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HABILITATION À DIRIGER DES RECHERCHES
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Essays in competition policy

JURY

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1 Introduction

Since my PhD, all my research works have been centered on competition policy issues. I have mainly used the methods of theoretical Industrial Organization, and in some recent works, I also started using empirical methods. A common thread running through many of my papers is the focus on vertical relations between suppliers and buyers with market power. My PhD essay, entitled “Structures de marché et réglementation : les fondements des rapports de force entre producteurs et distributeurs”, was about the relationships between producers and retailers. It focused on the balance of power between the large retail chains and their suppliers, and on the way it is influenced by market structure and by the regulatory environment. Since then, the analysis of conflicts and negotiations in vertical chains has been a central topic of my research work. These questions naturally led me to discover other topics in competition policy, and I progressively extended my research field to issues such as collusion or mergers.

I started my PhD in 1996, at the Ecole des Hautes Etudes en Sciences Sociales, under the supervision of Bernard Salanié. I obtained a PhD grant from CREST, and I spent three years at Laboratoire d’Economie Industrielle (CREST-LEI) before becoming a junior Lecturer at ENSAE for two years. I then became a CNRS researcher and joined the Ecole Polytechnique in 2001, and I remained an associate member of CREST until today, when the Economics Department of Ecole Polytechnique is merging with CREST. A few years after I joined CNRS, I spent one year at London Business School in 2005-2006. I kept visiting LBS on a regular basis for the next few years.

During my PhD I wrote a case study with Claire Chambolle (INRA ALISS), who obtained a one-year grant at CREST to finish her own PhD on a closely related topic. This was the first of a long series of collaborations. A few years after, we started a collaboration with Patrick Rey (Toulouse School of Economics). We are about to finish our first paper together, and we have other projects. I am especially grateful to both of them. Over the years, I also benefited from stimulating research collaboration with several researchers, among whom Sofia Berto Villas Boas (University of California Berkeley), Marcel Boyer (University of Montréal),

Clémence Christin (University of Caen), Laurent Flochel (CRA), Emeric Henry (Science Po), Margaret Kyle (Mines ParisTech), Jean-Pierre Ponsard (Ecole Polytechnique), Said Souam (CREST), Stéphane Turolla (INRA, SMART), Thibaud Vergé (CREST) and Patrick Waelbroeck (Telecom ParisTech). I also benefited from my interactions with other researchers, especially Anne Perrot (MAPP), who advised me and introduced me to real-world competition issues, Stéphane Caprice (Toulouse School of Economics), who used to share my office while we were writing our PhD essays on similar topics, Laurent Linnemer (CREST), Philippe Février (CREST), Denis Gromb (INSEAD), Jérôme Pouyet (Paris School of Economics), Eric Avenel (University of Rennes), Hans-Theo Normann (Duesseldorf Institute for Competition Economics), Ozlem Bedre (European School of Management and Technology), Nicolas Schutz (University of Mannheim), Sabrina Teyssier (INRA-ALISS) and Rida Laraki (Ecole Polytechnique), among others.

The first part of this note is a research summary that presents an overview of my research works since I finished my PhD. This part is organized in three sections: the first section focuses on vertical relations and competition in the retail sector; the second section presents some works on vertical relations, investments and innovations, and the third section presents my research works on cartels and mergers. The second part of this note presents my main research perspectives in the short and medium term.

2 Research summary

This research summary will be organized along three lines. The first line of research presents the works I did after I completed my PhD, when I continued working on the issue I had investigated in my dissertation, that is, the relationships between manufacturers and retailers. I tried to improve my knowledge of the retail sector, and of the sector-specific regulation. This applied work then led me to consider some issues about vertical contracts and price restraints from a more theoretical perspective.

A few years after I joined CNRS, I progressively started working on new projects that still dealt with vertical relations, but with a different focus on the “long term” effects of vertical relations on investment and innovation. These works constitute the second line of research that I will present in section 2.2. A first set of papers investigates the effect of vertical integration on the firms’ incentives to invest, for instance in an innovative process, in a context of upstream and downstream imperfect competition. Another paper considers the effect of competition among the potential buyers, hence buyer power, on the efficiency of the innovation process; it analyzes how competition between the potential buyers of a license may affect inefficient delays in the signature of license contracts.

Finally, I investigated more general competition policy issues, especially those related to “alliances” between firms, such as cartels and mergers. In these works, presented in section 2.3, I study the way some kind of cooperation between the firms may impact competition and welfare. A first set of papers deals with cartel deterrence, and more precisely the issue of whether fines against cartels are set at a proper level. A second set of papers analyzes horizontal mergers in vertically related industries, both from a theoretical and from an empirical perspectives.

In what follows, I will present references to the relevant economic literature for each topic. However, as the theme of vertical relationships is running through most of my work, I am going to introduce briefly here a few reference articles from the Industrial Organization literature on this theme. Since the seminal work by Spengler (1950), who brought forward the idea of double marginalization, a large stream of literature has attempted to understand how this vertical externality can combine

with horizontal competition. The literature on intrabrand competition developed in the 1980-1990s has focused on vertical restraints that can restore vertical control in the case of a monopolist supplier selling to competitive retailers (see Rey and Tirole, 1986, and Mathewson and Winter, 1984). The issue of negotiation inside the vertical chain has then been studied to account for the possible existence of buyer power (see for instance Inderst and Wey, 2007, or Chipty and Snyder, 1999), while some papers have “reversed” the usual framework to study the relationships between a monopolist downstream firm and its competitive suppliers (see Marx and Shaffer, 1999), or between a duopoly of imperfectly competitive downstream firms and their perfectly competitive suppliers (Shaffer, 1991). The most recent strand of literature attempts to account for imperfect competition in both the upstream and the downstream industries; however, the study of these “interlocking relationships” raises technical issues, among which the possible non-existence of equilibria (see Rey and Vergé, 2010).

In this summary I will also refer to the literature on vertical integration. Vertical integration is known to have welfare-enhancing effects in many circumstances, through the elimination of double marginalization, hold-up, or free riding distortions. Its possible anti-competitive effects rely on more complex exclusionary mechanisms: vertical foreclosure characterizes situations where full access to a necessary input is denied to competitors by an integrated firm. The rationale for foreclosure has long been the subject of an economic debate. The Chicago School claimed that, as a monopolist can extend its power to vertically related segments, vertical integration cannot increase the profit of the merging firms in the absence of efficiency gains (see Bork, 1978 or Posner, 1976): vertical mergers should thus not be considered as potentially anticompetitive, and should be authorized. This argument raised a debate that led to more rigorous research on the welfare effects of vertical integration (see Rey and Tirole, 2007). Two seminal papers by Hart and Tirole (1990), and Ordovery, Saloner and Salop (1990) have opened new perspectives. The former explains how vertical integration may restore market power; the latter how it may create a new source of market power.

I will now present a summary of my research works. I will proceed in three

sections, each of them dedicated to one of the above-mentioned research lines. I will start in section 2.1 by presenting my researches on vertical relations and competition in the retail sector.

2.1 Vertical relations and competition in the retail sector

So far, a large part of my research work has been dedicated to the economic analysis of retailing, especially the study of vertical relations between producers and retailers. I have worked on this field both from a theoretical perspective and from a policy-oriented perspective, and I have regularly contributed to the debate on regulatory reforms in the retail sector. In my PhD dissertation, I focused on the determinants of the balance of power between producers and retailers, and I explored how market structure and regulation may affect these relationships. Since then, the analysis of conflicts between retailers and their suppliers has constantly been a central topic of my research work.

Right after my PhD I wrote, in collaboration with Claire Chambolle, a survey of the theoretical literature on vertical relations centered on profit-sharing between the upstream and downstream industries. In this paper, published in 2003 in *Economie Rurale*, we point out the role of market structure and regulation. The issue of how market structure affects profit-sharing between manufacturers and retailers was also at the center of a paper derived from a chapter of my PhD dissertation, published in 2002 in *Louvain Economic Review*. In “The Balance of Power Between Producers and Retailers: a Differentiation Model”, I built a tractable model of successive duopolies in a market with a captive demand, and I studied how horizontal differentiation in the upstream and downstream industries influences margins and profit-sharing.

This section presents my works on the economics of retailing. It is organized in three parts. I will first give an overview of the retail industry, before addressing some issues related to its regulation. I will then present a set of theoretical research works on pricing restraints and the policy implications that can be derived from the results.

2.1.1 Overview of the retail sector

When I joined CNRS in 2001, I started working with Claire Chambolle on a book, intended for a non-specialized readership, on the economics of retailing. “Economie de la Distribution” was published in 2003 by the *Editions la Découverte*, in the “Repères” Collection. Our purpose in this book is to provide a general picture of the sector, of its role in the economy and of the historical evolution that led to the creation of the large retail chains active today. We highlight the competitive issues at stake. The first part of the book describes the evolution of the retail sector. We first present the main features of the retail industry and offer some statistics that illustrate its economic weight. We then trace the historical evolution of the industry and the emergence of mass distribution. In the second part, we analyze competition between retailers, their relationships with manufacturers and the sector-specific regulations from an industrial organization perspective. Writing this book gave me a better understanding of the retail industry, and helped me identify relevant policy issues that led to further research.

More recently, I wrote with Claire Chambolle and Stéphane Turolla an article in a collective book entitled *A quoi sert la concurrence?* This book, edited in 2014 by M. Behar-Touchais, N. Charbit and R. Amaro, aims at offering a comprehensive overview of competition to a large audience through a collection of short articles. In “La concurrence dans le secteur de la distribution”, we review the determinants of competition in the retail sector. We first point out the twofold dimension of retail competition, which is determined by national as well as local factors. We then analyze how the sector-specific regulation has impacted the competitive environment, especially by defining the conditions of entry and the contracting possibilities. The issue of the influence of regulation on the competitive environment of the retail sector is developed more in-depth in the works presented in the next sub-section.

2.1.2 Sector-specific regulation

In France, firms in the retail sector must comply with a large set of specific rules that add to the general business and competition law. Over the years, many

reforms have attempted to modify the evolution of the sector, with varying and sometimes conflicting objectives - among others, protecting the small, independent stores, protecting the consumers against high prices / bad quality / low variety, protecting the suppliers (especially farmers and small food producers) from retailers' buyer power, and even protecting all agents from the possible entry of hard discounters.

I was first introduced to these issues during my PhD. Soon after, I wrote with Claire Chamolle an article entitled “Les relations entre producteurs et distributeurs : bilan et limites de trente ans de régulation”, published in 2003 in the *Revue Française d'Economie*. In this paper, we provide a critical review of the sector-specific regulation of the retailing industry in France. We review the rules that govern the control of market structures and the contractual relations between the firms.

I will focus first on the regulation of entry, before turning to contractual relations in the next subsection. I will talk about merger control in section 2.3.2.

Entry regulation

The evolution of retail market structures is constrained by the general merger control, and by specific laws controlling entry in the retail sector. The entry of new stores with a surface over a given threshold (this threshold has been modified a couple of times), or the expansion of existing stores, are restricted by specific laws. The Raffarin Act enacted in 1997 made the regulation of entry particularly restrictive compared to other European countries, by conditioning the opening of a new store (or the expansion of an existing one) to the approval of a local commission (Commission Départementale d'Équipement Commercial, or CDEC), gathering elected representatives and qualified leading figures. These commissions were supposed to control the balance between different retail formats. However, several corruption cases have pointed out the dysfunction of these commissions. More generally, restricting entry in the retail sector has contributed to increasing the main retail chains' market power. During my PhD, I addressed this issue with Laurent Flochel. In “Contrainte de capacité et développement des marques de

distributeurs”, published in 2001 in *Revue Economique*, we look at the impact of the law on profit sharing from the angle of the limitation of retailers’ sales capacity. We show that, were entry free at the retailers’ level, a restriction of shelf space, as imposed by the Raffarin law, could improve producers’ profit by slowing down the development of own brands. However, barriers to entry on the downstream market suppress this effect.

The Raffarin Act was amended by the Loi de Modernisation économique (LME) in 2008. This act increased the surface threshold over which the opening of a new store has to be approved by the CDEC. However, this reform was limited and arrived late. In its Opinion No 10-A-26, the Autorité de la Concurrence stresses these limits, by noting that “the Autorité de la concurrence believes that the level of concentration in some customer catchment areas is excessively high, particularly for hypermarkets and local shops. For this latter retail format, the case of Paris, in which only two retail chains, active under several different retail-brands, are actually in competition, needs to be highlighted. This concentration of customer catchment areas is all the more worrying as the food retail sector has major barriers to entry which result, in particular, from regulations governing the establishment of new shops and the relative scarcity of commercial land.”

In 2011, I published in *Concurrences* a paper written with Claire Chambolle and Clémence Christin, entitled “Analyse critique des réformes de la réglementation de la distribution française”, in which we review the recent reforms of the sector-specific regulation in France. We point out that the reform of the Raffarin law is too limited to restore efficient competition at the local level and suggest possible reforms. We also consider the reforms from the angle of the regulation of the contractual relations. I will give more details on these aspects in the next subsection.

Finally, in december 2014, I have been invited, with several economists, by the French Minister of Economics to participate in a meeting to discuss about a new Bill, now called the “Macron Act”. In this meeting I had the occasion to express my views on the need to remove barriers to entry in the retail sector, especially by facilitating the transfers of stores between chains.

Contractual relations between producers and retailers

The contractual relationships between the retailers and their suppliers are also regulated in France by the “Code de Commerce”. I have specially studied the economic consequences of the ban on retailer’s loss leading. This ban prevailed in France since 1963, but its redefinition in 1996 in the “Loi No 96-588 du 1er juillet 1996 sur la loyauté et l’équilibre des relations commerciales”, also called Galland Act, made it much more constraining.

More precisely, the Galland law prevents retailers from setting the price of a good below a threshold defined as the net invoice price, excluding all off-invoice and anticipated rebates that are not already on the bill at the time of delivery, plus the transport cost. All rebates that are already deducted on the invoice are included in the threshold, but the conditional rebates that are not already deducted on the invoice are not included in the threshold, even if their conditional amount is known (for instance, if they are published in the general terms of sale) and if they are anticipated by the retailer. For instance, slotting fees that are often negotiated on an annual basis and paid at the end of the year cannot be integrated in the threshold. In most cases, the real unit price paid by the retailer to the manufacturer is much lower than the unit price invoiced: the so-called “backroom margins”, that gather discounts, rebates and commercial services paid by the producers to the retailers, are non-transparent and difficult to measure. Commonly accepted estimates by ILEC (an association of French Producers) evaluated them to about 60% of the unit price invoiced in France at the end of the nineties. In addition to the ban on loss leading, the “Code de Commerce” requires that general terms of sales offered by producers to “similar” customers had to be non-discriminatory. In other words, a manufacturer cannot set different unit prices to its various retailers, which means that the threshold imposed by the Galland Act was uniform across retailers.

Similar bans on loss-leading exists in other countries, but the way it is coupled with non-discrimination requirements makes the French law rather specific. In “Loss-Leaders Banning Laws as Vertical Restraints”, written with Claire Chambole and published in 2005 in the *Journal of Agricultural and Food Industrial*

Organization, we analyze the impact of the ban, such as it is formulated in the French law, on the vertical relationships between a monopolist producer and its two differentiated retailers. We model the negotiations between producers and retailers in a way that tries to come as close as possible to the real conditions in the French market: We assume that the producer has to publish a non-discriminatory unit wholesale price before secretly bargaining with the retailers over rebates that are excluded from the price threshold. Retailers then set final prices. In that framework, we highlight an adverse effect of the ban, by showing that it allows a producer to indirectly impose a price-floor to his retailers – a restriction prohibited by most competition laws in Europe as well as in the United States. We show that this effect may lead to higher retail prices whenever the retailers' bargaining power is high. Furthermore, the ban's adverse effect on prices appears even in situations where there would not necessarily be below-cost pricing in equilibrium without the legal constraint (the retailers net margin is positive): this clearly supports the use of a rule of reason rather than a *per se* ban of below-cost pricing by retailers.

In that simple framework, the effect of the ban on retail prices is determined by two conflicting forces. First, a price-floor suppresses the effect of downstream competition, that tends to drive prices down. Second, in the absence of price restriction, double marginalization drives prices up, all the more so when the producer has a higher bargaining power as he takes then a higher margin: When the retailers have all the bargaining power, the producer gets zero margin ; When by contrast the producer has all bargaining power in the negotiation, the retailers can still set strictly positive margins after the wholesale negotiation, and get positive profit. The double margin inefficiency, and thereby final prices, thus increase in the producer's bargaining power. Overall, when the supplier's bargaining power is moderate, the second effect is dominated by the first: competition leads retailers to set prices at sub-optimal levels. It is then profitable for the supplier to use the price-floor in order to increase final prices up to the industry profit-maximizing level. By contrast, when the supplier's bargaining power is high enough, unconstrained final prices are rather too high because of double marginalization. The producer would need a price-ceiling to reduce final prices: a price-floor is thus

ineffective and does not affect the final equilibrium prices. Finally, we show that the ban unambiguously decreases consumers' surplus and welfare.

Several decisions by the French competition authority show that such a mechanism has been widely used to suppress competition between retailers (see *e.g.* Conseil de la Concurrence, 2003, on the market for calculators, 2005 on the market for videotapes, and 2007 (b) on the sector of toy distribution). In these cases, upstream and downstream firms have been found guilty of having used falsely conditional rebates to set artificially high price-floors. The fact that this mechanism has been made possible by the wording of the Galland Act is explicitly mentioned. Empirical evidence on the overall effect of the regulation on prices is scarce (see for instance Biscourp, Boutin and Vergé, 2008 or Bonnet and Dubois, 2010) but consistent with our price-floor interpretation. In 2008, Claire Chambolle, Thibaud Vergé and I addressed these issues in a book, intended for a non-specialized readership, entitled “La loi Galland sur le commerce: Jusqu’où la réformer ?”, published in the *Collection Opuscule du Cepremap*. In this book, we expose the adverse effects of the Galland Act, attempt to evaluate the price increases that it caused, and discuss several options for reform.

Several reforms have attempted to correct the adverse effect we depict. Both the Dutreil Act (2005) and Chatel Act (2008) modified the definition of the price threshold, into which “backroom margins” were progressively reintegrated. The price increase was checked, but prices did not really decrease. The government thus attempted to further reform the contractual relations between producers and retailers, and in 2008, Claire Chambolle and I have been invited to a hearing by the Commission Hagelsteen, which was working on these reforms. The Commission heard a series of experts and invited us to give our opinion about whether general terms of sales of the producers should be discriminatory. The conclusions of the Commission Hagelsteen served as the basis for the reform of the general terms of sales included in the “loi de modernisation de l’économie” (LME), enacted in august 2008, which repealed the requirement to offer non-discriminatory terms of sales to all retailers.

2.1.3 Vertical price restraints

Building on our joint work on the Galland law, presented in section 2.1.2, Claire Chambole and I developed a more general analysis on the welfare effect of two vertical price restraints, namely resale price maintenance contracts (RPM) and price-floors. In “Anticompetitive Effects of Resale-Below-Cost Laws”, published in 2011 in *International Journal of Industrial Organization*, we go one step further by modeling an industry with imperfect competition among suppliers as well as among retailers. We consider a duopoly of producers, producing two horizontally differentiated goods, which they can sell through two differentiated retailers. Competition at both levels is in prices. We thus model interlocking relationships in the spirit of Dobson and Waterson (2007): consumers finally choose between four substitute goods. Again, we consider that producers first publish their general terms of sales (that may include pricing restraints: either an industry-wide RPM or an industry-wide price-floor) before secretly negotiating with each retailer on wholesale tariffs (we consider both linear and two-part wholesale tariffs). Finally, retailers set final prices. We focus on subgame-perfect Contract Equilibria in pure strategies (Cr mer and Riordan, 1987). We thus build a tractable setting in which we can characterize equilibria with two-part tariffs as well as with linear tariffs, even in the absence of pricing restrictions. In particular, this setup allows us to bypass the difficulties highlighted by Rey and Verg  (2010), who show the inexistence of pure strategy equilibria in a similar vertical structure (with imperfect competition at both levels, interlocking relationships and take-it-or-leave-it public two-part tariff contracts offered by producers to retailers).

We show that both restraints may suppress downstream competition and dampen upstream competition, leading to higher final prices. The main contribution of this paper is to highlight differences between two restraints that are usually considered as similar by antitrust authorities: our comparison of price-floor and RPM shows that a price-floor may be more profitable for producers, lead to higher retail prices and, in short, be worse for total welfare than a RPM. More precisely, in our framework, while resale price maintenance may have ambiguous effect on welfare, price-floors always harm welfare. These results hold with linear as well as two-part

tariff contracts.

In this paper as in Allain and Chambolle (2005), retailers' buyer power appears as a key element in the determination of prices in the different situations. Consider the simple case of linear wholesale tariffs. First, in the absence of price restraint (benchmark situation), final prices increase in the producer's bargaining power, because producers' margins increase. By contrast, under RPM contracts, final prices decrease in the producers' bargaining power: When producers have all the bargaining power, they behave as two vertically integrated producers; retail prices thus account for interbrand competition, but not for intrabrand competition, which is internalized. When retailers have some bargaining power, however, they claim a higher margin at the expense of the producers, who then increase the final price imposed by RPM to protect their margin, at the detriment of their demand. As a consequence, a RMP reduces final prices and improves welfare (compared to a situation with no price restraint) whenever the producers' bargaining power is large enough.

Furthermore, the relative bargaining power of upstream and downstream firms is also crucial in the difference between a price-floor and a RPM. When buyer power is large enough, a price-floor works out as an RPM: benchmark prices are low and the producers are better off using a price-floor to increase final prices. By contrast, when their bargaining power is large, producers would like to set lower prices than in the benchmark equilibrium, and a price-floor set at the RPM level is therefore inefficient. Price-floors thus implement corner solutions that yield higher retail prices and lower welfare than those under RPM. When retail prices are constrained, producers extract a larger share of profit, because not being free to choose retail prices reduces the retailers' outside option in the bargaining. Producers thus set price-floors above the optimal RPM level so as to ensure that they will be binding: they receive then "a larger share of a smaller pie". In these cases, the price-floor is even more profitable for producers than a RPM. As a consequence, when the producers' bargaining power is high enough, a price-floor is worse than a RPM in terms of final prices and welfare.

Finally, this article brings some new elements to the debate on the RPM. Both

RPM and price-floor were banned per se in the US until the 2007 Leegin decision by the Supreme Court (US Supreme Court, Leegin Creative Leather Products Inc, vs. PSKS inc, 06-480, 2007/06/28), which went back on the jurisprudence and replaced the per se ban with a rule of reason. In “The Recent Economic Debate on the Welfare Effects of Resale Price Maintenance”, a short article in collaboration with Claire Chambolle, published in 2008 in *Concurrences*, we give an overview of the economic debate on the pros and cons of RPM. We support the view that RPM may on occasion have a beneficial impact on competition and welfare. However, we argue that price-floors may be worse in terms of welfare, and that a clear distinction should therefore be made between price-floors and RPM.

2.2 Vertical relations, investments and innovation

In a more recent set of research works, some of which still under progress, I keep working on vertical relations and their implications in terms of competition policy, but with a specific interest in their long term effects: I focus on how the dynamic efficiency of sectors, and specifically the firms’ incentives for investment and innovation, is affected by competition and vertical relations.

In a first paper, in collaboration with Claire Chambolle and Patrick Rey, we study the impact of vertical integration on the firms’ incentives to invest. A natural application is the issue of the impact of vertical integration on the incentives to invest in an innovative process. This paper is related to ongoing research projects that I will present in section 3. A second part of my research works in this field is dedicated to the effect of buyer power on the efficiency of the innovation process. In a joint work with Emeric Henry and Margaret Kyle, we analyze how competition between the potential buyers of a license may affect inefficient delays in the signature of license contracts.

2.2.1 Vertical integration

The paper entitled “Vertical Integration as a Source of Hold-up”, written with Claire Chambolle and Patrick Rey has just been conditionally accepted at *The*

Review of Economic Studies. This paper deals with vertical integration, and revisits both the literature on hold-up and the literature on vertical foreclosure.

The literature on incomplete contracts (see, *e.g.*, Williamson, 1975, Klein, Crawford, and Alchian, 1978, and Grossman and Hart, 1986) has emphasized the role of vertical integration as a possible solution to hold-up problems. In this paper, we highlight instead that it can *generate* hold-up problems for rivals, thereby reducing the rivals' incentives to invest. To explore this issue, we introduce a classic hold-up concern in an oligopolistic setup, in which two downstream competitors must invest (in stage 1) before contracting with one of two upstream suppliers (in stage 2). Keeping in line with the hold-up literature, we consider an incomplete contract framework: it is not possible to contract *ex ante*, before investment decisions are made. We consider two possible market structure: vertical separation, in which the four firms are independent, and (partial) vertical integration, in which one upstream and one downstream firm merge while the other two firms remain independent.

Despite the lack of *ex ante* contracting, under vertical separation the competition among suppliers eliminates any risk of hold-up, and firms obtain *ex post* the full return from their investments. By contrast, we show that vertical integration creates hold-up concerns for the downstream rival, by affecting the integrated supplier's incentives from both *ex ante* and *ex post* standpoints.

To see how vertical integration may generate *ex ante* incentives to create hold-up concerns for independent rivals, we consider first a simple model in which, provided that she invests and obtains support from a supplier, a downstream firm obtains a profit that decreases in her rival's investment. We allow here suppliers, if they wish so, to commit themselves *ex ante*, before investment decisions (that is, in stage 0), to leaving no more than a given share of profits to their downstream customers - in other words, we allow them to commit *ex ante* to being "greedy". In practice, this commitment can for instance be achieved by delegating decision powers to appropriate third parties. For instance, in information and communications technology industries, some firms delegate the monetization of their patent portfolios to Patent Assertion Entities, or "patent trolls", who have built a repu-

tation of being particularly aggressive and engaging in economic rent-seeking, at the expense of patent users.

Independent suppliers never make such a commitment, as this gives them a competitive disadvantage in the competition stage. However, committing to being “greedy” allows a vertically integrated firm to ensure that his upstream competitor will have an increased market power, and will be able to extract a higher part of the independent downstream firm’s profit. Anticipating the hold-up, the independent downstream firm reduces her investment, to the benefit of the integrated firm. Finally, similar insights apply when suppliers can threaten to dissipate, rather than appropriate, part of their customers’ investment benefits.

In a second step, we show that, *even in the absence of any pre-commitment*, vertical integration can raise hold-up concerns when the quality of the support is not verifiable: Vertical integration alone may then suffice to alter a supplier’s *ex post* incentive to degrade the support provided to a downstream rival, thus exposing the rival to being held-up by the other supplier. This is the case whenever degrading the support provided to one firm directly benefits the rival firm but reduces total industry profit. The fear of *ex post* quality degradation was for instance at the core of the discussions surrounding the 2008 merger between TomTom, the leading manufacturer of portable navigation devices, and Tele Atlas, one of the two main providers of digital map databases in Europe and North America, where TomTom’s rivals were concerned that the merged entity would provide them with map databases of lower quality, preventing them from effectively competing with TomTom. Quality degradation could also involve the abuse of commercially sensitive information.

To see this, we exclude any pre-commitment possibility (we thus suppress stage 0), and we suppose instead that suppliers choose *ex post* the quality of their support, which is unverifiable and thus cannot be contracted upon. In this framework, an independent supplier will not benefit from degrading the support he provides. By contrast, a vertically integrated firm has an incentive to degrade the quality supplied to the independent rival, so as to increase the profit of its downstream subsidiary- to do so, he is even ready to offer a negative tariff to the independent

downstream firm. As a result, which supplier wins the competition depends on whether degrading the support increases or reduces total industry profit. When degrading the support provided to the independent downstream firm reduces total industry profit, the independent supplier not only wins the competition, but is able to charge a supra-competitive tariff for its support: the independent downstream firm is thus held up. Anticipating this, the independent downstream firm reduces her investment in stage 1, to the benefit of the integrated firm.

We thus show that vertical integration may create hold-up problems for the independent downstream rival, by increasing the market power of the alternative supplier. This insight is robust in many respects. It extends for instance to partial vertical integration, that is, when one firm acquires a stake (of less than 100%) in the other. We also show that the mechanism holds in the presence of several independent upstream firms, as long as degrading the perceived quality of the integrated supplier confers greater market power to the other suppliers. The analysis also applies (“upside-down”) when the upstream firms are the ones that are subject to hold-up. Finally, we explore the possibilities of counter-fighting strategies by the independent rivals, who may have incentives to merge too. We discuss conditions for a second merger not to be profitable.

Finally, our paper also relates to the literature on foreclosure (see Rey and Tirole, 2007, for an overview of this literature), and in particular to the seminal paper by Ordober, Saloner and Salop (1990), which has highlighted the impact of vertical integration on product market competition through “raising rivals’ costs” effects. We revisit this literature by focussing on hold-up and investment incentives, rather than on product market competition. Moreover, as stressed by Hart and Tirole (1990), the “raising rivals’ costs” argument relies on inefficient pricing (namely, linear tariffs), even *ex post*; otherwise suppliers’ market power would affect the division of profits, but marginal input prices would still reflect (marginal) costs, as independent suppliers have no incentives to make their customers less competitive. By contrast, here hold-up problems alter rivals’ investment incentives despite efficient *ex post* contracting. In addition, we further show that, in contrast with this literature, vertical foreclosure can arise even in the absence of

any pre-commitment to denying or degrading access. Vertical integration alone triggers incentives to degrade them, even *ex post*, whenever doing so brings direct benefits to the downstream subsidiary. As long as degrading access reduces total industry profits, the threat of such degradation exposes independent rivals to being held-up (by the other suppliers), thereby generating foreclosure.

2.2.2 Buyer power and inefficiencies in the market for licenses

I started working on another issue related to the long term effects of vertical relations during my post-doc at London Business School. About the end of my visit, I met Emeric Henry, who had then just been hired as an assistant professor at LBS. We started a theoretical research project to investigate whether buyer power could influence the timing at which an innovation was licensed, and thereby the efficiency of the innovation process. Margaret Kyle then joined the team and addressed this issue empirically. This work resulted in a joint paper entitled “Inefficiencies in Technology Transfer: Theory and Empirics”, which has recently been accepted for publication in *Management Science*.

Specialization in different phases of the innovative process is facilitated by the growth of licensing markets. This division of labour potentially improves the efficiency of the innovative process. We argue in this paper that these efficiency gains crucially depend on the timing of exchange, by which we mean the phase of development at which an innovative project is transferred from one firm to another. Among firms involved in a R&D process, some are more efficient in conducting early stage research (R) and others more efficient in the final stage of product development (D). It is socially optimal to have the relatively efficient firm own the project at each stage, i.e. to transfer the project at the right phase of development. However, imperfect information on the quality of the innovation may distort the timing of the transfer. We consider several scenarios of imperfect information: Our baseline model assumes seller overconfidence, and we show that assuming asymmetric information between seller and buyers leads to similar results. We analyze the effect of competition between the potential buyers of a license, hence of buyer power, on this timing, and thus on the efficiency of the innovation process,

when buyers and sellers of licenses have imperfect information about the value of innovation.

We first present new empirical evidence from pharmaceutical licensing that suggests a relationship between market structure and delays in the sale of ideas or projects. The pharmaceutical industry provides a case in point as drug development involves several distinct phases which are clearly defined and controlled by regulatory agencies: Typically, the discovery phase is followed by the preclinical phase, during which the drug candidates are tested on animals; at this point, clinical trials in humans begin. Clinical trials are split into three additional phases. Going from one phase to the next requires approval from a regulatory agency: Verifiable evidence of a drug candidate's quality is thus produced at each phase. Furthermore, in this industry we observe a fact that motivates our research: the fraction of licensing contracts signed after the discovery and preclinical stages has increased by more than 30% between 1990 and 2007. This shift coincides with a period of increased market concentration, as the pharmaceutical industry has undergone substantial consolidation.

Our data contains detailed information on all licensing deals in the pharmaceutical industry signed since 1973, including financial details and information about the geographical region covered by the license and about the type of contract (marketing, production, research). Finally, it records the phase of development of the drug at the time the license was signed. We combine these with data on potential buyers, who compete on the product market as well as for the license. Controlling for various measures of financial constraints and other factors, we provide empirical evidence that there is a relationship between downstream competition and licensing delay. Specifically we show that an increase in the number of buyers has a non-monotonic effect on licensing delays: Downstream competition appears to have an inverted U-shaped effect on the timing of licensing. Furthermore, an increase in the number of entrants in the disease market delays licensing while an increase in the number of incumbents reduces delays.

This evidence motivates our theoretical analysis. We develop a class of theoretical models that link market structure and the timing of licensing. We consider one

innovator with a pre-existing innovation, who may license it to one of n potential buyers who will develop the project and, if it succeeds, market the product. The license is sold by running an auction. It grants the full ownership of the innovation to the buyer. The innovator does not have the resources necessary to fully develop the innovation, but she can choose to run an auction in the first period or to do so after incurring additional development costs, in the second period. Developing the project from the first to the second period is costless for the buyers: It is thus socially optimal to transfer the project from the innovator to one of the buyers in the first period. However, the value of the innovation is uncertain before development (in period 1), but the development efforts reveal verifiable information that resolves all uncertainty about the project's value (in period 2). Our baseline model assumes that, in period 1, the seller is overconfident: she assigns a higher probability that the project is good than the buyers.

In that framework, we show that market structure affects the timing of the transfer. If the payoffs on the market do not depend on the number of potential buyers, the condition for early licensing is harder to meet as the number of buyers increases. However, if the number of potential buyers negatively affects the profits, the effect of a change in the number of competitors is more subtle. There are two countervailing effects of n on the price the innovator can extract. On the one hand, it raises the “bargaining power” of the innovator, since there is a higher chance that one bidder has a low implementation cost. On the other hand, it decreases the actual profits derived from the innovation, since profits are a decreasing function of n . The tension between these two effects yields an ambiguous effect of n on the price in the auction and thus on the timing of licensing.

We then introduce an additional source of buyer heterogeneity, assuming that some potential buyers, the “incumbents”, are active in the same class as the licensed innovation, while others, the “entrants”, are not currently active on the downstream market. The number of entrants thus plays a role in the bargaining power of the seller, but it does not affect the profits in the same way, as *in fine* at most one entrant enters. The first result states that an increase in the number of potential entrants unambiguously delays licensing. By contrast, delay is likely to

decrease with the number of incumbents.

We finally discuss what alternative assumptions yield similar predictions, and we define a common thread for those models that predict the patterns highlighted in the empirical study. We then explore other plausible assumptions. For example, the seller might be better informed about the quality of the project or about some characteristic of the market, such as the number of buyers competing for the purchase. The buyer and seller may also have different risk profiles. Any of these assumptions yield the same qualitative result for the relationship between the efficiency of markets for technology and competition.

Though our model is not specifically designed to analyze the issue of mergers, our results suggest some implications for competition policy. In particular, merger reviews in highly technological areas should consider this additional effect of the merger on upstream licensing markets. The pharmaceutical industry has undergone significant consolidation in recent decades, particularly between the large multinationals that are the typical buyers of licenses. In addition, there is much concern regarding a slowdown of innovation in this industry that the widespread use of licensing has failed to reverse. This paper highlights some frictions in licensing and the role of competition that may at least partially explain these patterns.

2.3 Coordination and Competition Policy

The last part of my research works deals with competition policy issues related to “alliances” between firms, in other words, by the way competition is affected by some kind of cooperation between competitors. These issues are structured around two main research areas: cartels and mergers.

I started working on cartel deterrence in 2010 as I wrote a report, with Jean-Pierre Ponsard and Marcel Boyer, about cartel deterrence. In this report, we discussed the actual methods of cartel deterrence by competition authorities, and the assessment of social damages caused by cartels - we focused on the estimation of cartel overcharge. We then reviewed the economic literature on cartel fines, with the aim of defining the “appropriate” level of fines. Participating to this report gave me the opportunity to become more familiar with the issue of cartel

deterrence, and introduced me to the economic analysis of crime. I will present two papers on this topic.

The second part gathers several research works related to mergers, a topic on which I started working during my PhD. I will first present a theoretical analysis of mergers in vertically related industries, followed by an empirical paper that presents a retrospective analysis of a merger in the retail sector. In both cases, I consider the implications for merger control.

2.3.1 Cartel deterrence

Preventing the formation of cartels and stopping the active ones is a major objective of competition policy. Though some countries have adopted criminal sanctions against individuals who engaged in cartels (including the United States and a few countries within Europe), antitrust authorities rely mainly on financial penalties to enforce laws against cartels. Properly setting the amount of the fine for each convicted cartel is thus an important issue, as the fine is the main tool of antitrust authorities to achieve their objectives of deterrence and compensation.

A few recent articles have tried to investigate whether in practice fines are set adequately, and especially whether they are sufficient to be deterrent. Connor (2010) uses a large database of international cartels to study cartel overcharges, and concludes that "...penalty guidelines aimed at optimally deterring cartels ought to be increased". However, Connor (2011) acknowledges that, following the 2006 Guidelines, the fines imposed by the European Commission have dramatically increased : "The new Guidelines produced hard-core cartel fines that were more than six times as severe as comparable fines imposed under the 1998 Guidelines". This makes recent fines more in line with their objectives: "For the first time in antitrust history, I believe we are observing fines that regularly disgorge the monopoly profits accumulated by cartelists". Combe and Monnier (2011) consider 64 prosecuted cartel cases in the European Union. They define and compute optimal fine benchmarks, which they compare to the actual fines inflicted to the cartels they consider. From their theoretical analysis and empirical estimates, they conclude that "fines imposed against cartels by the European Commission

are overall sub-optimal”.

Two articles in collaboration with Jean-Pierre Ponsard, Marcel Boyer, and Rachidi Kotchoni contribute to this literature. In a first article written with Marcel Boyer and Jean-Pierre Ponsard, and published in 2011 in *Concurrences*, we discuss the general methodology used to estimate the cartel overcharge (that is, the difference between the cartel price and the price that would prevail in the absence of the cartel), and especially the choice of the counterfactual scenario. We then discuss how to determine the optimal level of fines in cartel cases in view of the objectives of deterrence and compensation.

The economic theory of deterrence of criminal activities proceeds from the seminal works by Becker (1968) and Landes (1983). This approach considers the incentives of firms to engage in illicit activities: to ensure deterrence, the expected fine should be high enough to wipe out any expected profit from the participation in the cartel. More precisely, a firm is deterred from participating in a cartel if the expected excess profit (caused by cartel behavior) is lower than the expected loss, which equals the fine times the probability of being discovered and convicted. For a given probability of detection, this approach defines a lower bound such that any fine above this benchmark will be deterrent.

Another objective of the punishment of criminal activities is to achieve the reparation of the harm that these activities have caused to society. To make sure a fine is in line with the value of the harm caused, one would need to base fines on a precise estimation of social damages. Yet measuring social damages, especially consumer welfare losses, is a demanding exercise that requires a precise case-by-case analysis, which is too costly to be systematically conducted by antitrust authorities (See OXERA, 2009). We therefore follow a “second-best” approach, in an attempt to provide a simple benchmark that can be computed from available public data. We thus deem as “compensatory” any fine such that the illicit profit of the cartel is seized back. This defines a benchmark fine satisfying the compensation objective.

These two objectives define two lower bounds: any fine above the maximum of these bounds will thus satisfy both objectives. However, setting too high a fine

may be inefficient: it may induce social costs. First, large fines may violate principles of proportional justice. Second, they may force companies into bankruptcy. Wils (2006) warns that bankruptcy entails costs on innocent stakeholders: it would “hurt not only managers and shareholders, on whom the bankruptcy may be considered to have a desirable deterrent effect, but also all other stakeholders in the firm: employees, suppliers, customers, creditors and tax authorities.” These considerations have driven antitrust authorities in Europe and in the US to take into account the ability to pay of the convicted firms when they set fines. Finally, setting too high a fine may paradoxically decrease deterrence, as stated by Andreoni (1991) in the case of criminal activities: if the jurors decide whether to convict an individual by weighing the costs associated with false acquittals and false convictions, as the cost of false conviction increases in sanctions, higher sanctions may lead jurors to convict less frequently. We therefore claim that the optimal fine is the maximum of the two lower bounds.

In “Are Cartel Fines Optimal? Theory and Evidence from the European Union”, written with Marcel Boyer, Rachidi Kotchoni and Jean-Pierre Ponsard and published in 2015 in the *International Review of Law and Economics*, we go further by using an extensive analysis of EC fines over the period 2005-2012 to assess whether recent EC-imposed firm level fines satisfy the deterrence and/or compensation benchmark. We first consider a simple dynamic model of cartel along the lines of Aubert, Rey and Kovacic (2006) to define the benchmark fine for the deterrence objective. We consider that firms interact in an infinitely repeated game. In each period, they must first communicate before setting prices, and communication is a necessary condition for the cartel to exist. For each firm participating in the cartel, we define the deterrence benchmark fine as a function of the annual excess profit (that is, the difference between the profit in the cartel and the profit under competition) and of the annual probability of detection by antitrust authorities. Furthermore, we simply define the compensation benchmark as the annual excess profit multiplied by the number of years of cartel activity.

We then follow a method developed by Buccirosi and Spagnolo (2007) that requires parsimonious information on market conditions to assess cartel excess

profits as a function of each firm's annual sales and three parameters: the price-elasticity of demand, the but-for competitive markup (that is, the markup that would prevail in the absence of the cartel), and the cartel overcharge.

We build a database of all cartels fined by the European Commission over the period 2005-2012. During this period, the European Commission fined 325 firms for their participation in 49 cartels. As the EC does not publish all data for confidentiality reasons, we have workable data for slightly less than half the firms, and our sample covers a wide range of sectors. The data recovered are: the duration of infringement, the size of the firm's annual sales in the relevant markets, and the level of the fine¹. As for the but-for price, the probability of detection, and the price-elasticity of demand, we base our analysis on several reasonable representative scenarios corroborated by the empirical literature.

We then compute the two benchmark fines in the different scenarios and compare those to the actual level of the fine imposed the European Commission. For instance, assuming that the annual probability of detection is 15% and the price-elasticity of demand is -1, the share of actual fines above the deterrence benchmark varies according to the scenarios from 28% in a scenario with powerful cartels in a very competitive industry (with a cartel overcharge of 30% and a but-for markup of 5%) to 89% in a scenario with much weaker cartels in a less competitive sector (with a cartel overcharge of 50% and a but-for markup of 20%). Similarly, with the same assumptions regarding the probability of detection and the price-elasticity of demands, the share of fines above the restitution benchmark varies from 43% for a 5% but-for markup and a 30% cartel overcharge, to 95% for a 5% cartel overcharge (irrespective of the markup). Overall, we find on average a higher proportion of fines above the two benchmarks than Combe and Monnier: this comes partly from the definition of our deterrence benchmark in a dynamic setting, and partly because our data select more recent cartels. These empirical results could indicate that recent fines are closer to their deterrence and compensation objectives than they were in the past. However, a striking feature of our results is the dispersion of the fines : some seem to be too high, while others are much too low. This calls

¹We use the level before mitigating and aggravating factors and before leniency reductions.

for further research on the optimal way to design fines.

2.3.2 Horizontal mergers

The preventive control of mergers is a central activity of competition authorities, and perhaps their main tool for the control of market structures. In Europe, since the 1989 Merger Regulation 4064/89, all firms (above a given turnover) have to notify their merger projects and receive the authorization from the competition authorities. Competition authorities base their decisions on the assessment of possible effects on competition and welfare. According to the European *Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings* (2004/C 31/03), “Through its control of mergers, the Commission prevents mergers that would be likely to deprive customers of [the benefits of competition] by significantly increasing the market power of firms. By ”increased market power” is meant the ability of one or more firms to profitably increase prices, reduce output, choice or quality of goods and services, diminish innovation, or otherwise influence parameters of competition.” In this section I present several contributions to the economic analysis of mergers.

A merger influences competition not only in the industry in which it occurs, but also in vertically related sectors: It may influence the market conditions in these sectors, for instance through the costs or the demand function, and even the market structure, for instance by affecting the incentives to merge in these sectors. Although this indirect effect is important for competition policy, very little literature has been devoted to assessing its impact. In the E.U. and the U.S., Competition Authorities generally consider a merger as less harmful when the demand stems from sufficiently concentrated firms: the underlying idea is that buyers’ market power will translate into bargaining power towards their suppliers. A stream of literature has developed this theme since the seminal work of Galbraith (1952). However, a more detailed analysis of the effect of the vertical position of firms on their incentives to merge and on the welfare consequences of mergers is necessary.

I started investigating this question during my PhD, in collaboration with Saïd

Souam. We continued working on this topic after my PhD and published in 2006 in *Annales d'Economie et de Statistique* a first article entitled “Concentrations horizontales et relations verticales”. In this article, we provide a theoretical analysis of horizontal mergers in vertically related sectors, focusing on the link between concentration in the two sectors and the sharing of profits between upstream and downstream firms. We consider a model of successive Cournot duopolies, with quadratic costs that depend on the firm’s capital investment – this cost structure follows McAfee and Williams (1992) and allows us to take into account size effects created by a merger. In this setting we compare the profitability of mergers in the two sectors. We show that, everything else being equal, mergers tend to be more profitable downstream than upstream. This result contrasts with Ziss (2005), who shows in a similar framework, but without size effects, that, when the upstream marginal cost and the degree of concavity of final demand are constant, the profitability of a horizontal merger is the same, everything else being equal, in both sectors. Furthermore, the losses caused by a merger in the upstream sector to downstream firms are worse than the losses incurred by upstream firms due to a merger downstream. As a consequence, even though mergers are more profitable downstream than upstream, they may be more harmful to welfare when they occur among upstream firms. We also show that increasing concentration in one sector reduces the profitability of mergers in the other sector.

A second article in collaboration with Saïd Souam, entitled “A Note on horizontal mergers in vertically related industries” and published in 2011 in *Economics Bulletin*, attempts to generalize some of the results obtained in the first article. We build a tractable model of successive Cournot oligopolies with an elastic input supply function in the upstream market and an elastic final demand function. Our first contribution is to compare the profitability of mergers in the two sectors. We characterize conditions on the concavity of the input supply function and of the final demand function such that, everything else being equal, an upstream merger may be more profitable than a downstream merger. Our second contribution consists in analyzing the impact of a merger in one industry on the joint profit in the other industry in a framework where the input supply function is elastic, with con-

stant degree of concavity. We show that the elasticity of the input supply function may lead upstream losses to become worse than downstream losses. Finally, we discuss these mechanisms when the two degrees of concavity are not constant, and we sketch a welfare analysis.

The application we had in mind while starting these researches was the issue of mergers among retailers, especially whether these are as likely to be welfare-decreasing as mergers among suppliers. A theoretical analysis sheds some light on this issue, but I was soon convinced that an empirical investigation would be useful, especially in a context of growing retail concentration. In fact, over the last thirty years, successive merger waves have dramatically increased food retail sector concentration in most western economies. In 2000, in the US, the largest five retail groups realized close to one third of total food sales. In Europe, the highest concentration ratios are reached in the northern European countries, but the retail sector is rather concentrated in most countries in western Europe.² Yet supermarket mergers are a particularly important issue for antitrust authorities because food expenditures represent a large share of household budget - about 13% on average in European countries in 2012.³ Large price variations due to a retail merger may thus cause a large impact on consumer surplus.

In 1999, Claire Chambolle and I had been invited by the French Antitrust Authority (Conseil de la Concurrence) to present a survey on the welfare consequences of retail mergers to the members of the Conseil. Our main conclusions were that two particular features of the retail sector, namely the local dimension of competition and the existence of buyer power, make the antitrust analysis of a merger in the retail sector more complex than a merger between producers. First, because supermarkets compete at the local level, the effects of a merger have to be analyzed for each local relevant market. Second, as in any sector, a merger between retailers reduces competition, which tends to increase prices; this effect can however be balanced by possible efficiency gains due to synergies. A third effect, which is specific to the retail sector, is the possible gains induced by buyer power.

²According to Einarsson (2011), in 2004, the total market share for the largest three retailers (CR3) was above 79% in Denmark, Finland, Iceland, Norway, and Sweden.

³Source: Eurostat.

Indeed, the merged retailer is likely to obtain better terms and conditions from its suppliers, and to pass on part of this cost reduction to consumers. Increased buyer power can thus lead to a welfare-enhancing reduction in final prices. This effect is specific to the vertical structure of the retail industry, which explains why competition authorities may be more prone to clear mergers in the retail industry than in other sectors. For instance, among the 99 retail mergers proposed between 1990 and 2012 to the European Commission, 89 were approved, 8 were approved subject to conditions, and only 2 were rejected.⁴

The opportunity to start working on an empirical analysis of a retail merger was given by the exceptional database purchased by INRA, which gave us access to data on food purchases by a consumer panel representative of the French population. With this database, we could attempt to retrieve the impact of a large merger among supermarket chains on prices and on consumers purchasing behavior. This work led to a paper in collaboration with Claire Chambolle, Stéphane Turolla and Sofia Berto Villas-Boas, entitled “The impact of retail mergers on food prices: evidence from France”. It is currently under revision at the *Journal of Industrial Economics*. In this paper, we attempt to causally identify localized price effects of a merger. Furthermore, we test several economic mechanisms at play behind the price responses to a retail merger. We obtained a 9 000 US Dollars grant in 2014 from the France-Berkeley fund, and a 2 000 Euros grant in 2013 from CEPREMAP, to develop this project.

This paper analyzes the impact of a merger that took place in 2000 in the French retail sector, when two of the main retail chains merged. The merged entity then became the first chain at the national level. The EC cleared the merger on the condition that some divestments were made. It then delegated the decision to the French and Spanish competition authorities in order to assess the impact of the merger on retail competition at the local level. The French CA concluded that competition was likely to be affected in 27 local areas. However, the remedies required were not all enforced by the French Ministry of Economics,

⁴For instance, in 1997, the EC prohibited the merger between two leading food retail chains in Finland, Kesko and Tuko (see, 97/277/EC Kesko/Tuko, OJ L 110/53, 26/4/1997).

and the merger finally received final administrative approval in May 2000.

We use the scanner data collected by *TNS Worldpanel*. This dataset records food purchases from a panel of households that are representative of the geographical and socio-economic group characteristics of the French population. We have information on prices paid and quantities purchased, all products purchased are described by a rich set of characteristics, and households provide information about their shopping place. We complement these data with information on retail store characteristics over the same time period, obtained from the *Panorama Tradedimensions* dataset. Lastly, we collect population and average household income information from census surveys, to proxy for determinants of demand faced by stores at the *commune* level (the French administrative unit similar to city). We consider the period that spans 1998 to 2001, in order to avoid two sets of “shocks” that are orthogonal to the merger and may have influenced prices as well: first, the Raffarin and Galland laws enacted in 1997 (and previously discussed) – so we start in 1998 – and second, the monetary change that took place in 2002 (French Franc disappeared as Euro was launched on January 1, 2002) – so we stop in 2001.

In order to measure the price-effect of the merger on food prices, we perform a difference-in-differences analysis by comparing price changes at stores situated in markets affected by the merger (treated markets) to price changes in markets unaffected by the merger (counterfactual control markets). First, in line with the position of the French CA, we define around each store a “local market” as the set of hypermarkets within 20 km around the city center where the store is located, and of all other stores within 10 km. Our baseline definition of the treatment group is the set of stores affected by the merger either directly (i.e., stores belonging to the merging firms, or “insiders”), or indirectly (i.e., stores not belonging to the merging firms, that is, “outsiders”, but belonging to a local market where at least one insider is active). Outsiders that do not compete with a store belonging to the merging firms are included in the control group. A consequence of this definition is that the treatment group is larger than the control group – we thus use several methods, including a propensity score matching estimator (see Hirano et al., 2003), to correct this potential bias.

First, even though we are unable to estimate the causal effect of the merger on insiders, as we cannot construct a counterfactual for the insiders (by definition they all belong to a treatment group), we find that the merger is correlated with price increases of the merging firms: comparing prices before and after the merger shows that prices at insider stores increased by 4 to 5%. Second, we use the difference-in-differences method to analyze the effect of the merger on the outsiders prices. Our results show that the approved merger affected competitors' prices positively and significantly, *i.e.* between 1.5% and 2.5%. In addition, we empirically investigate economic forces behind the observed price changes. By decomposing this effect even further, we show that competitor prices increase more in local markets that experience larger structural changes. We break up the overall increase in the outsiders' prices and find that a change in local concentration and a drop in local retail differentiation explain a large part of the treated outsiders' price increase. In contrast, isolating a pure rebranding effect, which appears in markets where one of the merging firm rebrands after the merger, but where no store of the other merging group operates (to avoid any local concentration effects), and where no store of this new brand was operating before the merger (to avoid a drop in local differentiation), does not explain significantly the treated outsiders' price increase. Finally, we show that our results are robust to changes in the definition of the treatment and control group and to anticipation concerns.

In terms of competition policy, we confirm that mergers in the retail sector must be analyzed at the local level. Two recent reports by the French Competition authority on the retail sector express the view that retailers benefit from weak local competitive conditions and exert significant market power in local markets (see Conseil de la Concurrence (2007 a) and Autorité de la Concurrence, 2012). The French Competition Authority even calls for the right to impose ex-post remedies on retail groups when they are too highly concentrated in some areas, such as Paris. We support this analysis. We plan to continue working on this issue, and I will develop further in section 3.1.1.

3 Research perspectives

In this section, I present my research perspectives in the short and medium term. One of the objectives I have for the coming years is to develop empirical and experimental methods in addition to the theoretical ones. I have a few projects which I hope will inaturally lead me to use the methods of experimental economics. I also wish to develop more empirical works, and if possible explore the field of structural econometrics.

In terms of applications, I wish to further extend my researches beyond the field of vertical relations. In what follows I will present some of my research projects. This section is organized as follows: I will start with two projects about retail mergers in section 3.1; in section 3.2, I will then present an experimental project on vertical integration; then in section 3.3, I will present a project on two-sided markets, before moving on category captains in section 3.4, and finally on cartels in section 3.5.

3.1 Retail mergers

One of the main themes I plan to study in the short run is horizontal mergers. I already have two on-going projects, and I hope to develop other researches on that topic. Both on-going projects deal with mergers in the retail industry. The first project is empirical: we plan to adopt a structural approach in order to complete and refine our analysis of retail merger, and test the results on the data we have on the French retail market. The second project is theoretical: in order to go further in the analysis of mergers in the retail sector, we plan to introduce new features in the analysis, such as the mix of local and national pricing strategies.

3.1.1 Empirical analysis

The growing economic literature that attempts to evaluate the price effect of mergers relies on two main methods, and there is a lively debate between the two approaches (see for instance Angrist and Pischke, 2010, or Nevo and Whinston, 2010). First, some papers, in the spirit of Nevo (2000), build structural models of

demand and supply in order to simulate mergers using pre-merger data. A second stream of empirical papers uses both pre- and post-merger data on prices to directly estimate the effects of structural changes and mergers (such as Focarelli and Panetta (2003) for retail banking; Hastings (2004) for retail gasoline; Basker and Noel (2009) for retail entry and Hosken, Olson and Smith (2012) for US retail chain mergers). Recently, Houde (2012) reconciled both approaches by conducting both a retrospective analysis and a structural econometric simulation of a vertical merger in the Canadian gasoline sector.

In Allain, Chambolle, Turolla and Villas-Boas (2013), we use a retrospective methodology to analyze the price effect of a merger. In terms of policy implications, this method allows us to criticize a decision that has been taken in the past. However, another challenge is to predict *ex ante* the potential price effects at the time when antitrust authorities are notified of a merger, in order to impose relevant remedies and to better protect consumers. Several steps could be taken in this direction.

Using our detailed data, we can first perform a simple prediction of how the local concentration changes induced by the merger would affect local market retail prices. Using our estimation of the correlation between the Herfindahl-Hirschmann Index (HHI) and prices pre-merger, we perform an out-of-sample price prediction, given the post-merger local HHI levels. We find a predicted price increase of 2.11% with the new HHI, with a standard error of 0.05%. We conclude that these predictions, that rely on a simple method based on the variation in the local HHI index, are rather close to the 2.5% price increase obtained in our expenditure weighted DID specification. Hence, using the HHI as a preliminary screen for merger analysis appears to be an attractive tool - a finding consistent with Hosken, Olson and Smith (2012).

In order to complete and refine our analysis of retail mergers, we plan to adopt a more structural approach. Our goal would be to simulate the effect of divestitures with a theoretical model and calibrate the model with our data. Smith (2004) measures market power firms derive by internalizing cross-effects between stores in their chain. He then uses the model to predict the effects of demergers in the

UK retail sector, by calculating the profit margins that individual stores would set if they operated independently of other stores with the same firm. We could build on his approach to construct our model and incorporate new features.

An important difference would come from the variety of the pricing strategies of the French retail chains. In Allain et al (2013), we point out that the French retail chains have very different strategies. More precisely, we use our data in the pre-merger period to relate prices at the group level (each retail group is composed of several retail chains) to variables controlling for local market conditions, including the level of concentration in local markets (measured by the HHI). This analysis reveals that, though no chain has a pure national pricing strategy, as pure within-chain price dispersion measures are not zero for any of the retail chains, one of the merging chains, say, *M1*, tends to respond less than the others to local competitive factors: *M1* is closer to having a national pricing strategy. We claim that these strategies have different impacts on the price effect of mergers. We therefore would like to understand better the impact of retailers pricing strategy on retail mergers. A theoretical project in collaboration with Claire Chambolle and Stéphane Turolla deals with this issue.

3.1.2 Theoretical analysis

It has been well documented by consumers' associations that retailers distort their offers locally, mainly by adopting local pricing policies. Local pricing strategies have been reported in Spain (see *e.g.* Asensio, 2014), or in the US (see Ellickson and Misra, 2008). In France, Biscourp, Boutin and Vergé (2013) show that price decisions in the French retail sector are partly made at the national level and partly at the store level. Similarly, in Austria, Pennerstorfer and Sinabell (2013) show that some retailers "seem to regionally differentiate prices extensively". This contrasts with the pricing strategy of the main retail chains in the UK, where uniform pricing at the national level prevails. In 2004 for instance, the main British retail chains (Tesco, Asda, Sainsbury's, and Morrisons) made a public commitment to uniform national pricing in the newspapers. Asda stated that "Asda pricing does not discriminate by geography, store size or level of affluence - we have one

Asda price across the entire country". Taking this dimension into account could enhance the analysis of the welfare effects of mergers.

There is a large literature on retail pricing strategies. Some empirical papers, in the marketing literature for instance, as Ellickson and Misra (2008), observe the pricing strategies chosen by the retail firms and reveal their variety. They stress the importance of local demand factors in the determination of these strategies. Similarly, Chintagunta, Dube and Singh (2003) and Li, Gordon and Netzer (2013) compare the profitability of different strategies when several retail chains compete on several markets. However, few papers model the pricing strategies of multi-outlets chains operating different stores in different local markets. Dobson and Waterson (2005) endogenize the chains' choice of the pricing strategy (local or uniform). They provide a theoretical framework explaining why, under certain local market conditions, national retail chains are better off setting uniform prices: They show that, in some cases, local pricing may not be the optimal strategy. However, none of these papers studies the way such a choice may impact the welfare consequences of a merger.

In this project, we plan to go one step further by investigating how the welfare effects of a merger in the retail sector may vary according to the choice of the pricing strategy. In a first contribution, presented in January 2015 at the workshop "Regards croisés en Economie et Politique de la Concurrence" in Paris, and currently submitted to a special issue of the *Revue Economique*, we present a simple model to analyze this issue. We focus on two polar cases: purely national ("uniform pricing") or purely local pricing strategy. We consider two local markets A and B, each of them being modeled as a Salop circle on which three stores compete: 1, 2 and 3 on market A, and 1,3 and 4 on market B. We consider the effect of the merger between 1 (who is present on the two local markets) and 2 (who is present only on market A).

In the benchmark situation, all firms adopt a local pricing strategy. In that case, after the merger, prices increase (and the welfare decreases) only in market A, and market B is not affected, in the sense that the merger does not change concentration in this market (as at least one of the merging groups operates no

store there). However, our first results show that, when a retailer (either an insider or an outsider) adopts a uniform pricing strategy, the price increase on markets affected by the merger spreads to markets “unaffected” by the merger. This calls for a redefinition of the relevant market in the case of a merger in the retail sector. However, this propagation effect can be counterbalanced by a reduction of the price increase in the local areas affected by the merger (here, the market A), but only if the unaffected market is sufficiently competitive compared to the affected market. We plan to build on these first results to develop the insights in a more general framework. In particular, we want to compare the welfare effects of the merger on the two markets depending on which chain adopts a national pricing strategy (an insider or an outsider). We also want to endogenize the choice of the pricing strategy by the merging firms after the merger, and to investigate whether antitrust authorities should consider that a merger is more likely to be anticompetitive if the firms adopt a uniform pricing strategy, and whether they should impose a change in the pricing strategy as remedies.

3.2 Vertical integration: an experimental perspective

In Allain, Chambolle and Rey (2014) we have highlighted that, when competition prevails in two vertically related sectors, vertical integration can *generate* hold-up problems for rivals, thereby reducing the rivals’ incentives to invest. We plan to further develop this analysis by testing whether the conclusions of our theoretical analysis appear in an experimental setting.

Due to a lack in field data, empirical investigations on hold-up inefficiencies rely mostly on laboratory experiments. For instance, Ellingsen and Johannesson have conducted a hold-up experiment in which unilateral investment is followed by bilateral bargaining. They show that without communication, investment is low, and that unilateral communication facilitates coordination. However, most studies test whether hold-up arises in a bilateral bargaining setting, in which two players have to share the return on one’s sunk investment. As we highlight in our theoretical paper, taking into account competition upstream and downstream modifies the conditions of emergence of the hold-up externality, and may even

reverse the findings.

Furthermore, we have seen that our theoretical results also relate to the literature on foreclosure. Experimental testing of the “raising rivals’ costs” mechanism highlighted by OSS has been performed by Normann (2011) and Martin et al. (2001), who explore the emergence of foreclosure in an experimental setting. We build on their analysis to develop our experimental method.

We plan to run an experiment in order to test whether hold-up arises in a framework with upstream and downstream competition. We have already written the protocol, and run the “pilot” experiment. We hope to go on with several treatments before the end of the year. We are going to study two setups, in order to see whether we replicate our analysis both from an *ex ante* and an *ex post* perspectives. The first one replicates the “simple model” presented in Allain, Chambolle and Rey (2014), section 2.1, in which hold-up relies on the possibility for upstream firms to pre-commit *ex ante* to being “greedy” and leave no more than a given sharing rule to their customers. The second test relies on the more elaborated model with unverifiable quality developed in section 3.1, in which hold-up relies on the possibility for upstream firms to degrade *ex post* the quality of the support they provide to their customers. Each of these models will constitute a “treatment”, while a third treatment will consist in playing the benchmark game without pre-commitment, and without possible quality degradation.

In each session, we play one treatment ten times without integration (phase 1), and ten times with integration (phase 2). Thirty players are active in each session: twenty play the role of the two upstream firms (10 play the role of U_A and 10 others U_B), and ten play the downstream firm D_2 . The fourth player in our model, D_1 , is a non-strategic player whose behavior is determined by a program. We therefore focus on the two upstream competitors (the ones who take the decisions to hold-up their customers or not) and on the reaction of the independent downstream firm, D_2 . In each session, a role (U_A , U_B or D_2) is first attributed to the players. This role is fixed for the entire course of the experiment. Then the game is played ten times in phase 1. At each time, the players are matched. Matching between players U_A and U_B follows the “perfect strangers” protocol, that is, each player

U_A meets at most once each player U_B . By contrast, players D_2 are randomly matched with a pair $U_A - U_B$ at each time.

Our experiment will take place at Ecole Polytechnique between may and december 2015. Both Polytechnique Students and employees from the administration will participate to the experiment. At the end of each session, one of the twenty treatments will be drawn randomly, and the subjects' monetary earnings will equal their payoffs in this session. To finance this project, we obtained credits from the Agence Nationale de la Recherche (ANR) and the Deutsche Forschungsgemeinschaft (DFG) for the French-German cooperation project "Competition and Bargaining in Vertical Chains," from the European Research Council under the Grant Agreement no. 340903, and from Labex Ecodec Investissements d'Avenir (ANR-11-IDEX-0003/Labex Ecodec/ANR-11-LABX-0047).

3.3 Vertical restraints in two-sided markets

The Internet technology and the web economy create new types of markets and new relationships between market players. The majority of these new markets can be associated to platforms where two sides of the same market meet. Such "two-sided" industries raise specific issues of competition policy. Since november 2014, I started supervising a PhD student, Thomas Larrieu, in collaboration with Philippe Février. Thomas is working on these issues, and benefits from a "CIFRE" convention: he works part time at the Economics Department in Ecole Polytechnique, and part-time at two closely related consulting firms, MAPP (a consulting firm that offers microeconomic analysis services with a focus on competition issues) and Veltys (a "sister company" specialized in micro-econometric analysis, and more generally in data management).

Applying the standard tools of competition policy to two-sided markets can be misleading, especially as the competitive pricing strategies of two-sided platforms can be difficult to read: platforms can abuse their dominant position by setting their prices too low (predatory pricing) or too high (excessive pricing). Given the typical pricing structures of two-sided platforms, it is possible to find excessive pricing on one side and predatory on the other side, even though the platform

remains competitive overall. Indeed, it may be privately and socially optimal to price one side of the market below costs when the other side of the market is the one where the platform earns revenues. In such a framework, specific contractual clauses may have unexpected effects, and Thomas Larrieu plans to explore these issues in his PhD.

We have a project in collaboration that focuses on most-favoured-nation (henceforth MFN) clauses. MFN clauses are contract provisions in which a seller agrees to give the buyer the best terms (*e.g.*, price) it makes available to any other buyer. In theory, the impact of MFN clause is ambiguous: although there is some concern that MFN may restrict competition and harm consumers, potential benefits can also be pointed out. For instance, MFN can be used to prevent free-riding, or opportunism in situations where one of the parties makes relationship-specific investments. Platform MFN agreements in particular have played a key role in recent antitrust cases involving credit cards, ebooks, and health-care networks (see Salop and Scott Morton, 2013).

A case in point is provided by online hotel booking platforms. In several countries, competition authorities are currently investigating MFN clauses in distribution contracts in this sector. Booking platforms are two-sided, as they offer an intermediation service to consumers and hotels. Typically, platforms charge a fee to the hotel when a room is sold on their website. Knowing these fees, the hotels decide on which platform to be listed, which quantity (number of rooms) they offer on each platform they are listed on, and at which price. Finally, consumers select one or several platforms, and book hotels. In the present case, under a MFN regime, the hotels affiliated to a platform are contractually bound to offer no lower price for equivalent rooms, neither on other platforms, nor on their own booking system. There exists little theoretical and empirical work on the competitive impact of MFN clauses. We plan to work with Thomas Larrieu on this issue first from a theoretical perspective, before making an empirical analysis with data he has started to collect.

3.4 Category captains

Because they sell an increasing variety of products, retailers often are confronted with insufficient knowledge about each product category. Category management became widespread in the early 1990's in order to overcome this lack of information and improve how retailers answer the consumer's needs. Retailers often entrust a Category Captain to help them managing a product category: the UK Competition Commission, for instance, defines a "category captain" or "category manager" as "a supplier invited by a retailer to provide advice, research and make recommendations to optimize how that retailer stocks and sells all product (including competing product) within a particular grocery category."⁵ A category captain is thus a producer involved in decisions that affect not only its products, but also those of its competitors. Typically, the category captain gives advice on how to present the products, how to organize promotional policies, and shares information on market trends and consumer shopping behavior. Subramanian et al. (2010) quote the example of Kraft Foods who was selected as category captain for the pourable dressings category, and "demonstrated to retailers that changing the relative placement of [the products could increase] category volume by 12.3%."

The information and advice provided by category captains may thus bring efficiency benefits, but such arrangements are also a growing concern for competition authorities. A recent report by the French Competition Authority (2010a) points out that the status of category captains is "an informal process marked by a significant lack of transparency". The French Competition Authority then mentions that there are risks of exclusionary conduct resulting from the category captain's possible influence in stores, and risks connected to exclusive transfers of information. Furthermore, the Authority also mentions risks of horizontal concerted practices connected to category management relationships (both between distributors and between suppliers). I have two research projects on these issues. The first one

⁵See Competition Commission, 2005, Cott Beverages / Macaw (Holdings) merger inquiry, Glossary, available at <http://webarchive.nationalarchives.gov.uk/20140402141250/http://www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/rep-pub/reports/2006/fulltext/512glossary.pdf>

is joint with Claire Chambolle and Patrick Rey, and the second one is joint with Clémence Christin.

In the first project, we plan to focus on potential foreclosure effects of category captain arrangements on rival manufacturers, resulting from the information exchanged by the retailer and its category captain. Our starting point is the observation that the successful development of a manufacturer's project often requires the exchange of sensitive information with its distributors. In particular, the promotional activities associated with the launch of new products generally require advance planning with the main retailers. But since category captaincy involves intense exchanges of data and know-how between the retailer and its category captain, it can give the captain an access to strategic information about its competitors' projects. That is, rival manufacturers can be concerned that strategic information about their product development plans, marketing strategies, and so forth, that need to be passed on to retailers, may end-up being disclosed to those competitors who enjoy a category captain position. Providing the category captain with advanced information about the launch of a new product may for example reduce or even eliminate the lead time before the apparition of an imitation, and thus partly dissipate the profit expected from the innovation.

In this project, we consider category captaincy as an organizational choice that enhances the information flow between a retailer and one of its supplier. This information flow confers the category captain the advantage of being able to know about its competitors plans to launch new products, thus creating a risk of imitation. Being a category captain thus increases the expected profit of a manufacturer, while facing a category captain reduces a manufacturer's profit because of imitation. This creates distortions in the incentives to innovate: *ex ante*, the category captain increases its investment while the competitor reduces it. In that framework, we are interested to see how competition for category captaincy may affect these distortions. Furthermore, we are interested in the effect of category captaincy on the probability of innovation, on consumer surplus as well as on welfare.

In the second project with Clémence Christin, we take a different perspective.

We do not consider the information issues, but we view the category captain as the provider of a service that will boost demand for all the products of a given line. However, the impact of this effort is differentiated across the products. We consider the intensity of spillovers as a parameter (that can even be negative). In this framework, we are interested in a retailer's choice of category captains for her different lines of products. We specifically study how choosing the same manufacturer as a category captain for several lines of products may affect the retailer's bargaining power in the negotiations with her suppliers.

3.5 Cartels

Finally, I would like to carry out research on the implementation of competition policy, especially in the field of cartels. First, from an applied perspective, I would like to carry on with the work I have started on the fines set by the European Commission, and investigate whether fines set by national Antitrust Authorities, for instance in France and in other european countries, are at the right level. A first look at data I have on a rather narrow period (between 2008 and 2010) seems to indicate that, everything else being equal, fines imposed by the French Competition Authority are much lower than the fines set by the European Commission. I am currently building a more thorough database on the fines set by the French Competition Authority since 2006 in order to better study this issue. In the long run I would also like to go further in investigating the optimal design of fines, and their interactions with the detection effort.

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Smith, H. (2004) "Supermarket Choice and Supermarket Competition in Market Equilibrium", *The Review of Economic Studies*, 71 (1): 235-263.

Spengler, J.J. (1950), "Vertical Integration and Antitrust Policy", *Journal of Political Economy*, 58(4): 347-352.

Subramanian, U., J. S. Raju, S. K. Dhar, Y. Wang (2010) "Competitive consequences of using a category captain" *Management Science* 56 (10): 1739-1765.

Turolla, S. (2012), "Spatial Competition in the French Supermarket Industry", Working Papers SMART - LERECO.

US Supreme Court, *Leegin Creative Leather Products Inc, vs. PSKS inc*, 06-480, 2007/06/28.

Williamson, O. (1975), *Markets and Hierarchies: Analysis and Antitrust Implications*, New York: Free Press.

Wils, P.J. W (2006), "Optimal Antitrust Fines: Theory and Practice", *World Competition* 29(2): 183-208.

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5 Annexes

5.1 ANNEXE 1 - Curriculum Vitae

Marie-Laure ALLAIN

8 rue des Boulangers
75 005 Paris
born 01/01/1973
married, one child

Département d'Economie, Ecole Polytechnique
91 120 Palaiseau Cédex
e-mail : marie-laure.allain@polytechnique.edu

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| APPOINTMENTS |
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Currently: Chargée de recherche CNRS (CR1), Economics Department, Ecole Polytechnique

Professeur chargé de cours, Ecole Polytechnique.

Research Fellow, Laboratoire d'Economie Industrielle (LEI), CREST.

2008-2010 Director of the M1 (first year of master) Quantitative Economics and Finance, Ecole Polytechnique – HEC

2005-2006 Visiting Research Fellow, London Business School (01/09/2005- 31/08/2006).

2001-2005 Research Fellow CNRS (CR2), Laboratoire d'Econométrie de l'Ecole Polytechnique,

1999-2001 Assistant Professor of Economics, ENSAE, Research Fellow at CREST-LEI.

1996-1999 PhD student at CREST-LEI, CREST grant.

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| EDUCATION |
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1996-00 **PhD, Ecole des Hautes Etudes en Sciences Sociales (EHESS)**, "Analyse et Politique Economiques". Director : Bernard Salanié. With honors.

Thesis : « Structures de marché et réglementation : les fondements des rapports de force entre producteurs et distributeurs ».

Jury : Bruno Deffains (President), Marc Ivaldi, Anne Perrot, Pierre Picard (referee), Patrick Rey (referee), Bernard Salanié.

1995-96 **DEA "Analyse et Politique Economiques"**, EHESS, with honors. Thesis : « Intégration verticale sur les marchés du multimédia », director: B. Salanié.

1993-96 **ENSAE** : Ecole Nationale de la Statistique et de l'Administration Economique.

1993-94 Degree (Licence) in Mathematics, University Paris VII-Jussieu.

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| PUBLICATIONS |
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Books and book chapters

- « La concurrence dans le secteur de la distribution », with Claire Chambolle and Stéphane Tuolla, in « A quoi sert la concurrence ? », M. Behar-Touchais, N. Charbit et R. Amaro ed., Institut de droit de la Concurrence, 2014.
- « La loi Galland sur les relations commerciales : Jusqu'où la réformer ? », with Claire Chambolle and Thibaud Vergé, *Opuscule du CEPREMAP*, ED. de la Rue d'Ulm, 2008.
- « Economie de la distribution », with Claire Chambolle, Repères (La Découverte), 2003.

Articles

- « Vertical Integration as a Source of Hold-up », with Claire Chambolle and Patrick Rey, *IDEI Working Paper*, n°836, sep. 2014, *Conditionally accepted, Review of Economic Studies*.
- « Inefficiencies in technology transfer: theory and empirics », with Emeric Henry and Margaret Kyle, forthcoming, *Management Science*.
- « Are cartel fines optimal ? Theory and Evidence from the European Union », with M. Boyer, R. Kotchoni and J.-P. Ponsard, *International Review of Law and Economics* (2015), 42, 38-47.
- « Anticompetitive Effects of Resale-Below-Cost Laws », with Claire Chambolle, *International Journal of Industrial Organization* (2011), 29 (4), 373-385.
- « A Note on horizontal mergers in vertically related industries », with Said Souam, *Economics Bulletin* (2011), 31 (1), 156-166.
- « The determination of optimal fines in cartel cases : Theory and practice », with M. Boyer and J.-P. Ponsard, *Concurrences* n°4-2011, 32-40. "Best Academic Economics Article - 2012 Antitrust Writing Awards"
- « Analyse critique des réformes de la réglementation de la distribution française », with Claire Chambolle and Clémence Christin, *Concurrences* n°4-2011, 17-21.
- « The Recent Economic Debate on the Welfare Effects of RPM », with Claire Chambolle, *Concurrences*, sept.2008.
- « La concurrence entre distributeurs favorise-t-elle la variété des produits? », with Patrick Waelbroeck, *Economie et Prévision* (2007), N°178-179, 1-14.
- « Concentrations horizontales et relations verticales », with S. Souam, *Annales d'Economie et de Statistique* (2006), Vol.82, 103-127.
- « Loss leaders Banning Laws as Vertical Restraints », with Claire Chambolle, *Journal of Agricultural and Food Industrial Organization* (2005), Vol. 3, No. 1, Article 5, <http://www.bepress.com/jafio>.
- « Les relations entre la grande distribution et ses fournisseurs : bilan et limites de trente ans de régulation », with Claire Chambolle, *Revue Française d'Economie* (2003), 17 (4), 169-212.
- « Approches théoriques des rapports de force entre producteurs et distributeurs », with Claire Chambolle, *Economie Rurale* (2003), n°277-278, 183-191.
- « The Balance of Power Between Producers and Retailers : a Differentiation Model », *Louvain Economic Review* (2002), 68 (3), 359-370.
- « Contrainte de capacité et développement des marques de distributeurs », with Laurent Flochel, *Revue Economique* (2001), 52 (3), 643-653.

Submitted papers

- « The impact of retail mergers on pricing strategies: evidence from France », with Claire Chambolle, Stéphane Turolla and Sofia Berto Villas Boas, *Revise and Resubmit, Journal of Industrial Economics*.
- « Politique tarifaire locale ou nationale: Quel impact pour le contrôle des concentrations dans le secteur de la distribution? » », with Claire Chambolle and Stéphane Turolla, submitted to *Revue Economique*.

Work in progress

- « Vertical Integration, Information and Foreclosure », with Claire Chambolle and Patrick Rey, *IDEI Working Paper*, n°673, march 2011, revised nov. 2011.
- « Category captains », with Claire Chambolle and Patrick Rey.

Other publications

- « Vertical Integration and the risk of information leakage », with Claire Chambolle, The Chair's update, décembre 2010.
- « Retail Structure and Music Variety », with Patrick Waelbroeck, CREST WP 2006-21.
- « Un survol de la théorie économique sur les switching costs », with Jérôme Pouyet, in "rapport sur les switching costs" by Philippe Nasse for the Ministry of Industry, 2005 (<http://www.industrie.gouv.fr/biblioth/docu/dossiers/sec/rapport.htm>).
- « Les relations entre producteurs et distributeurs : conflits et réglementations », with Claire Chambolle, *INRA Sciences Sociales* n°6/03, march 2004.
- « La grande distribution généraliste en France », with Jeanne Lubek, *Regards sur l'actualité*, La Documentation Française, n°257, january 2000, p. 29-45.
- « Les rapports de force entre producteurs et distributeurs : aspects économiques et réglementaires », with Claire Chambolle, *La lettre du CREST*, n°39, april 2001.
- « Retailers' buying power in France », with Claire Chambolle, in « *Buyer power and its impact on competition in the food retail distribution sector of the European Union* », Dobson Consulting, EC publications, 1999.

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| OTHER RESEARCH ACTIVITIES |
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Referee for *American Economic Review*, *Review of Economic Studies*, *Economic Theory*, *Scandinavian Journal of Economics*, *International Journal of Industrial Organization*, *Journal of Economics and Management Strategy*, *International Journal of Game Theory*, *Journal of Economic Behavior and Organization*, *Journal of Risk and Insurance*, *European Review of Agricultural Economics*, *Strategic Behavior and the Environment*, *Louvain Economic Review*, *Annales d'Economie et de Statistique*, *Economie et Prévision*, *Revue Economique*, *Revue d'Economie Politique*, *Cahiers d'Economie et Sociologie Rurales* and *Economie Rurale*.

Referee for Agence Nationale de la Recherche.

Organizer of the Séminaire Parisien d'Economie Industrielle (2001-2005, 2006-2010, since 2012), of the workshop « Market power in vertically related markets », Paris, 3-4 fevrier 2011, of Journées Doctorales de l'ADRES (2003).

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| CONGRESS AND SEMINARS |
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- **EEA** (European Economic Association Annual Congress) 1999 (Santiago de Compostela), 2004 (Madrid), 2009 (Barcelone), 2011 (Oslo).
- **ESEM** (Econometric Society European Meeting) 1998 (Berlin), 2006 (Vienne).
- **EARIE** (European Association for Research in Industrial Economics Conference) 1998 (Copenhagen), 2000 (Lausanne), 2003 (Helsinki), 2004 (Berlin), 2008 (Toulouse), 2012 (Rome).
- **HIOC** 2006 (NorthEastern University, Boston), 2010 (University of British Columbia, Vancouver).
- **CRESSE** 2010 (Competition and regulation European Summer School and Conference), Chania, Crete.
- **EAAE** (European Association of Agricultural Economics) Seminar 1998 (Toulouse), 2004 (Paris).
- **EALE** (Conference of the European Association of Law and Economics) 2004 Zagreb.
- **RES** (Royal Economic Society) Conference 2007, Warwick.
- **ACE** (Association for competition economics) 2007 (Toulouse), 2008 (Budapest).
- **INRA-IDEI** Conference on « Industrial Organization and the Food-processing Industry » 1998 (Toulouse), 2004 (Toulouse).
- **JMA** Journées de Microéconomie Appliquée 1998 (Pointe à Pitre), 1999 (Lyon), 2000 (Québec), 2004 (Lille).
- **AFSE** 2000 (Paris).
- **Workshops**: “Regards croisés en Economie et Politique de la Concurrence”, Paris, 2015; CEPR workshop in Applied Industrial Organization, Athens, 2014; ECODEC Workshop “Antitrust and consumer protection”, 2014, Paris; ANR-DFG « Buyer power in vertically related industries », Rennes (2014), Toulouse (2012) and Paris (2011), « the Economics of Information and Communication Technologies » (ENST Paris, 2006).
- **Seminars** : TOM (Theory, Organization and Markets), Paris School of Economics, 2014 ; INSEE DSE Paris (2014), Telecom Paris (Paris, 2012), Université Paris Sud- ENS Cachan (Cachan, 2012), Banque de France, Paris (2008), London Business School (2006), CREST-LEI (Paris, 2005), Ecole Polytechnique (Paris, 2005), Séminaire « Industrial Economics and Sectorial Politics », Ministère de l’Economie, Direction de la Prévision (Paris, 2004), GAEL Université de Grenoble (2004), ESCP-EAP, Paris (2004), Séminaire SFER « Competition Policy in agricultural markets » (Paris, 2003), INRA-IDEI (Toulouse, 2001), EPEE (Université d'Evry, 2001), THEMA (Universités de Cergy et de Nanterre, 2001), GREMARS (Université de Lille II, 2001), EUREQua (Paris, 2001), INRA-X-INAPG (Paris, 2001), LEI-CERAS (Paris, 1999), Premières Journées Doctorales (Paris, 1999), Université Paris I (Paris, 1998).

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| TEACHING |
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Ecole Polytechnique :

Microeconomics course, 2nd year (L3).
 Industrial Organization course, M1 Quantitative Economics and Finance (in english, 2008-2009, and since 2014-2015).
 Microeconomics course, M1 QEF (in english, 2009-2013)
 Tutorials in Industrial Organization (2010-2013)
 Tutorials, Economics of the firm (2006-2008)
 Tutorials , Introduction to Economics (2001, 2007-2010, 2014).

London Business School :

« Topics in Industrial Organization », Ph.-D. course, with J. Pouyet and E. Henry (2008).

Master Analyse et Politique Economique :

Research seminar « dynamic games and models of imperfect competition », with R. Laraki and J.-P. Ponsard (2004-2008).

ENSAE :

Microeconomics course, 1st year (2001-2005).
 Research seminar « Competition and régulation », 3rd year (M1 APE and M1 EIME), with Jérôme Philippe (1999-2001).
 In charge of organizing all tutorials in microeconomics (1st and 2nd years, 1999-2001).
 Tutorials in microeconomics (1st and 2nd years, 1996-2001).
 Supervisor of students research thesis (2nd and 3^{ème} année)

Ecole Nationale des Ponts et Chaussées :

Competition and markets course, (3rd year, with Bernard Caillaud and J. Pouyet, 2001-2004)
 Industrial Organization course (3rd year, with Bernard Caillaud and J. Philippe, 1999-2001).

Cour de Cassation (French Supreme Court):

Training seminar on the Economics of antitrust, for judges, 2005 (with Patrick Rey, Jérôme Philippe and Philippe Choné, supervised by Frédéric Jenny)

Université de Paris IX - Dauphine :

Tutorials in microeconomics (L2 MASS, 1996-1999).

Université de Paris V - René Descartes :

Tutorials in industrial organization (M1 MASS, 1997-1999).

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| PhD SUPERVISION |
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PhD supervision (in collaboration):

Thomas Larrieu (with Philippe Février), since 2014.
 Clémence Christin (with Jean-Pierre Ponsard), PhD obtained in 2009.

Member of PhD committees: Clémence Christin, 2009, Stéphane Turolla, 2007

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| RESEARCH CONTRACTS |
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- Agence Nationale de la Recherche (ANR) and Deutsche Forschungsgemeinschaft (DFG)** French-German cooperation project “Competition and Bargaining in Vertical Chains” (2013-2016). Research grant for a joint project involving several institutions in France (TSE, Rennes University, INRA) and Germany (Duesseldorf Institute for Competition Economics).
- Labex Ecodec Investissements d’Avenir (ANR-11-IDEX-0003/Labex Ecodec/ANR-11-LABX-0047). Ecole Polytechnique, CREST, HEC, 2012-2019**, Co-Principal Investigator of the area « Consumer Decision making and product market regulation ».
- Agence Nationale de la Recherche (ANR) and Deutsche Forschungsgemeinschaft (DFG)** French-German cooperation project “Market Power in Vertically Related Markets” (2008-2012). Research grant for a joint project involving several institutions in France (TSE, Ecole Polytechnique) and Germany (DIW, Humboldt University, Duesseldorf Institute for Competition Economics).
- Chair for Business Economics, Ecole Polytechnique** : Principal Investigator of the area « Vertical relations », 2007-2009.
- Fédération Française de la Franchise (2009)** : report on « The effects of franchising on competition», with Thibaud Vergé and Philippe Février. Presented at « Entretiens de la franchise » 2009.

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| CONSULTING |
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- Cleary Gottlieb (2011)** « Cartel deterrence», with Jean-Pierre Ponsard and Marcel Boyer.
- De pardieu, Brocas (2010)** Estimation of social damages in a cartel case.
- Lafarge (2002-2003)** : Consulting on « merger control ».
- Porter-Novelli (2002-2003)** : Consulting on the regulation of the relationships between industry and retail.

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| ADMINISTRATIVE REPORTS AND ADVISORY COMMITTEES |
|---|

- Conseil d’Etat** : hearing before the Commission Hagelsteen on the negotiability of tariffs and general terms of sales, January 18, 2008
- Ministry of Industry (2005)** : « A survey of economic theory on switching costs », with Jérôme Pouyet, in the report on exit costs by Philippe Nasse, available at <http://www.industrie.gouv.fr/biblioth/docu/dossiers/sec/rapport/htm>.
- Conseil d’Analyse Economique (2004-2005)** : participation to the « competition policy» working group.
- Conseil de la Concurrence (2000)** : hearing before the College of the Conseil during the examination of the merger proposal between Carrefour and Promodès (with Claire Chambolle) – presentation of a survey on the welfare consequences of retail mergers.
- Commissariat Général du Plan (2000)** : participation to the report « La place de l’économie française dans l’économie mondiale » written by CREST-LEI (2000).
- European Commission (1999)** : participation to the report « *Buyer power and its impact on competition in the food retail distribution sector of the European Union* », by Dobson Consulting, with Claire Chambolle.