

Innovation of Music

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Abstract:

The paper analyses the innovation process of music goods from an organisational point of view and the effects of digital technology on the allocation of property rights.

It applies the incomplete contracts framework introduced by Grossman/Hart/Moore to the music industry and studies the contractual relationship between artists who create music and labels who promote and distribute it.

In the spirit of Grossman/Hart/Moore, different types of ownership structure are analysed. The result confirms the current allocation of property rights of the innovation as it suggests that music labels, whose role in the production process is indispensable due to their promotion and distribution knowledge, should own the innovation.

However, as digital technology further advances, alternative ways to promote and distribute music develop. Labels become less important and the human capital intensity of the innovation process increases. The paper describes these alternatives and argues that the incumbent ownership structure ceases to be the optimal one. Finally, it discusses new organisational structures of the music industry.

1 Introduction

The impact of new information technologies is a hot topic in economics and business. In particular the issue of digital content is in the spotlight.

This paper analyses the consequences for the music industry of the recent advances in information processing and transmission. It is based on the incomplete contracts framework introduced by Grossman and Hart (1986) and Hart and Moore (1990) and it studies the innovation process of music goods from an organisational point of view.

Artists who create music and record labels who promote and distribute it are the two agents of the model. Obviously, the result of their combined work (a song or album) is not predictable at the moment they agree to cooperate. Therefore the exact nature of the piece of music is ill-defined *ex ante*. The contract between artist and label cannot specify the innovation itself. According to the basic framework they can only contract on the allocation of the property rights of the innovation.

Based on a detailed case study of the music industry we identify its two most essential business areas and relate them to the two relevant parameters of the incomplete contracts model: the relative marginal efficiency and the relative indispensability of the agents.¹ The results of the model application are in line with the incumbent ownership structure since they predict copyright of songs to be owned by the labels. Based on the analysis we conjecture a change in the allocation of property rights and a gradual decrease of the label's power. We also discuss new types of intermediaries in a future music market.

The structure of the paper is as follows. Section 2 takes an in-depth look at the music industry. The historical development of the industry is illustrated and its implications on the market structure. The copyright law, which determines the *ex ante* bargaining power of the agents, and the payment system in the music industry is shortly explained. Moreover, two aspects of the core music business (marketing and distribution) are examined in detail and analysed with respect to the model parameters.

In section 3, the recent advances in information technology and their impact on the industry are briefly explained. As well an outlook of possible future developments and their implications is given. Finally, the consequences for the marketing and the distribution of music are described.

Section 4 is simply the incomplete contracts model and section 5 presents an extension of the standard framework, which introduces two different types

¹compare Grossman and Hart and also Aghion and Tirole

of agents. Section 6 concludes.

2 The Music Industry

Music is one of the bigger consumer markets of the world with a global revenue of around \$40 billion annually.² In most industrialized countries per capita consumption of music products is above \$30 a year. Japanese, Norwegians, Icelanders and U.S. Americans are spending even more than \$50 a year on average.³

2.1 History

The birth of the music industry took place in the early 20th century. The development of a new technology (the gramophone) allowed to re-play music. Records were used to save the information of music on a physical container. Consumers were then able to play them on their gramophone whenever and wherever they liked. Thanks to the mass production of records it became possible to distribute recorded music and offer it for a reasonable price. Because the incumbent companies were able to control the important retail distribution system, today's music industry is characterized by very high barriers to entry.⁴

This makes it an oligopolistic market since it is dominated by five record companies. The so called major labels BMG, EMI, Sony, Universal and Warner have a combined market share of approximately 80%.⁵

Arguably the emergence of the software Napster marked another important date for technology used in the music market. Music had already gone digital in the early 80s when Philips and Sony invented the CD which quickly replaced analog forms of music products such as records and cassettes. Information technology like the development of the MP3 compressing format⁶ by the Fraunhofer Institute and internet broadband data transmission facilitated the exchange of music files among friends, albeit on a very small scale

²data from the Recording Industry Association of America (www.riaa.com)

³year 2000 figures from "The Economist", source: IFPI

⁴see Tschmuck

⁵see also Tschmuck

⁶MP3 (MPEG Audio Layer 3) uses a psycho-acoustic algorithm to reduce the file size by 90%. Quality is reduced as well, although this is hardly noticeable for common consumers.

and certainly in the sense of fair use.⁷ It was only in 1999 that file-sharing networks emerged and their huge success - epitomized by Napster - made the record industry and the public at large realise the technological possibilities of digital music in the networked age.

Therefore, this account distinguishes between the pre-Napster music industry with no or minimal and thus insignificant copying and a post-Napster music industry that features large scale copying of music files using peer-to-peer file sharing networks.

2.2 Industry Structure

A label's role in the pre-Napster music market is basically to find and finance artists, to produce and promote their songs and finally to distribute the product in the retail industry. The label functions as an intermediary between the artist and the final consumer and it services the artist in a number of ways. Two fields seem to stand out:⁸

2.2.1 Marketing

An artist's reputation is obviously very essential for the sales of a record. Naturally, good quality of previous records can build up a favorable reputation for a band since music is an experience good.⁹ Also promotion in any kind of form (TV advertisements, TV show appearances, magazine advertisements, concerts to name a few) improves the sales of an artist's recordings.

Whereas the quality of songs depends mainly on the artist's effort, successful promotion is reliant on the label and its investment. Established artists will already have a certain reputation based on their quality of songs

⁷Copies for private noncommercial purposes are fair use and thus exempted from copyright infringement. Samuelson provides an in-depth analysis of the character and the importance of fair use for society.

⁸Among the other core competences of labels are their function as risk agents (at least for newcomer bands, because they own a portfolio of bands and can pool the risk), their experience in handling the stars' media affairs (a "star agency"), the production of CDs and talent scouting. Although these are certainly necessary, they do not seem to be overly important and the model will focus on marketing and distribution.

⁹Shapiro and Varian describe the properties of information goods. Music for instance is an experience good, because you have to experience it to know what it is and to be able to value it.

and the media promotion of a newly released record will not be all that important, although it should not be underestimated. For newcomer artists though, their own reputation obviously will not have a very high impact on record sales. Here the label's promotion of the artist in the media is the part of marketing that significantly influences sales.

Therefore, seeing the market as a whole, the label's promotional endeavour seems to be more important to sales than the effort of the artist and its effect on quality. However, by no means at all is the artists' investment ineffective. The marginal productivity of their effort varies with the level of their reputation (the quality of their previous work), but in general it tends to be lower than the marginal productivity of the label's investment into promotion.

2.2.2 Distribution

The main way to sell CDs and other music products is through the retail industry. Labels command a very good retail distribution network for their products. Other ways to reach the final consumer such as online shops still seem to account for negligible sales and they are mostly owned and provided with music products by the labels anyway.

There does not seem to be an alternative distribution channel to the retail distribution network, which makes the labels indispensable in the production process of music. Their distribution role is irreplaceable. They have the experience and the corporate connections to run the retail distribution of music products. Artists have no other option than to work with them in order to sell their products to the final customers of the mass market.

2.3 Legal Aspects and Payment

Copyright is the legal tool that arranges property issues between artists who create music, customers who consume it and the intermediary labels.

Obviously, copyright law prohibits customers copying the artist's work unless it is for fair use. However, protection is not the primary goal of the idea of copyright, which goes back to the writing of the U.S. constitution in 1787. Instead, the intention is "to promote the progress of science and useful

arts”¹⁰ and therefore a temporary monopoly can be granted to the innovator (to motivate him). The duration of copyright depends on the country - there are differences in U.S. and EU legislation - and the exact work, but it is usually between 30 and 100 years.

Very relevant for the music industry is the ”work for hire” aspect of the copyright law: Copyright will not be owned by the artist, if - by and large - the innovation has been commissioned by a company. Examples include a journalist whose articles are owned by the newspaper that employs him, whereas the contribution of a freelance writer remains his property (due to the ”work for hire”).¹¹

Although the contract situation seems less clear in the music market, songs are generally declared ”works for hire” and copyrights are owned by the labels. Only in some rare cases with highly successful artists labels agreed that the ownership of the copyrights will revert to the artists after a certain period.¹²

The payment scheme of the industry is based on royalties. Artists receive a certain percentage of the revenue their songs generate. The initial rate is between 7-15% (depending on the reputation of the artist). However, a number of deductions make the final royalty percentage the artist receives (for instance 12%) go down to about 3% of sales revenue.¹³

Obviously, this is not the major piece of the profit cake.

2.4 Summary

Generally property rights of music products are allocated to the labels. The ”work for hire” clause of the copyright law grants them ownership of the innovation and it gives them a good (ex ante) bargaining position.

¹⁰www.riaa.com

¹¹see King in Wired

¹²according to Krasilovsky and Shemel which is an excellent account of the music business.

¹³3% deducted since the artist has to pay the producer’s royalty out of his own royalty. 25% reduction for packaging (the artist’s royalty is based solely on the recording itself, not on the artwork, wrapping or sales appeal added on by the packaging ingenuity of the label). 15% are reduced for free goods (labels do not pay artist royalties on records that are given away to distributors for promotional purposes (despite the name they are sold to consumers). 20% reduction for CDs (labels claim they need to get reimbursed for their research and development costs for new technology). 35% reduction for reserves (artists are not paid royalties on returned (unsold) records and therefore a portion of royalties is held back as a reserve against these returns): $(12\%-3\%)*0.75*0.85*0.8*0.65=2.98\%$ (example from Krasilovsky and Shemel)

The analysis of marketing and distribution in the music industry showed that relative marginal productivity and indispensability are in favor of the labels, because of their more efficient marketing and their distribution network. Therefore the incomplete contracts situation calls for the same ownership structure as the one already in place. The distribution of profits between artists and labels only confirms this balance of power.

3 Post-Napster Scenario

3.1 Technological Change and Future Developments

At the moment the music market is getting thoroughly restructured. On behalf of the major labels the Recording Industry Association of America (RIAA) sued Napster for infringing copyrights. The verdict returned was "guilty" and its centralised file service was forced to shut down in July 2001. However, other peer-to-peer file trading software (like Gnutella, FastTrack (consisting of MusicCity, Kazaa, Morpheus) which in contrast to Napster operate without a central file server) became increasingly popular. In fact, the number of people typically logged on to the FastTrack network recently surpassed Napster's record of 1.57 million users in February 2001.¹⁴ Lawsuits of the RIAA against some of the Napster offshoots are ongoing, but it doesn't seem very likely that they can be stopped for good.

As explained earlier technological advances had a deep impact on the industry and further developments will gradually keep on changing it. The amount of transmittable data and the density of high-speed internet connections in the population is bound to further increase significantly in the near future.¹⁵ Whereas today the download of one song is convenient (in terms of time and connection costs) only for users with cable modems or digital subscriber lines, these numbers certainly increase and downloading MegaByte-files should be common very soon for the broad public.

These advances in transmission technology will allow the addition of supplements to the song itself. Parts of the CD cover and its information about the album/song (like the lyrics) could be added to the music file, thus shifting more and more information from the physical containers of the product (the disk itself, the box and the booklet) to a digital-only form.

¹⁴see Richtel in New York Times

¹⁵A recent Jupiter Research report forecasts that by 2007 44% of European households with internet will have a broadband connection compared to 3% at the end of 2001

Whereas today many consumers still prefer a CD (definitely the more complete product) to a file because of its design, collectability and convenience, in the future all information contained in a CD might be visualised digitally and there might even be more features added to that product that are not feasible with a CD (virtual disc or band interviews on video for instance).

3.2 Marketing

The internet offers artists new and efficient ways to promote themselves compared to the conventional marketing.

Established artists might use their own website, newsgroups and mailing lists to update their fans about new products. In this way they can easily inform and service their already existing user base. These customers already experienced the artist's music and are convinced of his quality. The necessary update to inform them about new products is very cost-efficient.

Newcomers are helped by peer-to-peer file sharing networks where potential consumers can try and experience their products, before eventually buying them as a CD if they like it. The P2P networks serve as information transmission channels for these artists. The widespread and hardly stoppable use of the networks provides an informational externality that increases the reach of newcomer music that was not possible before.¹⁶ The loss of control over rewarded distribution is happily given up in exchange for the exponential increase in publicity.¹⁷

3.3 Distribution

The labels' traditional retail distribution channels become less important and will eventually fade away when music is distributed entirely electronically.

¹⁶Duchene and Waelbroeck conclude that distribution in a file sharing environment offers large advantages to new artists. The P2P network functions as an information diffusion technology. Consumers with high marginal willingness to pay for a quality product will buy the CD - after testing the song as an MP3 for free. A more general account of this positive network effect of copying is Shy and Thisse.

¹⁷Also market studies seem to confirm this as a Jupiter report relates the use of Napster to increased music purchases. (Jupiter 2000)

Firstly, music products can be sold in an online shop, which can be set up comparatively easily. Secondly, internet-related distribution technologies (for instance direct distribution of MP3 files) emerge.

Still, as long as there is a significant quality difference¹⁸ between an original music product (CD) and a digital copy there will be demand for the original product and its way of distribution, although it is more expensive. Thus, labels will by and large maintain distribution control over physical music products for quite a while.

However, when it becomes technologically feasible to provide all the CD's information in digital form that is convenient to use then the traditional distribution system will cease to be useful.

3.4 Summary

The migration process from label ownership to artist ownership will certainly not happen from one day to the next.

First of all it depends on the technological development as explained above. Since the CD clearly offers a quality advantage to many users compared to the MP3 file alone, the retail distribution system - the labels' stronghold - is necessary. In the short term it will only be challenged by online CD sales.

Moreover, artists need to recognize their option. They might have strong personal ties with agents of the labels and might prefer the incumbent situation. They also might shy away from the transaction costs of starting a business of their own, which would demand some entrepreneurial involvement.

Figure 1 plots the relative productivity against the relative indispensability of artists and labels. It visualises the pre-Napster situation (generally in label ownership territory) and the technology-induced movement towards artist ownership.

In the advanced stage of the model, A will own the innovation and in theory would employ workers for the various tasks internet-based marketing and distribution require (web services (design and maintenance of a web site, running an online shop (CD sales)), promotion services (concert agency), art design of booklet and cover). These services are not particular and workers can be replaced on the spot market.

¹⁸again caused by the network effect and users who prefer high quality products.

However in reality artists would rarely run their business entirely alone, instead asking intermediaries to provide them with the necessary services (see above). Again, these intermediaries are easily replaceable as the markets for web services, promotion services and art design can be expected to be rather competitive.

These new intermediaries in the music industry might even be the old ones if the labels restructure and refocus their business. Nonetheless, they would face tougher competition than before since agents from other markets (IT services, promotion agencies) can enter the market and their indispensability in the industry is lost.

Conjecture 1 *1) Labels are getting more and more dispensable as their retail distribution network becomes replaceable due to alternative ways of distribution.*

Conjecture 2 *2) Relative marginal productivity is in favor of the artists, because they are able to promote their products more efficiently themselves.*

4 The Model

There are two agents in the model, the artist A and the label L . Combined they produce a piece of music, the innovation. Both can improve the value of the innovation by investing in their respective human capital. However, once made - the investments are to a certain degree specific to that very relationship. The minimum level of effort is normalised to be 0. This level already contains basic effort out of artistic curiosity, willingness to express and fun.¹⁹ The economic relationship between artist and label lasts for two periods: at date 0 the agents choose their respective investment level (denoted as i_A and i_L) and at date 1 they produce.

The production function $v(i_A, i_L, a)$ is characterized by decreasing marginal returns of the agents' inputs. If the agents cannot agree to produce together, one agent only receives his outside option $v(i, 0)$ and the other agent produces alone $v(j, a)$. Moreover, the investments of artist and label are complements. The marginal efficiencies of the two agents can be different according to their

¹⁹see also Aghion and Tirole's concept of researchers' intellectual curiosity

respective productivity. The cost of both investments is $c(i)$ and they are assumed to be linear: $c(i) = i$

Moreover, the importance of an agent as a trading partner influences the division of the ex post payoff. If one of the parties is indispensable in the production process, then he cannot be replaced by an outsider from the market. The overall payoff drops to zero without his participation. On the other hand if an agent can be fully replaced by an outsider he is regarded as dispensable and there is no negative effect on the total ex post payoff, when this agent is removed. Let λ then denote an agent's importance as a trading partner where $0 \leq \lambda \leq 1$ and high values of λ mean high dispensability of an agent. If an agent is to be replaced in the production process, his investment i_j is substituted with his dispensability λ_j in the production function: $v(i_A, \lambda_L, a)$.

Assumption 1: $i_j \in [0, \infty]$ for $j = A, L$

Assumption 2: $c(i) = i$

Assumption 3: $v(i_A, i_L, a) \geq 0$ and $v(i_j, 0) = 0$ for $j = A, L$

v is twice differentiable in i : $\frac{\partial v}{\partial i} > 0$, $\frac{\partial^2 v}{\partial i^2} < 0$

$$\frac{\partial^2 v}{\partial i_A \partial i_L} > 0$$

Assumption 4: $0 \leq \lambda_j \leq 1$ for $j = A, L$
 $v(i_A, \lambda_L, a) \leq v(i_A, i_L, a)$

and accordingly for the case with i_L and λ_A

Assumption 5: $\frac{\partial v(i_L, \lambda_A, a)}{\partial i_L} = 0$ if $\lambda_A = 0$
 $\frac{\partial v(i_L, \lambda_A, a)}{\partial i_L} = 1$ if $\lambda_A = 1$

and accordingly for the case with i_A and λ_L

As the exact nature of the innovation is ill defined ex ante, the two agents cannot write a contract for the delivery of a specific innovation.²⁰ Moreover,

²⁰In fact, ex ante contracts can only be written on the allocation of ownership of the innovation.

the investment effort might be observable, but it is not verifiable. Thus, there is no guarantee the trading partner will provide his investment for the final production. If one party holds up and they do not produce the innovation together, their total payoff is significantly lower.

The total ex post surplus is then named $v_{coop} = v(i_A, i_L, a)$ if both agents cooperate and it is denoted $v_{non-coop} = v(i_A, a) + v(i_L, 0)$ (or $v_{non-coop} = v(i_A, 0) + v(i_L, a)$) if the agents do not cooperate and then one of them has to settle on his outside option. Based on the properties of the production function v it is assumed that there are always ex post gains from trade.

$$v_{coop}(i_A, i_L, a) - v_{non-coop} > 0 \quad (1)$$

Although a first best solution cannot be achieved in the initial contract because of the ex ante uncertainty about the quality of the innovation, the parties can be expected to realize the gains from trade by negotiating ex post. At the time of bargaining their investments are observable to both agents and according to the Nash bargaining solution they split the potential gains from trade equally.²¹

4.1 First-best choice of investments

the joint surplus maximising investment is reached when the two agents cooperate and thus coordinate their actions ex ante. The first order condition for v is then as follows:

$$\frac{\partial v(i_L^*, i_A^*)}{\partial i_L^*} = 1 \quad \text{and} \quad \frac{\partial v(i_L^*, i_A^*)}{\partial i_A^*} = 1 \quad (2)$$

²¹see Rubinstein. The bargaining process is assumed to be costless and based on perfect information about the investments.

4.2 Second-best choice of investments

Whereas in the real incomplete contracts world the two agents are not able to choose their investment level in a coordinated way. So in all likelihood

they will not invest the first best investment level i_A^* or i_L^* at date 0, but then will bargain over the ex post gains from trade at date 1 and split them 50:50. However, the agents foresee that part of their generated surplus is expropriated in the bargaining process, which leads to hold up behaviour. The results of the bargaining process and the according incentives to invest are given below for the two ownership structures discussed.

4.3 Label ownership

If ownership of the innovation got allocated to the label, then the artist would loose most interest to invest as the entire monetary return goes to the label. Then their access to the asset is denoted as 0, whereas the labels' is a .

$$\Pi_L = v(i_L, \lambda_A, a) + \frac{1}{2}(v(i_A, i_L, a) - (v(i_L, \lambda_A, a) + v(i_A, 0))) - c(i_L)$$

$$\Pi_L = \frac{1}{2}v(i_A, i_L, a) + \frac{1}{2}v(i_L, \lambda_A, a) - \frac{1}{2}v(i_A, 0) - c(i_L) \quad (3)$$

$$\Pi_A = v(i_A, 0) + \frac{1}{2}(v(i_A, i_L, a) - (v(i_L, \lambda_A, a) + v(i_A, \lambda_L, 0))) - c(i_A)$$

$$\Pi_A = \frac{1}{2}v(i_A, i_L, a) - \frac{1}{2}v(i_L, \lambda_A, a) + \frac{1}{2}v(i_A, 0) - c(i_A) \quad (4)$$

Differentiating Π_L and Π_A with respect to i_L and i_A yields the following incentives to invest:

$$\frac{\partial \Pi_L}{\partial i_L} = \frac{1}{2} \frac{\partial v(i_L, i_A, a)}{\partial i_L} + \frac{1}{2} \frac{\partial v(i_L, \lambda_A, a)}{\partial i_L} - 1 = 0 \quad (5)$$

$$\frac{\partial \Pi_A}{\partial i_A} = \frac{1}{2} \frac{\partial v(i_L, i_A, a)}{\partial i_A} + \frac{1}{2} \frac{\partial v(i_A, 0)}{\partial i_A} - 1 = 0$$

If he does not get anything from the overall surplus, the artist will not have any incentives to invest here. His optimal investment level is determined only by his bargaining extraction:

$$\frac{\partial \Pi_A}{\partial i_A} = \frac{1}{2} \frac{\partial v(i_L, i_A, a)}{\partial i_A} - 1 = 0 \quad (6)$$

The total surplus in L-ownership is the sum of Π_L and Π_A :

$$\Pi_{L\text{-ownership}} = v(i_A, i_L, a) - c(i_L) - c(i_A)$$

4.4 Artist ownership

If instead the artist gets the ownership of the innovation, then it is the label that does not have strong incentives to invest:

$$\Pi_L = v(i_L, 0) + \frac{1}{2}(v(i_A, i_L, a) - (v(i_L, 0) + v(i_A, \lambda_L, a))) - c(i_L)$$

$$\Pi_L = \frac{1}{2}v(i_A, i_L, a) + \frac{1}{2}v(i_L, 0) - \frac{1}{2}v(i_A, \lambda_L, a) - c(i_L) \quad (7)$$

$$\Pi_A = v(i_A, \lambda_L, a) + \frac{1}{2}(v(i_A, i_L, a) - (v(i_L, 0) + v(i_A, \lambda_L, a))) - c(i_L)$$

$$\Pi_A = \frac{1}{2}v(i_A, i_L, a) - \frac{1}{2}v(i_L, 0) + \frac{1}{2}v(i_A, \lambda_L, a) - c(i_L) \quad (8)$$

Differentiating Π_L and Π_A with respect to i_L and i_A yields the following incentives to invest:

$$\frac{\partial \Pi_L}{\partial i_L} = \frac{1}{2} \frac{\partial v(i_L, i_A, a)}{\partial i_L} + \frac{1}{2} \frac{\partial v(i_L, 0)}{\partial i_L} - 1 = 0$$

$$\frac{\partial \Pi_A}{\partial i_A} = \frac{1}{2} \frac{\partial v(i_L, i_A, a)}{\partial i_A} + \frac{1}{2} \frac{\partial v(i_A, \lambda_L, a)}{\partial i_A} - 1 = 0 \quad (9)$$

Again, lack of property rights of the innovation and thus no profit leads to the label investing only at the base level (determined by the bargaining extraction):

$$\frac{\partial \Pi_L}{\partial i_L} = \frac{1}{2} \frac{\partial v(i_L, i_A, a)}{\partial i_L} - 1 = 0 \quad (10)$$

The total surplus in A-ownership is the sum of Π_L and Π_A :

$$\Pi_{A\text{-ownership}} = v(i_A, i_L, a) - c(i_L) - c(i_A)$$

4.5 Analysis of the optimal ownership structure

To decide which ownership type is more efficient, the two total surpluses of label and artist ownership are compared. In the general case, the surplus will be:

$$\Pi = v(i_A, i_L, a) - c(i_L) - c(i_A) \quad (11)$$

However, from the above analysis we know that the investment levels of artist and label depend on the ownership type: Getting a return only from the bargaining means the agent will not invest more than his base level, denoted as $i(0)$. If the ownership right is instead allocated to him, he has good incentives to invest, but his investment level depends on the importance of his trading partner - denoted as $i(\lambda)$.

We can therefore express the surplus in the L-ownership case as

$$\Pi_{L-ownership} = v(i_A(0), i_L(\lambda_A), a) - c(i_L(\lambda_A)) - c(i_A(0)) \quad (12)$$

and the one in case of artist ownership as

$$\Pi_{A-ownership} = v(i_A(\lambda_L), i_L(0), a) - c(i_A(\lambda_L)) - c(i_L(0)) \quad (13)$$

Obviously L-ownership is optimal, if $\Pi_{L-ownership} > \Pi_{A-ownership}$.

4.5.1 Discussion of λ

It follows from equation (5) that the owner of the innovation will invest more if his trading partner is more dispensable. In the extreme case of complete replaceability of one agent the incentives for the other one will not be less than in the cooperation situation, since there is no threat of expropriation.

However, if one agent cannot be replaced easily, his indispensability significantly reduces the incentives to invest of the other agent. In fact, if an agent is unique and thus irreplaceable, his partner's incentives to invest will only be at the base level.

Following from equation (12), it is straightforward that the overall surplus in L-ownership increases in the investment levels of A and of L. Since $i_A(0)$ is constant and $i_L(\lambda_A)$ increases in λ_A , it follows that the overall surplus increases in λ_A .

Thus:

$$\frac{\partial \Pi_{L-ownership}}{\partial \lambda_A} > 0$$

Conversely, for A-ownership $\frac{\partial \Pi_{A-ownership}}{\partial \lambda_L} > 0$ holds true.

4.5.2 Discussion of Productivity

The marginal efficiency of each agent's investment influences the question of ownership as well. The overall surplus of an ownership structure is higher when the allocation type provides more incentives to invest for the agent whose marginal efficiency of investment is higher - *ceteris paribus* - than the other agent's.

Thus, label ownership would be more efficient, if their marginal productivity is larger than the artist's (assumed everything else is the same) and vice versa.

5 Model Extension

As an extension of the basic model we further specify the role of agent A. We introduce two different types of artists: an established artist who already published music and has a certain reputation and a newcomer artist who is just entering the business and does not have any reputation yet. Moreover, the established artist has some initial cash endowment thanks to his previous work, whereas the newcomer artist does not have any cash at all.

5.1 Pre-Napster Effect

By and large there is not much change in the model outcome for an established artist. He might have more bargaining power in the pre-Napster scenario than the normal artist of the basic model, though. His fame and reputation might even be so important that they offset the label's advantageous distribution position. Then possibly the property rights of his music products revert to the artist.²²

For the newcomers the situation is far clearer. Without any reputation to build on these artists have no other choice but to rely on a label to promote and distribute their music in order to sell. Obviously, the property right of the innovation gets allocated to the label.

²²assuming the copyright initially belonged to the label due to the "work for hire" clause

5.2 Post-Napster Effect

Again, the higher reputation of an established artist will make it more likely that the artist retains the ownership rights of the innovation compared to the situation of the basic model. Also, very well known artists may be the first ones who start to promote and distribute their products without a label.

However, the situation for newcomer artists looks significantly different. Although file sharing networks provide them with a low cost opportunity to promote their recordings (without the labels), their marketing possibilities are certainly restricted because only a very limited amount of consumers (friends and relatives) knows them and the competition from other artists is very high.

Additionally, the lack of a cash endowment will keep the newcomer artist from compensating the label in case they have indeed better incentives to invest according to the described change of parameters λ and the relative marginal productivity. In order to get the property rights they would have to buy out the labels by paying their ex ante outside option $v(i_L, a)$. Since they are financially unable to compensate the labels this would lead to the labels still having the property right and thus to a situation of inefficient underinvestment.

5.3 Mentoring

This potentially inefficient situation might be avoided if a third agent steps in and provides cash and reputation for the newcomer artist.²³

Both can be done by established artists assumed they have some sort of entrepreneurial spirit (to invest their capital) and faith in the success of the newcomer (to credibly promote them with their own reputation). They would function like a mentor, adopting a young artist they particularly like or one who they regard as very promising. Obviously, the established artist would pick a newcomer of his own artistic field who he can credibly recommend and promote. He would finance the newcomers financial needs of setting up an own business and compensating the label with its ex ante outside option. Generally, he would then act as a venture capitalist, an outside agent who finances, believes in and promotes the project of the newcomer.

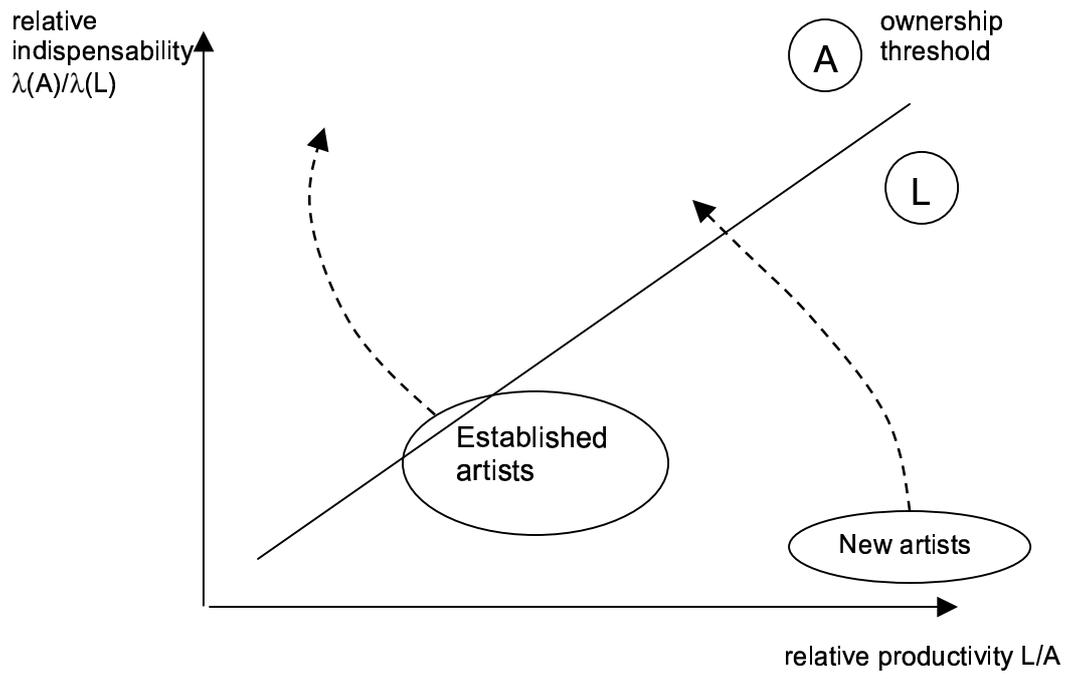
²³the later is not actually relevant in terms of efficiency

6 Conclusions

The incomplete contracts framework appears to be very useful to understand the current ownership structure in the music market. Based on a detailed case study of the industry the findings of the model are in line with reality. The recent and future developments of technology in information processing and transmission suggest that the relevant parameters of the model could be affected. Therefore the paper questions whether the current industry structure of the music market - emerged and established over the course of a century - still offers the most efficient way to provide music innovations. If the human capital intensity of the innovation process of music is high enough, then artists should own the music product.

This paper attempts to shed some new light on the highly interesting field of digital content in the networked age. It can only be regarded as a beginning. A formal extension of the model to explain the contractual relationships between artists, mentors and labels (or new intermediaries) will be the logical next step. Some issues have not been considered in this work (a payment or reward model, for instance). They remain for future research.

Figure 1:



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