (1) musicians and composers; (2) fashion designers; (3) commercial and industrial designers;[264] (4) writers and authors;[265] (5) Painters, Sculptors, Craft Artists, and Artists Printmakers; and (6) photographers. With the exception of photographers, in the category of artistic occupations performing

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[262] Filer, *The "Starving Artist" – Myth or Reality?*, *supra* note 244.

[263] 17 U.S.C. § 102. Since 1994, the Federal law protects only live musical performances (17 U.S.C. § 1101). State legislation may provide some protection to live performers. Roughly speaking, the protection for performers is relatively ineffective. *See* Brian M. Levy, *Legal Protections in Improvisational Theater*, 9 COLUM. J. ART & L., 421 (1985); Gregory S. Donat, *Note: Fixing Fixation: A Copyright With Teeth for Improvisational Performers*, 97 COLUM. L. REV. 1363 (1997); Bruce H. Kobayashi and Ben T. Yu, *An Economic Analysis of Performance Rights: Some Implications of the Copyright Act of 1976*, 17 RES. IN L. & ECON. 237 (1995); Gregory S. Donat, *Fixing Fixation: A Copyright with Teeth for Improvisational Performers*, 97 COLUM. L. REV. 1363 (1997).

[264] For the rise of commercial and industrial designers in the recent years *see* Chris Bangle, *The Ultimate Creativity Machine: How BMW Turns Art into Profit*, 79 HARV. BUS. REV. 47(2001); Olivia Crosby, *Working So Others Can Play: Jobs in Video Game Development*, 14 OCCUPATIONAL OUTLOOK Q. 2 (2000).

[265] For a comprehensive study of authors' income, albeit old, *see* WILLIAM J. LORD, JR., HOW AUTHORS MAKE A LIVING (1962) (studying the 1953-1957 sources of income of writers; emphasizing their need to compromise in their writing projects in order to make a living).

artists are compensated significantly less than artistic creative workers.[266] Put differently, performing artists starve more than artistic creative workers. It follows that the general economic situation of artists is not sensitive to various types of artists and, therefore, cannot be taken seriously in the context of the debate over creativity at the workplace.

The image of the starving artists is too general to be taken seriously also because it does not distinguish between employed and independent artists. Independent artists, as suggested above, enjoy higher levels of non-pecuniary satisfaction; however, they earn on average less than employed artists.[267] Independent artists contribute to the perception of the image of the starving artists, but since they are not employed they constitute another group of artists that is irrelevant to the debate over creativity at the workplace. Hence, since the artists who earn less are part of the image of the starving artist, the image clearly depicts the artistic worker significantly skinnier than she is.

Three additional prevalent employment patterns among artists shed some further light on the negative income effect of artists' inner-necessity: (i) the common short-term

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[266] The peculiar economic problems of performing arts have been a source for a rich literature following the pioneering analysis of Baumol and Bowen. BAUMOL AND BOWEN, PERFORMING ARTS, THE ECONOMIC DILEMMA, *supra* note 259. To a large extent, this literature is focused on "Baumol's cost disease" that describes the soaring costs of performing arts. In a nutshell, the relative costs of live performing arts persistently goes up because these activities offer little opportunity for major technological change. To illustrate, four players were needed to play Hyden's string quartet when it was composed in the eighteenth century and four players are still needed today. In contrast, the production costs of substitutes for concerts went down, because of standardization that permits duplication and low transaction costs. A CD may not be a perfect substitute for a concert but its price is 20% or less of a concert ticket and it may be heard more than once. For a recent comprehensive study of the economics of performing arts *see* KEVIN F. MCCARTHY ET. AL, THE PERFORMING ARTS IN A NEW ERA (2001).

[267] Filer, *The "Starving Artist" – Myth or Reality?*, *ibid* (estimating the negative effect of self employment on the average income in 1980 at $2,046 ($4,407 in today's terms)); Brian Taylor, *Artists in the Marketplace: A Framework for Analysis*, in ARTISTS AND CULTURAL CONSUMERS 77-84 (D. Shaw et al. eds., 1987).

employment pattern;[268] (ii) the oversupply of artists;[269] and (iii) the skewed distribution of incomes (superstars are paid numerous times more than their less successful colleagues).[270] The combination of these patterns implies that artists persist in the race for glory and prizes although in expectancy it entails significant economic sacrifices.[271] The sacrifice of most artists, however, is limited either by choice or by physical need: only *20-25%* of artists work full-time at their art, and there is abundant evidence that the majority of those working less than full-time would prefer spending more time in the arts but are deterred from doing so by the need to make ends meet elsewhere.[272]

To conclude, the existing evidence suggests that in light of the excess supply of artists and the structure of employment (short-term contracts), employers seem to be able to induce the non-superstar artists merely by providing creative opportunities and do not need to provide significant pecuniary incentives.[273] Thus, while allocation rules that

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[268] *See*, *e.g.*, Robert R. Faulkner and Andy B. Anderson, *Short-Term Projects and Emergent Careers: Evidence from Hollywood*, 92 AM. J. SOC. 879 (1987). There are very few exceptions to this pattern, such as orchestral players and conductors. *See* Jutta Allmendinger et al., *Life and Work in Symphony Orchestras*, 80 MUSICAL Q. 194 (1996).

[269] Menger, *Artistic Labor Markets and Careers*, *supra* note 260, 566-569.

[270] Sherwin Rosen, *The Economics of Superstars*, 71 AM. ECON. REV. 845 (1981); Moshe Adler, *Stardom and Talent*, 75 AM. ECON. REV. 208 (1985)

[271] It should be noted that not all new artists compete over the 'big prizes' because some of them are considerably more talented than others. CAVES, CREATIVE INDUSTRIES, *supra* note 22, at 7-8. For a general analysis *see* Glen M. Macdonald, *The Economics of Rising Stars*, 78 AM. ECON. REV. 155 (1986).

[272] JOAN JEFFRI, THE ARTISTS TRAINING AND CAREER PROJECT: PAINTERS (1990); Gregory H. Wassal and Neil O. Alper, *Towards Unified Theory of the Determinants of the Earnings of Artists*, in CULTURAL ECONOMICS 187-200 (Ruth Towse and Abdul Khakke eds., 1992); David Thorsby, *The Production and Consumption of the Arts*, *supra* note 259, 17-18 (1994); NEIL O. ALPER ET AL., ARTISTS IN THE WORK FORCE: EMPLOYMENT AND EARNINGS, 1970-1990 (1996); Menger, *Artistic Labor Markets and Careers*, *supra* note 260, at 545 (1999).

[273] *See* Tschmuck, *The Court's System of Incentives and the Socio-Economic Status of Court Musicians in the Late 16th Century*, *supra* note 12.

favor employers might induce them to invest in artistic activities, they are not needed to motivate the typical artist worker in order to promote the progress of useful arts. In other words, if the goal is to promote arts then the default rules that favor employers seem to be desirable in the context of artistic works, which are generally protected by copyright law.

(2) Science

The analysis of the existing evidence on what motivate scientists leads to four major conclusions: (1) most contemporary R&D and scientific workers are not creative workers and as such they should be beyond the scope of the debate over creativity at the workplace; (2) many R&D and scientific workers are motivated by incentives other than property rights; (3) creative R&D and scientific workers are highly responsive to pecuniary and non-pecuniary incentives; and (4) because R&D and scientific workers are responsive to an array of incentives, default allocation rules are superior to mandatory rules. The path to these conclusions is summarized here.

As early as in 1930, Joseph Rossman conducted a survey among 710 American inventors and asked them: "What motives or incentives cause you to invent?" The frequency of motives mentioned by these 710 Inventors was as follows:[274]

Love of inventing ……	193
Desire to improve ……	189
Financial gain ……...	167
Necessity or need …….	118

[274] Rossman's study was published in various forms in 1931 and is still one of the important studies in the field. *See* THE PSYCHOLOGY OF THE INVENTOR: A STUDY OF THE PATENTEE (rev. ed., 1931) (the first and the revised editions were published both in 1931); Joseph Rossman, *The Motives of Inventors*, 45 Q.J. ECON. 522 (1931).

Desire to achieve ……..……..	73
Part of work …….……...	59
Prestige ……..	27
Altruistic reasons ……	22
Laziness ……..…….	6
No answers ……...	33

The popularity of the motives "love of inventing" and "desire to improve" presumably implies that most of the inventors in Rossman's survey were motivated at least partially by the desire to invent for sake of inventing, just as many artists are motivated by art for art's sake.

Furthermore, among the 710 inventors that participated in the survey only 38.2% earned their livelihood by inventing, while 22.7% earned their livelihood partially by inventing and 39.1% did not earn any livelihood by inventing.[275] These findings could suggest, again, that a significant portion of inventors from Rossman's survey made some sacrifice in order to devote time to science, but Rossman's study does not offer enough data to support such an inference. Rossman himself argued that the foregoing findings emphasized the weight of the prospects of financial gains in the motives of inventors. Later studies did establish a negative relationship between scientists' dedication to science and their compensation, namely, a negative income effect.[276]

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[275] *Ibid*, at 526.

[276] *See, e.g.*, Robert K. Merton, *Priorities in Scientific Discoveries: A Chapter in the Sociology of Science*, 22 AM. SOC. REV. 635 (1957); Robert K. Merton, *The Matthew Effect Science*, 159 SCI. 56 (1968); Robert K. Merton, *The Matthew Effect in Science, II: Cumulative Advantage and the Symbolism of Intellectual Property*, 79 ISIS 606 (1988).

Scott Stern, *Do Scientists Pay to Be Scientists?*, NBER WORKING PAPER NO. 7410 (1999).

The inventors in Rossman's survey belonged to the first generations of the third era of employed creativity, in which inventing became a specialized profession and the first R&D laboratories appeared.[277] In this era the typical inventor transformed from an entrepreneur who was responsive to market demands and vigorously pursued returns to her inventions[278] to an R&D worker employed by a businessman who hired potential inventors and directed their work in order to collect the profits to his pocket.[279]

Today, most R&D and scientific workers have more characteristics of humdrum workers than of creative workers: they are directed and supervised by more senior (and more creative) workers, follow defined procedures, and use limited discretion in their work. Their tasks in the production of creative products are almost humdrum, yet crucially necessary to increase the creative productivity of their department or specific individuals with it.[280] For individuals with the right academic degree, plenty of R&D positions with relatively generous compensation are available. In 1997, for example, more than *60%* of the employed engineers in the United States engaged in R&D as their first or the second job activity, where the level of education and year of graduation were positively related to the percentage of engineers whose primary or secondary job activity is R&D (*see Figure 2* below). For scientists, who were not engineers, the results were similar although the percentage of scientists whose primary or secondary job activity was

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[277] *See* Subsection II.C. above.

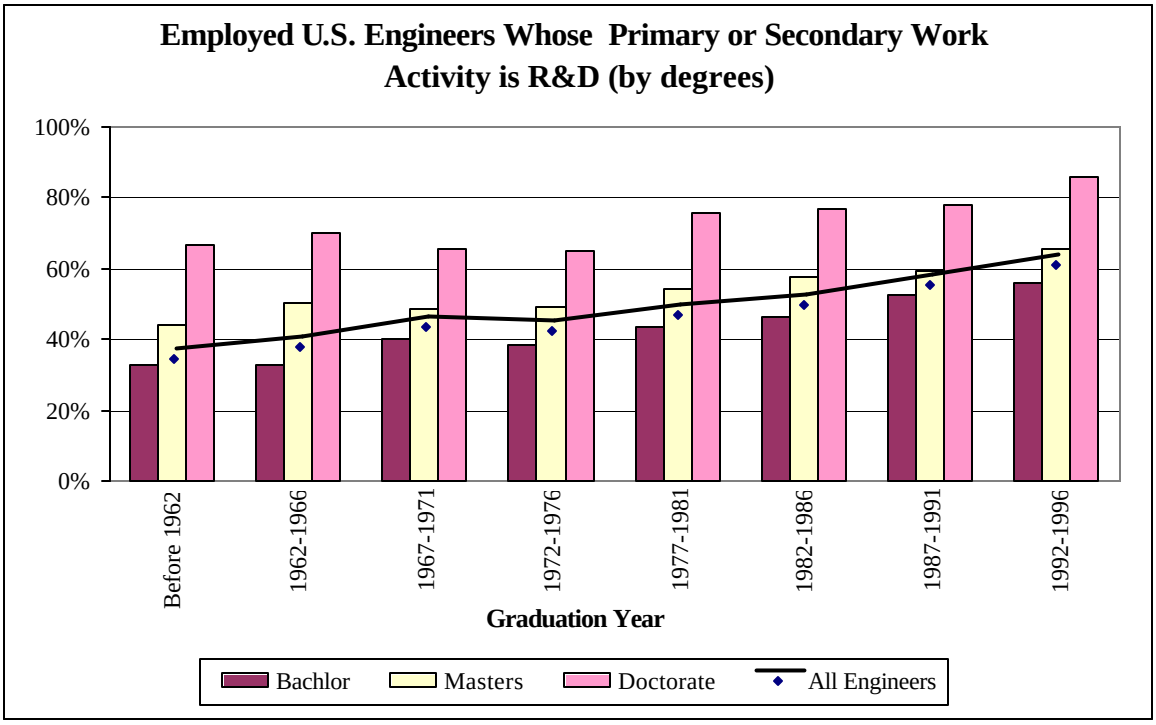
[278] Sokoloff, *Inventive Activity in Early Industrial America*, *supra* note 15; Khan and Sokoloff, *Schemes of Practical Utility*, *supra* note 15.

[279] Lamoreaux and Sokoloff, *Inventive Activity and the Market for Technology*, *supra* note 23.

[280] *See* discussion in Subsection IV.D.2. above.

R&D was lower for each category of workers. Moreover, unlike artists, engineers and scientists are well compensated: on the list of white-collar occupations, they are among the top compensated occupations.[281] In short, while the choice of careers in arts represents some indifference to risk,[282] the choice of a career in R&D seems to represent quite the opposite: R&D activities create many jobs with good income and relative security. Creativity in R&D-related professions might be a key for success, but it is not a prerequisite requirement for the job.

Figure 2[283]



[281] U.S. DEPARTMENT OF LABOR, BUREAU OF LABOR STATISTICS, BULLETIN 2548 (Nov. 2001). *See* Subsection IV.E.1.c)(1) above.

[282] Filer, *The "Starving Artist" – Myth or Reality?*, *supra* note 244.

[283] Data source: NATIONAL SCIENCE BOARD, SCIENCE AND ENGINEERING INDICATORS 2000 (Sep. 2000). The data refers to employment status in 1997.

The fact that creativity is highly concentrated in only a few engineers and scientists is known at least since 1926, in which Alfred Lotka published his pioneering article on the distribution of productivity among scientists.[284] Lotka used scientific bibliometric data to measure "the part which men of different caliber contribute[ed] to the progress of science."[285] By using data on chemists' and physicists' publications, he discovered the *inverse square law of productivity*: the number of people producing *n* papers is proportional to $1/n^c$, where $c=2$. That is, for every *100* scientists who produce one paper there are approximately $100/2^2$, or *25*, who produce two papers, $100/3^2$, *or* 11, who produce three, etc.

Later studies confirmed the inverse square law of productivity for some occupations, or found that *c* was close to *2* or higher.[286] When the studied product was patents, rather than publications, *c* was found significantly greater than *2*, which means

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[284] Alfred J. Lotka, *The Frequency Distribution of Scientific Productivity*. 16 J. OF WASHINGTON ACAD. OF SCI., 317 (1926).

[285] *Ibid*, at 317.

[286] *See, e.g.*, William Shockley, *On the Statistics of Individual Variations of Productivity in Research Laboratories*, 45 PROC. OF THE IRE 279 (1957); DEREK J. DE SOLA PRICE, LITTLE SCIENCE, BIG SCIENCE (1963); Derek J. De Sola Price, *A General Theory of Bibliometric and Other Cumulative Advantage Processes*, 27 J. OF THE AM. SOC'Y FOR INFO. SCI. (1976); DEREK J. DE SOLA PRICE, LITTLE SCIENCE, BIG SCIENCE… AND BEYOND (1986); Larry Murphy, *Lotka's Law in the Humanities*, 24 J. OF THE AM. SOC'Y FOR INFO. SCI. 461 (1973); Alan E. Schorr, *Lotka's Law and Library Science*, 14 REFERENCE Q. 32 (1974); T. Radhakrishnan and R. Kernizan, *Lotka's Law and Computer Science Literature*, 30 J. OF THE AM. SOC'Y FOR INFO. SCI. 51 (1979); Kee H. Chung and Raymond A.K. Cox, *Patterns of Productivity in the Finance Literature: A Study of the Bibliometric Distributions*, 45 J. FIN. 301 (1990); Raymond A.K. Cox and Kee H. Chung, *Patterns of Research Output and Authors Concentration in the Economic Literature*, 73 REV. OF ECON. & STAT. 740 (1991)

that the productivity of inventors is much more concentrated than the productivity of authors.[287]

The aforementioned studies compared the productivity of individuals who produced at least one creative product. These individuals amount to a small fraction in the scientific community and the rest discharge their duties without being credited even for the production of a single creative production. Some of the individuals of the latter type are creative although their contributions to the production of creative products do not appear in bibleiometric and patent-citation indices.[288] For their contributions, these creative individuals might be acknowledged by their mentors in footnotes or supported when recommendations are needed. This internal reward system is very familiar to and widely accepted by any academic scholar, including those who criticize the abuse of creative workers, as all scholars are aided by research assistants.[289] Rewards of this kind (*i.e.*, recognition of the mentor-employer), as any scholar also knows, are crucial at early stages of the career as they are the key to future prosperity. Property rights, therefore, are not necessarily needed to motivate R&D and scientific workers to contribute to the

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[287] *See, e.g.*, Lowell Juilliard Car, *The Patenting Performance of 1000 Inventors During Ten Years*, 38 AM. J. of Soc. 569 (1932); Francis Narin and Anthony Breitzman, *Incentive Productivity*, 24 RES. POL'Y 507 (1995); Holger Ernst, Christopher Leptien and Jan Vitt, *Inventors are not alike: The distribution of patenting output among industrial R&D personnel*, 47 IEEE TRANSACTIONS ON ENGINEERING MANAGEMENT 184 (2000)

[288] *See*, for example, the case of Thomas Armat who invented the first advanced motion-picture projector, for whom Edison was credited. *Supra* note 180 above.

[289] For examples for scholars who criticize the abuse of student workers under the present law of creativity at the workplace who in a footnote credit their own workers for their "superb research assistance" and "efficient and persevering research assistance" *see* Roberta Rosenthal Kwall, *Moral Rights for University Employees And Students: Can Educational Institutions Do Better Than the U.S. Copyright Law?*, 27 J. OF C. & U. L. 53 (2000); Bill L. Williamson, *(Ab)Using Students: The Ethics of Faculty Use of a student's Work Product*, 26 ARIZ. ST. L.J. 1029 (1994).

production of creative products. In hierarchical systems other rewards, including the option to future property rights, are functioning as a motivating factor.

Sociologists have linked the skewed distribution of creativity among scientists and inventors to the their responsiveness to incentives which are tied to success and are in the forms of recognition and resources. The intuition behind this view is that because of feedback through recognition and resources, highly productive scientists increase their productivity, while scientists who produce very little produce even less later on. This connection, commonly known as the *Matthew Effect*,[290] emphasizes the responsiveness of creative R&D and scientific workers to incentives, other than property rights, and highlights the complexity of designing optimal incentive policies.

Much has been written about the design of incentive policies for scientists, but the only conclusion to which sociologists, historians, and economists of science all reached was that reward policies, if not tailored carefully to the specific creative

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[290] This idea was popularized by Robert K. Merton and is commonly known as the *Matthew Effect. See* references in *supra* note 276. *See* also Paul D. Allison and John D. Stewart, *Productivity Differences Among Scientists: Evidence from Accumulative Advantage*, 39 AM. SOC. REV. 369 (1974); Keith and Babchuk, *The Request for Institutional Recognition*, *supra* note 229. For the acceptance of this idea in non-sociologist *see, e.g.*, Edward Lazear and Sherwin Rosen, *Rank Order Tournaments as Optimal Labor Contracts*, 89 J. POL. ECON. 841 (1981); Sherwin Rosen, *Auhority, Control, and the Distribution of Earnings*, 13 BELL J. OF ECON 311 (1982); Paula E. Stephan, *Research Productivity Over the Life Cycle: Evidence from Academic Scientists*, 81 AM. ECON. REV. 114 (1991) Steven W. Floyd, *"Only If I'm First Author": Conflict Over Credit in Management Scholarship*, 37 ACAD. OF MAGMT. J. 734 (1994); Michael Gibbs, *Incentive Compensation in a Corporate Hierarchy*, 19 J. ACC. ECON. 247 (1995); George P. Baker, Michael C. Jensen, and Kevin J. Murphy, *Compensation and Incentives: Practice vs. Theory*, 43 J. OF FIN. 593 (1988); Kasof, *Explaining Creativity*, *supra* note 229; Richard A. Posner, *The Theory and Practice of Citations Analysis, with Special Reference to Law and Economics*, CHICAGO OLIN LAW & ECONOMICS WORKING PAPER NO. 83 (2nd Ser., 1999). *See* also *Weinstein v. University of Illinois*, 811 F.2d 1091 (7th Cir. 1987) (a dispute over the order of names in the title of a coauthored article).

environment, might divert creative endeavors to undesirable directions.[291] For example, in collaborative research environments certain reward policies lowered cooperation between scientists. In other instances, when rewards were offered for patents regardless of their quality, there was a dramatic increase in the number of patents and an equally dramatic decrease in their quality. This corollary suggests, again, that general mandatory allocation rules are likely to create distortion in the allocation of resources to science.

2. Do Employers Provide Workers with Incentives?

a) The Incentive Problem in Collaborative Production

Mention was made throughout this paper that in modern creative environments creative production is undertaken in teams, where frequently each team member has various responsibilities for humdrum and creative tasks. Collaborative production presents difficult problems in facilitating cooperation between team members, as it is virtually impossible to estimate for each one of them the invested effort and the

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[291] *See, e.g.*, Z. Clark Dickinson, *Suggestion from Workers: Schemes and Problems*, 46 Q.J. ECON. 617 (1932); Fritz Machlup, *The Supply of Inventors and Inventions*, in THE RATE AND DIRECTION OF INVENTIVE ACTIVITY 143 (Richard Nelson ed., 1962); Donald W. Mackinnon, *Intellect and Motives in Scientific Inventors: Implications for Supply*, in THE RATE AND DIRECTION OF INVENTIVE ACTIVITY 361 (Richard Nelson ed., 1962); J. ROGER O'MEARA, EMPLOYEE PATENT AND SECRECY AGREEMENTS (1965); NEUMEYER, THE EMPLOYED INVENTOR IN THE UNITED STATES, *supra* note 37; Robert K. Merton, *The Matthew Effect in Science .2. Cumulative Advantage and the Symbolism of Intellectual Property*, 79 ISIS 606 (1988); Thomas R. Savitsky, *Compensation for Employee Inventions*, 83 J. OF PAT. & TRADEMARK OFF. SOC. 645 (1991); Lynn W. Ellis and Sandra Honig-Haftel, *Reward Strategies for R&D*, 35 RES. TECH. MGMT. 16 (1992); Sandra Honig-Haftel and Linda R. Martin, *The Effectiveness of Reward Systems on Innovative Output: An Empirical Analysis*, 5 SMALL BUS. ECON. 261 (1993); Christopher Leptien, *Incentives for Employed Inventors: An Empirical Analysis with Special Emphasis on the German Law for Employee's Inventions*, 25 R&D MGMT. 213 (1995); TODD R. ZENGER, COMPENSATING FOR INNOVATION: DO SMALL FIRMS OFFER HIGH-POWERED INCENTIVES THAT LURE TALENT AND MOTIVATE EFFORT? (Mimeo, John M. Olin School of Business Washington University,

contribution to the production process. As a result, *ex* ante each team member has incentives to shirk because the costs of shirking are shared with her peers, whereas the cost of her efforts are borne entirely by her, and *ex post* disputes over the division of profits and honors are likely to arise because the marginal contribution of each team member cannot be estimated precisely.[292]

An old solution to the collaboration problem is the integration of the production activities within firms, where the firm – the employer – monitors the workers, roughly estimates their productivity, pays them accordingly, and in return receives the residual product, the part of the earnings and property rights, which was created in the production process and was not used to cover costs.[293] Indeed, alternative solutions to the problem exist; however, the rise of employed creativity in the late nineteenth century and its dominance ever since tell that this solution defeated alternative ones.[294]

From the legal perspective, the ultimate dominance of employed creativity with such patterns generally implies that default rules in favor of employers are likely to save

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1997).

[292] *See* Bengt Holmstrom, *Moral Hazard in Teams*, 13 BELL J. OF ECON. 324 (1982). For an illustration of the problem *see Weinstein v. University of Illinois*, *supra* note 290 (a dispute over the order of names in the title of a coauthored article).

[293] *See* generally Alchian and Harold Demsetz, *Production, Information Costs, and Economic Organization*, *supra* note 198.

[294] *See* discussion in Subsection II.C. above, the references there, and particularly NOBLE, AMERICA BY DESIGN, *supra* note 20; Lamoreaux and Sokoloff, *Inventors, Firms and the Market for Technology*, *supra* note 14. For a theoretical treatment *see* Aghion and Tirole, *The Management of Innovation*, *supra* note 39.

tremendous transaction and litigation costs, and the history of the law of creativity at the workplace shows that legislators follow this logic.[295]

It is left, therefore, to answer whether employers know how to motivate workers or whether legal intervention is needed in the design of incentive systems.

b) The Role of Market Forces in Assuring Good Incentive Systems

Economists unanimously believe that what "the firm wants when it hires [a worker] is productive performance… It wishes to buy quality of work rather than merely time on the job."[296] However, as discussed earlier, economists and scholars of other disciplines have not yet found the answer to the question of how to optimize incentives of creative workers because the answer depends on the time and place and cannot be generalized to a formula.[297] For example, although pecuniary incentives that are tied to performance have the potency to motivate creative workers, in certain circumstances they might be destructive.[298] Many creative workers have a mixture of responsibilities, partially creative responsibilities and partially humdrum ones. Tying the compensation of the worker to her performance may lead her to divert her efforts towards tasks

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[295] Fisk, *Removing the Fuel of Interest from the Fire of Genius*, *supra* note 10; Fisk, *Working Knowledge*, *supra* note 11; Fisk, *Authors at Work*, *supra* note 11. *See* also Jaszi, *On the Author Effect*, *supra* note 36.

[296] ARTHUR M. OKUN, PRICES AND QUANTITIES: A MACROECONOMIC ANALYSIS 68 (1981); ALFRED MARSHALL, PRINCIPLES OF ECONOMICS 438 (8th ed., 1948) ("[E]ven if the number of [working] hours in the year were rigidly fixed, which it is not, the intensity of work would remain elastic").

[297] *See* generally Charles Brown, *Firms' Choice of Method of Pay*, 43 INDUS. & LAB. REL. REV. 165S (1990)

[298] For an illustration of the problem *see* NEUMEYER, THE EMPLOYED INVENTOR IN THE UNITED STATES, *supra* note 37, at 96-98; Kerr, *On the Folly of Rewarding A, While Hoping for B*, *supra* note 177.

(creative or humdrum) she believes are likely to yield high rewards, while neglecting other tasks. Under such circumstances, the best solution may be a fixed salary.[299]

Because a general model that optimizes incentives, if exists, has yet to be found, recipes of the participants in the debate on how to enact mandatory rules in order to optimize creative endeavors seem rather pretentious. No less pretentious is the idea that the legislator would be able to concoct a good recipe.

Scholars, however, found that in historical terms employers are forced by competition to learn quickly how to elicit creativity from their creative workers through improvements in their reward policies. Slow learners, so history tells, lose businesses to competitors and their most creative workers leave them in order to establish independent enterprises.[300] Furthermore, the prosperity of the capital markets and venture capitalists

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[299] *See* generally Bengt Holmstrom and Paul Milgrom, *Multitask Principal-Agent Analysis: Incentive Contract, Asset Ownership, and Job Design*, 7 J. OF L. ECON. & ORGAN. 24 (1991).

[300] For the problems of the employers in learning how to deal with workers and to motivate them *see* Lamoreaux and Sokoloff, *Inventors, Firms and the Market for Technology*, *supra* note 14 (United States); Christine MacLeod, *Negotiating the Rewards of Invention: The Shop-Floor Inventor in Victorian Britain*, 41 BUS. HIST. 17 (1999) (United Kingdom). For specific case studies that link the improvements of reward policies to competition *see* NEUMEYER, THE EMPLOYED INVENTOR IN THE UNITED STATES, *supra* note 37, at 85-162; WILLIAM LAZONICK, COMPETITIVE ADVANTAGE ON THE SHOP FLOOR (1990); Richard B. Freeman and Morris M. Kleiner, *The Last American Shoe Manufacturers: Changing the Methods of Pay to Survive Foreign Competition*, NBER WORKING PAPER NO. 6750 (1998). *See also* Z. Clark Dickinson, *Suggestion from Workers: Schemes and Problems*, 46 Q. J. OF ECON. 617 (1932) (studying the appearance of suggestion boxes in the last quarter of the nineteenth century).

in recent years puts employers under a threat that under-rewarded workers would become fierce competitors.[301]

The evolution of incentive systems for creative workers is, therefore, very similar to the evolution of incentive systems for humdrum workers: under competitive conditions employers would strive to motivate their workers in any possible manner, including by giving them creative freedom and ownership of assets.[302] Thus, if competition is the key to inducing employers to improve the incentives they provide workers, then the conclusion should be that a balanced competition policy and the removal of various regulatory barriers to competition might lead to better incentive systems than a modification of the law of creativity at the workplace would.

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[301] *See, e.g.*, Amar Bhide, *How Entrepreneurs Craft Strategies that Work*, 72 HARV. BUS. REV. 150 (1994) (20% of the 1989 Inc. Magazine's 500 fastest-growing companies had "replicated or modified an idea encountered through previous employment."); James J. Anton and Dennis A. Yao, *Start-Ups, Spin-Offs, and Internal Projects*, 11 J.. OF L., ECON. & ORG. 362 (1995); Jeseph Bankman and Ronald J. Gilson, *Why Start-Ups? (Economic Rationale for Start-Up Companies)*, 51 STAN. L. REV. 289 (1999); Jeffrey W. Allen, *Capital Markets and Corporate Structure: The Equity Carve-Outs of Thermo Electron*, 48 J. OF FIN. ECON. 99 (1998) (studying Thermo Electron's strategy to elicit creative ideas from its employees by carving out new companies in which the employees held stocks).

[302] For good surveys of this approach *see* Paul Milgrom and John Roberts, *An Economic Approach to Influence Activities in Organizations*, 94 AM. J. OF SOC. S154 (1988); Bengt Holmstrom and Paul Milgrom, *The Firm as an Incentive System*, 84 AM. ECON. REV. 972 (1994); OLIVER HART, FIRMS, CONTRACTS, AND FINANCIAL STRUCTURE 1-74 (1995); Bengt Holmstrom, *The Firm as a Subeconomy*, 15 J. OF L., ECON. & ORG. 74 (2000). *See* also Jeffrey W. Allen, *Capital Markets and Corporate Structure: The Equity Carve-Outs of Thermo Electron*, 48 J. OF FIN. ECON. 99 (1998) (Thermo Electron's strategy to elicit creative ideas from its employees by carving out new companies in which the employees held stocks).

V. Conclusions

To a large extent this paper sought to ask whether there are free lunches in the production of creative activities. At first glance it may seem that in favoring employers the law of creativity at the workplace creates opportunities for employers to exploit creative individuals, thereby earning some free lunches at the expense of the latter. This perception, I argue, is wrong.

My analysis suggests that although creative individuals are generally willing to sacrifice some material welfare, in most aspects they are just like humdrum individuals and, hence, there are no good justifications for distinctive allocation rights for them. Like the turtle, the creative individual sticks her head out when lettuce is put in front of her and, knowing that, employers provide her with lettuce although they intend only their own good. The purpose of the law of creativity at the workplace should be, therefore, no other than facilitating the symbiosis between creative workers and their employers. In this sense, those who criticize the law because it favors employers are wrong in their critique.

The analysis of the law of creativity at the workplace and the properties of employed creativity clarifies the structure of the allocation rules of the primary and secondary sets of branches of the law of creativity at the workplace. While this analysis suggests that the allocation rule of the secondary set is a good law, it does expose several weaknesses of the allocation rules of the primary set. These weaknesses, however, are unrelated to the major critiques against the freedom of contracts under the law of

creativity at the workplace and the bias of the default rules towards employers. The conclusions of my analysis can be summarized as follows:

(a) Collaborative Production. The law of creativity at the workplace is mistakenly focused on bilateral employment setups, while in reality most creative activities are carried out in multilateral setups. The focus on bilateral setups is not only factually wrong, but also creates confusion in understanding the nature of the organization of creative activities.

(b) *The Default Rule for Trademarks, Trade Names and Publicity Rights.* The secondary branches of the law of creativity at the workplace share one simple allocation rule: the rights in the creative product go to the party that is the first to possess the information. This rule is a good law.

(c) Freedom of Contracts. The law of creativity at the workplace should be governed by default rules and not by mandatory rules, as the flexibility to design the allocation of rights is likely to facilitate better incentive systems for workers. An exception to this rule is that assignment clauses of products, the production of which is unrelated to the employment relationships, should be prohibited. The purpose of this exception is to protect humdrum and creative workers from coercive practices that are tied to employment contracts. In addition, the general limitations on the freedom of contracts should of course also apply to the relationships between employers and creative workers.

(d) Default Rules Are Superior to Penalty Rules. Penalty rules are intended to complete unobvious contractual gaps or to elicit important information from an informed party. Because the organization of creative activities is so similar to the organization of humdrum activities, the answer to the question of who should retain the rights in the product should be rather obvious: to the party that organizes the production. Namely, there is no unobvious contractual gap with respect to ownership. Similarly, in the general setup of employed creativity there are no informational problems that call for penalty rules.

(e) Categorization of Players. The default rules should distinguish between workers and independent creative individuals and between employers and financiers. Independent creative individuals and employers should retain the rights in creative products because they initiate the production and organize it. In contrast, the rights of workers and financiers should be limited to their contractual arrangements with other parties. The distinction between contractors and employees is too vague to be applied in practice and substantively does not justify different allocation rules for these two types of effort suppliers.

(f) Sharing Rules. When a worker produces a creative product outside the scope of her work, while using resources of the employers, the employers should get a shop right in the product if it is protected by patent or copyright law. For products protected by trade secrets, neither party should have the right to enforce sharing or to refrain usage of the information.

(g) Copyright's Reversion Right. There is no justification for the copyright reversion right that entitles a worker to terminate the assignment of rights after thirty-five years. Such a right presents a limitation on the freedom of contracts, which is undesirable.

The law of creativity at the workplace is indeed far from perfect and calls for a reform in the spirit of the foregoing conclusions. Such a reform, I believe, would create a coherent, workable framework of allocation rules. As to the debate over creativity at the workplace, both parties to the debate are wrong since the law is too crude to be good and yet it does not call for allocation rules substantially different from those of humdrum products.