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Thesis title:

"Batman vs Teenage Mutant Ninja Turtles – Studies on the Tension between Synergy and Creativity in the US Comic Book Industry"

PhD in	Business Administration and Management
Cycle	XXIII
Candidate's tutor	Prof. ALFONSO GAMBARDELLA
Year of discussion	2011

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BATMAN VS TEENAGE MUTANT NINJA TURTLES - STUDIES ON THE TENSION BETWEEN SYNERGY AND CREATIVITY IN THE US COMIC BOOK INDUSTRY

A dissertation presented
by

Allya P. Koesoema

in partial fulfillment of the requirements for the degree of

Doctor in Business Administration and Management

Dissertation Committee: Alfonso Gambardella, Ashish Arora, Claudio Panico

Bocconi University

January 2012

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Acknowledgements

This dissertation was built on the generous permission of several publicly and private/commercially available databases on the United States Comic Book Industry, which include the following:

- *Comicbase.com*
- *Comichron.com*

The author also wishes to express her gratitude to her supervisor, Prof. Alfonso Gambardella who was abundantly helpful and offered invaluable assistance, support and guidance, both in matters academic and otherwise. Deepest gratitude is also due to the members of the supervisory committee, Prof. Ashish Arora and Prof. Panico, without whose knowledge and assistance this dissertation would not have been successful.

Special thanks also to other members of the faculty in Bocconi and Duke University, as well as all her graduate friends, especially Marty, Kun, Gianluca, Bruno, Yulia, Masoomeh, Yuanji, Weiwei, and Haoxi, for sharing all the fun (and not so fun) times and their invaluable assistance throughout our journey. Not forgetting of course all other fellow PhDs who has always been there.

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To Mama, Papa, De Lily, Azisa, Afifa and Ilham,
for their constant support and encouragement to follow my dreams,
even if it includes me being far, far away almost all the time.

To Pak Soegi, Pak Oerip and Bu Tati,
who taught me that being an academic might just be a little bit fun.

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INTRODUCTION

My dissertation centers on innovation strategies for creative industries. Specifically, I focus on how firms and individuals manage the tension between creative and economic considerations. In the creative industries, the duality between art and commerce is a much studied topic (e.g. Lampel et. al, 2000, Mezias & Mezias, 2000, & Lewis, 2000). On the one hand, creativity is generally accepted as a strong driver of economic outcome, and a valuable outcome by itself (Caves, 2000). However, transforming creative to economic outcomes often requires a multiplier effect driven by economies of scale and scope. In other words, success is driven by a combination of creativity and efficiency. The core of the tension lies in the often conflicting drivers of these two factors. Structures and routines that allow efficient operations and the deployment of economies of scale and scope may preclude the possibility of highly creative results, and vice versa, an endeavor to achieve highly creative results runs a high risk of failure and inefficient operations.

Faced with this tension, firms and individuals can attempt to balance this tension either by focusing more on one aspect, or attempting a measure of 'ambidexterity' between the two factors. Theoretical and empirical literature on the effect of these tensions are mixed. Some studies focus on their polarization and incompatibility (e.g. Mezias & Mezias, 2000), in which firms and products focus solely on either creativity or mass production, while others focus on cases where synergies between creative and economic considerations can be created (e.g. Andriopoulos & Lewis, 2000, Gilson et al, 2005). Further, generally the literature would focus on either the perspective of the firm or the individuals, and seldom investigates the between level relationships between firm and individual creative actors' decision.

To study this topic, I accumulated an original dataset containing detailed firm, product and individual level data on the USA comic book industry, covering more than 7000 creators and 11000 comic book issues published by 176 firms in the industry from 2000 to 2009. This database then allows me to track the economic and creative outcomes of individual products and creators. The dissertation is comprised

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of three papers, each focusing on different facets of the tension between creative and economic considerations.

In the first paper, I argue and show that the on the product level, the allocation of property rights serves as a lever that allows firms to choose between stimulating creative incentives and leveraging its specialized experience. When property rights are assigned to the creative unit, products tend to be more creative, but are less able to leverage firms' specialization. On the other hand, when property rights are assigned to the firm, it tends to be less creative due to reduced incentives on the individual artists' side, but can make better use of firms' specialization. Importantly, product level decisions on the allocation of property rights may have a cumulative effect on the evolution of a firm's product portfolio by enticing a self reinforcing mechanism to differing strategies. Firms generally choose to be either creativity oriented or specialization oriented. This paper brings several relevant contributions to both the empirical and theoretical literature. By investigating the joint impact of specialization and property rights allocation as a tool for creative incentive management, I highlight the opposite and self-reinforcing effects that they have to creative and economic outcome. While there are numerous studies on the drivers of creativity as well as the creativity-economic performance link, there is a dearth of studies that considers them together.

On the first paper, the role of individual talents is taken as a given, raising the question of what role they may play, especially in affecting change. Consequently, the second paper deals with how hiring mobile talent from different types of contexts help switch between creativity and efficiency based strategy, at least on the product level. Focusing on the difference between large, scale-based firms and smaller, creativity oriented firms, I contend that individuals who are contextually mobile, i.e. balance their work between different types of firms, has a positive impact both to creative and market outcomes, controlling for mobility between similar types of firms and projects. Individual level expertise gained from working in diverse settings will compensate for firm level capabilities. This is different from simply hiring a specialist

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from a different field to obtain their capabilities. Putting a specialist into a completely different context introduces integration problems, as routines and assumptions may be incompatible across contexts. While individuals who balance their work between diverse settings may not have the depth of knowledge of specialists, they are better able to transition and transfer knowledge between different types of contexts, resulting in better performance on average. This paper speaks both on a theoretical and managerial basis on managing talent across a firms' innovative portfolio, especially in creating stylistic, as compared to technological innovations.

While the first and second paper focuses on the perspective of the firm, in the third paper I delve deeper into the individual creator level and investigate what determines the direction of their career trajectories. Specifically I look at how artists balance between creative and more humdrum projects and firms along their productive lifecycle. I argue and show that artists manage their preference for both creative freedom and monetary needs by moving between well paying, but less creative commercial projects and lower paying, more creative oriented project as their needs dictate. This paper highlights how the practice of a fluid labor market from the point of view of the firm is matched and sustained by mechanisms on the individual talent level, and shows a fine grained observation of the drivers and dynamics of the mobility of knowledge intensive workers, specifically creative workers.

Taken together, the three papers within this dissertation tie in to create a more cohesive picture of how the tension between creativity and economic consideration drives decisions and outcomes in a creativity intensive setting. They shed light not only on their individual merits, but also reveals a deeper understanding on how different levels of decisions (firm, product, genre and individuals) interact. Firms serve to provide structures for different strategic orientations by either having divisions concentrating on creativity or efficiency. On the other hand mobile creative workers provide a bridge between firms and works that emphasizes creativity or commercial success.

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Naturally, this dissertation has strong boundary conditions, both in theoretical and empirical basis. Our current analysis is confined to one industry, and do not observe firm level performance nor the long run consequences of the firm strategies. Moreover, it does not yet consider interfirm interaction, especially on the movement of creative actors, which is a strong driver of creativity in the industry. Multi industry studies may further develop our insights by examining variations which are not visible in the single industry. A particularly interesting issue is the effect of production process complexity. Comic books by nature are relatively simple to produce, as opposed to more complex products such as movie or television series production. Complexity in production may moderate the tensions presented in this paper in distinct interesting ways that merit further investigation.

In conclusion, in this dissertation we endeavor to use fine grained data to investigate the tradeoff between creative and economic mechanisms, highlighting processes that have been implicitly assumed but not often explicitly tested in the literature on innovation. Further, the arguments presented and future results may hint at future research avenues, including extension of research towards the mechanisms dynamics and extension to firm level mechanisms.

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Essay 1

Batman, Inc. vs The League of Extraordinary Gentlemen: Diversification, Specialization, and Control in the U.S. Comic Book Industry

Abstract

Knowledge-intensive and creative industries are typically partitioned in group of firms that use two different strategies: a creativity-based strategy, with the creative units being in control of their activities, or a control-based strategy, according to which the firm keeps control and owns intellectual property rights. Why do we observe such polarization, and under which conditions is one strategy more effective than the other? Using data from the United States comic book industry, we show that firms can benefit from a creativity-based strategy in those product areas in which they are not specialized, whereas the control-based strategy is more fruitful if they are specialized. These two strategies also have consequences for the firms' choice to be diversified or specialized. With a creativity-based strategy, the creative units own the intellectual property; they control the activities and favour creative outcomes. Therefore, the firm has limited latitude is choosing the specialization in genres or themes (e.g., producing coherent and similar superhero titles), and remains more diversified. By contrast, in product areas in which the firm is specialized, it is more beneficial to collect the intellectual property and keep control, and this reinforces specialization.

Keywords:

Creative outcome, property rights allocation, property rights specialization, creative-economic tension

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INTRODUCTION

In many creative industries, success seems to be determined by a combination of novelty and efficiency, by a leveraging of the innovation with economies of scale and scope (Teece, 1986). Yet, novelty and efficiency typically have conflicting drivers, and to combine them effectively a fundamental tension must be addressed. The routines needed to support efficient operations, economies of scale, and economies of scope may jeopardize highly novel results; and vice versa, an endeavour to achieve highly creative results may imply high risk of failure and inefficient operations (e.g. Gilson et al, 2005). This tension can also be exacerbated by the misalignment of incentives between the parties that are responsible for bringing novelty (e.g. artists and scientist, or research units) and those of the parties that must ensure efficiency (Caves, 2000).

To address the tension between novelty and efficiency, firms may simply decide to focus on one aspect, or they can attempt to strike the right 'balance' between the two. The theoretical and empirical results are not conclusive about which options is the best. Some studies stress incompatibility (e.g. Mezias & Mezias, 2000), and consider firms that focus either on creativity or on mass production. Other studies consider instead the cases in which synergies between creative and economic considerations can be created (e.g. Andriopoulos & Lewis, 2000, Gilson et al, 2005).

Going more in the details of the strategies for managing creativity, firms must make decisions that pertain to the single product level (e.g. Gilson et al, 2005) as well as to the whole portfolio of products (e.g. Shamsie, Martin and Miller, 2009; Morgan & Rego, 2009). And from the many decisions at the micro level, a coherent strategy must emerge at the firm level, particularly in relation to the choice of having a specialized or diversified portfolio of products. In this paper, we propose a mechanism that explains the micro-macro relationship and shed a light on the tension between novelty and efficiency and on people's incentives. This mechanism hinges on the allocation of intellectual property rights, much in the spirit of Grossman and Hart (1986) and Aghion and Tirole (1994). We advance a set of propositions and then we test them using a panel of product and firm level longitudinal data on the

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United States comics industry. Our dataset span the comic book issues between 2000 and 2009, with a sample size of over 11000 issues.

Starting from the single product level, the tension between creative incentives and control is addressed by establishing who should own the intellectual property rights (IPRs), the firm or the creative unit. Following property-rights economics, the allocation of IPRs to the firm enhances economic outcomes, but it also reduces the incentives of the creative unit, thus reducing creative outcome. We show that the polarization between economic and creative outcomes increases with increasing product level specialization. Thus, the decision to allocate IPRs is strongly related to the degree of product area specialization.

These product level mechanisms are then aggregated to the firm level. In product areas in which they are not specialized, the benefits of leveraging specialization are small, thus firms may benefit more from betting on creativity. This is achieved by allocating the IPRs to the unit, who then keeps control of its activity. Because artists prefer variation in their creative outcomes (Towse, 2000), the firm cannot leverage specialization in specific genres or themes, and it ends up being increasingly more diversified. By contrast, in product areas in which the firms are specialized, the benefits from further specialization are high. Therefore, it is more beneficial for the firm to keep control and collect the IPRs, and to reinforce specialization. However, for larger scale firms with both specialized and peripheral products, there can still be benefits from relinquishing control to the unit. Therefore, the firm may be ‘ambidextrous’ (Tushman and O’Reilly, 1996) in their different innovation fields. These mechanisms highlight how the IPRs strategies for the single products aggregate at the firm level, and it explains the extent of specialization and diversification. Our investigation shows general support for our propositions, and provide different hints for future research.

The United States comics industry is a natural setting to study our theory, due to three elements: i) the tension between creativity and specialization; ii) the variance in the allocation of IPRs; and iii), the existence of firms’ genre-based portfolio of products, which is easily mapped into the degree of specialization/diversification. But

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the underlying theory and mechanisms are applicable to a larger empirical setting, as similar issues abound on other creative industries. And more generally, in research-intensive industries such as the pharmaceutical industry, we observe similar tradeoffs with bigger firms needing to manage their research portfolio, collaborating with smaller biotechs or research units (e.g. Guedj and Scharfstein, 2004; Arora, Gambardella, Magazzini, and Pammolli, 2009; Panico

The rest of the paper is arranged as follows. Prior to explicating our theoretical argument, we present a short overview of the US comic book industry as the empirical background by which we develop and test our theory. Next, we develop our theoretical propositions, establishing the creativity-specialization trade-off on the product level. We proceed to briefly summarize our empirical strategy, present the results and conclude with a discussion on our contributions, limitations and avenues for future research.

EMPIRICAL BACKGROUND: THE UNITED STATES COMIC BOOK INDUSTRY AND THE CREATIVITY-SYNERGY TENSION

Our theory on balancing between creativity and specialization was developed with the background of the US comic book industry. As part of the creative industries, the comic book industry is characterized by the tension between ‘creativity’ and efficiency. Because of the uncertain nature of product valuation (Cappetta, Cillo, Ponti, 2006), success is paradoxically driven by a combination of ‘novelty’ and ‘familiarity’ (Lampel, Lant and Shamsie, 2000; Horn and Salvendy, 2006). Novelty is needed for the differentiation and enjoyment of cultural goods. However, consumers also need some degree of familiarity to put into context what they are offered, i.e. creating relevant schemas or categories substituting for a ‘quality standard’ of valuation. Each firm in the industry typically offers a line-up of titles across differing genre configurations. The way firms configure and reconfigure their genre line-up offers an explicit window on studying how firms develop

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specialization or diversification over time. The tension between ‘artistic values’ and ‘mass entertaiment’ considerations (e.g. Lampel, et. al., 2000, Anand & Peterson, 2000) induces firms to make a decision regarding their product portfolio. Firms can attempt to balance this tension either by focusing more on one aspect, or attempting a measure of ‘ambidexterity’ between the two factors.

An important lever in managing the creativity-synergy tension is the allocation of control or property rights. We can observe the variance in the allocation of property rights (IP), which is allocated either to the firm or the creator, on the project level. There are generally two modes of work in the comic book industry, roughly delineated by the allocation of property rights. When artists own the title, generally she will have more creative freedom and is entitled to residual rights, including royalties and rights of refusal for development of derivative works or licensing. On the other hand, when the title is owned by the firm, artists generally work under the ‘work for hire’ clause, in which basically they work as an employee paid on a per page rate or other arrangements, while the firm holds the residual rights. Perhaps not surprisingly, these allocation of property rights corresponds to the firm strategy, with creator owned titles generally finding their home in creativity-oriented publishers, and the mainstream publishers accumulating an increasing stable of firm owned portfolio of related titles. Our theory relates to how these product level mechanism of the allocation of property rights shift the creativity-synergy trade off, and how they aggregate towards firm level development in product area specialization or diversification.

The United States comic book industry is typically characterized as a partitioned industry with two main groups, the mainstream and independents comics segment. To some extent, the two groups represent the polar opposites of the trade-off between firm specialization/synergy and the novelty/diversity of innovations. ‘Mainstream’ comics, representing the strength of specialization and its reliance on firm assets and capabilities, are dominated by two major companies, holding 70% market share and characterized by superhero genre comics featuring families of firm

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owned IP. These companies own a stable of copyrights within an area of specialization that are exploited across a variety of mediums through licensing and the development of related derivative products. Creators are largely ‘work for hire’ freelance employees paid on a per page rate.

In contrast, the ‘independents’ segment employ a more diverse strategy of product area diversification, by having a portfolio of mixed genres and business models relying more on innovativeness of individual titles. A lot of these firms put in their bet on championing creativity. An archetypal example is ‘Image comics’, famously created by former Marvel Comics artists after disagreements regarding remuneration and creative freedom issues, who concentrates on the aspect of non creative interference and creator ownership. Alternatively, some other independent firms choose to focus on creating ‘novel’ and ‘edgy’ content as their main selling point.

While there are firms taking both extreme strategies, some companies would have a mixed strategy, balancing both a coherent portfolio of specialized product area with a variety of more exploratory ‘imprints’ (subsidiaries) for their more peripheral product areas. These firms can be medium sized firms aspiring to create a blockbuster, or a big firm aspiring to be ‘ambidextrous’ while maintaining their core area of competence.

THEORETICAL DEVELOPMENT

Creativity Management Strategy and Specialization: Product Level Mechanisms

In this section, we establish the product level mechanism driving the tradeoff between novelty and familiarity based strategies in creative industries. The main two levers for the firm in our model is the allocation of property right and product area specialization.

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The Allocation of Property Rights and The Tradeoff between Creativity and Economic Outcomes

When there is a separation between the party producing an innovation (scientists, artists, engineers, etc.) and the party holding complementary assets necessary to either produce or exploit the innovation (generally firms), then the allocation control and property rights (IP allocation) is a crucial issue. The allocation of property rights may span several aspects that drive the dynamics of production and exploitation of the innovation, including the right to control the ex ante 'problem definition', the right to control the innovation process, and the right to ex ante exploitation, including the development of derivative innovations.

It should be noted that while the decision of property rights allocation is made at the inception of each product or innovation, its impact on creative and economic outcome stretches across the lifetime of the innovative product. This is especially significant for products that are not one shot innovations, but have several iterations/versions and derivative products. Comic books titles, which generally consist of at least several individual issues, and may include derivative titles or merchandize, is a prime example of this.

It is well established, and in fact is the main reasoning behind formal IP protection, that a party's control over an innovation's property right increases economic performance due to monopoly rents, providing incentive to innovate or fund innovations (Towse, 2001). Further, incentives between creative actors and holders of complementary assets may not be completely aligned, thus obtaining the property rights of the innovation eliminates multiple holdup potentials (e.g. on creative direction, distribution, derivative use). The level of control enabled by acquiring the IP gives firms flexibility in exploiting synergies within and between innovations and their assets. On the individual innovation level, control allows firms to implement innovation and selection routines freely, capitalizing on the cumulativeness of firm experience in specific areas. Across innovations in the firm portfolio, it allows coordination in exploiting economies of scale and scope in production, distribution, marketing and other activities, utilize experience from

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previous related innovations, as well as other possible synergies. Over time, it allows firms to develop a coherent innovative path, synergizing the development of innovations and their co-specialized assets.

H1a: Firm IP ownership is positively correlated with a product's Economic Outcome

By contrast, while firm's ownership of IP enhances economic outcomes, firm's control over innovative process and results may incur penalties on creativity. It is established in the contract theory literature, that if the effort of agents matter for innovative outcomes, firms should give agents incentive to innovate by assigning residual rights of the innovation to them (Aghion & Tirole, 1993). Taking residual rights prevents innovators from appropriating ex post benefit from their effort, making them have less incentive to put a maximal effort to the innovation. Even if it may be argued that creators create art for art's sake (e.g. Caves, 2000), and average benefits from copyright royalties are minimum except for blockbuster cases (Towse 2001), there are other arguments to support the negative effect of the loss of artists' ownership rights for creativity.

Gambardella, Giarratana and Panico (2010) postulates that increasing the autonomy (e.g. by giving control rights) of an employee provides a better way for her to manifest her true skills, which in turn enables firms to identify the highest skilled employees and encourage them to work on their projects by allowing them to use the firm assets for their own purposes (i.e. developing their own ideas). Therefore decreasing creators' perceived autonomy by allocating ownership to the firm mitigates this mechanism for the firm, and reduces the probability of both hiring the best artists and having the artist reveal her true potential.

Further, firm IP allocation may introduce holdup problems between creators and firms. This not only increases the firms' transaction cost, but also decrease an artist's intrinsic motivation because generally firms care more about economic performance, while creators also enjoy utility from other factors (Caves, 2000).

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Moreover, given the fact that firms maximize over a portfolio of products (Caves, 2000; Leiponen and Helfat, 2010), the control provided by IP ownership may induce firms to exert variance reducing mechanisms and limit search scope to reduce risk and increase synergy between existing and future projects. This creates friction with creators who would be betting on only her works. An illustrative example is the case where a firm with a successful line of comics may not want to deviate from the 'successful formula', introducing increasingly incremental innovations. In sum, ownership of IPR by the firm mitigates creativity due to search scope limitations, reduction of intrinsic motivations, and reduced incentive to innovate.

H1b: Firm IP ownership is negatively correlated with a product's Creative Outcome

Product Area Specialization: Reinforcing the Tradeoff

Previously, we have argued that the extent to which firms can profit from their innovations are positively correlated to the degree of control, and thus firm IP ownership of an innovation positively impact economic outcomes because of the mechanism of monopoly power and the lack of holdup problems with creators in exploiting the innovation. We now contend this effect will be stronger for product areas in which the firm is more specialized.

The positive impact of specialization, whether on the product or technological level to innovative and economic outcomes is well documented. A higher specialization in the firm portfolio for a specific segment implies a more coherent & larger pool of resources synergies, as well as a greater degree of managerial attention (compared to periphery fields). Further, specialization enables firms to better exploit their knowledge base and conduct recombination for innovations in their field (e.g. Katila and Ahuja, 2002), allowing the development of superior competence or competitive advantage within their focus areas (e.g. Prahalad and Hamel, 1990, Henderson and Cockburn, 1994).

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Based on the argument above, the degree of product area specialization within a firm's innovation portfolio enhances the positive impact of firm IP ownership to economic outcome because it implies a larger pool of assets and synergies to be leveraged. In fact, having innovations within a firm's focus area that are not controlled by the firm may negatively impact economic outcomes due to conflicts and diseconomies between innovations and assets in this segment.

H2a: The positive effect of Firm IP ownership on product economic outcome increases with increasing product level specialization

In our basic setup, we have argued that firm IP ownership negatively impacts product creative outcomes. Now we will argue that the degree of this negative influence varies with the firm's specialization on that product area. There are two opposing argument that can be made on this. On the one hand, enabled by the control provided by firm IP ownership, specialization will induce firms to increasingly exert variance reducing mechanisms with the intention to increase synergy between existing assets and current/future innovations. This will be especially true for 'anchor' innovations/titles, i.e. very successful titles and titles that function as a 'parent' to several derivative titles. An illustrative example would be that a firm with a successful line of serialized comics may not want to deviate from the 'succesful formula' and will introduce increasingly incremental and complementary innovations/product lines, which eventually will decrease creative performance. On the other hand, working for firms with a large presence in a genre may bring up a creator's reputation and serve as a signalling effect of their quality, thus bringing effort, and possibly novelty, up.

The issue of which of these two mechanisms dominate may be an empirical question. However, a previous side result that may have actually indicated the existence of this moderating effect is in Taylor & Greve's (2006) who investigated the antecedents of creative performance in the comics industry. They found that

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publisher size, which is correlated with experience, has a negative and significant effect on (creative) performance, while generally resources are associated with better performance. This may be related to the fact that in a significant chunk of the big firms, IPR are assigned to the firm, limiting the creative performance of the creators. We argue this may be because while signaling and incentive mechanisms may increase the effort of creators, the effort is more likely to be focused on improving the quality of the product within the realm of best practice for the genre, instead of trying to create something completely novel. Figure 1 summarizes the product level mechanisms that are encapsulated in Hypothesis 1 and 2.

H2b: The negative effect of Firm IP ownership on product creative outcome increases with increasing product level specialization

RESEARCH DESIGN

Sample: The United States Comic Book Industry

Our hypotheses are tested with longitudinal data on the United States comics industry between 1998 and 2009, resulting in a sample size of over 11000 comic book issues. We utilize a combination of publicly available data, with the main source obtained from the Comicbase, a comic book collection software compiling detailed information on titles, creators and creative performance of individual comics. Sales estimate data are compiled from comichron.com, a compilation site which accumulates distributor's publicly reported sales figures since 1996 to present. While the theory was tested for the comics industry, the basic framework applies more generally.

Operationalization of Independent Variables

Allocation of property rights

In the case of comic book industry, generally speaking comic titles are either owned by the firm or the creator. For firm owned titles, artist work on terms called

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'work for hire'. In this case firms define 'ex ante problem definition' in the form of story type and premise (generally working on an existing property/concept), have discretion on the degree of control exerted in the production process, as well as exploitation and other downstream activities, including the development of derivative titles, sequels, merchandize, and other scope economies-related activities. While artists may have some lee-way in the form and expression of the ideas, they are generally constrained by the scope of the predefined concept and creative direction from the firm. By contrast, when authors own the property rights, they generally either created the whole project ex ante or start with a concept idea sample (similar to a 'pilot' episode for tv series) to pitch to a publisher. In this case, while publishers and editors can have some say even in the content generation, generally creators have much more freedom of creation than when they are doing work for hire.

To test our hypothesis, we use the allocation of property rights on the product level, in which property rights is allocated to either the firm or the author. This information is available on the cover of each issue and from the database.

Using Genres to Study Specialization

In the comic book industry, each title can generally be classified to one or more genres. Typically, each firm in the industry will offer a line-up ofserials across differing genre configurations. Similar to movies, each genre represents a loosely prescribed distinctness in terms of plot, character, setting, thematics and style (Shamsie, et. Al., 2009, Gomery, 1991, Schatz 1981). The difference in elements of both contents and physical style of presentation determines the kinds of people and skills needed for production, its target markets and the downstream strategy in publishing the comic book. We emphasize that both firm and individual level capabilities are at least to some degree genre specific, enabling us to identify the particular capability configuration and trajectory that a firm are building by publishing in a given genre. Therefore, we utilize genre categories to operationalize specialization.

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Although there are some slightly different classifications, as in various entertainment-content industries (e.g. movies, books, TV series), some basic genres has been identified to characterize the majority of offerings in the comics portfolio. These classifications may differ subtly between countries, but a relatively standard classification exists within the US. We rely on a categorization of 24 genres as per described in the Comicbase Database.

In our analysis, product Area Specialization is operationalized by the share of a title's genre within the firm's publishing portfolio. An alternate measure used is a dummy variable indicating "focus" if the genre comprises more than 50% of a firm's portfolio. This alternate measure is used to see if the effect only becomes relevant if the genre specialization is very prominent within the firm. Results show similar qualitative conclusions, and are thus not reported for brevity.

Operationalization of Dependent Variables

Economic Outcome (SALES) - We measure economic outcome at the product level as national sales of a comic book issue in its release month (copies sold for Batman #3).

Creative Outcome (AWARD) – To measure creative outcome, we use the awards given for comics titles, which measures creator peer judgments of extreme positive creative performances. We utilize two prominent awards in the American comics industry, i.e. the Harvey and Eisner Awards. While there are variances in the details, the impact of awards as a measure of creative/innovative performance has been well documented in the literature on creative industries (Gemser, et.al 2008). While awards are not a perfect proxy for creativity, using awards as a measure of creativity in the comic industry has an advantage in particular because the awards are given one year ex post to the publication, so it should not impact the economic outcome other than through its inherent value of creativity.

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Control Variables

Empirical evidence and face validity suggests additional factors may affect economic and creative performance. We explicitly control for this with several additional variables. First, we control for industry variation over time by having year dummies in the observation. Specific to the firm, we control for firm publishing capacity using the number of books it published in a particular year (BOOKPERYEAR). On the issue level, we control for the issue number (ISSUE_NUM). Further, taking into account that economic outcome may be determined by price, we include price (PRICE) on the empirical analysis and endogenize it using the number of pages for each issue as an instrumental variable.

To control for non firm and IP allocation drivers of creative outcome, we include by creator team specific variables, i.e. the length of experience (tenure) and the variety of genre a creator has worked on. These variables have a strong support in the literature as a strong determinant of innovative performance (e.g. Taylor and Greve 2006) but should not have any direct effect for economic performance. Further, in comic books, demand is more driven by the characteristics of the product itself (e.g. comic book characters, style and storyline) as opposed to the less known creators, which change over the lifetime of a title. This is unlike movies or music, where a product is much more intertwined with its performers/artists.

The Endogeneity of IP Allocation

Given that IP ownership by the firm conveys potential advantages, especially for firms with certain competences and assets or specific types of innovations, IP allocation may be endogenous. IP allocation may be determined by which party is able to exploit the property better, resulting in the most efficient allocation of resources. When the innovator's efforts are important, control is assigned to the innovator, while if complementary assets matter more, control is assigned to the firm (Aghion and Tirole, 1993). In this case, titles with more potential for longevity or the development of related innovations are allocated to the firm, who are better at exploiting them, while shorter, standalone titles are allocated to authors. By this

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reasoning, there is an issue whether the creativity-synergy tradeoff is simply an artifact of the selection process, i.e. if standalone titles are inherently more 'creative', while the firm owned titles are inherently more suited to mainstream tastes. To take this phenomenon into account, we need to find instruments that play a role in determining the choice of IP but can be excluded from the estimation of Creative and Economic outcomes. The incentive to acquire IP for firms are determined by two main aspects, i.e. the inherent properties of the title and the firm's capabilities to exploit it. As an inherent property of a title, potential longevity (LONGEVITY) of a title enables firms to optimally exploit titles in a longer timeframe, and increase potential for future holdups with creators if the creator owns the title. Therefore, firms are more likely to own titles with a potential longer lifetime. Importantly, the length of a series do not directly affect the creativity or sales of *a particular* issue. To assess potential longevity, we constructed a measure in cooperation with academic experts in comic books and assessed each title's potential longevity individually. To reduce bias caused by known short/long lived titles, the sample includes only relatively recent titles starting from the year 1998. The measure for longevity contains 3 items regarding i) episodic format (supports longer lifetime), ii) the concept of character aging/movement of timeline (non existence of aging supports an indefinite title lifetime), and iii) limited series format (a limited series format is a form in comic that has a predetermined number of issues from beginning to end, usually on the range of 3-6 issues, indicating a shorter lifetime)

A second instrument is the size of a firm's existing IP pool, which would increase its likelihood to acquire more IP as it provides a larger pool from which to exploit synergies, and due to path dependence in part of the firm repeating a previous governance strategy. Further, it does not strictly affect the creativity of a new title, nor the popular demand for them because the scale-related reputation effects on a firm's brand and titles relies on titles *published* by the firm, with less regard of whether the firm *actually owns* the IP for the title.

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Estimation Method

We conduct analysis first on the product level. We define each comic book issue as a single observation, with each title having several issues (e.g., Batman #1, #2, ...). Considering the endogenous nature of the main variables, we conducted three steps of regression for each of the dependent variables. First, we regress choice of IP allocation for all number one issues (when IP allocation is determined) over its determinants, including title's specialization (FOCUS). We then construct an estimate of IP (IPnew) for all titles, and use the estimate as an instrument for IP allocation into the equation determining the project's creative performance (AWARD). This is in accordance to the procedure suggested by Wooldridge (2002) for binary endogenous regressors, which is more efficient than standard IV regression for this case. From this, we create an estimate of creative outcome to incorporate in the equation for sales. As an alternative method, we also employ the regressions as a simultaneous system of equations and regular IV regressions with qualitatively similar results, not reported in this paper. The result for F values and Sargan's statistic to test for overidentifying restrictions indicated that the instruments are valid (Sargan's test P value of 0.78 and 0.51 for economic and creative outcome regressions, respectively).

RESULTS & ANALYSIS

Product Level Data: Interaction of IP Allocation and Specialization for Performance

Descriptive statistics and correlation matrix for the variables are presented in Table 1 and 2. Regressions testing our main hypotheses are reported in Table 3, through 8. In general, the data lends support to the set of hypotheses proposed. Table 3 presents the probit regression to determine the probability of a title to be owned by the firm, as opposed to being a creator-owned title. We can see that

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consistent with our prediction, potentially longer titles are more likely to be firm owned.

Model 1-2 on Table 4 displays the results for the negative binomial regression on creative outcome. The coefficient for firm IP is negative and statistically significant, giving support to Hypothesis ***1b***, i.e. that allocation of control to the firm reduces innovative performance. The negative and significant coefficient on the interaction between IP and specialization supports Hypothesis 2b, and means that the negative effect exerted by firm's variance reducing mechanism is empirically stronger than possible reputational or incentive attenuating effect conveyed by increasing firm experience. It should be noted that with the interaction effect, the direct effect of IP is smaller, indicating that the negative effect of firm IP ownership is less important when firms are new to a genre, and thus have no prior knowledge to enforce variance reducing mechanisms. This also goes against the incentive argument, indicating that creators may care more about their work quality and exerts effort regardless of residual rewards allocation.

The economic outcome regressions are presented in model 7-8 on Table 5. Consistent with our prediction, both product area specialization and product creativity increases economic outcome. The main effect of firm IP ownership is positive, in accordance to H1a. Further, the interaction effect of firm IP ownership and specialization is positive, in accordance to H2a. This indicates that firm IP control allows firms to better leverage specialization to create economic outcome. Interestingly, the simple effect of specialization after considering the interaction effect is negative. This indicates that conflicts between creator and firms exists, i.e. firms are only able to utilize their assets optimally if they control the innovation.

Further Analysis: Firm Strategy and Division of innovative labor

As in many industries where there is the trade-off between novelty and economies of scale/scope, the US comic book industry is comprised of a small number of large,

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scale based firms and a larger number of smaller firms relying on certain niches or innovative capabilities. In the creative industries, a specific terminology for the different types of firms is the division between ‘Promoter’ and ‘Picker’ firms (Caves, 2000). Picker firms are exploration-based, focused on the the identification of creative product and talents. By contrast, Promoters are more exploitative, relying more on downstream assets and commercial exploitation. While their activities may overlap, each has resource advantages on their domain, restricting the ability of one type to compete on the others’ core terrain, making their relationship less competitive (Gander, Haberberg & Rieple, 2007).

In the US comics industry, a rough cut would classify the big 2 firms – dominating 70% of the market share – as promoters, with the rest of the sample functioning mostly as picker firms. By separating the two segments of the market, we can observe whether the effects observed is an artifact of the “giant two” firms, or if it is applies through the whole market. Product level results for picker firms are presented in Model 3 & 4 (creative outcomes) and in Model 9 & 10 (economic outcomes), and results for promoter firms (“the big two”) are presented in model 5 & 6 and 11 & 12 respectively. While general results hold, in picker firms the simple effect of firm ownership of IP is not significant for creative outcomes, and the simple effect of firm ownership becomes negative for economic outcomes. This may indicate that excessive control of creativity happens only above a certain scale threshold (e.g. on the “big 2” firms), and the synergy benefits of control is lesser for small scale firms in general. For independent firms, owning a non-central title to the firm may even damage its economic outcome due to non-matching synergies or diseconomies with the current capabilities and asset of the firm. Further, this imply barriers for smaller picker firms to acquire a coherent portfolio of IP (which is the main advantage of the promoter firms) due to the negative marginal effects of acquiring each title.

Importantly, we find that in determining economic outcome (model 8), the interaction between creative outcome (#Awards) and being a promoter firm (Big 2) is negative, and the coefficient of creative outcome is larger for picker than promoter

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firms (model 9-10 vs model 11-12). This means that the impact of creative outcome is stronger for picker firms. Further, the impact of specialization is stronger for the promoter firms. The differing effect of specialization and creative outcome further supports the existence of partitioning between firms, with large firms focusing on exploitation-based practices based their specialized IP portfolio, and smaller firms specializing on innovative titles. This may imply ambidexterity on the industry level of sorts, where it is optimal to divide exploration and exploitation at the level of the industry instead of the firm. In these settings, the interaction between explorative and exploitative activities are done via the mobility of talent or market for ideas (patents, licensing and other methods of exchange).

Empirically, the partitioning we observe in the industry relates to the more general concept of resource partitioning (Carroll, 1994, 2000) and sunk cost theories (Sutton, 1991). Our theory is consistent their assertions, and may offer a subtly complementary explanation for it. The resource partitioning theory relies on a scale driven competition to capture the market center, and the sunk cost theory highlights oligopolists' escalating commitment in scope-based competition. Our results suggest a partition in the resource base may also result from using property right allocation as a tool to manage creative incentives, creating an industry level 'division of innovative labor' (Arora et al, 2009) of sorts between the scale based promoters and the novelty based picker firms.

DISCUSSION

Aggregating on The Firm Level

This paper has outlined and shown a product level mechanism of that regulates the tradeoff between creativity and synergy, with IP allocation being the main moderator and product specialization reinforcing its effect. The natural next step is then how does this interplay aggregate on the firm level?

Since the benefit of control increases with increasing firm specialization, in product areas in which the firms are specialized, it is more beneficial to keep control

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of the intellectual property. The increasing returns for specialization combined with firm IP ownership may lead firms to further specialize and keep the property rights on consequent specialized products, reinforcing firm level specialization. By contrast, in peripheral product areas, the lack of benefits from specialization induces firms benefit from betting on creativity. This is achieved by relinquishing the intellectual property to the artist, who then keeps control of her activity, including deciding what type of product to create. The fragmentation of ownership to multiple owners introduce higher potential holdup problems, limiting the firm's ability to build specialization in specific product areas.

Therefore we expect to observe that specialized products are owned by the firm, while peripheral products are owned by artists. Further, we expect to observe that firm specialization is positively correlated to the proportion of firm IP ownership. This results in the polarization between specialized firms with a coherent IP portfolio and diversified firms with most of their products owned by the individual artists.

To analyze the impact of the creativity-control tradeoff in the firm level, we conduct a regression on the firm level, aggregating our product level data to obtain average measure for each year in all our sample firms. As we can see from Table 7, firm level specialization is positively correlated with the proportion of firm IP ownership. This is consistent with the argument that a strategy of betting on creativity by giving control rights to artists is correlated with a high level of diversification. While we do not claim any causal relation or direction, our results suggest that the strategy of either betting on creativity or relying on a coherent stable of property right is a strong influence.

Table 6 gives a rough picture of how the industry landscape looks like. The first row represents smaller and medium sized firms, which tend to be diversified and has a large proportion of its IP controlled by the artist. Row 2 to 4 illustrates the three viable strategies adopted by the three largest firms in the industry. We can observe Marvel comics with its highly specialized portfolio, and practically all titles being owned by the firm. By contrast, Image comics with aims for a strategy with a high

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level of diversification and high percentage IP allocation to the artist, while DC comics adopts a mixed strategy. In fact this correlates to their official statement of the firm's strategy as discussed in the empirical setting section, with diversified firms emphasizing creativity and specialized firms emphasizing cross product synergies. The next section evaluates the role of scale and the distribution of these possible strategies across the industry and makes some suggestions on the division of innovative labor on the industry level.

Limitations and Contributions

Our arguments are important for both its contributions to the current debate in the literature and how their limitations hints on possibilities of future research. By investigating the joint impact of specialization and IP allocation as a tool for creative incentive management, we highlight the opposite effects that they have to creative and economic outcome. Methodologically, we contribute by conducting a direct test of the tradeoff between creative and economic outcomes as directed by allocation of control. While there are numerous studies on the drivers of creativity as well as the creativity-economic performance link, there is a dearth of studies that considers them together. Further, we addresses the fact that IP allocation may be endogenous contingent on inherent properties of the innovation as well as firm specific factors.

Naturally, this paper has limitations to its theory and empirics that may lead to further research avenues. Our current analysis is confined to one industry, and do not observe firm level performance nor the long run consequences of the firm strategies. Moreover, it does not yet consider interfirm interaction, especially on the movement of creative actors, which is a strong driver of creativity in the industry. Multi industry studies may further develop our insights by examining variations which are not visible in the single industry. A particularly interesting issue is the effect of production process complexity. Comic books by nature are relatively simple to produce, as opposed to more complex products such as movie or television series

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production. Complexity in production may moderate the tensions presented in this paper in distinct interesting ways that merit further investigation.

Finally, on a more micro level, a question that is raised is how the industry manage to maintain a diverse pool of creative actors given the polarized structure of the work environment? While it is generally believed that there may be an oversupply of willing labor especially in creative industries, as well as a high elasticity to wages, given the polarized choices of work, how do workers self select? Specifically, how do big firms attract sufficiently creative workforce and how do small firms maintain a cadre of high quality given high risk/degree of failure? A possible answer is in the high and complex mobility pattern of creative individuals across individual projects and firms. Investigating this may bring a more sophisticated insight on the division of labor in innovation not only on the firm level, but also how it relates to both the general pool of innovative labor resources on the industry level and on managing creative actors on the individual artist level.

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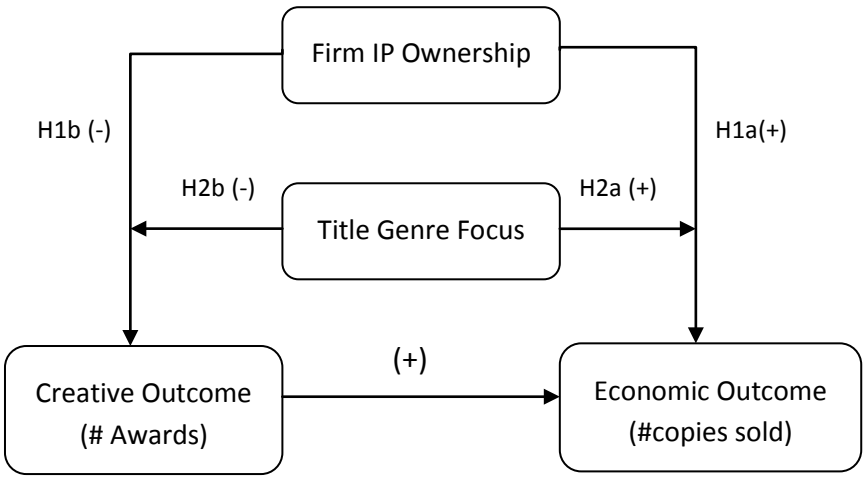

Figure 1. The Underlying Product Level Mechanism for the Creativity-Focus Tradeoff

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TABLE 1. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
FIRM IP	0.53	0.49	0	1
AWARD	0.10	0.79	0	12
Revenue	77684	108074	1692	1159083
Capacity (book/year)	554.24	427.62	1	1231
Firm Genre Homogeneity	0.37	0.24	0.0011	1
Title Genre Focus	0.35	0.34	0	1
Issue number	95.82	9187.04	0	1000000
Ln Editor Genre Count	0.28	0.48	0	1.79
Ln Editor Issue Count	0.96	1.69	0	6.50
Ln Artist Publisher count	1.69	0.75	0	3.55
Ln Artist genre count	1.65	0.65	0	3.04
Ln Artist Issue count	3.25	1.38	0	6.90
Ln Writer Genre Count	0.99	0.91	0	2.77
Ln Writer Issue Count	4.59	1.78	0	7.18

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TABLE 2. Correlation Matrix

	Firm IP	AWARD	SALES	Books/year	Firm Homogeneity	Genre Focus	Issue-number	Editor genre count	Editor issue count	Writer issue count	Artist genre count	Artist issue count
Firm IP	1											
AWARD	0.0211	1										
SALES	0.2089	0.0208	1									
Book per year	0.3523	0.0241	0.4873	1								
Firm homogeneity	0.4442	0.0875	0.3532	0.5358	1							
Title Genre Focus	0.3477	0.0762	0.1162	0.2207	0.3529	1						
Issue number	0.0096	-0.0013	0.0078	0.0072	0.0051	0.0091	1					
Editor Genre Count	0.0198	0.0102	0.1296	0.1239	0.1558	-0.0214	-0.0054	1				
Editor Issue Count	0.0142	0.0142	0.1468	0.1424	0.1321	-0.0497	-0.0049	0.9039	1			
Writer issue count count	0.0349	0.0983	0.1832	0.2003	0.1467	0.0025	-0.0122	0.0719	0.0764	1		
Artist genre count	0.0484	0.1133	0.1449	0.1473	0.0878	-0.0127	-0.0135	0.0504	0.0655	0.9023	1	
Artist Issue count	0.0905	0.0822	0.1432	0.1618	0.1348	0.039	-0.0078	-0.0104	0.0207	0.7917	0.7994	1

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TABLE 3. Results on Probit Regression on Allocation of IP

VARIABLES	Firm_IP
Longevity	0.23***
	(0.05)
EXPERIENCE	0.14***
	(0.04)
IP stock	0.000380***
	(5.25E-05)
homogeneity	0.38
	(0.37)
Genre Focus	0.43
	(0.32)
_2003	0.72***
	(0.22)
_1999	-0.24
	(0.3)
_2008	0.31
	(0.23)
_2006	0.27
	-0.22
_2007	0.39*
	(0.23)
_2005	0.36*
	(0.21)
_2004	0.37*
	(0.21)
Ln(Book per year)	-0.34***
	(0.08)
Firm yearly sales	-0.000161
	(0.045)
Constant	0.29
	(0.513)

p-values: *** p< 0.01, ** p<0.05, * p<0.1

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TABLE 4. Determinants of Creative Outcomes (# awards)

Dependent variable: # Awards						
	(1)	(2)	(3)	(4)	(5)	(6)
	Whole Sample		*Without "big 2" (Picker firms)*		"Big 2" (Promoter Firms)	
Firm IP Ownership	-3.514***	-1.490*	-4.79***	-1.93	-8.913***	-3.109**
	(0.775)	(0.821)	(1.418)	(1.708)	(1.417)	(1.296)
Firm Ownership x Genre Focus		-10.69***		-13.61**		-31.53***
		(1.649)		(5.491)		(2.918)
Genre Focus	-0.167	10.16***	2.16*	7.644***	-7.406*	57.36***
	(0.739)	(1.772)	(1.161)	(2.474)	(4.064)	(6.279)
Issue Number	-0.0518***	-0.0644***	-0.074***	-0.08***	-0.0505***	-0.0687***
	(0.0103)	(0.0106)	(0.0165)	(0.017)	(0.0119)	(0.0113)
ln*(#book published/year)*	0.0226	0.228	-0.420**	-0.371**	-2.913***	1.181
	(0.139)	(0.143)	(0.168)	(0.175)	(0.706)	(0.823)
Firm Genre Homogeneity	7.094***	7.435***	-2.567**	-2.256*	26.21***	14.68***
	(0.976)	(1.024)	(1.240)	(1.251)	(2.783)	(1.975)
"Big 2" Promoter Firms dummy	-0.291	-1.025*				
	(0.545)	(0.553)				
Creator controls (experience in number of books and variety of genres)	Yes	Yes	Yes	Yes	Yes	Yes
Genre dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,429	11,429	6,120	6,120	5,391	5,391
Number of firms	81	81	79	79	2	2

*Notes: This table reports the results of negative binomial regression of the number of awards received by individual comic books as determined by firm properties and allocation of property rights. The sample covers the period of 2000-2009 of US comic. Standard errors (in brackets) are robust to arbitrary heteroskedasticity and allow for serial correlation through clustering by firms. * significant at 10%; ** significant at 5%; *** significant at 1%.*

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TABLE 5. Determinants of Economic Outcomes (thousands of issue copies sold)

Dependent variable: copies sold (in thousands)						
	(7)	(8)	(9)	(10)	(11)	(12)
	Whole Sample		*Without "big 2" (Picker firms)*		"Big 2" (Promoter Firms)	
# Awards	8.052***	18.25***	9.432***	10.91***	2.630***	2.424**
	(0.729)	(5.671)	(2.054)	(2.167)	(0.988)	(1.011)
#Awards x "Big 2" dummy		-10.52*				
		(5.529)				
Firm IP Ownership	8.524***	3.497*	-1.541	-6.539***	18.28***	10.48***
	(1.748)	(1.867)	(1.487)	(2.342)	(3.470)	(3.232)
Firm Ownership x Genre Focus		21.95***		18.12***		34.46***
		(5.258)		(4.725)		(8.680)
Genre Focus	10.34***	-8.956*	-7.83***	-17.92***	4.821***	-23.47***
	(1.809)	(5.050)	(1.562)	(2.919)	(1.588)	(7.536)
Issue number	-0.0102	-0.0148	0.0140	0.00733	-0.0499**	-0.072***
	(0.0148)	(0.0153)	(0.0162)	(0.0171)	(0.0235)	(0.0242)
ln(#book published/year)	1.443***	1.415***	-0.0859	-0.223	-1.485	-2.926
	(0.377)	(0.395)	(0.215)	(0.232)	(3.185)	(3.350)
Firm Genre Homogeneity	2.135	1.474	16.57***	12.28***	-1.766	-3.036
	(2.238)	(2.345)	(1.907)	(2.239)	(3.792)	(3.935)
Price	-0.0575	0.484	-3.292***	-3.197***	9.286***	10.97***
	(0.563)	(0.601)	(0.316)	(0.333)	(1.416)	(1.548)
"Big 2" Promoter Firms dummy	14.24***	16.49***				
	(1.379)	(1.492)				
Genre dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,429	11,429	6,120	6,120	5,391	5,391
Number of firms	81	81	79	79	2	2
R2	0.2	0.158				

Notes: This table reports the results of 2SLS regression of the number of monthly sales for individual comic books as determined by awards, firm properties and allocation of property rights. Awards are endogenized with creator specific characteristics working as instruments. The sample covers the period of 2000-2009 of US comic. Standard errors (in brackets) are robust to arbitrary heteroskedasticity and allow for serial correlation through clustering by firms. * significant at 10%; ** significant at 5%; *** significant at 1%.

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TABLE 6. The correlation between IP allocation tendency and firm level specialization

	Firm Level Specialization	Proportion of firm IP Ownership	Capacity (book/year)
"SME"s	0.21	0.34	481
Big Firm 1: DC exploit/explore mix	0.44	0.38	1910
Big Firm 2: Marvel Exploitation strategy	0.61	0.94	2381
Big Firm 3: Image Exploration strategy	0.17	0.14	1600

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TABLE 7: Firm level panel regression on Firm Level Specialization

Dependent Variable	Firm Level Specialization
Proportion of Firm Owned IP	**0.0753****
	(0.0366)
Firm Size	**-7.64e-06**
	(9.57e-05)
New Firm (Dummy)	-0.0536**
	(0.0261)
Awards in a Year	0.000445**
	(0.000226)
Observations	532 (185 firms)

p-values: *** p< 0.01, ** p<0.05, * p<0.1

Notes: This table reports the results of a dynamic panel regression for the firm level specialization as determined by the the proportion of titles in the firm's portfolio allocated to the firm (δ. Proportion of firm IP). * significant at 10%; ** significant at 5%; *** significant at 1%.

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Essay 2

Moving Between Contexts: Balancing Mobile Individuals and Firm Capabilities in Creative Production

ABSTRACT

This paper investigates the effect of using mobile talents in project-based industries. Focusing on the contrast between large, commercial-market oriented firms and smaller, creativity oriented firms in the US comic book industry, we argue and show that individual level expertise gained from working in diverse settings may compensate for capabilities in which the firm is lacking. Mobile talents are most useful when they bring in experiences novel to the focal firm. However, taking a specialist from a desired field of expertise may not work well as they may not be able to integrate their knowledge due to lack of experience in the focal firms' context and mismatches in routines between the different contexts. Therefore we propose and find that context mobile individuals, i.e. individuals who spend their career balanced between firms with different types of orientation, is more effective in boosting performance in fields outside of the firms' realm of expertise.

Keywords:

Individual Mobility; Capability Imitation, Transfer and Replication; Strategic/Cognitive Groups

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INTRODUCTION

Hiring away inventors has long been recognized as a way of stimulating change and preventing organizational rigidity (March, 1991; Palomeras & Melero, 2009). The resource and capability based view contends that firms create competitive advantage through the posession and deployment of non-imitable resources, among them potentially mobile skilled personnel. Hiring new skilled personnel is purported to be an effective learning mechanism, especially to gain access to external knowledge, while losing star employers to competitors may be detrimental, as not only firms lose the skill and contribution of the employees, they run the risk of knowledge spillovers to competitors, undermining their competitive advantage (e.g. Cassiman & Veugelers, 2006, Almeida & Kogut, 1999, March, 1991). This issue is especially relevant considering the increasing fluidity on the mobility of skilled personnel, with expert employees job-hopping across a wide variety of firms, projects and even industries along their careers. Individuals learn and adopt different knowledge and routines from different organizations, allowing them to have a larger and more diverse repertoire for recombination and innovation. These mechanisms highlight the bidirectional nature of knowledge and resource flows that are made possible by employee mobility. Importantly, the characteristic of knowledge accumulated by talent at her previous occupation affect what hiring firms can learn from them (Palomeras & Melero, 2009).

Using data on US comic book industry, we investigate the consequences of hiring mobile talent across projects and firms. First, we argue and find that external talents have positive impact for performance, specifically when they possess experience in areas where firms lack significant competitive advantage. In other words, talents are hired to complement lacking capabilities in the part of the firm. Employee turnover brings variations that reduce stagnancy in the organizational code, thus improving the performance of the organization and its innovations (March, 1991). However, taking a specialist from a desired field of expertise may not work well as they may not be able to integrate their knowledge due to lack of experience in the focal firms' context and mismatches in routines between the different contexts.

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Therefore we argue and find that context mobile individuals, i.e. individuals who spend their career balanced between firms with different types of orientation, is more effective in boosting performance in fields outside of the firms' realm of expertise.

To illustrate this argument, we study the effect of individual mobility in the US comic book industry. While only becoming more prevalent recently in the more traditional industries, the project-based method of innovation and employment has long been a staple in the creative industries, an instance where project based, loosely bounded career model is the norm. Importantly, like other creative industries, the comic book industry has the distinct feature where there is always tension between creative and economic/efficiency considerations, resulting in a partitioned industry consideration consisting of a small number of large, commercially oriented scale-based firms and a larger number of more creatively oriented small firms, relying more on niche innovative capabilities. Generally speaking, one type of firm cannot function well as the other, as there are tradeoffs between their mechanisms. Firm's control over innovation is vital in achieving economies of scale and scope for promoter firms, because it enhances the effect of firms' resources to economic outcomes. However, by causing risk adverse project selection processes, as well as incentive and holdup problems with individual talents, this control reduces creative outcomes, the main advantage of the picker firms.

In this paper, we contend that using mobile individuals may help firms to compensate for their lack of expertise in fields outside their core orientation, i.e. helping commercially oriented firms to be more creative, or a creatively oriented firm to have more commercial appeal. We conceptually differentiate between mobility among similar types of firms and firms that are conceptually different in their strategies and capabilities. This is conceptually important, because simply 'transplanting' a specialist from one field, e.g. using an artist used to work in only creatively oriented firms for a commercially oriented project may not work well due to mismatches in routines and expectations, creating potential conflicts and inefficiencies.

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Specifically, we argue that mobile individuals who divide their working time between these two types of firms, or 'logics of operation' can create a bridge between their different types of competitive advantage. Talents who alternate between commercially oriented and creatively oriented works and interact with both sides of the community may be able to take – and create - the best of both worlds. In a sense, these talents will use their external experience to supplement the aspect of the project in which the firm capabilities are lacking. When they work on 'creative' oriented firms, they are more able to temper the novel elements to at least somewhat attract 'mass market' commercial orientation (increasing economic outcomes), while still satisfying the need for creative freedom. On the other hand, while working on the commercial sector, they are able to recombine novel elements they gathered through their 'wanderings', creating both economic and creative outcomes, with this work probably providing more stable income.

The rest of the paper will be structured in the following way. The next section describes the theoretical development, starting from different types of firms concentrating on either creativity or efficiency, and why each cannot operate as the other, We continue to explicate how the mobility of talents between the two different contexts serves as a bridge that connects the two modes of operation, and develop our propositions there. The third section describes our empirical strategy, starting with a brief overview of the empirical setting, a discussion regarding the endogeneity of mobility and our analytical strategy to tackle the issue, and capped with operationalization of variables. Next we present the results and the final section contains a short discussion of contribution, future research and concluding remarks.

HYPOTHESIS AND THEORETICAL DEVELOPMENT

Commercial and Creative Orientation in the Creative Industries

In industries where creativity and economies of scale or scope are important, we commonly see an industry configuration that consist of a small number of large, scale based firms, with a larger number of specialized smaller firms, relying more on

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placing themselves in a particular niche or certain innovative capabilities. These industries are thus partitioned (Carroll, 1994; Mezias & Mezias, 2000) with a few large firms with higher market shares and smaller firms exploiting resources not accessed by (or accessible by) the major firms. A typical example is the media industries, which commonly consist of a small number of commercially oriented 'Major' firms, and a larger number of smaller firms, the more creatively oriented 'Independents' that are typically privately owned. Another terminology for them are the commercially oriented 'Promoter' and creatively oriented 'Picker' firms, as exemplified by Caves (2000) by contrasting types *art galleries and music studios*. Two key aspects in analyzing the two type of firms is their distinct sets of resources and the proposition that they do not generally compete on the same niches (Gander, Haberberg and Rieple, 2007).

Creativity oriented 'picker' typically focuses on the creative effort that identifies and develops the creative product and talents, thus they tend to be good at explorative projects, generating novel creations and finding new talent, styles or types. On the other hand, the commercially oriented 'promoter' firms are generally more exploitative, armed with financial and downstream resources. They are thus better at exploiting a portfolio of product commercially. While their activities may overlap, generally the resource advantages of each firm type are significant, restricting the ability of one type to compete on the others core terrain, making their relationship less competitive (Gander et al, 2007).

There are strong reasons that commercially oriented promoter firms generally cannot imitate the function of creatively oriented pickers, and vice versa. By focusing on the screening of artists and their personal relations, picker firms may have to forgo control and synergy, the hallmarks of the promoter firms. Attempts to achieve synergies between the different projects and assets in the firms' portfolio may reduce selection of high-risk, possible high-reward creations, thus reducing the potential creative output in general. In addition, letting talents have control and residual rights over the innovation will increase the motivation and incentives for talents to innovate. These factors add up to pickers having less incentive and ability to become

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promoters, and vice versa. While creatively oriented pickers may sometimes morph into a more commercial orientation if they find blockbusters, and commercially oriented promoters may attempt to create a more explorative subsidiary, in general the complementarity between their set of capabilities and focus objectives keeps each types of firms operating within their niche.

WANDERING CREATIVES - THE IMPACT OF TALENT MOBILITY IN PROJECT BASED INDUSTRIES

While firms are generally more constrained by their routines, resource commitments and 'reputation' when attempting to simultaneously conduct explorative and exploitative activities (e.g. major labels are not very attractive to artists valuing creative freedom, and their routines may prevent them from developing artists that doesn't fit their existing formats), individual talents may be significantly more mobile. This is especially true in the so called 'project-based' industries, where teams of individual talents constantly move between different projects and firms along their career paths. Given theoretically free mobility between firms, while there are artists who work consistently on the 'creative'/independent sectors, and ones who work on the major sectors, the best result is achieved for talents that spans both worlds.

The main argument in this section is that the mobility of individuals between these two types of firms can create a bridge between them. While there are talents who work exclusively in major promoter firms or independent picker firms, there are a significant percentage that spans both worlds. Talents who alternate between exploitative and creative works and interact with both sides of the community may be able to take the best of both worlds. In a sense, these talents will use their external experience to supplement the aspect of the project in which the firm capabilities are lacking. When they work on the 'creative' projects on picker firms, they are more able to temper the novel elements to at least somewhat attract 'mass market' orientation while still satisfying the need for creative freedom. On the other hand, while working on the 'major' sector, they are able to recombine novel elements they gathered, creating both economic and creative outcomes, while providing more stable income.

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Effect of Talent Mobility to Project Outcomes

The mobility of individuals allows for transfer of their expertise and interpretation of knowledge in new contexts (Rosenkopf & Almeida, 2003). We differentiate mobility among similar types of firms and movement between the two different types of firms, which we will define as **contextual mobility**.

Taking mobile talents who move between similar firms and projects may bring in new knowledge and expand the network of relations between talents, however the external knowledge brought in may not be that much different from each other, and thus may offer limited added value to each project. On the other hand, attempting to 'transplant' a specialist from a different context who has never worked in the focal setting introduces its own set of problems, as his/her unfamiliarity with the new context renders them like 'a fish out of water'. Misalignment between working routines, incentive structures and values may render the specialist ineffective in transplanting their expertise. Therefore we propose that using contextually mobile individuals who balance their mobility between different types of contexts can function as a middle ground between the two options.

First, experience in diverse creative oriented firms, with significantly variant knowledge bases, pool of people, routines and operating procedure may allow talents to access new and unique knowledge for its context (e.g. Rosenkopf & Almeida, 2003), and proceed to recombine a diverse mix of knowledge, resulting in higher creativity. This argument is also in line to the network literature that suggests non-redundant ties increase flows of knowledge (e.g. Burt, 1992). Second, contextually mobile individuals who balance their work between creative and commercially oriented projects are also more able to temper their creativity to still attract 'mass market' commercial orientation, increasing economic outcomes while still satisfying the need for creative freedom. Finally, new talent may bring in superior work or innovation routines that can be transferred from their previous work experiences and enhance project outcomes. Therefore, we argue that using talents who are contextually mobile will increase a project's creative and economic outcome.

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H1a: Talent's contextual mobility is positively correlated with a project's creative outcomes

H1b: Talent's contextual mobility is positively correlated with a project's economic outcomes

As a caveat, straying too far from one's core field of expertise may be detrimental to overall performance. To be able to create work of sufficient quality that matches the strengths valued in a particular context, individuals need to have a sufficient stock of knowledge and capabilities matching this context. Thus Individuals who do not have any strong knowledge base or identity in a particular context may not be able to recombine knowledge efficiently in a particular context. Similarly, individuals who work equally in the major and independent sectors may produce works that are too 'regular' for the independent segments, but at the same time too 'strange' for the major market.

The Complementarity between firm specialty and individual repertoires

We have argued that contextual mobility has a positive relationship to creative and economic outcomes of projects. Next, we will contend that the magnitude of the effect would be different according to the type of firm a project is in. We argue that the knowledge and skills brought in by context-mobile individuals will contribute most in aspects of the project in which the firm lacks a competitive advantage, forming a complementary set of contributions for creative development between the firm and the individual talents.

The population of creatively oriented 'picker' firms consists of a diverse set of idiosyncratic firms, each with their own niche of innovation. While different set of ideas, skills or knowledge may be brought in from the context of the commercial major firms, they may or may not have any special advantage compared to other sets of ideas gained from mobility within the varied set of firms in the creatively

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oriented independent segment itself. Inserting talent from a less creative sector may even be detrimental to novelty in these creatively oriented firms. On the other hand, creative outcome of projects in commercial major firms may suffer from the exploitative nature of the field, and thus the contribution of novel knowledge brought from context-mobile individuals may be especially valuable.

H2a: The effect of contextual mobility to creative outcomes is more positive for commercially oriented firms

Second, for projects within firms that rely mostly on creativity, having innovators who are experienced or are concurrently working with promoter/major projects may add the benefit to their economic outcome. This can happen because mobile talents work on 'creative' projects in picker firms, they are more able to temper the novel elements to at least somewhat attract 'mass market' orientation (increasing economic outcomes) as per their experience in the 'Major' sector, while still satisfying the need for creative freedom. Further, they may have adopted standard routines that boost efficiency such as certain technical qualities, innovation routines and adherence to efficiency based measures (e.g. deadlines).

On the other hand, talent outcomes in major firms' projects may depend significantly less on talent properties. Commercially oriented major firms rely significantly more on economies of scale and scope, distribution channels or the image/familiarity of their brands. Further, due to the more synergized, and to some extent – standardized - nature of their projects, both talents and products tend to be more 'exchangeable', though they will have joint consumption value, i.e. the value gained by consumers increase with the number of consumption.

H2b: The effect of contextual mobility to economic outcomes is more positive for creatively oriented firms

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EMPIRICAL STRATEGY

Description Of Empirical Setting And Data: The United States Comic Book Industry

Our hypotheses are tested with longitudinal data on the United States comics industry between 1999 and 2009, resulting in a sample size of over 6000 comic book issues. We utilize a combination of publicly available data, with the main source obtained from the Comicbase database, a comic book collection software compiling detailed information on titles, talents and creative performance of individual comics. Sales estimate data are compiled from comichron.com, a compilation site which accumulates distributor's publicly reported sales figures since 1996 to present. While the theory was tested for the comics industry, the basic framework applies more generally.

The US comics industry represents a promising setting to study the impact of talent mobility on creative and economic outcomes. First, as a project based industry, mobility between projects and firms are commonplace. Second, the relatively simple mode of production allows for a cleaner separation of the contribution between the talents and firms. Third, as both a creative industry with constant demand for novelty, and a media industry in which economies of scale and synergies on firm assets are important, the industry represents a setting in which both creativity and the use of efficiency and firm capabilities are vital for performance. Finally, the serial nature of comics represents a continuing innovation path for each product, making it possible to explicitly test propositions over time.

In the United States, the industry can be roughly divided into the two main archetypes in this paper, with commercially oriented promoter firms represented by the mainstream or "Major" sector and the creatively oriented picker firms represented by the "independents" segment of the market. 'Mainstream' comics, representing the strength of firm assets and capabilities, are dominated by the "big two" companies, holding 75% of market share and characterized by superhero genre comics featuring families of firm owned titles. Talents are largely 'work for hire' freelance employees

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paid on a per page rate, and there is a specialization in production process supervised by editor (writer, penciler, colorist, letterer). These two firms are used to represent the 'major' sector in the whole sample. In contrast, the 'independents' segment employ a strategy of differentiation, by having a portfolio of mixed genres and business models relying more on innovativeness of individual titles. Firms generally operate in a mix of talent owned and publisher owned IP. Work practices are also accordingly diversified, i.e. a mix of integrated production (stand alone artists or more stable 'production teams') and specialized modular production (similar to the mainstream segment).

Handling Sample Selection in Mobility Studies

The regression is done on the level of comic book issues, i.e. each title (e.g. Batman) would consist of several consecutive issues (e.g., Batman #1). The relationship between creative/talent outcomes and mobility may be endogenous. An issue in estimating the consequences of using mobile talents is the sample selection bias due to unobservable heterogeneity in the drivers of mobility and the propensity of firms to use mobile artists. In other words, mobile workers may be systematically different from stationary ones, and different firms choose to use mobile talent for different types of projects.

To reduce the effect of sample selection bias, we employ 'Coarsened Exact Matching'method (Blackwell et al, 2010; Azoulay et al, 2010), which is basically a matched sample strategy in which for each book using contextually mobile talent, we create a control sample or group with similar properties. The control group contains titles which do not use contextually mobile talents, but in relevant respects are similar to the ones that do, and uses talent which have similar characteristics to the mobile talents. The approach did not decrease sample size significantly, and it is able to reduce the sample selection bias by reducing the imbalance value from 0.66 to 0.46.

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To account for the determinants of firms to use mobile talent, control titles are chosen such that they are of the same allocation of property rights, from similar types of firm in terms of size and specialization. We use these variables specifically because they may cause the use of mobile talent more or less likely. When the title is owned by the firm, the firm may be more free to conscript the services of different talents from different firms, as opposed to when the title owned by the talent. Further, firms may decide whether to utilize internal or external talents based on their perceived level of expertise (specialization) in that niche. Finally, the size of the firm may serve as a proxy of the quantity of internal talent pool they may potentially use, impacting the probability of using mobile talents.

Similarly, to account for the concern that different types of actors may be more or less mobile, we use variables that may determine level of mobility. It may be that some talents prefer to work in only one type of operation, or they are better at one type of innovation as opposed to the other. We use the average of the lagged property of actors (i.e. specialization and past experience).

Identifying Creative Outcome

Creative Outcome is used both as a dependent variable and a driver of economic outcome. Therefore, we identify Creative outcome by using the instruments of individual talents within the production team. In comic books, demand is more driven by the characteristics of the product itself (e.g. comic book characters, style and storyline) and the result of team collaboration, as opposed to the individual characteristics of less known talents, which may impact talent outcome mostly via the quality and creativity of the product. This is unlike movies or music, where a product is much more intertwined with its performers/artists. Thus, in our regression Creative Outcome is instrumented by talent team specific variables, i.e. the length of experience (tenure) and the variety of genre a talent has worked on. These variables have a strong support in the literature as a strong determinant of creative

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performance (e.g. Taylor and Greve 2006) but should not have any direct effect for economic performance.

VARIABLES

Dependent Variables

We measure **creative outcome** by using awards given for comic titles, which measures peer judgments of extreme positive creative performances. We utilize two prominent awards in the American comics industry, i.e. the Harvey and Eisner Awards. While there are variances in the details, the impact of awards as a measure of creative performance is well documented in the literature (e.g. Gemser, et.al 2008). Our measure of **economic outcome** is the national sales of individual comic issues in its release month. (e.g. number of copies sold for Batman #3).

Explanatory Variables

Contextual mobility is measured by the proportion of titles in which a talent works on a different type of firm from the focal project's firm type in a particular year. We control for mobility between firms of the same type, we use the count of firms a talent works in on a particular year. We measure time in the project by the issue number of each title, e.g. Batman #10 is older than Batman #9.

As described in the Empirical Setting section, we differentiate between creatively oriented picker and commercially oriented promoter firms, assigning a 'Commercial' dummy for two major firms taking the 75% of market share, while the rest of the sample functions as 'Creative' firms. As a robustness check, to differentiate between middle sized firms, we also run the equation excluding the other top 5 firms andobtain similar qualitative results. Finally, project time is measured by the issue number of the comics, e.g. Batman #5 is older than Batman #3.

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Control Variables

Finally, empirical evidence and common face validity suggests additional factor that may affect economic and creative performance. We explicitly control for this with several additional variables. First, we control for industry variation over time by having a dummy for each years in the observation. Specific to the firm, we control for firm size/publishing capacity by using the number of books it published in a particular year.

We control for mobility between similar firms to emphasize that there are an additional effect to just moving between firms that is contributed to contextual mobility. We operationalize non contextual mobility as the number of firms that talents have worked on so far in his/her career. We expect that this mobility will have a positive effect to performance, but that contextual mobility will have an additional, distinct positive effect.

Finally, we also control for the allocation of property rights (IP allocation) for the comic books. IP allocation is a straightforward measure, allocating property rights to either the firm or the author, as information made available on the cover of each issue and from the database.

RESULTS

Descriptive statistics and correlations are reported on table 1 and 2. Results of the regressions testing our main hypotheses are reported in Table 3. Contrary to our expectations, on both creative and talent outcomes, we can see that the coefficient for contextual mobility is either negative or not significant, disproving hypothesis 1. However, it can be seen that the interaction between contextual mobility and being a project in a commercially oriented firm (***Contextual Mobility* Commercial Orientation***) is positive for creative outcomes and negative for talent outcomes, lending support for Hypothesis 2a and 2b. This means that for commercially oriented firms, hiring talent from the more creative sector is beneficial

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for their projects' creative outcome, but may not have an effect for their economic outcomes,

Similarly, for creatively oriented firms, hiring talent from the more commercial sector may increase their economic outcome but is not useful for their creative outcome. More generally, this implies the context mobility is useful for areas in which the firm has a competitive advantage, but may not have an effect - or even be detrimental - to aspects in which firms have the advantage. Importantly, the fact that Hypothesis 1 was not supported means that hiring contextually mobile personnel is only useful contingent on the type of firm and the desired outcome of the project.

We can see that the impact of using somebody who has never moved (zero mobility) is negative for both creative and economic outcome, indicating the general positive impact of mobility. Interestingly, the impact of non-contextual mobility (movement between similar types of firms) after controlling for contextual mobility is negative for creative outcome, but positive for economic outcome. The negative impact non-contextual mobility to creative outcome may indicate that mobility between similar types of firms and projects do not bring much novel or different ideas that fuel creativity, and indeed may in fact reaffirm certain ingrained practices and formulas, reducing variation. Non contextual mobility does have a positive impact to economic outcome, which may indicate the depth of expertise on a certain field garnered by observing and participating in different iterations of a similar work context.

Insert Table 1 about here

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Insert Table 2 about here

Insert Table 3 about here

DISCUSSION

In this paper, we have argued and shown that mobile talents are most useful when they bring in experiences novel to the focal firm. Specifically we find that context mobile individuals, i.e. individuals who spend their career balanced between firms with different types of orientation, is more effective in boosting performance in fields outside of the firms' realm of expertise. This is interesting as in contrast and controlling for mobile individuals who move only between similar types of firms, contextually mobile individuals present an additional benefit, especially on increasing creative outcome.

Naturally, this paper has several limitations. While we concentrate on the effect of proportion of time spent in different fields, we do not observe detailed temporal mobility patterns. For example, we do not explicitly observe the difference between individuals who balance between different fields by moving frequently, and ones who balance between different fields but moves more rarely. However, our main focus in this study is the effect of balance between different fields, and we

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believe that the temporal pattern of mobility is a distinct concept that deserves a more in depth investigation outside the scope of this paper. We do control for the number of firms the artist have moved across reducing the effect of this variable.

Another flipside question arising from our results is then how does the situation look from the artist side? Are mobile artists simply more capable, or are inherently different from more stationary ones? Do they move because voluntarily or by necessity? Talent with superior track records may be more able to move between different types of operations. It has been suggested that past performance drives brokerage ties formation (Lee, 2010), and there are evidence that there is simultaneity in the relationship between mobility and innovative productivity (Hoisl, 2009). While our study controls for this possible driver of mobility, we did not examine their theoretical impact. Therefore, one avenue for future research is to take into account the past performance for talents as a factor that determines current mobility distribution.

On a different, but related track, one of the unique properties of highly creative or innovative people is that they may derive utility not only from monetary rewards, but also from the act of innovating itself. The biggest hurdle for independent artists is marketing to a larger audience. Only the most successful artists are able to cut loose and follow their own creative instinct, the rest are obliged by financial considerations to work on regular contract assignments for the mainline publishers, while intermittently publishing their own independent comics on an irregular schedule, as time and finances permit. These dynamics may cause artists to switch voluntarily back and forth between more creative and humdrum projects, which in actuality is aligned with the firms' needs for different kind of personnel for different projects.

While the scope of this study is most visible in the cultural industries, it is also salient in other, more technological oriented work that requires creativity and novelty. Examples may include the switch of computer programmer work between humdrum company project and participation in open source communities or the allocation of time between corporate and more science oriented objectives for scientists.

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Theoretical and Empirical Contribution

This paper builds on and aims to contribute to the extant literature in several ways. First, in the resource and capabilities based view of the firm, the study hopes to add a deeper insight into the interaction between individual and firm level contributions to innovative capabilities for the firm. Theoretically, the story of talent mobility also adds another dimension to the tension between exploitation and exploration, in which tension reconciliation is done on the individual, instead of on the project or firm level.

Recent studies have started to explore the contingencies for the consequences of mobility, i.e. The type of knowledge transferred (Maliranta et al, 2009; Song et al, 2003; Rosenkopf & Almeida, 2008), the types of firms that can benefit from knowledge transfer (e.g. Almeida et al, 2003), and opposing motives for firms in choosing their location with the tradeoff between absorbing and emitting knowledge spillovers. Our study contributes to this debate regarding contingencies of mobility consequences by exploring the complementarity between firm and individual level capabilities, as well as examining different types of capabilities that can be transferred and implemented in different contexts.

Finally, this study potentially has theoretical and practical implications for the management of creative workers and in managing the tension between creative and economic directives in relevant industries (DeFillippi et al, 2007). In the cases where property rights are strong on at least some salient component of the innovation, if granting freedom to innovator may cost the firm synergy benefits, then giving freedom to work on outside projects/ instituting a freelance structure may attenuate the problem.

Empirically, most studies regarding innovator's mobility utilizes patent and citation data as a way to track mobility. While this methodology is highly effective and has yielded valuable insights on the topic, it does possess several in-built limitations. Using patent data seriously underestimate the intensity of mobility (Lenzi, 2007). Moreover, it includes only patenting inventors, introducing a sample selection bias by design. Using patent data also confounds the inventor and the invention. This

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method only catches transfer of knowledge in innovation/R&D function, while this is not necessarily the case. Maliranta et al (2009) found hiring workers from R&D to non-R&D activities boost productivity, indicating transfer of knowledge to non-R&D functions. Further, mobility studies generally assumes one shot movement, while the existence of highly fluid mobility and quasi-freelance contract work are becoming more relevant in a lot of industry sectors. By tracking individual mobility continuously through projects in which they participate, we hope to contribute in enriching the empirical execution of research on mobility by considering the cumulative effect of mobility, as well as different types of movement between similar or different types of contexts.

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Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Talent Outcomes	6772	69344.38	88072.49	1692	998349.9
Creative Outcome	6772	0.1024808	0.8209053	0	45
Contextual Mobility	6772	0.1056519	0.1403161	0	0.5
Commercial firm	6772	0.4771116	0.4995127	0	1
Time	6772	68.20304	167.1942	0	879
		Talent/Individual Controls			
Non Contextual Mobility (#firms worked in)	6772	2.412041	1.547716	1	8
Talent proportion of firm owned work	6772	0.7089536	0.3564315	0	1
Talent Multirole	6772	0.0937402	0.2637329	0	1
Talent Genre Experience	6772	0.8300453	0.2025311	0	1
Talent Experience	6772	2.425866	2.286971	0	10
Talent Workload	6772	30.77658	28.80882	1	172
		Firm/Title Controls			
Firm IP	6772	0.7025989	0.4571483	0	1
Firm Experience	6283	5.55689	1.833278	0	7.657519
Title Centrality	6772	0.4796804	0.3226543	-0.0001	1
Firm Capacity	6283	1278.578	890.5971	1	2819.5

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Table 2. Pairwise Correlations

	Market Outcome	Creative Outcome	Contextual Mobility	Commercial Orientation	Issue Number	non contextual Mobility	Firm IP	Specialization	Firm Capacity
Market Outcome	1.00								
Creative Outcome	0.02	1.00							
Contextual Mobility	0.06	0.11	1.00						
Commercial Orientation	0.40	-0.05	0.10	1.00					
Issue Number	0.12	0.00	-0.01	0.24	1.00				
Non Contextual mobility	0.15	0.05	0.53	0.07	-0.03	1.00			
Firm IP	0.19	0.00	0.09	0.52	0.19	0.10	1.00		
Specialization	0.30	-0.03	-0.02	0.59	0.18	0.03	0.43	1.00	
Firm Capacity	0.42	-0.05	0.04	0.89	0.17	0.01	0.34	0.46	1.00

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Table 3. Fixed Effects Panel Regression on Creative and Talent Outcomes

VARIABLES	(1)	(2)	(3)	(4)
	Creative Outcome		Economic Outcome	
Creative Outcome			-0.0332**	0.0153
			(0.0147)	(0.0191)
Contextual Mobility	-2.612***	-3.888***	0.0503	0.452***
	(0.783)	(0.944)	(0.0668)	(0.122)
Contextual Mobility* Commercial Orientation		6.752***		-0.676***
		(2.324)		(0.171)
Specialization	5.479**	3.887*	0.326*	0.129
	(2.154)	(2.244)	(0.184)	(0.189)
Firm IP*specialization	-8.577***	-7.109***	-0.306	0.0495
	(2.508)	(2.553)	(0.223)	(0.239)
Issue Number	-0.00122	0.00258	0.00126***	0.00111***
	(0.00716)	(0.00749)	(0.000401)	(0.000399)
sumyearweight	-0.00277***	-0.00263***	0.000406***	0.000528***
	(0.000829)	(0.000826)	(6.16e-05)	(6.86e-05)
Non contextual Mobility	-0.228**	-0.227**	0.0236**	0.0356***
	(0.109)	(0.108)	(0.0116)	(0.0119)
Zero Mobility	-1.426***	-1.060***	-0.104**	-0.0858**
	(0.362)	(0.367)	(0.0419)	(0.0421)
Year Controls	Yes	Yes	Yes	Yes
Talent controls	Yes	Yes	No	No

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Essay 3

Salaryman by Day, Superhero by Night:
Balancing Creative and Economic Needs for Creative Workers

Abstract

This paper explores how artists balance creative and economic considerations across their careers. Among the distinguishing features of the artistic labor market is the fact that artists are mobile, and they derive utility from both pecuniary and non pecuniary rewards. Due to the imbalance between pecuniary and non pecuniary rewards in different types of projects, artists may move back and forth between more creatively rewarding and more monetarily rewarding projects according to their current situation. Using data on US comic-book writers, we show that artists move from creative to stable work when their past economic outcome is low, and move back after they have gathered sufficient funds. Importantly, since individual quality of artists is highly uncertain, explicit signals such as awards are used by firms to hire proven talent, which functions as another driver of mobility. This effect is stronger for firms who focus more on commercial project and has less information in general on the creative potential of artists.

Keywords:

Career Mobility; Contingent and Temporary Work; Creative Workers

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INTRODUCTION

The artistic labour market is characterized by consistent oversupply of talent, despite the persistent lower average wages and the high uncertainty nature of careers in the arts (Caves, 2000; Towse, 2000; Frank & Sohn, 2011). There are differing reasonings provided for this phenomenon, including the cognitive biases caused by the high uncertainty in valuation of creative goods (Lampel et al., 2000). One of the reasons proposed for the persistence of this phenomenon is the argument that artists are thought of as deriving utility from performing creative work, thus they are willing to pay a premium to engage in creative, as opposed to 'routine' work (Frey, 2003, Frank & Sohn, 2011). There are several potential sources to supplement artists' income, including private support (e.g. working spouses, family or friends) or public support (e.g. subsidies, grants and sponsorships). Alternately, artists can hold multiple jobs, supplementing their income by having either other non creative (e.g. working in a bank) or creative related work (e.g. teaching arts) (Throsby, 2007; Frank & Sohn, 2011).

Individually, while artists prefer to concentrate on creative work, inadequate financial returns often force them to supplement creative work with less or non creative activities with other income sources (Throsby, 2007; Towse, 2003). From a nationwide survey of Australian artists in 2000-2001, Throsby and Hollister (2003) found that artists divide their time between creative and non creative work due to insufficient income, and would prefer to do more creative work. Within the realm of creative work itself, not all works are created equal. Within a creative field, artists are often faced by the choice between projects that are more artistically rewarding but less commercially viable, and projects that are more routine but more lucrative or providing stable income (Menger, 1999; Throsby, 2007; Frank & Sohn, 2011). For example, creative writers may prefer writing poetry to short stories, and comic artists may prefer writing their own stories rather than contributing to an existing mainstream book. While artists may prefer to engage in more creative projects, they generally offer less financial return and are higher risk endeavours, and are forced to

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engage in more routine work that may be less artistically rewarding but better paid (Thorsby, 2007).

In this paper, we argue that artists try to balance between their preference for creative work and financial returns by cycling between more creatively rewarding projects and more secure routine art works throughout the length of their careers. This phenomena is consistent with the high mobility of individuals in the industry, and the common nature of contingent/contract work in the arts. While contingent work causes higher uncertainty than stable unemployment, it may also provide higher flexibility in terms of work preferences. An illustrative example comes from Norcliffe & Rendace's (2003) work in the comic book industry. Mainstream publishers are generally geared to producing comics that circulate along established themes of their existing titles, with perhaps a few cautious innovations, while many artists would like to explore more creative, unorthodox ideas. Due to high risk and generally insufficient financial returns, only the most successful independent artists are able to work consistently on their own, while the remaining work on regular contract assignments for mainline publishers, intermittently publishing their own work as time and finances permit (Norcliffe & Rendace , 2003; Gordon, 2002).

Using data on the career and performance of individual US comic book writers, we show that writers do move from more creative to less creative, but stable work when their past outcome is low, and will move back to more creative projects when their outcomes are high. Importantly, awards serve as a signal that moderates this mechanism. Since the contribution of a creative actor to a firm is highly uncertain, explicit signals such as awards are used by firms to hire proven talent.

THEORETICAL DEVELOPMENT

Gradations in Creative Work: The Role of Firm Creativity Orientation and IP allocation

While work in the creative arts may inherently contain some degree of creativity, they may not all be equally artistically rewarding. This is due to the tension

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between economic and artistic considerations common in the arts related industries. On the one hand, creativity is a potential driver of economic outcome, and can be considered a valuable outcome by itself (e.g. Amabile, 1996; Caves, 2000). However, transforming innovation or creativity to economic outcomes often requires a multiplier effect driven by economies of scale and scope (Teece, 1986). The core of the tension lies in the often conflicting drivers of these two factors. Structures that allow efficient operations and the deployment of economies of scale and scope may preclude the possibility of highly novel results, and vice versa, an endeavour to achieve highly creative results runs a high risk of failure and holdup problems (e.g. Gilson et al, 2005).

First, on the firm level, we often see the distinction between large, commercial market oriented firms such as major music labels or mainstream publishers, and smaller 'independent' creativity oriented firms, such as indie movie producers or music labels. Major mainstream firms generally concentrate on more 'popular' arts, which are geared towards a large mass market and relies on downstream assets such as marketing and distribution capabilities. Consequently, on average they produce more minor innovations which generally contains familiar elements. These projects have higher expected economic value, but involve less creatively rewarding work. On the contrary, smaller firms may choose to emphasize creativity/originality and expression, with less regards to mass market considerations, and involve work that is highly rewarding creatively, but less rewarding financially.

Second, within a firm, an important lever in managing the creativity-synergy tension is the allocation of control or property rights. In creative industries, we can observe the variance in the allocation of control and property rights (IP), which is allocated either to the firm or the artist, on the project level. When artists owns the creative project, generally she will have more creative freedom and is entitled to residual rights, including royalties and rights of refusal for development of derivative works or licensing. This creative freedom, however, is usually offset by lower average monetary payoff. While some very creative works gets disproportionately

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high monetary success, on average they fare worse economically than more commercially oriented projects.

On the other hand, when the project is controlled by the firm, artists generally work under the 'work for hire' clause, in which basically they work as an employee paid on a per page rate or other arrangements, while the firm holds the residual rights, resulting in a more stable monetary payoff but less rewarding creative work. Perhaps not surprisingly, these allocation of property rights corresponds to the firm strategy, with creator owned titles generally finding their home in smaller creativity-oriented publishers, and the mainstream publishers accumulating an increasing stable of firm owned portfolio of related titles.

Moving Between Degrees of Creative Work: Balancing cash constraints and Preference for Creative Work

In allocating their time and resources, the artist derives utility from both engaging in creative work and from obtaining extrinsic (economic) compensation. However, she faces a dilemma in which a project that is highly rewarding in creative aspiration may not be as financially rewarding, and vice versa. The financial returns of highly creative projects in which artists have creative freedom are often highly uncertain, and in general have lower expected value to more popular works, especially when they are self published or not backed with large complementary assets. On the other hand, more commercially oriented projects offer a stable rewards that are less dependent on performance uncertainty, but are often less rewarding creatively, especially when the artist have limited control over the creative process. Given the choice, artists would continue to work more on creative projects, but cash constraint may drive them to take more commercial, less creative works (Throsby, 2007). Therefore we argue that artists are more likely to switch from a more creative oriented project to a commercially oriented one when they are confronted by cash constraints due to lower economic performance in previous projects, i.e. moving from projects in which they control the IP to a project owned by a firm, or moving from a creative oriented firm to a commercially oriented firm.

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Proposition 1: The Probability of switching from a creatively oriented project to a commercially oriented project is negatively correlated with the economic performance of previous projects

On the flipside, assuming that artist generally prefer creative work given the satisficing of a certain level of economic income, then we would expect them to switch from a more commercial project to a more creative one if their financial situations permit them to do so. While income provided by more commercial projects are less correlated with individual project success (i.e. per piece pay rate vs royalties), in general there are some correlation between individual project successes and renumeration (which may be in the form of bonuses or other performance-based payment). Therefore, we expect that higher commercial performance increase the probability of artists to switch to more creatively rewarding project i.e. moving from firm controlled work for hire project to their own project, or moving from a commercially oriented firm to a creative oriented firm.

Proposition 2: The Probability of switching from a commercially oriented project to a creative oriented project is positively correlated with the economic performance of previous projects

Awards as a signal for quality and bargaining power

While creative workers may prefer certain modes of work, publishers are also faced with a choice of which creative workers to hire or publish for. In the creative industries, this choice is characterized by both the oversupply of willing labor and the high uncertainty of quality ex ante, or even ex post given the variability of demand and preferences(Caves, 2000). Large firms with a strong commercial orientation and significant complementary assets such as major music labels or mainstream publishers are faced with an oversupply of willing labor, with the priority to obtain a

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certain standard and reliability of work. Due to difficulties distinguishing between the contribution of complementary assets of the firm with the contributions of the artists to the economic outcome, they cannot easily tie artists' compensation to performance (Anand & Galetovic, 2004). Therefore, large commercially oriented firms generally offer stable and comparatively above average returns. While they can select individuals above a certain threshold of quality over time due to oversupply of artists, they may not be able to select exceptionally creative artists whose expected value from creative work exceed the average offer made by the firm.

While on average it is optimal for the commercially oriented firm to take the regular 'above average' artists as their input, major firms who would like to rejuvenate their existing products' creativity or create new creative products would search for highly creative talent. One of the signals that can be employed by firms as an indicator of quality are awards and exceptional successes, and thus award winners are likely to be hired to more high profile projects. This signal is more meaningful for commercially oriented firms, which in general possess less capabilities and thus information in selecting creative talent. Importantly, major commercially oriented firms can afford higher extrinsic rewards to incentivize highly performing artists, which may use it as savings for future period of creative projects. Further, given the revelation of their high quality, they are able to derive some bargaining power to obtain more monetary rewards or creative freedom, even in more commercially oriented firms (Aghion and Tirole, 1993). Since the incentive of the firm to hire these highly creative artists in was to inject a degree of creativity to their product, in this case the motivation of the firm and the artist may be more aligned, and the firm can hire the award winning artist, giving them comparatively more compensation and possibly creative freedom. This type of entry would indicate a different type of entry to the commercial type of firms than the influx of artists that are searching for a stable job. Therefore, we propose that in addition to cash-constrained artists, award winners are also likely to switch from a creative to a commercially oriented firm.

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Proposition 3: Winning an award increases the probability of switching to a commercially oriented firm

RESEARCH DESIGN

Our hypotheses are tested with a fixed-effect panel of comic book writers on United States comics book industry, resulting in a sample size of over 900 writers across more than 11000 comic book issues. We utilize a combination of publicly available data, with the main source obtained from the Comicbase database, a comic book collection software compiling detailed information on comic books. Individual writers are tracked over time by the comic book titles and publishers in which they work. Sales estimate data are compiled from comichron.com, a compilation site which accumulates distributor's publicly reported sales figures since 1996 to present. Analysis is done on a panel of individuals, i.e. each writer (e.g. Alan Moore) would work across several titles over their 'career'.

We measure lagged economic outcome ***(L.REV)*** at the product level by national sales figures of comic issues. By lagged revenue we construct a time weighted average of past projects' income, with older projects weighted less and more recent projects valued more. To measure award given ***(L.AWARD)***, we use the number of last year annual awards given for each creator, which serves as explicit proxies of individual creativity/quality (Gemser et al 2008).

To measure the degree of creativity, we use two alternative categorizations of project types, and then combined the two to obtain a stronger test. First we measure the probability of switching from a writer owned to a firm owned project in a different firm (***TO_FIRM_IP)*** as a proxy of moving from a more creative to a more commercial project, and vice versa the probability of switching from a firm owned to a writer owned project in a different firm ***(TO_WRIT_IP)*** as a proxy of moving from a more commercial to a more creative project. Second, we measure the probability of switching from a creativity oriented firm to a more commercially oriented firm ***(TO_MAJOR)*** as a proxy of moving from a more creative to a more commercial project, and vice versa the probability of switching from a commercial firm owned to

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a creative oriented firm ***(TO_INDIE)*** as a proxy of moving from a more commercial to a more creative project. We measure the degree of commercial orientation by the percentage of the publishers' title that are owned by the firm and the specialization of the firm to a specific genre. We argue that the larger the publishers' portfolio of property rights, the more incentive that they have to exploit synergies, tilting them to more commercially oriented projects. Finally, we measure the probability of switching to a firm owned project in a more commercial firm (***TO_MAJOR_FIRM_IP)*** as a stronger test to moving to a more commercially oriented project, and switching to a personally owned project in a more creativity oriented firm ***(TO_INDIE_WRIT_IP)*** as a test of moving to a more creativity oriented project. We control for writer time variant specific properties (temporal and genre specific experience), as well as title specific control (centrality to the firm).

This method of measuring the probability of switching to different types of projects are done as our basic analysis step. Next, to estimate the length of time that writers spent consistently on more creative or more commercial projects, we conducted a hazard analysis with two types of failure events, i.e. moving to more or less creative projects.

Insert Table 1 about here

RESULTS

Descriptive statistics are presented in table 1. Table 2 reports results for the fixed effect panel logit regression to estimate the probability of switching to different types of project. Models 1,3 and 5 displays the fixed effect panel logit on the probability to switch to a firm owned ***(TO_FIRM_IP),*** to a more commercial firm (***TO_MAJOR)***), and to firm owned projects in commercial firms

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(***TO_MAJOR_FIRM_IP)*** respectively. These equations predict the probability to switch to a more commercial project. The negative and significant coefficient on lagged revenues ***(L.REV)*** supports Proposition 1, and means that artists are more likely to switch to a more commercially oriented project given a lower previous economic performance of their projects. Further, the positive coefficient of lagged awards ***(AWARD)*** shows that writers who are given an award on a previous project is more likely to be hired in a more commercially oriented firm in firm owned projects, in accordance to Proposition 3.

Finally, models 2,4, and 6 describes the opposite event of moving towards a more creative project, as represented by a switch to a writer owned ***(TO_WRIT_IP),*** to a more commercial firm (***TO_INDIE)***), and to writer owned projects in independent firms (***TO_INDIE_WRIT_IP)*** respectively. Consistent with proposition 2, writers are more likely to switch to a more creative oriented project after commercial success in a previous project. Interestingly, when they gain an award on the past commercial project, writers are actually less likely to seek to move to more creative oriented project. This may be because the creative needs are already satisfied (and acknowledged through the award), even in the seemingly commercial oriented project.

Insert Table 2 about here

Table 3 and 4 reports the result of hazard analysis, with failure events being switching to more (TO_INDIE) or less (TO_MAJOR) creative projects, given the current position. We can see results also supports our proposition. The coefficient for very low lagged revenue is larger than one, indicating higher probability to move to

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more commercial projects. It's smaller than one for the hazard rate of moving to more creative projects (Table 4), indicating smaller probability of moving to more creative projects at any one time. Results on having a recent award also supports proposition 3, with recent awardees more probably moving to commercial projects.

Interestingly, while the effect of recent award is positive towards moving to a commercial project, its effect towards moving back to more creative project is theoretically ambiguous. While generally creative artist may prefer to work in more Having an award even in a commercial project may indicate fulfilment of creativity even in a commercial setting, which may disincentivize writers to move back to economically less lucrative projects.

Insert Table 3 & 4 about here

Figure 1 to 4 plots the Survival rates based on the hazard rate regression. Figure 1 and 2 plots the survival rates of switching to more commercial firms and more creative firms for low and high earners respectively, and the results basically illustrates our proposition. High earners are more likely to stay longer on creative projects, while low earners are more likely to stay longer on commercial projects. Figure 3 and 4 plots the survival rates of switching to more commercial firms and more creative firms for recent awardees and non award recipients respectively. Figure 3 illustrates clearly our proposition that recent award recipients are very likely to be hired soon by a commercial firm, while figure 4 plots the ambiguous effect of receiving an award for a commercial project. Further, the hazard analysis reveals that artists that on average achieved receive more awards over their lifetime (Mean_award, table 3 and 4), which we can argue as a rough proxy for creative 'talent', has a higher propensity to move to both directions, indicating a higher demand or possibility for mobility for higher quality talent.

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Insert Figure 1-4 about here

DISCUSSION

Using data from the United States comic book industry, this study aims to investigate how creative actors balance creative and economic considerations across their careers by moving between different types of project. We have argued and shown that writers do move from more creative to less creative, but stable work when their past outcome is low, and will move back to more creative projects when their outcomes are high. Importantly, awards serve as a signal that moderates this mechanism. Since the contribution of a creative actor to a firm is highly uncertain, explicit signals such as awards are used by firms to hire proven talent. This study contributes to the literature on careers and artistic labor market by theoretically and empirically disentangling between individual mobility driven by individual needs for pecuniary and non pecuniary rewards, as opposed to mobility driven by the firm's search for optimal talent. An interesting avenue for further study would be to disentangle the career paths of different types of individuals, e.g. between artists who are highly mobile by need or by demand, as well as artists who prefer (and are able to survive) mostly within one chosen domain.

Naturally, this paper has limitations to its theory and empirics that may lead to further research avenues. First, we do not yet measure bargaining power explicitly. Further analysis exploring the difference of tenure time in commercial projects before switching to more creative projects between high performing and cash seeking writers may help us in untangling the issue. Second, we do not have an explicit measure for wages, which we proxy for here using the projects' economic performance. While this is a reasonable proxy after controlling for IP ownership (which influences the portion of monetary rewards the individual can appropriate from the project) and considering standardized practice within the industry, there

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may be individual variations that are tied to the relative bargaining powers between the individual and the firm. Third, our analysis have not yet taken into account team dynamics and confined to one industry. With respect to our individual level of analysis, we will reserve the inclusion of team level dynamics as outside the scope of this paper. In this paper, we minimize the effect of team level dynamics by limiting our sample to works in which there is only a single writer. Further, tracking each individual allows us to observe the decision in a precise way, giving insight to the microfoundations for the role of creative actors to innovation from the perspective of the artist. Finally, while the scope of this study is most visible in the cultural industries, it is also salient in other, more technological oriented work that requires creativity and novelty. Examples may include the switch of computer programmer work between humdrum company project and participation in open source communities or the allocation of time between corporate and more science oriented objectives for scientists.

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Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
L.Rev	24968	99594.38	108257.8	0	1159083
L.Award	24968	0.062847	0.568685	0	12
Move	24968	0.119032	0.323833	0	1
To Firm IP	24968	0.014585	0.11986	0	1
To Writer IP	24968	0.014064	0.117732	0	1
To Major	24968	0.047541	0.212797	0	1
To Indep	24968	0.045418	0.208224	0	1
Experience (year)	24968	10.26658	9.504995	0	67
Genre Focus	24968	0.614026	0.306604	0	1
Artist-Writer	24968	0.085149	0.279109	0	1
Sum Award	24968	11.01586	43.83971	0	471

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Table 2. Probability to switch between different types of projects and firms

VARIABLES	(1) *TO_FIRM_IP*	(2) *TO_WRIT_IP*	(3) *TO_MAJOR*	(4) *TO_IND*	(5) *TO_MAJOR_FIRM_IP*	(6) *TO_MAJOR_FIRM_IP*
L.REV	-1.13e-05***	3.62e-06***	-9.82e-06***	2.79e-06***	-1.05e-05***	3.52e-06***
	(1.72e-06)	(6.24e-07)	(6.82e-07)	(3.18e-07)	(1.79e-06)	(6.45e-07)
L.AWARD	0.280***	-1.539***	0.116***	-0.189**	0.264***	-1.407**
	(0.0625)	(0.566)	(0.0445)	(0.0909)	(0.0622)	(0.572)
Writer experience controls	Yes	Yes	Yes	Yes	Yes	Yes
Title specific controls	Yes	Yes	Yes	Yes	Yes	Yes

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Table 3. Hazard Ratio to switch to less creative project (TO_MAJOR)

_t	Haz. Ratio	Std. Err.	z	P>z	[95% Conf.	Interval]
Very low past rev	2.002668	.1625257	8.56	0.000	1.708166	2.347945
L.REV	1.079702	.0064246	12.89	0.000	1.067183	1.092368
L.AWARD	1.990023	.2933486	4.67	0.000	1.490675	2.656645
Mean_award	1.82842	.2198978	5.02	0.000	1.444457	2.314445
Genre Focus	.3966319	.073935	-4.96	0.000	.2752439	.5715545
Artist-writer	.3190584	.0823851	-4.42	0.000	.192344	.529251
Experience	1.023724	.0043523	5.52	0.000	1.015229	1.03229

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Table 4. Hazard Ratio to switch to more creative project (TO_INDEP)

_t	Haz. Ratio	Std. Err.	z	P>z	[95% Conf Interval]	
Very low past rev	.8035432	.0554409	-3.17	0.002	.7019079	.919895
L.REV	1.014022	.0029244	4.83	0.000	1.008307	1.01977
L.AWARD	.7828127	.1527999	-1.25	0.210	.5339602	1.147643
Mean_award	1.971672	.1686787	7.94	0.000	1.667299	2.33161
Genre Focus	.2762523	.0311363	-11.41	0.000	.2214968	.3445438
Artist-writer	.7110283	.137087	-1.77	0.077	.4872753	1.037527
Experience	1.008585	.0031272	2.76	0.006	1.002475	1.014733

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Figure 1. Survival rate to switch to less creative project (TO_MAJOR)

(lower dashed line indicates lower earners (Low LREV))

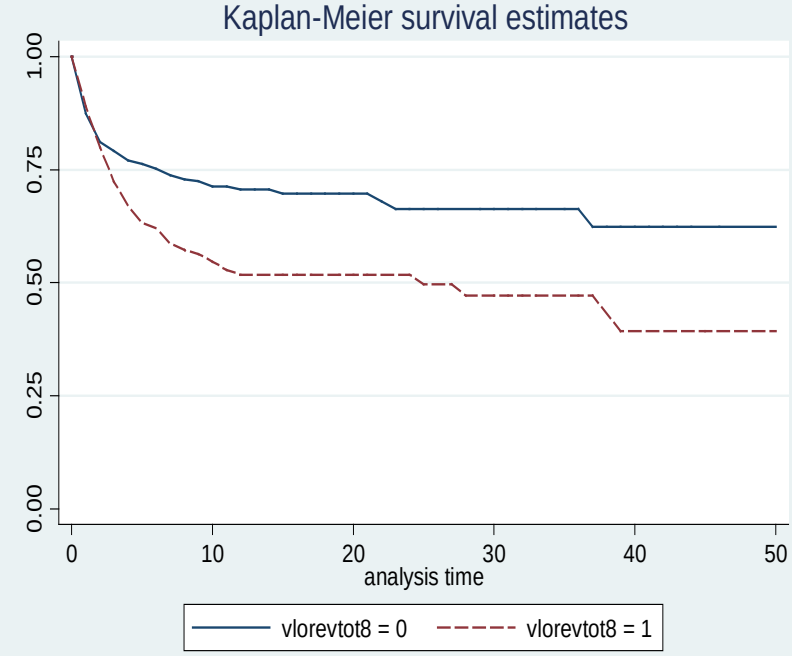

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Figure 2.Survival rate to switch to more creative project (TO_INDEP)

(red top line indicates lower earners (Low LREV))

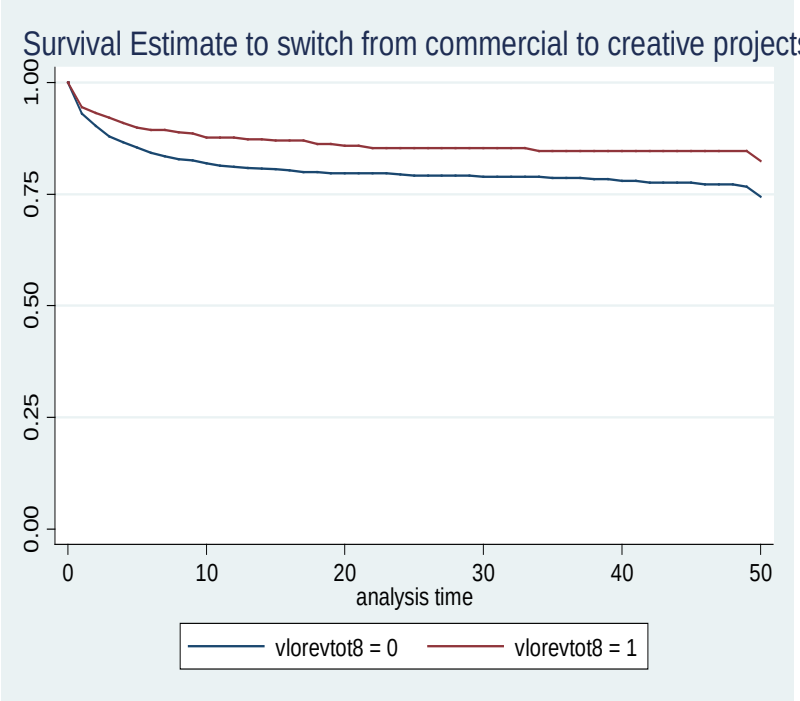

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Figure 3.Survival rate to switch to less creative project (TO_MAJOR)

(red dashed line indicates recent award winners (L.AWARD))

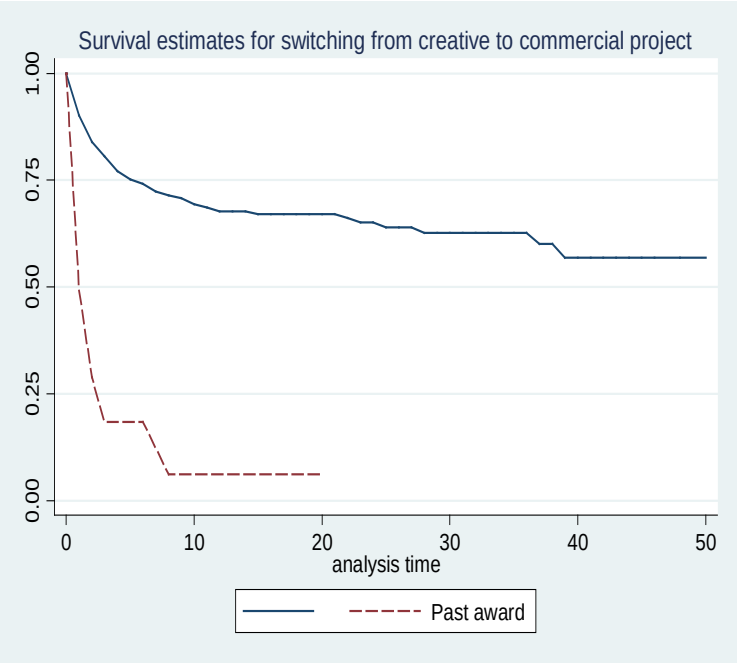

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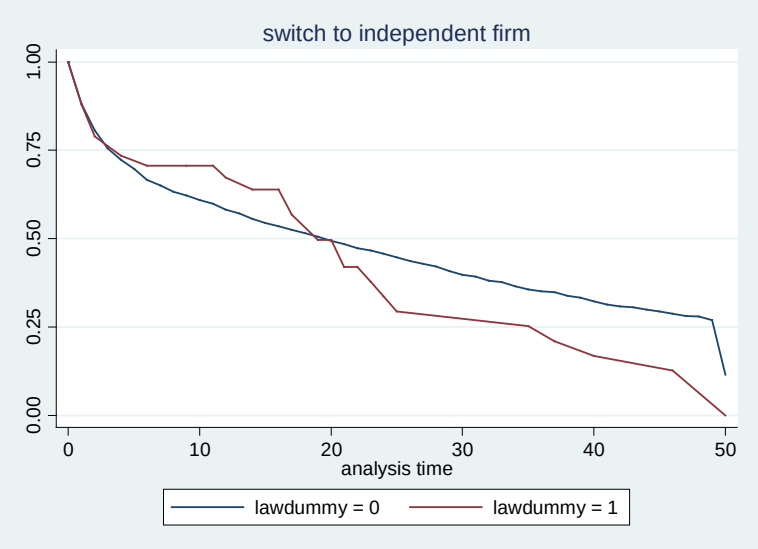
Figure 4.Survival rate to switch to more creative project (TO_INDEP)

(red dashed line indicates recent award winners (L.AWARD))



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