
# Pricing (and Selling) Copyrighted Goods on a Digital Support:

# The Case of Magazine Press

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## Abstract

This paper analyses the economic issues raised by the emergence of a potentially disruptive innovative support such as Reading Tablets on Press Magazine's market. Different studies have shown that the impact of digitalization is eventually stronger when coupled with a technological innovation on the support side. Moving from this set up, we will analyse the possible pricing strategies for digital magazines, considering the peculiarities of these good in terms of copyright issues, cost structure and distribution system.

A switch from a "paper press model" to an "hybrid digital press model" may generate highly positive externalities of the kind often referred to as "network effects". Moreover, new market opportunities may emerge for media brands (publishers and distributors) in terms of bundling and differentiating contents. But what would be the role of media brands in the digital market? What would be the relative market power of economic agents along the value chain? Finally, what would be the optimal pricing and strategy to "go digital"? Drawing on data from French press magazine market, we will tackle these questions developing a model that takes in account both the bargaining issues along the value chain and the cross-externalities on the roll-out of reading tablets.

We infer that the adoption of the new support will generate positive network externalities if hardware producers, media publishers and distributors cooperate to favor the roll-out of the support. By cooperating, agents through the media value chain may eventually determine if a target consumer will adopt the technology, thus determining the size of the potential digital press market. We will try to determine under which pricing hypothesis editors and distributors will support the subsidy's cost of the roll-out. We further analyse the impacts of their strategy on the other key operators of the industry. The enforcement of Copyright and the standardization of the formats of digital contents become crucial to understand who will benefit, in fine, from the deployment of the support. The new role of media brands and the responses of the legislator through the deployment's process are also critical since, by determining the structure of the market along the value chain, they will either accelerate or slow down the creation of the digital market.

Keywords: bundling, copyright, publishing brands, indirect network effects, media economics, digital magazine, bargaining, technology adoption.

# Index

# Introduction

Media industry, on the supply side, depends mainly on authors, on publishers, and on the development of technology in media supports.

Magazines are bundles of articles subject to copyright, edited and published on a regular schedule under a publishing brand. They are generally financed by advertising, by a purchase price and by pre-paid subscriptions. The utility of this good is composed by expressions of various kinds (texts, photos, covered by copyrights) gathered under a publishing brand coupled with a support allowing for its diffusion.

Digitalization (Varian, Shapiro 1998) of copyrighted goods have had a growing impact on media industry since it allows for a much greater circulation of contents, the drawback being the creation of new challenges for legal institutions such as massive piracy and Creative Commons, resulting in an exponential increase of IP enforcement costs.

Moreover the introduction of reading tablets, which are conceived as a dedicated support for written or generally visual contents, allows for much greater bundling possibilities, thus raising a number of strategic questions for Media Publishers and distributors. Which type of bundle? Which brand are customers going to subscribe to? What would be the optimal pricing of a digital bundle? Is cannibalization of the paper market ineluctable or can we avoid it?

Finally, the “switch” from a traditional publishing model, where the key success factor is an accurate prediction of the number of single copies sold, to an “hybrid digital press model”, slightly more centered on acquisition and retention of subscribers, imposes a reflection on the changing role and the future value of media brands in the digital era.

The objective of this paper is to address these questions by analysing the interactions between agents in the “hybrid digital press” value chain. In order to do so we outline a competitive game of optimal pricing with three agents, namely: tablets producers, publishing brands and distributors, facing the decision to offer and price a digital bundle.

In the next section of this paper, we analyse the original characteristics of digital magazines and the “hybrid digital press model”. We will then proceed by outlining the model and we will finally relate the model with the roll-out of reading tablets, since it is a key variable in order to predict the size of the digital magazines’ market. The conclusive section will tackle copyright issues and the role of publishing brands in the digital magazine press.

# The Pricing of Digital Magazines

## 1. Publishing industry and digitalization

Publishing was probably invented around 3 800 b.C. by the Assyrian, who were the first to use a support, the clay tablet, allowing for the diffusion of written texts. Technology innovations have consequently increased the utility of the publishing industry by allowing to store contents on smaller and lighter supports and by reducing the duplication time and costs of contents. These two characteristics, coupled with transportation, are the main constraints to the diffusion of articles.

Digitalization of press magazines, radically changes the business model of the industry by relaxing both the space, the copying and the distribution constraints.

The zeroing of marginal costs of an additional copy of a digital magazine allows for a number of discrimination's opportunities such as bundling of contents, versioning of articles and ATAWAD[1] subscription offers. There is evidence that when the marginal cost of a good is close to zero, a mixed bundling strategy[2] is a profit maximizing strategy for a publishing firm unless consumers have a very low degree of preference for digital goods or the gap between paper and digital advertising revenues is very high (Venkatesh, R. and Chatterjee, R. 2006).

Moreover, economists have shown that the adoption of binary code as the universal standard for globalized communications generates highly positive externalities often referred to in terms of network effects (Liebowitz, Margolis, 2002).

A disruptive innovation on the support side, such as a dedicated reading device, may further amplify these effects by raising the degree of preferences for digital contents and by introducing positive network effects in the business model of Media Brands. Positive network effects arise when the consumer utility of using a product or service increases with the number of users of that product or service. The typical example of this phenomenon is telephone network, which increases its value whenever a new connection is added. Consumption benefits may also be indirect, in markets where a large customers' network leads to increases in complementary products and services, which in turn, lead to increased consumer utility (Farrell and Saloner 1985; Katz and Shapiro 1985; 1986).

The compensation for these potential benefits is a marketing effort that may become a sunk cost if the

[1] Any Time, AnyWhere, Any Device.
2 For a publishing brand a mixed bundling strategy is a marketing strategy in which the firm proposes both the paper copy, the digital copy and the possibility of buying only some digital articles.

technology is not adopted by a sufficiently large share of the population or if too many non-compatible standards emerge in the market[3] (Epstein 2005).

Digitalization may also introduce non-negligible drawbacks in the industry, coming from the inequitable allocation of welfare along the value chain, as we will see in the following sections.

Finally, the concepts of copyright and author's Intellectual Property are particularly under pressure because the shift from a physical to a digital support allows for easier counterfeiting of contents, thus increasing the costs of enforcing these rights, up to the point that they exceed the benefits of enforcement. One way to protect IP would be the creation of non-compatibles, proprietary standards and environments such as kindle from Amazon.com or i.Pad from Apple. Although "walled gardens" may be more efficient in protecting and valuing copyrighted goods, thus encouraging publishers to go digital, they present intrinsic risks for the whole cultural industry. Platforms' producers may gain a dominant position and become the modern "censorship authorities" of media contents.[4]

## 2. Digital press magazine: characteristics

A magazine is a (distribution) platform bundling a collection of selected separate articles together with ads. The bundle is identified through a publishing brand which has specific functions: it signals and it connotes, it adds meaning for the consumer (Bomsel, 2011).

It is a unique product subject to copyright both relatively to its contents (articles) and its final output (the bundle formatted and published). Each publishing brand may thus be considered as a monopolist on a specific population target. Thus:

1. The publisher will set a monopolistic price for his bundle to maximize his profits.
2. Profits will depend mainly on circulation, costs and advertising revenues (the latter depending on circulation as well)

On the demand side, the utility of a magazine for consumers is uncertain and unpredictable ex-ante. A magazine is what we call an experience good (Nelson 1970)[5], since an utility evaluation can be made only after the consumption of the good. Moreover, publishing is a cultural industry (Baumol, William J. and William G. 1966), strictly dependant on the human capital accumulated by journalists and authors in their articles, and characterised by few peculiarities:

[3] An example of successful deployment of a new technology enhancing positive network externalities for the producers of complementary goods is the DVD standard. The new technology was a very good opportunity both for hardware producers and for the Hollywood Majors, still the deployment was about two fail because of the two standards (DVD and BlueRay) competing for the mass market. The cooperation between agents in the movie value chain was crucial to develop the market and make it an incredible opportunity.

[4] A good example of this issue is represented by Google. The largely dominant search engine makes a large share of his 30 B$ by selling keywords to private companies. Basically they decide what you should, or should not find whenever you search for a specific word. Censorship through Catholic inquisition was far less restrictive.

5 See Nelson, P., Information and Consumer Behavior (1970)

- Uncertainty on value and quality of goods
- Infinite variety, which makes goods hard to compare.
- High concentration in traded products. A major part of sales is in best-sellers or block-busters.
- Short life cycle. Most items are sold shortly after introduction.
- High fixed cost. There is high cost before introduction. Making a magazine is much more expensive than producing another copy6.

These characteristics entails high transactions costs (Williamson, Oliver, 1981). Publishing Brands and distributive channels acts cooperatively to minimize these costs. The former signals a bundle and invest in marketing to promote both his brand and the bundles he offers. The latter is a platform that on one side drives bundles' supply and on the other side reduces customers research costs.

The consequence of these peculiarities is a market structure characterised as follows:

- Publishing: few major brands (platforms) proposing their magazines (bundles), the rest of the market consisting of a large number of brands operating on niche markets.
- Distribution: atomized platforms, each kiosk has is own basin of customers, the differentiation is mainly based on localization

A digital magazine is a dematerialized version of the paper magazine. As we said above, the peculiar characteristic of this product is a negligible marginal cost of production and distribution[7].

A digital article is a complementary good of a technological support, which allows for the exploitation of digital contents. The complementarities between a technological support and his contents have been largely studied, a good example is the study on video games market[8] (Rochet, Jean-Charles 2003). This introduces a new agent, with bargaining power, in the press's value chain.

These differences between the paper press model and the digital press model may change the role and business model and distributor as well as the vertical interactions in the value chain.

Resuming, an "hybrid digital press" model:

- Allows for new bundling opportunities and new distribution channels
- Allows for disintermediation
- Changes the interaction between customers and Media Brands

[6] See Caves R. (2000)
7 See Annex 1, The cost structure of a paper magazine.
[8] Rochet shows that both monopoly and competitive platform design their price structure so as to get both sides of the market on board instead of allocating the costs fairly, even if we consider a Ramsey planner.

Pricing a magazine will thus have a different significance. While pricing a paper bundle is a way to perform a selection ex-ante on the market, which is then coupled with a choice on quantity, in the hybrid digital model pricing reflects a model of auto-selection, in which each consumer access all the contents and then selects following his personal preferences. Competition for Publishing Brands shifts towards subscriptions, since the costs of research for the consumers drop significantly.

## 3. Digital Magazines' Value Chain

If we momentarily exclude authors, paper press's value chain is composed by publishers and distributors Brands acting independently, with different degrees of coordination depending on the good and on local markets. In the digital press's value chain we will have three different agents bargaining on price setting, in order to establish production standards and to redistribute the profits. The market power of the different agents would depend on the concentration and regulation on the three relevant markets: technological support, distribution (platforms) and publishing[9].

A distributor who develops a digital offer would be able to set up a diversifying strategy by offering either:

1. A bundle of magazines, forming a large bouquet of contents, on the model of Pay-TV Channels Package.
2. A bundle of versions of a single content, allowing for multi-support consumption, basically unlimited access to magazines' content in time and space. This may include access to contents on up to "four screens" (namely TV, PC, Tablet and Smartphone) plus the paper version,

or both of the above.

These two strategies will also affect consumer's utility function for reading tablets. The more complementary contents a consumer can find on the platform, the more his risk from technology adoption is reduced[10].

While the classic bundling literature (Adams & Yellen (1976), Bakos & Brynjolfsson (1999, 2000)) largely justifies the first strategy in order to reduce the heterogeneity of evaluations from consumers, the potential increase in consumer utility of a multiform bundle has been studied only recently by economists and has proved to be effective only if the launch of the bundle is supported by an advertising campaign informing the consumer about the different usage situations[11] (Kukova, Kannan & Ratchford, 2008).

Both of these strategies may result in a transfer of surplus from the consumer to the distributor.

9 Hogendorn, C. and Ka Yat Yuen, S. (2009) propose a model in which indirect network effects internalisation depend on popularity of complementary goods and explicit results of bargaining between platforms producers and distributors.
10 The risk of receiving a lower utility if the technology is not adopted by the market and raising his utility by adding new usage functions.
11 They obtain this result through an experimental manipulation where participants are provided either with communications that emphasize using the different forms in different situations, or using the different forms in the same situations.

3. Another versioning opportunity, related to the second strategy, is represented by the creation of a digital version specifically designed for reading tablets.

This option represents a heavier investment for the publisher, the distributor, or both. It allows them to enter a new potential market, providing added features and an enriched reading or multimedia experience for target consumers, but it affects the cost function and increases the risk faced by both the firms and the consumers. The overall benefits of this strategy will be thus correlated to the shape of consumer's utility as well as the deployment of the support. For these reasons we will consider this strategy separately.

Versioning of magazines and bundling possibilities are not the only opportunities on the supply side. The profitability of press, both paper and digital, depends also on advertising revenues. Digitalization of press opens new scenarios both for advertisers and publishers.

Internet's share grows steadily in the advertising expenses of all industrial sectors (in France it represents already 13% of global advertising market of 2010 while Google globally generates 30 Billion in revenues with its economy of search and advertising)[12]. Moreover, developments in technology allow for more effective, dynamic advertising (a dynamic, cookie-based banner results to be up to six times more effective than a traditional banner[13]). Should these trends be confirmed, the initial reticence of advertisers, resulting today in a lower evaluation of digital advertising spaces, *ceteris paribus*, could be quickly disrupted.

Digital magazines are slightly more flexible and can be enriched with hyper-textual links even in the most standard formats such as PDF. As for enriched formats, they allow for video advertising and even personal advertising through the acknowledgement of user preferences.

Finally, the analysis of previously digitalized media industries shows that dematerialization changes both the frequency and the modes of interaction between customers and contents distributors. The latter being constantly informed of the former consumption habits, his preferences and his critics. The utility generated by this growing interaction is certainly valuable but it raises a number of economic questions: which agents will benefit from this utility along the value chain? How should private information be collected and exploited on the internet? Which would be the impact of the emerging business model on social welfare?

Going back to the drawbacks of digitalization, some economists argued that the diffusion of news and articles on the internet heavily cannibalize paper press (Simon 2007), while others more cautiously state that it depends on the versioning of the free information (Deleersnyder 2002). Most of them agree on a substitutability effect between the two supports and could not find evidence of complementarities between supports. Acknowledging that the press market is facing a structural decline facing digitalization of information, we argue that the deployment of dedicated digital reading devices will introduce two effects: on the one side a substitution effect due to the generally expected lower price of the digital edition, on the

[12] Data from Kantar Media, TF1, Google.
[13] Data gathered from a private web-based advertising company.

other side complementarities' effect, due to the increased utility of the paper version for those who can afford to take the time to go to the kiosk and read their chosen paper magazine after having browsed on their digital press review. Moreover the versioning opportunities and the growing accessibility of contents should increase the global base of magazine press consumers and thus the global sales volume.

### 4. Pricing of digital bundles

While setting up a subscription offer or a pricing scheme for a digital or a tablet edition of a magazine, a number of economic issues have to be considered.

First of all, the size of the market which, particularly in the latter case, is strictly dependent on the number of individuals or families equipped with a reading tablet and the number of different standards on the market. Economists have shown that in such cases, an investment (ex. advertising or standard development) would be rentable for a firm only if the new equipment is adopted by a sufficiently large number of users and therefore sometimes the adoption of the new technology by the early-adopters has to be subsidized (Rohlfs, J. 1974). Moreover, recall that different platforms often represent closed and independent environments, thus creating a strong complementarities between platforms and media producers[14].

Summing up, the development and pricing of a digital offer for magazines on reading tablets support is a complex issue, which has been considered marginally by economists, as far as our knowledge, since all the contributions in this field focus on one aspect of the problem at a time: either bundling and pricing of media contents[15], either indirect network effects of information goods[16], either complementarities' effects in two-sided market[17] .

Our model's objective is to analyse digital magazines' pricing issue and to outline the competitive and cooperative choices among agents along the digital press value chain.

## Bargaining Pricing Model

### 1. Definition of agents, variables and timeline of the game

[14] See Mauleg, D. and Schwartz, M. 2006, for compatibility incentives in a market with indirect network effects.
[15] See Bakos, Y. and E. Brynjolfsson. 1999.
[16] See Shankar, Venkatesh and Barry Bayus. 2002 or Joseph, Farrell and Klemperer Paul. 2006, or Katz, Michael L. and Carl Shapiro. 1985.
[17] See , Heeb, R. 2003 or Matthew, Gentzkow. 2006

The model is structured as follows: we have four rational agents along the digital press value chain. These will be generally identified by an index:

- *h*= Hardware (Tablets) Manufacturer
- *p*= Publishing Brand
- *d*= Digital Media Distributor
- *c* = Consumer

Agents maximize their profit functions ($\Pi_i$ ) under different market conditions. Generally speaking, they can select a price ($p_i$) for the good they are selling and a marketing or signaling effort ($\alpha_i$). The overall demand for a bundle (platform + contents) depends on the total price faced by a consumer ($p_c$ ) and the cumulated marketing effort. Publishing brands may also provide subventions ($\lambda$) to the network by underpricing contents in the bundles.

$$(1) \quad D(p_c, \Sigma\alpha_i, \lambda, q) = f(p_c, \Sigma\alpha_i, \lambda) \times q$$

Where q is the potential market for the invention, which is exogenous in the model. In our example it could be the number of households in a range of age between 14 and 65, or the number of readers who also own a computer. This data are easily accessible in any statistical database.

The model has three stages:

- t=0 At this stage the new hardware is ready to be launched on the market. The manufacturer selects the investment effort ($\alpha_h$) in terms of marketing and the price of the device ($p_h$).
- t=1 A Publishing Brand observes the marketing effort and the price chosen by the manufacturer. He faces two strategic decisions:
    1. Whether to enter the digital market or keep doing business as usual.
    2. If he goes “digital”, then at t=2 he decides whether to distribute the digital versions by creating his own ATAWAD bundle or to outsource distribution by participating in a bundle of contents.

  Then the publishing Brand set his price ($p_p$) and his marketing effort ($\alpha_p$).
- At t=2 the distributor observes the prices and marketing efforts and chooses the price of his bundle ($p_d$) and his own marketing effort ($\alpha_d$). $p_d$ is a fraction of cover price $p_p$. Thus a customer observes the final price

$$(2) \quad p_c = p_h + p_p$$

  and decides whether to buy or not to buy the bundle composed by the hardware and the bundle of contents of his choice.

As in many two-sided markets, we assume the existence of indirect network effects resulting from the complementarity of the two goods. It is obvious that the utility of the bundle for consumers grows with the quantity and quality of contents available *via* the platform. The converse is also true: the quantity of contents will be directly correlated with the number of consumers subscribing to the bundle.

Moreover, we assume that marketing efforts of the three agents are strongly positively correlated since the goods are complements. This seems acceptable since both a marketing campaign for a platform without contents and a campaign for digital contents without an appropriate support are meaningless. As for distributors, they have to associate their brand to their product, which is again a complementary content of the digital device.

From the above discussion we infer that while on one side the three agents bargain to capture extra-profits in the hybrid digital markets, on the other side they have to cooperate in order to enhance these extra-profits.

In a market with network effects, if the number of consumers adopting the technology does not reach the critical mass, the deployment of the network and the subjacent extra-profits are not guaranteed[18].

The problem of cooperation along the value chain may also be solved, as we will see, by vertical integration. This solution presents advantages for copyrights holders and for media brands, but are inefficient for consumers and for the cultural industry, since they introduce lock-in cost and entry barriers in the market.

In the next sections we will analyse the bargaining problem from the point of view of each agent and we will try to establish the market condition under which cooperation is preferred to vertical integration.

## 2. Platform manufacturer

A company issuing a new technology faces the problem of maximizing her profits under a budget constraint and a roll-out constraint. We assume here that the invention is protected by patents. The manufacturer is a first mover, he can freely set the price of the device but his demand will depend on the global marketing effort and on the final price faced by consumers ($p_c$), which incorporates the price of the bundle of contents of his choice.

Resuming: as a monopolist, a hardware manufacturer rationally maximizes his profits depending on price, production costs, marketing expenses along the value chain and the price of complementary contents[19]:

[18] This hypothesis are fully discussed in the Appendix, where the Rohlf's model of network effects is modified and adapted to capture consumers behavior

[19] For a detailed analytical description of the agents in the model, please refer to the Appendix.

$$(3)\quad \max_{p_h,\alpha_h} \Pi_h\left(f(p_c,\alpha), p_c(p_h,p_p), c_h(f,\alpha_h)\right)$$

The hypothesis of a hardware manufacturer acting as a monopolist is acceptable since the market of reading tablets is actually composed of three non-compatible standards. Two of them are single owned (i-Pad and Kindle) and they account for more than 80% of the sales in Europe. Moreover the platforms have very different underlying technologies (LCD vs. e-Ink) and may thus be considered as two standards competing for readers but different targets of readers.

Since there is perfect information in the market, the manufacturer can observe α*, which is the level that guarantees a successful deployment of the network[20]. He has to set is couple ($p_h$ , $\alpha_h$ ), in such a way that the resulting $\alpha \geq \alpha^*$.

The hardware manufacturer is also subject to a budget constraint determining whether he could possibly invest α * on his own.

## 3. Publishing Brand

A Magazine Publisher is defined as a company producing one or more bundles (magazines) under a Media brand (platform). The company has the opportunity to enter the digital market or continuing with business as usual. In addition, he can choose whether to provide a subsidy to favor the deployment of the new support.

A publisher acts as a monopolist (he disposes of copyrighted contents) and rationally maximizes his profits depending on selling price, production costs, diffusion, advertising revenues (γ). If he goes digital, his profit function will depend also on marketing expenses ($\alpha_p$), distributor's commission ($p_d$) and the price of the technological support ($p_h$).

$$(4)\quad \max_{p_p,\alpha_p,\lambda_p} \Pi_p\left(p_p, c_p(q_p), \gamma_p(q_p), \alpha_p, f(p_c,\alpha), p_c(p_h,p_p), c_p(f,\alpha_p), p_d\right)$$

Although his bundle is a unique product, a publisher faces competition from other publishing brands, thus they act as monopolists only in a certain share of the paper market ($s_p$), given at t=0. Since we are not interested in the demand for paper magazines of the firm and we want to focus on the strategic decision of going online, we will consider it as exogenously determined.

A publisher observes $p^*_h$ , $\alpha^*_h$ and decides whether he should enter (index *pe*) the digital market or not (index *pne*). If he decides to enter the digital market, the publisher invests $\alpha_p$ . This sunk cost includes, for simplicity, all costs needed to produce the digital version as well as marketing effort. On the other end this effort impacts positively the roll-out of reading tablets as outlined above.

[20] This is justified by the shape of the demand curve for a new technology described in the modified Rohlf's model. See Appendix.

Publisher will enter (*e*) the digital market if and only if $\Pi_{pe} \geq \Pi_{pne}$.

If the publisher keeps doing business as usual, at t=2 two states of nature may occur. If the deployment of reading tablets is unsuccessful (with probability β), we assume that the profit function of the media brand will not be affected.

On the other hand, if the roll-out is successful (probability (1- β) and the media brand has not entered the digital market, it is more than likely that his profits will decrease, because of both a higher pressure on prices and a reduction in the demand for paper press, or because competitors which have had a digital strategy have taken a share of his market. This simple argument explains why most publishing brands have set up a digital strategy.

If the media brand enters the digital market, it has to choose a price for the digital version in order to maximize its profits. The digital price would be equal to the hardcopy cover price minus an eventual discount[21]. This spread, identified by $\lambda_{p,}$ creates a subsidy effect on the roll-out model increasing the possibilities of a successful deployment of reading tablets' network[22].

Digital versions of magazines may be offered "tout court" or as a complement of the paper version, providing an enhanced ATAWAD[23] subscription offer to consumers.

In both cases, digital editions are more suited to subscription models than paper ones. This is because on-line distribution carry economies of scale, thanks to the absence of logistics. Online distribution is based on zero delivery costs but high transaction costs which can be mutualised in the subscription model. As a consequence, getting digital will convert a share of sales by the piece into subscription bundles.

In other words, the bundling alternative which exists in the paper business (selling by the piece vs subscription) but which is not favorable to subscription (conversely to newspapers) in magazine press, has a different economy in the digital format.

Moreover, the ATAWAD strategy may result in disintermediation of distributive channels since the publishing brand may exploit his client base of paper subscribers and his web platform to distribute the new bundle.

If that is not the case, the publishing brand will need a distributive channel just like kiosks in the paper model.

## 4. Digital Media distributor

[21] A large share of e-readers seems to expect a reduction in price, since the marginal cost of a digital magazine is slightly lower tha the marginal cost of a paper copy
[22] See Appendix for details
[23] Any Time, Any Where, Any Device.

A digital press distributor invests $FC_d$ to set up his distribution platform and enter the market. He set his price (a share $p_d$ of the cover price $p'_p$) by bargaining with the publishing brands. His profit function depends on the deployment of the network and on his share of the emerging market ($s_d$). The latter depends on the availability of contents in the distributor's bundle (a distributor may propose as well a single magazine by the piece following the kiosk model, but high transaction costs will more likely redirect consulers to the kiosk in this case).

A distributor can choose a level of marketing investment $\alpha_d$ in order to increase his potential customer base and his negotiating power. By choosing $p_d$, a distributor determines whether a magazine would be available in his bundle.

The probability of negotiating a contract with a publishing brand depends on the strength and resources of publishing brands, let's see why.

A publishing brand may not go online if $\Pi_{pe} \geq \Pi_{pne}$ is not satisfied. If he does go online he may choose to be also a distributor or to outsource distribution of his digital magazine. He will choose his strategy by looking at a new maximizing problem in which publishing brand and distributor are integrated and under a unique budget constraint.

Intuitively, we can infer that a strong, well established media publishing brand will have more resources to invest and will not be willing to give up a high share of the cover price to outsource distribution. Moreover he will be able to use his large client base as a stepping stone for the commercialization of hybrid digital bundles.

On the other hand, a small brand will probably have limited available resources and will thus accept to give up a higher share of his profits to have the possibility of increasing his sales by being in a bundle.

Let's have a look at the problem analytically. Demand for a bundle offered by a distributor depends on the quantity of contents in the bundle as in Bakos and Brynjolfsson (1996) bundling model.

$$(5) \quad \max_{p_d, \alpha_d} \Pi_d \left( p_d, c_d, s_d, \alpha_d, f(p_c, \alpha), p_c(p_h, p_p) \right)$$

Moreover, demand for a distributor depends on prices, on marketing investments, on market's share and on the availability of contents. A publishing brand will make the content available only if $\Pi_{pe} \geq \Pi_{pne}$ holds and the profit from outsourcing ($\Pi_{peo}$) is greater than the profit obtained by a firm producing and distributing his own contents ($\Pi_{ped}$): $\Pi_{peo} = \Pi_{pe} \geq \Pi_{ped}$

If the profit obtained by internalizing distribution is higher than $\Pi_{peo}$ the publishing brand will distribute his copyrighted contents on his own.

Following the same reasoning, we could analyze the case in which the hardware manufacturer tries to internalize distribution. Intuitively, since hardware producers are usually global players with important

resources, they will have an incentive to internalize distribution in order to create lock-in costs for both customers and publishing brand and too squeeze out the latter from the extra-profits generated by network externalities.

These two solutions in which a single agent gets a relevant market power may be suboptimal for consumers if the corresponding surplus are not reinvested in media creation enlarging the media offer, since distribution costs will be higher. On the other hand, it may affect either positively or negatively a cultural industry such as publishing since both implies a higher control on copyrighted contents. Regulators should be aware of this and constantly monitor the development of the digitalization process with a two-fold objective: to favor circulation of cultural contents respecting copyrights and to avoid excessive concentration or censorship in the market.

## 5. Consumers

Consumers intervene at t=2. We assume that the majority of consumers are interested in the technological device only when the media of their interest, their preferred bundle, is available on a platform. As explained in the appendix, there is a category of consumers that we call the “geeks” or the early-adopters, which have a certain utility for the device itself. This group of people may buy the device even at t=1 and they contribute to raise the utility of the network for other consumers.

Utility $U_i$ of the $i^{th}$ consumer associated to the bundle composed by their preferred contents and a reading support is distributed uniformly. Namely consumers’ evaluation is uniformly distributed between 0 and 100, if the network is 100% developed, meaning all the contents are available on the reading device and all potential customers have adopted the technology.

The marginal utility of a consumer, namely the maximum price he will be willing to pay to join the network when the latter is incomplete, is proportional to the fraction of contents of his choice that he can find in the network. We denote this fraction f, with a value ranging from 0 to 1. The fraction of contents and the fraction of customers adopting the network is assumed to be perfectly correlated to simplify the model. This hypothesis derives from the new, hypothetically infinite bundling opportunities introduced by digitalization. If we consider uniformly distributed preferences, we will have that each new contents raise the utility of the network and each new adopter increases the potential market for contents producers. This virtuous circle defines the indirect network effects.

The $i^{th}$ consumer will thus buy the bundle if and only if the price is lower than his utility, calculated as:

$$(6) \quad u_i = f \times U_i$$

He will adopt the technology and buy the bundle if

$$(7) \quad p_c \leq f \times U_i$$

otherwise he will not join the network.

What will be the demand of a bundle priced $p_c$ ? It will be the fraction of the total population with a willingness to pay equal or higher than $p_c$. This fraction can be calculated analytically following the model described in the appendix. Since we assume that there are network effects in the market, we will have a fraction $f_{low}$ representing the critical mass of consumer that we have to reach in order to have a successful deployment of the new technology. If we do not attain this level, we will have only a small fraction of consumers, mainly early adopters, as the potential digital press market. If we do attain the critical mass, we will have a mass market.

Intuitively, this critical mass can be reached more easily if the marketing investments are important (α) and if the Publishing brands favor the deployment by providing digital contents in the network. This effect is increased if the digital contents are offered at a discounted price compared to the hard copy as described in the appendix.

This part of the model tries to answer the questions related to the so far low impact of digitalization on press, if compared to other markets such as home video or music or even gaming. We argue that the lack of a dedicated support has caused this different path. Another reason is the difficulties of Publishing Brands to overrule the "free lunch" model for contents on the net[24].

The appearance of dedicated reading devices, if adopted by a mass public, may change this paradigm, since there will be few standards, mostly "walled gardens", where contents can be valuated fairly. Moreover, the resilience towards reading digital contents will be lowered consistently.

## 6. Considerations on optimal pricing and vertical integration

Optimal pricing will depend on the configuration of hybrid digital press's value chain. From the discussion above, we know that, if the technology is successfully adopted, we could have three possible pure configurations:

1. Three independent agents
2. Hardware Producer+Distributor vs. Publishing Brands
3. Publishing Brand+Distributor vs Hardware Producer

In addition, we could end up with mixed configurations in which strong publishing brands manage to disintermediate while weaker brands outsource digital distribution. The stabilised regime will also depend on the shape of consumer's preferences. If the representative consumer is a regular consumer of a few

[24] See Bomsel, O. – Gratuit!, 2005

titles he might like getting them through a direct subscription. If he is an occasional consumer of various titles depending on his mood and the time of the year, then he will prefer a wide title bundle.

Claim 1: If an hardware producer internalize distribution, he can capture all extra-profits by introducing lock-in costs or barriers to entry such as non-compatibility of standards. This solution is suboptimal for the industry and should be opposed by the regulator. On the other hand, if seriously regulated, this configuration allows for a stronger enforcement of authors' copyrights.

Claim 2: If a Publishing Brand internalize distribution, he may be able to gain all extra-profits but the network may never reach the critical size due to underinvestment from both hardware producers and the Publishing Brands. This would probably be the best solution for authors, who would benefit from more gains from redistribution of extra profits, but it will encourage hardware producers to allow piracy and discourage investments from Publishing Brands to subsidize network.

Claim 3: if the Distributor is independent, the three agents have to act cooperatively and redistribute fairly the extra-profits to attain a successful deployment of the new technology. This would be the optimal solution for customers since the competition in the value chain would lead to lower prices and higher availability of contents. Unfortunately, this configuration leads to an instable equilibrium, since every agent may have an incentive to change his strategy. There would be a strong need of regulation of the market not to start price war and to defend IP.

Beside economic considerations, the risk is to lose contents in the switch between paper model and hybrid digital model. While press magazine becomes a tradable good, vertically integrated distributor may fail to guarantee the appropriate protection of cultural diversities.

Claim 4: Optimal pricing for digital versions of magazines should be lower than paper cover price. This is due to different effects. First of all, in order to favor the deployment of the network early-adopters should receive a subsidy in the form of a discount for contents. Moreover, in order to capture the maximum surplus, bundles of contents should be assembled at a reduced price. Finally, since we move towards a model based on long-term subscribers, loyalty should be compensated with a price reduction.

Claim 5: A bundle should be priced at least at the average total cost. Signaling and editing efforts are crucial for a cultural industry in the hybrid digital model as it was in the paper model. Even if the marginal cost of an additional unit of a digital magazine is null, consumers should value the important fixed cost sustained by publishing brands and distributors.

## Conclusions

1. Different role of Brands in Digital Press Magazines

The role of a Media Brand in publishing is to signal a bundle to the market, to reduce transactions' costs and to add a new layer of meaning with the connotations of the names and symbols they introduce.

The switch to digital publishing introduces a new challenge for Media Brands. It becomes crucial to be recognized as the source of the utility for consumers. Since production costs and distribution costs become irrelevant, the value of a media will be associated either with a name (author's name or publishing brand's name) or with a distributive channel (as it is for Canal +, Sky, i-tunes). In order to become the provider of the utility derived from digital press, a strong publishing brand may internalize distribution by offering an ATAWAD bundle on his web-platform. The New York Times digital marketing is a good example of this strategy. They are trying to exploit their subscriber's base to sell their ATAWAD offer. Symmetrically, an hardware producer brand may internalize distribution by creating his "walled" distribution channel. AppleStore and Amazon are typical examples of this strategy. They try to lock-in customers using their technological devices and they charge a high $p_d$ on any content sold through their distributive platform.

a. Strong Brand

A strong media brand is regularly and massively consumed. It is recognised as a provider of added value (meaning) to copyrighted contents.

As discussed above, if a brand is strong enough to enter the digital market and sustain his own marketing investments, he can disintermediate distribution by either selling the digital version only on his proper distributive channels or by proposing only a degraded version to external distributors. This strategy maximizes discrimination opportunities and will be successful if scope economies are sufficient to justify the investment.

A key issue is to calculate the value of the new interaction with clients. An internalization strategy implies important changes in the business model. We go from a model in which the core business was to foresee the number of copies sold in the following week to a business in which it is crucial to attract and retain subscribers, exploiting new large sets of information on customers' habits and building up the meaning (bundles) on this information. This problem will be the same for important newspapers such as "L'Equipe" or the "New York Times" as it was for TV channels such as M6 and MTV through the privatization process of broadcasts.

b. Weak Brand

Weak brands are occasionally purchased and read through. They mainly capture the demand from impulsion to buy.

A weak brand has an urgency to enter the digital market to expand his business but does not have enough assets to do it independently. Going online may represent a huge opportunity to go from a "niche" market

to a global market. On the other hand, in order to do so, a weak brand has to delegate control of bundle's marketing strategy and pricing to an external distributor.

Distributors such as Relay.com or AppleStore charge today around 30% commission in order to distribute contents. This percentage may seem unfair since the actual costs of distribution are close to zero for digital newspapers. Nevertheless, our model shows how important the marketing efforts of distributors are for the digital value chain as a whole. The issue here is to foresee which agent is going to become the referential client interface and how the economies of scales are going to be redistributed to Media Brands.

## 2. Copyright issues and distributive channels

We have argued that the main effects of digitalization and the roll-out of dedicated reading tablets on publishing industry are the introduction of infinite new bundling opportunities and a substantial reshaping of magazines' press distribution model.

Both effects entail consequences on IP exploitation and copyright enforcement. While digitalization is often associated with piracy and the increase of copyright enforcement costs, new bundling opportunities may increase the value of copyrighted contents, generating extra-profits for authors. This is due on one side to the peculiarities of magazines, which are characterized by a short shelf life (generally ranging from 1 week to 8 weeks) and on the other side on the increased complexity of the offers on the market. While it may be easy to find a pirate version of a magazine, it may be costly and time consuming to reproduce illegally a large bundle of contents.

Distribution is another key aspect; we found that there is evidence of the emergence of "walled gardens" in the digital press magazines. While this may be good for IP exploitation, the risks of monopoly prices and indirect censorship is concrete if the distributive channels end up integrated in a few, dominant firms. This is particularly important in a cultural market like Europe, where 27 languages "compete" to the formation of culture.

## 3. Policy issues and tradable cultural goods

The switch to a hybrid digital press model raises a number of policy issues. We have already introduced the problem of cultural diversities. Digital magazines become easily tradable, the only constraint to their circulation being the language in which they are written. This enhances the problem of the dominance of Anglo-Saxon culture in the digital era. We have also introduced the problem of censorship. While digitalization is correctly associated with higher circulation of information, there is no guarantee on the

quality of information encoded in bits and sent through the net. The need for quality information at reasonable research costs should be solved by Media Brands. But where is the border between allowing exclusive distributive rights to Media Brands in order to guarantee quality and censorship?

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# Appendix