
MERGERS AND PRICES: NEW EVIDENCE USING FRENCH PPI

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Comments welcome.

Abstract

The existing empirical literature generally concludes that market consolidation generates adverse price changes in the short run. Previous studies, however, focus only on one given sector and few mergers. Using a database including 93 sectors of the manufacturing industry, and all controlled mergers, both at French and European levels during the 1990s, we are able to identify short term effects of mergers on prices in the involved sector, relative to other non-merging sectors. We also find strong evidence that mergers in other European countries have some impact on French prices, although they only indirectly concerned French markets. As far as we know, these results on such a broad scope are new in the literature.

Keywords: mergers, prices, manufacturing industry.

JEL: G34, L10, L60.

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INTRODUCTION

Running from the 1950s until the 1980s, the paradigm of structure, conduct, performance (SCP) in industrial organization emphasized that market structure (degree of concentration) was responsible for the conduct of the firms in a given sector (degree of competition), hence the performance (social welfare) in this sector. The link between profits and concentration, measured by Herfindahl-Hirschman Index (HHI), has been intensively studied at that time, using cross-sectional data. The general conclusion of this literature is that higher concentration in a given sector is associated with higher price-cost margins. Unfortunately, as it is for instance reviewed by Salinger (1990), these types of study all suffer from a common flaw. Market structures and mark-ups are jointly determined by technology, fixed-cost, demand characteristics and the type of competition. A high level of profit might come from Ricardian rents or returns on investment in innovation. Furthermore, price-cost margins from accounting data are subject to measurement errors. Overall, this kind of study is then powerless to sort out what is the causal effect of concentration on price-cost margins.

Some later studies have focused on the relationship between concentration and price variations, the underlying hypothesis being that price variations are more exogenous than price-cost margins. Prices are also easier to measure (see Bresnahan 1989). Unfortunately, this program is flawed with the same kind of weaknesses as profit-concentration studies since prices are also jointly determined by demand and supply (see Evans, Froeb, and Werden 1993). For instance, higher prices might be associated with higher unobserved quality. Besides, geographical variability in prices might partially arise from unobservable heterogeneity in demand characteristics (see Newmark 2004). Prices and market shares evolutions may be the joint result of unobserved changes in quality or production functions. In the absence of a structural empirical approach to market structure and prices, the direct impact of the change in strategic relations between firms can only be identified through shocks that directly affect the incentive to compete for firms. There are few opportunities to observe such a structural shock. One is the withdrawal of a significant independent actor through a merger or an acquisition. Some information about mergers is public. This is at least the case for mergers that involve listed firms or are notified to Competition Authorities. Besides, the change in the incentive to compete in the market is immediate and substantial. For this reason, mergers are likely to have measurable price effects.

Thus, mergers provide us with an interesting instrument to study the link between strategic relations and prices. Moreover, mergers and acquisitions are subject to a specific control. For cases subject to merger control, antitrust authorities have to disentangle the intertwined effects of a lessening of competition and possible efficiency gains on social and consumer welfare. Studying the former effect is therefore of utmost importance for the assessment of Competition Policy. Nonetheless, despite the high stakes, empirical evidence on the effects of mergers on prices is relatively scarce. Using French data on the manufacturing sector, this paper intends to provide some evidence on short term price changes in a given sector at the time around controlled mergers.

The paper is organized as follows. In Section I, we review the literature about the empirical assessment of the impact of mergers. In Section II, we present our empirical approach, relying on a large number of sectors and mergers. Section III presents our dataset. In Section IV, we investigate the effects of controlled mergers for the entire sample of French and non French mergers. Section V focuses on mergers that were subject to an in-depth analysis by Competition Authorities. In Section VI, we take advantage of additional data on sectors to pursue a subsample analysis. Then we conclude.

I EXISTING EMPIRICAL LITERATURE

A first line of research for the assessment of the impact of mergers on prices relies on the joint estimation of demand and supply functions for differentiated products. These estimates are then generally used as inputs in a Bertrand-Nash competition framework to predict the effect of a given merger, through the change in player structure. Nevo (2000) studies the US industry of ready-to-eat cereals; Ivaldi and Verboven (2005) study the truck industry in Europe; Pinkse and Slade (2004) study the beer industry in the UK. The results provided by this method are conditional on the underlying competition model that posits the importance of the strategic relations between players. At the noticeable exception of Peters (2006), they exclusively focus on ex ante evaluations. These evaluations are very useful and much promising for practitioners, even if they still face important challenges, such as the necessity to better account for product quality changes. However, they do not provide insight on what actually happened on markets where mergers occurred. Besides, this type of work relies on sophisticated econometrics, which is very demanding in terms of data and computational resources. The precise structure of cost and demand is specific to each market. Overall, this approach is hence impossible to generalize for a broad range of markets.

The literature on corporate finance provides a large body of evidence on mergers (for a recent perspective, see Andrade, Mitchell, and Stafford 2001). First, the impact of mergers on stock prices has been intensively investigated. The main conclusion of this literature is that mergers tend to have a weakly positive effect on the stock price of the acquiring company, and a clearly positive one for the target company. The literature has also focused on the effects of mergers on operating performances of the involved firms, using accounting data. Post-merger operating performance seems to improve relative to the industry benchmark, even if there is some discrepancy among study results. Some articles also investigate the reasons for mergers to occur instead of internal investment. Andrade and Stafford (2004) for instance show that, in the USA, in the 1970s and 1980s, excess capacity led to mergers or acquisitions, while peak capacity utilization led to non-merger investments. On the contrary, in the 1990s, merger activity was mainly focused on industries with growth prospects, high profitability and near full capacity utilization. Stock markets can also provide some indirect evaluations of the effects of mergers on incumbent firms (see Duso, Neven, and Röller 2003, Duso, Gugler, and Yurtoglu 2005). These studies are easier to implement, especially over a large number of mergers and markets. However, they are subject to errors on measurement. They rely on the strong hypothesis of the absence of anticipations of the mergers by actors in the stock market. They also assume that stock markets are efficient.

The few direct ex post evaluations of mergers focused on specific sectors, such as airline industry (Kim and Singal 1993) or banking industry (Prager and Hannan 1998, Sapienza 2002). Focarelli and Panetta (2003) focus on the impact of mergers in the banking sector in Italy between 1990 and 1998. They use time and space variability to identify the effect of mergers on the interest rates paid by banks on current accounts. They show a short term (two years) anticompetitive effect, which turns to a pro-competitive effect after five years. They take advantage of a very large dataset, allowing the use of local markets to create reliable control groups. In particular, they consider that merger control has been quite lenient in Italy in those days. Their results are strengthened by sub-group analysis: they show that price effects are stronger for more concentrated markets and for smaller deposits, for which demand is supposed to be less elastic. They also provide strong evidence that market-power effects occur both for merging and non-merging firms, whereas efficiency effects are observed only for merging firms.

Focarelli and Panetta take advantage of the existence of many geographical markets to identify the effect of mergers on merging firms and rivals, as well as the impact of out-of-market mergers. This approach is effective because banking has some fea-

tures of a retailing industry. However, most retailing industries have other features that raise serious issues as for the possibility to use this approach. First, the variability of prices for one good in different locations may be significantly reduced by pricing practices. Firms may use national pricing strategies in order to build a national image. Such practices may also be the consequences of regulations or case law, forbidding price discriminations or resale at a loss (see Biscourp, Boutin, and Verge 2007, Competition Commission 2007). This is of importance for France, where the distribution channel has undergone significant regulatory changes during the period we are considering (Biscourp, Boutin, and Verge 2007). Besides, contrary to the situation in the banking industry, retailers are seldom vertically integrated with producers. Therefore, vertical issues are of prime interest. In particular, sorting out what is due to the producer-retailer relationship in the effects of mergers seems a challenging task. For all these reasons, we have chosen to focus on markets for which geographical relevant markets are more likely to be national or wider. Hence Focarelli and Panetta's (2003) approach cannot be used for our purpose, which is to broaden the scope of the analysis to as many markets as possible. On the contrary, McCabe (2002) uses a non-structural difference-in-difference methodology to study the impact of mergers in the academic journal sector.

II EMPIRICAL STRATEGY

Our goal is to investigate if, on average, mergers do modify strategic relations in an adverse way for customers. For that purpose, we wish to implement a general, robust and simple method. Competition authorities have access to privileged information on the mergers they control, either through their own expertise of the involved markets or due to specific information provided by the parties. We do not have access to this type of information. Hence, we do not intend to ex post replicate their analysis in order to determine if they took the right decisions. On the contrary, we establish as robust as possible results. We treat identically all mergers that received the same treatments by Competition Authorities (see Data section). Besides, as argued by Focarelli and Panetta (2003), the full effect of mergers will only appear after a long period of time. This is particularly obvious for organization or supply related efficiencies. On the contrary, strategic relations and the incentive to compete are immediately modified by the mergers. In particular, market power can immediately be exercised, and unilateral effects are liable to appear shortly after the merger.

Therefore, we focus on price changes just after mergers. However, sectors where mergers occurred are likely to have different observable and unobservable character-

istics. Accounting for the evolution of prices before mergers is then crucial. In this paper, a difference-in-difference type of approach is used to identify changes in prices around mergers. Our approach is similar to the one introduced by Jacobson, LaLonde, and Sullivan (1993) and our precise specification is close to the simplest one in their paper¹. Besides, our approach is also consistent with McCabe's (2002). More precisely, we suppose that monthly inflation rate of sector i in month t is given by the following statistical model:

$$\pi_{it} = \pi_t + \pi_i + \sum_{k=-12}^{12} \alpha_k \#mergers_{it-k} + \epsilon_{it}$$

where $\#mergers_{it-k}$ is the number of mergers in sector i at date $t - k$.

The period dummy π_t intends to capture each month macroeconomic shock. Several mergers may occur in the same market at different dates. The effects of mergers are supposed to be additive and cumulative, which is the only viable hypothesis in the absence of a history of mergers in these markets. It is then consistent to consider the number of mergers in one market, rather than a dummy, in the few cases where several mergers are notified, in the same month, in the same market. The coefficients α_k correspond to the impact of *one* merger on the monthly inflation rate. In the case of two mergers taking place in the same month, the market is assumed to have received the treatment twice. Mergers in our dataset were first *notified*, then subject to *control* by competition authorities (either French or European) and at last *authorized*². We assume that the incentives to compete for the incumbents are likely to change as soon as the merger is decided. The patterns of prices we obtain will confirm the relevance of this intuition, since the change in trend seems quite close to this date. Besides, some mergers are subject to in-depth analysis that delays the final decision (see Data section). Therefore, for the sake of simplicity and comparability, we set the notification date as the reference date, in order to compare price evolution for all mergers. However, as we estimate one coefficient for each month around the merger, the model is fully flexible and the precise choice of the reference is quite secondary³. This model is estimated by projecting on the orthogonal of the monthly mean:

$$\pi_{it} - \bar{\pi}_t = I_i + \sum_{k=-12}^{12} \alpha_k (\#mergers_{it-k} - \overline{\#mergers_{t-k}}) + \epsilon'_{it}$$

¹In line with Jacobson, LaLonde, and Sullivan (1993), an alternative specification with linear trends by sector for monthly inflation has been explored. This would correspond to an acceleration of prices during the period. The results were not qualitatively affected.

²As we are interested on the effects of merger on prices, we consider only *authorized* mergers. Prohibited mergers, which are extremely rare anyway, are discarded from the analysis.

³It matters only when we pool phase I and phase II mergers.

The inflation rate of sector i is then compared to the average of monthly inflation rates for all sectors, controlling for the average differential of inflation of the sector over the whole period (I_i). Identification of the coefficients arises from the fact that mergers in one market do not occur in each period and that for each period there are markets with no merger. Alternatively, the monthly inflation rate of one market may be compared with the average of monthly inflation rates for sub-groups of sectors. The first subgroup used is the subgroup of “adjacent sectors”. These sectors are the 4-digit sectors that are nested within the same 3-digit sector. Other sub-groups may be linked to the initial characteristics of the sectors (see Section VI). In all those cases, the statistical model we use for the monthly inflation rate of sector i , of group j at t is:

$$\pi_{ijt} = \pi_{jt} + \pi_i + \sum_{k=-12}^{12} \alpha_k \#mergers_{it-k} + \epsilon_{it}$$

which is estimated in a similar way by:

$$\pi_{ijt} - \bar{\pi}_{jt} = I_i + \sum_{k=-12}^{12} \alpha_k (\#mergers_{ijt-k} - \overline{\#mergers_{jt-k}}) + \epsilon'_{it}$$

Our approach is non-structural and does not allow to sort out the impact of mergers from other simultaneous factors or events. Then, it has clear limitations. Some limitations come from the limits of available data (see Data section), but also from our decision to keep the structure as general as possible. Causal interpretation of the results would rely on the assumption that the bias in sector-specific inflation is constant over the symmetrical two year period around a merger. This is the very classical assumption that is common to any difference-in-difference method. There exists some evidence that consolidation through mergers may be the consequence of excess capacity (Andrade and Stafford 2004), which could be associated with a decrease in prices before mergers. Mergers could then at least partly be a consequence of this price pattern before the merger. However, if the decision to merge is likely to be connected with the past evolution of prices, the exact date of the merger is also likely to be quite exogenous. It is subject to the existence of an opportunity for merger or acquisition and to the completion of preliminary steps as regards the financing of the operation, the agreement of both parties, etc. If the bias compared to other sectors did not change in the year after the merger for unobservable reasons, the change in trend that occur at the date of the merger can be interpreted as a consequence of the merger.

Interpreting this change in trend as the consequence of the modification of strategic relations between players would be totally fallacious if the average evolution of

prices before a merger was due to the imminence of the merger. This would for instance be the case if, on average, price decreases before a merger due to a price war aimed at lowering the price of the acquisition or to determine who buys whom. Overall, this strategy would be close to predation. Then, its feasibility, rationality and profitability should be questioned in general. The price of the target is linked to the beliefs of shareholders on the prospects of the firm: it would decrease only if the war on prices did shift these beliefs. This strategy would require highly imperfect informational settings for stock or credit markets. Besides, in order to be profitable for the incumbent, the losses from the price war would have to be compensated by the lower acquisition price: short term profit sacrifice has to be recouped.

Causal interpretation would not be relevant either if the parties try to alter the market assessment by Competition Authorities through a manipulation of their prices before the notification. Manipulation by the parties is a risk that is taken very seriously by Competition Authorities. For this reason, they require high standards of proof. Our experience of their practices is that they would be very cautious if they faced a claim by the parties that a decrease in prices signals that the market has become very competitive. This claim would only be taken seriously if it were supported by substantiated elements showing, for instance, that the decrease in price is a consequence of entry or aggressive behavior by third parties.

As far as we know, few theoretical or empirical elements are available to confirm or invalidate that prices should, or could, generally vary due to the imminence of a merger in a magnitude liable to invalidate causal interpretations. For this reason, the price patterns we obtain before mergers are, by themselves, very challenging. However, each time premerger prices were significantly increasing or decreasing, one should be cautious as regards causal interpretations.

III DATA

We use sector-specific production price indices for France for the manufacturing sector, on a monthly basis from 1990 to 2001. They are provided by the French National Institute for Statistics and Economic Studies (INSEE). The data about mergers is public. It comes from the Competition Directorate General of the European Commission and from the Directorate General for Competition, Consumption and Fraud Control of the French Ministry of Economy, Finance and Industry (DGCCRF). Cases reviewed by the European Commission are split between cases concerning primarily French markets and cases concerning mainly other European markets.

1 PRICES

As stated before, we focus on producer prices only, as we do not want to capture the producer-retailer relationship. Furthermore, the retailing industry has undergone significant regulatory changes in 1996. Our dataset about prices comes from the underlying series of the Production Price Index in France. The survey “Observation of Producer Prices and Business-Service prices” (Observation des Prix de vente de l’industrie et des services aux entreprises, hereafter PVIS) is used to track the monthly evolution of producer prices for the domestic market. Measurement of price movement is done at the product level for the main firms in a given sector, corresponding to a detailed level of the French product classification (Classification des produits français, hereafter CPF). CPF is a French extension of the NACE classification used at the European level. The total turnover covered by the sampled firms accounts for at least 50% of the sector. Through a visit to the sampled firms, INSEE field-officers choose the relevant products along with the value of the corresponding transactions, including invoice, rebates, etc. Products and transactions are selected in order to be representative of price movements in the involved sector. Each month, firms provide prices paid for the chosen transactions. Products and firms are selected for a five-year time span. Every year, one fifth of the sectors undergo a complete review, which implies a redefinition of the firms and the products involved. This methodology is modified if a given product is not produced any more, either because it is replaced or because the firm has exited the market. In this case, a partial renovation takes place, in order to replace the missing product by a close substitute if needed. PVIS survey coverage has been extended over the years. In particular, it incorporates more and more service sectors. As we want to focus on a long time period, we limit our study to the manufacturing sector.

Products are not described in a standardized way following some classification. Thus, we are not able to use product-level information. Aggregated price indices are computed by INSEE from those elementary series, weighted by the turnover they represent, at different levels of the classification. Each product is associated with the French identifying number of the corresponding firm (SIREN number). A serious difficulty lies in establishing precisely which firm is involved in a given merger. Unfortunately, our merger dataset does not allow us to fully identify which legal entity is precisely involved in a given merger. We cannot match mergers to firm level price indices, through the SIREN number.

Thus, our dependent variable is sector-level monthly inflation at a 4-digit level of the product classification. 4-digit level has been chosen as the relevant trade-off

between precision and aggregation. On the one hand, if price data is too aggregated, it will be hard to measure any specific effect of a merger affecting a small part of the sample. On the other hand, the affected sector, coming from merger data, is not always precisely identified. The relevant market considered by competition authorities is in general much smaller than the product sector identified within the classification of products: in this respect, the deeper the level of the classification the better. Unfortunately, our experience shows that there may be some errors or mismatches in the coding made by the competition authorities when they define the involved sectors. It is also possible that the competitive impact of a merger extends to adjacent sectors.

Data characteristics are summarized in table 2. Our series cover the 1990-2001 period and include 93 sectors at the end of the period. 63 sectors are covered during the whole period, many sectors being added to the survey in 1995. Observations are indexed by the date t (month and year) and the sector i (4-digit CPF). Total number of observations used in regression analysis is 11149. Average inflation π over the period 1988-2003 is 0.074% per month (0.8% per year), with a monthly volatility of 0.8%.

2 MERGERS

In the competition law sense, control can be different from the notion of financial control or from the notion of subsidiary used in the statistics of businesses. In particular, a merger might involve several legal operations, which are linked together by the competition authorities because they correspond to one operation from the economic point of view. However, they may be associated with several financial transactions, involving intermediaries. For this reason, it is very hard to detect mergers using data on firms' demography. In particular, it would be necessary to have continuous and reliable information on the structure of control between firms, including foreign ones when they control domestic firms.

As far as we know, and despite the efforts of the INSEE to improve firm demography, no such dataset exists yet, at least for France. It is thus preferable to rely on data providing direct information on mergers between firms. Merger control provides such a list. More precisely, DGCCRF kindly provided us with a list of merger cases controlled by French and European Competition Authorities. This dataset includes a CPF code for the involved sector and specifies notification and decision dates, as well as the type of decision.

Specific merger control as an ex ante control started as early as 1914 in the United States when the Clayton Act was passed. It forbids mergers that would entail a sub-

stantial lessening of competition. In Europe, such legislation was passed much later. In France, the Conseil de la Concurrence (Competition Council) was created as an independent body, in charge of antitrust, in 1987. DGCCRF is the department of the Ministry of Economy in charge of merger control. From 1986 to 2002, mergers corresponding to an aggregated five billion franc turnover or an aggregated 25% market share on a given product market were subject to this control. When merging companies had reached a definitive agreement, they could notify their project to the DGCCRF, who was to run a preliminary competitive assessment within five weeks. After this initial analysis, it could either clear the merger (phase I) or request an opinion from the Conseil de la Concurrence for cases that might entail a risk of creation or reinforcement of a dominant position (phase II). Including the time for the in-depth analysis by the Conseil, the DGCCRF should then reach a final decision endorsed by the Minister in charge of the Economy within four months. This setting was modified in May 2002 when the law about new economic regulations (Loi sur les nouvelles régulations économiques, NRE) was enacted. Notification became compulsory above certain turnover thresholds (mainly 150 million euros aggregated turnover). This modification has drastically increased the number of notifications and the workload of DGCCRF. As we want to ensure some homogeneity in the control regime, we analyze mergers over the 1990-2001 period. Even if merger notification was not compulsory over the period under study, we believe that most important French mergers have been under scrutiny by competition authorities and are therefore present in our analysis.

Until 1990, merger control was not under European Community supervision. This state of fact changed after a decision by the European Court of Justice, which provided the European Community with legal power to undertake merger control. The institutional framework was put into place by the European Regulation of the Council no 4064/89 of December 21st 1989, which entered into force in 1990. According to the regulation, mergers which create or strengthen a dominant position should be prohibited. All mergers with community dimension (for which several European countries were involved) and above certain turnover thresholds (five billion euros aggregated worldwide turnover for merging undertakings) have to be notified to the European Commission. Within one month, the European Commission has to run an initial assessment (phase I). If there is no competitive concern, the merger is cleared. If not, an extra three-month period is added for in-depth analysis (phase II). If no remedy can be found, the merger is prohibited.

It is important to stress that several types of mergers are present in the dataset. First, all mergers reviewed by French competition authorities correspond to mergers

involving firms active on French markets. On the contrary, mergers reviewed by the European Commission all affect the Common Market, but, in practice, one or few markets in a few countries are generally primarily affected. Among all mergers controlled by the Commission, using several proxies⁴, it is possible to determine which ones primarily affected the French market, and which ones only affected it indirectly. All cases with a likely impact on the French market are put together, irrespective of the Authority who actually took the decision. Conversely, cases that primarily affected a non-French market in the European Community are also put together.

Secondly, some mergers are cleared after the initial analysis, while others are subject to an in-depth analysis. In our analysis, we separate the first ones, namely *phase I mergers*, and the second ones, namely *phase II mergers*. Mergers that appear *prima facie* as the most anti-competitive ones are expected to lead to phase II analysis. However, they also have been more severely scrutinized and the clearance was generally subject to commitments, such as divestitures. Therefore, their competitive impact is not clear. Overall, our dataset lists all mergers examined by the DGCCRF, the Conseil de la Concurrence and the European Community between 1990 and 2001. Mergers have been split into four different categories: French merger phase I, French merger phase II, non-French merger phase I and non-French merger phase II (see tab. 1). For each merger, one or several sectors were affected. Then, counters were created for the number of mergers in a given month of a given year in each sector. The exact schedule of mergers is shown in annex A (see tab. 10 and 11). Some sectors are over-represented in our sample, and more mergers occurred in the end of the period. However, most sectors and most years are represented. Besides, no clear pattern of seasonality can be seen (see tab.12).

TABLE 1 : Number of mergers

	French mergers		Non French mergers	
	Phase I	Phase II	Phase I	Phase II
# of mergers	161	25	413	34

⁴First, for some mergers, the nationality of the target firm is present in the DOME merger database. When this information is not available, we use the language of the decision, considering that when the decision was written exclusively in French, it was likely to concern the French market. The classification is however not perfect, since it could indeed primarily concern Belgium or Swiss markets, or cases where the acquiring firm is French, but the target is foreign. Then we supplemented the few cases written in several languages on a case by case basis.

Merger control exists in all developed economies. Analyzing mergers in the absence of this regulation is thus impossible. However, it probably introduces several important biases. First, merger control has an obvious deterrent effect: mergers between two global leaders are generally not even considered by the firms. It also acts as a filter. Some mergers go under scrutiny, and might be amended through remedies or even prohibited. In theory, it should therefore be impossible to observe anti-competitive mergers. Nonetheless, it is possible that merger control is not fully effective, and one should still expect to see some influence of mergers. Besides, merger control objectives are actually different from limiting short term market power. For instance, it takes into account efficiency gains in the longer run. Even if those considerations were not emphasized in the early version of the European Regulation for instance, They are stated more clearly in the new version of the regulation (regulation EC no 139/2003). In France, contribution to economic progress is mentioned explicitly, and used by the Conseil de la concurrence, as a legal basis for authorizing an otherwise anticompetitive merger. Even though the very existence of merger control ought to be kept in mind while interpreting our results, we should still expect to see some short term impacts of mergers on prices.

3 OTHER DATA

We supplement our data with others coming from INSEE. Annual business survey (Enquêtes Annuelles d'Entreprise – EAE) and fiscal data (Bénéfices Réels Normaux – BRN) provide accounting data for firms. Level of export and import come from custom data. As the information contained in these dataset is annual, we cannot use them directly as control variables. We rather use them to segment the dataset in different categories (see Section VI).

We are able to compute some characteristics of the sectors such as the turnover, the number of firms and, among them, those that belong to groups. Concentration is measured by the Herfindahl-Hirschman Index, at the 4-digit level of product classification. This index is used to separate most concentrated markets from least concentrated ones. Contestability of a market should be linked to a stability of markets shares. We choose a proxy which measures the variability of market shares between two consecutive, weighted by average market share:

$$ds_{it} = \sum_j \frac{s_{jt} + s_{jt-1}}{2} (s_{jt} - s_{jt-1})^2$$

From custom data, we obtain exports and imports value in each sector. We define

openness of a sector as the very crude:

$$openness_i = \frac{import_i + export_i}{2} \frac{1}{turnover_i}$$

An accounting mark-up is also computed, accounting for user cost of capital:

$$\mu = \frac{turnover - charges - salary_costs - user_cost_of_capital}{turnover}$$

Capital intensity, measured as cost of capital over turnover, is also computed for each sector.

The statistics about all variables are summarized in Table 2.

TABLE 2 : Descriptive statistics

	Obs.	Mean	Std. Dev.	Min.	Max.
Inflation (percentage)	14871	0.07	0.80	-9.98	10.44
Annual imports	12937	2391265	3637466	1277	34400000
Annual exports	12937	2308256	3136837	16621	25600000
Number of branches	10528	2.41	1.94	1	10
Group	10528	0.29	0.14	0.05	1
Number of firms	10528	446.54	581.79	4	4703
Number of firms with MS > 1%	10528	11.33	4.96	1	36
Branch turnover	10528	4.53E+13	2.88E+14	5.85E+08	6.52E+15
HHI (sector)	10528	0.0467	0.0663	0.0014	0.4896
sl1	9830	0.69	0.40	0	1
sl2	9830	0.42	0.43	0	1
sl3	9830	0.24	0.37	0	1
Ds	9782	0.02	0.03	0.00	0.46
Profit	10444	-56284	3317150	-26800000	25700000
Mean markup	10444	-0.01	0.04	-0.25	0.19
mean k int	10444	0.07	0.17	0.00	4.98
c bfr	10444	0.14	0.03	0.06	0.23
Median markup	10444	0.00	0.03	-0.23	0.15
Std. markup	10363	0.14	0.03	0.00	0.39

Note: Statistics over 1988–2003. Actual time span may vary depending of the type of data

IV PATTERN OF PRICES AROUND MERGERS

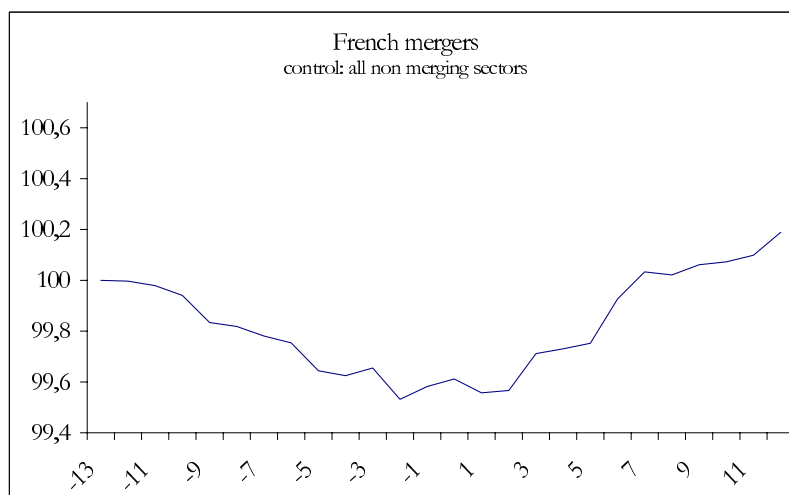
Our first regressions are computed by simply separating French and non French mergers in the same regression:

$$\begin{aligned} \pi_{it} - \bar{\pi}_t = & \sum_{k=-12}^{12} \alpha_k^{French} (\#French\ mergers_{it-k} - \overline{\#French\ mergers_{t-k}}) \\ & + \sum_{k=-12}^{12} \alpha_k^{nonFrench} (\#\text{non French mergers}_{it-k} - \overline{\#\text{non French mergers}_{t-k}}) \\ & + I_i + \epsilon'_{it} \end{aligned}$$

As stated before, we run two different regressions. We first compare the inflation rate of one sector to the average inflation rate of all sectors (as in the formula before), and then to the average inflation rate of all adjacent sectors. The reason for this second regression is to allow for a more flexible specification for the shock of inflation rates, which may not be homogeneous, even within the manufacturing sector. However, it *a priori* has two main drawbacks. On average, for the period, there exist 5 4-digit sectors nested within the same 3-digit sector. Significant variability may then be lost by using the means for each 3-digit sectors instead of the overall mean. Besides, if adjacent sectors are likely to have closer characteristics, they may also be affected by a merger in a close sector, especially if the same firms or groups operate in these sectors. Thus, adjacent markets might not be such a good group of comparison. These regressions both provide two sets of α_k that allow to build a pattern of prices for each type of mergers (reference for prices is set to 100 twelve month before the merger).

1 FRENCH MERGERS

FIGURE 1



Note: Period: 1990-2001. Number of observations: 10791. Number of sectors: 93. Number of concentrations: 198. The pattern of prices is computed from the results of regressions on differences of monthly sectoral inflation to the average of the sectoral inflation rates. Prices are fixed to 100 twelve month before the merger.

The pattern of prices for French mergers is presented in Figure 1. It shows an impressively clear pattern for prices around the merger, decreasing before, and increasing after. The magnitude for both slopes is limited to half a percent point, but it is significant (see subsection 3). Thus, prices in sectors where mergers occurred had

a negative progression before the merger and a positive one just after. The change in trends is of 1 percent. It should be compared with the 0.8 average yearly inflation in the sectors we consider. Moreover, this change in trends seems quite close to the date of notification, which was decided *a priori* to be date zero for the impact of mergers. The negative slope just before mergers raises serious concerns and interrogations as regards the interpretation of the results. As stated in section II, its interpretation may at least be twofold.

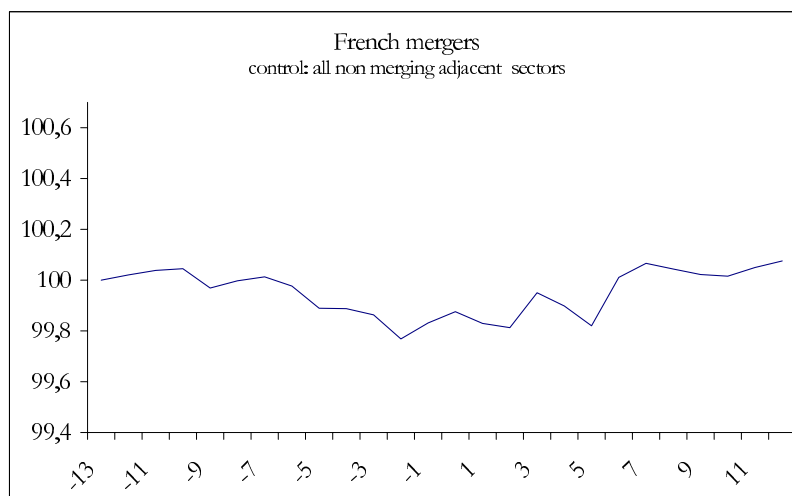
Mergers may first be understood as a reaction to the decrease in prices, or to the factors that led to this decrease. They would then at least partly be a consequence of this pattern of prices before the merger. However, if the decision to merge is likely to be connected with the evolution of prices, the exact date of the merger is also likely to be quite exogenous. Then, the change in trends would be the consequence of the merger. This interpretation would speak in favor of an average causal impact of mergers on strategic relations, which would lead to an increase in prices. In a comparable framework, and with comparable patterns, McCabe (2002) concludes that publisher mergers were at least partly responsible for the increase in prices of academic journals. However, this interpretation would be fallacious if the average evolution of prices before mergers would be due to the imminence of the merger, for instance because merging parties would have entered into a price war or tried to manipulate the assessment by Competition Authorities. As discussed in part II, we lack empirical evidence to convincingly decide between the two interpretations.

For this reason, this pattern of prices before the mergers is, in itself, challenging. It is in line with McCabe's (2002), and there already exists some evidence that consolidation through mergers may be the consequence of excess capacity (Andrade and Stafford 2004), which would be consistent with a decrease in prices in these sectors.

Figure 2 shows the pattern of prices where monthly inflation rate of a sector is compared to the average of monthly inflations for the adjacent sectors. None of the two slopes are significant, due to an absolute decrease in both coefficients, and not to an increase in standard error, which should be the consequence of the loss of variability (see 2). The reason for the introduction of this second regression was the fear that some groups of sectors might be on a specific path of prices when mergers occurred⁵. This problem should bias all our coefficients in the same direction. However, in this regression, prices decrease less before the merger, but also increase less after. Thus,

⁵We already control for the average inflation rate over the period. Thus, the problem we are trying to solve is not the fact that over the period some sectors may be declining, but that, within the period of study, some groups of sectors may be unequally affected by shocks, such as input prices for instance.

FIGURE 2



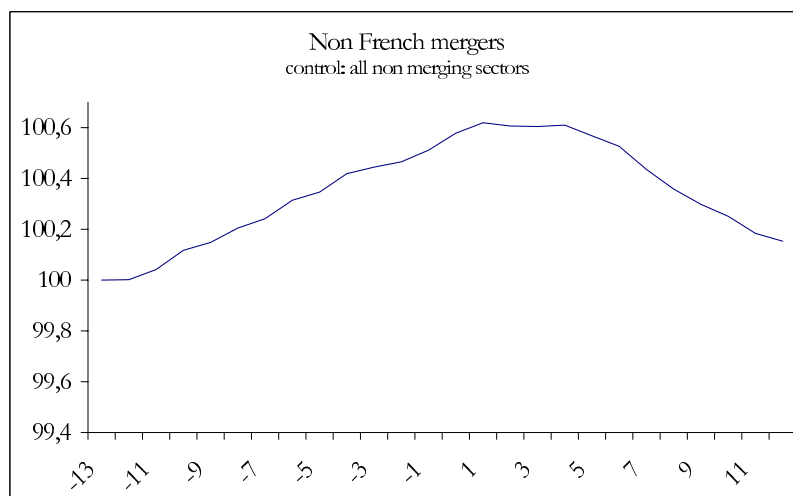
Note: Period: 1990-2001. Number of observations: 10791. Number of sectors: 93. Number of concentrations: 191. The pattern of prices is computed from the results of regressions on differences of monthly sectoral inflation to the average of the sectoral inflation rates for adjacent sectors. Prices are fixed to 100 twelve month before the merger.

coefficients are affected in various directions (to zero) and with similar magnitude (see subsection 3). This could rather indicate that sectors might also be affected by mergers in adjacent sectors. If so, adjacent sectors are not a reliable group of comparison.

2 NON FRENCH MERGERS

Figure 3 shows the pattern of prices in France after a non-French merger. From a legal perspective, the fact that these mergers were controlled by the European institutions indicates that the common market was judged to be affected. It is thus legitimate to focus on the impact of these mergers on French prices, even if French markets were not concerned in the first place. Contrary to the situation for French mergers, prices are clearly increasing before the merger, and are decreasing after. This pattern of prices is rather puzzling. As far as we know, it had never been quoted in the literature and it is a significant contribution of this paper. Non French mergers might then have positive impact for French consumers. A merger between two foreign firms might be threatening for French firms if it allows them to efficiently enter or compete in France. This might explain this pattern of prices. Besides, the change of trends seems to happen a few month after date zero. The effect of European non French mergers in French markets might then be lagged, for information would not immediately be

FIGURE 3



Note: Period: 1990-2001. Number of observations: 10791. Number of sectors: 93. Number of concentrations: 455. The pattern of prices is computed from the results of regressions on differences of monthly sectoral inflation to the average of the sectoral inflation rates. Prices are fixed to 100 twelve month before the merger.

integrated into domestic firms pricing strategies. This would be consistent with a framework of potential competition or entry.

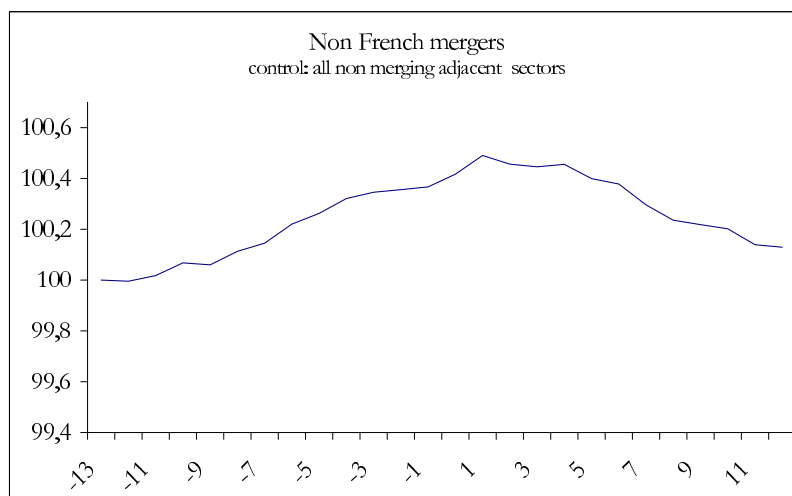
Figure 4 shows the pattern of prices where monthly inflation rate of a sector is compared to the average of monthly inflation for the adjacent sectors. The influence of the choice of a smaller group of comparison for monthly inflation rates is more limited than for French mergers. Then, adjacent sectors would be more affected by French mergers than by non French mergers, which seems reasonable.

3 INTERMEDIATE CONCLUSIONS

Table 3 summarizes the results for French and non French mergers. It shows that the magnitude of the change in trends is of the order of one percentage point, which is to be compared with the average yearly inflation of 0.8 in our sample. Most slopes, after and before mergers are significant. It also confirms that both coefficients shift toward zero when comparing with adjacent sectors, especially for French mergers. This is the reason why coefficients are not significant in the latter case, rather than an increase in standard errors. Adjacent sectors could also be affected by the merger, mainly as far as French mergers are concerned. Thus, they would not be a reliable group of comparison.

These results are based on a larger sample of mergers and rely on a broader

FIGURE 4



Note: Period: 1990-2001. Number of observations: 10791. Number of sectors: 93. Number of concentrations: 447. The pattern of prices is computed from the results of regressions on differences of monthly sectoral inflation to the average of the sectoral inflation rates for adjacent sectors. Prices are fixed to 100 twelve month before the merger.

TABLE 3 : Patterns of prices around mergers

	vs. all sectors			vs. adj. sectors		
	Before	After	Diff.	Before	After	Diff.
French mergers	-0.42** (-2.38)	0.58*** (2.99)	1.00*** (4.22)	-0.17 (-0.93)	0.20 (1.04)	0.36 (1.52)
Non French mergers	0.51*** (4.31)	-0.42*** (-4.38)	-0.93*** (-6.00)	0.37*** (3.12)	-0.29*** (-2.92)	-0.65*** (-4.19)
Obs.	10791	10791	10791	10791	10791	10791

Note: Robust OLS estimators. In parenthesis: t-test. 3, 2 and 1 stars respectively mean 99, 95 and 90 percent significance for a symmetric test. Before, After and Differences respectively stand for $\sum_{k=-12}^{-1} \alpha_k$, $\sum_{k=1}^{12} \alpha_k$ and $\sum_{k=1}^{12} \alpha_k - \sum_{k=-12}^{-1} \alpha_k$. French mergers: 198 (191 for the vs. adj. sectors regression). Non French mergers: 455 (447 for the vs. adj. sectors regression).

scope than previous studies. Given the limitations in data and empirical methods, their internal validity is limited, especially as for the exact measure of the impact on prices of mergers. This was the price to pay in order to increase their generality. On average, our results would support that prices rather increase after a French merger, while they rather tend to decrease after a non French one. Results on French mergers are consistent with previous work, but on a broader scope. Those for non-French mergers are new. However, the comparison of the impact of French and non French mergers raises questions as to their joined external validity. Prices seem to rather increase after the first ones, while they rather tend to decrease after the second. This

would at least be the case for those that were *a priori* the least anticompetitive ones, namely phase I mergers (see Section V). One interpretation could indeed be that “not too anticompetitive” mergers harm domestic customers, but are beneficial to those abroad. Overall welfare impact of those mergers would then be unclear. On the contrary, mergers may not be comparable for they would not affect markets with identical histories or because they would affect them at different moments of their histories. A French specificity could not be excluded *a priori* either. This would be the case if foreign mergers that were beneficial to French customers actually took place in formerly very regulated or foreclosed sectors. The answer to this question is left open for further research at this stage. Deeper analysis on the exact schedule of mergers in France and in Europe and some case studies would provide some insight on this issue. However, only similar, and cross, analysis in other European countries and in the USA are liable to provide a convincing answer.

V PHASE II MERGERS

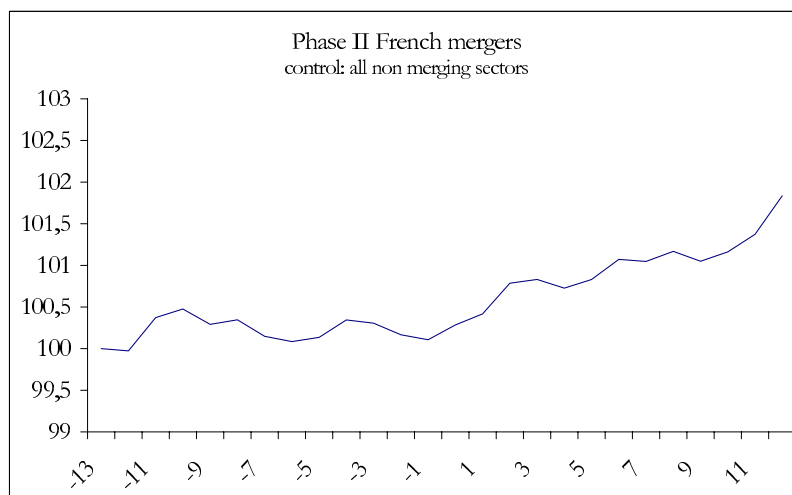
As stated before, some mergers were subject to an in-depth analysis by Competition Authorities. This analysis is generally called “phase II” by practitioners, and we will refer as such to these mergers. Decision is then reached after four month instead of one. Clearance is generally subject to commitments by the parties, for instant divestitures, obligation of licensing for patents, or access to facilities by competitors. This procedure is very demanding, both for the parties and for the Competition Authorities. For this reason, it only takes place when “serious doubts” were raised during the preliminary analysis (the “phase I”). We have 28 French phase II mergers for 169 phase I in our sample. For European mergers, the ratio is 34 to 421. Phase II mergers are thus those that shown the strongest anticompetitive potential. On the other hand, the mergers we consider were finally cleared after an in-depth analysis, and commitments that were expected to severely limit the harm to consumer. The balance between the two effects is then unclear. To address the issue of phase II mergers, we split the two types of mergers, within the same regression:

$$\begin{aligned}
\pi_{it} - \bar{\pi}_t = & \sum_{k=-12}^{12} \alpha_k^{French PI} (\#French PI_{it-k} - \overline{\#French PI_{t-k}}) \\
& + \sum_{k=-12}^{12} \alpha_k^{French PII} (\#French PII_{it-k} - \overline{\#French PII_{t-k}}) \\
& + \sum_{k=-12}^{12} \alpha_k^{non French PI} (\#non French PI_{it-k} - \overline{\#non French PI_{t-k}}) \\
& + \sum_{k=-12}^{12} \alpha_k^{non French PII} (\#non French PII_{it-k} - \overline{\#non French PII_{t-k}}) \\
& + I_i + \epsilon'_{it}
\end{aligned}$$

Results for phase I mergers are very close to those presented in the previous part. This was expected, since they represent most of our sample. For this reason, we only present and comment these results in table 4. We do the same for the second regression, where, similarly to the previous part, the inflation in a sector is compared to that of closer sectors. The following two subsections present the detailed patterns of prices for French and non-French phase II mergers.

1 FRENCH MERGERS

FIGURE 5



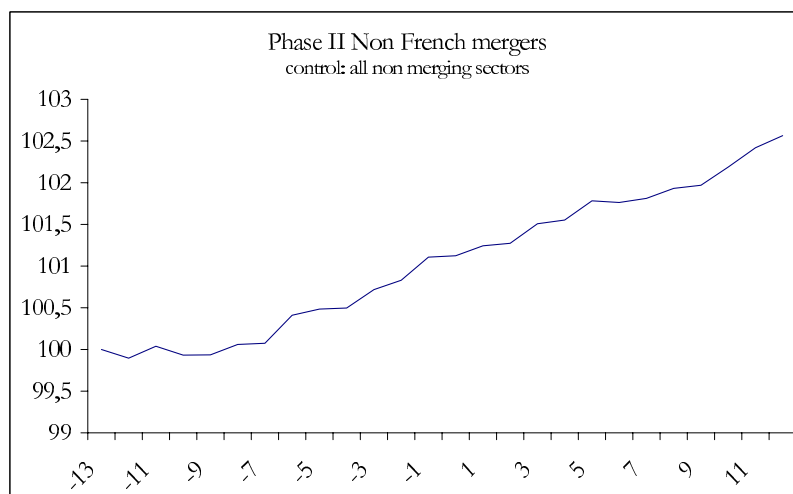
Note: Period: 1990-2001. Number of observations: 10791. Number of sectors: 93. Number of concentrations: 28. The pattern of prices is computed from the results of regressions on differences of monthly sectoral inflation to the average of the sectoral inflation rates. Prices are fixed to 100 twelve month before the merger.

Figure 5 shows the pattern of prices for Phase II French mergers. It is a clear pattern, with no clear relative inflation of prices before mergers, and a noticeable one

just after. The change is quite close to date zero. The absence of significant price changes before these mergers speaks in favor of a causal impact. Then, irrespective of the control and of the in-depth inquiry, phase II mergers would have short-term anticompetitive effects, the subsequent additional inflation being of 1.5%. Short term impact of these mergers is unambiguous. However, our results can hardly be interpreted as a proof of the inefficiency of merger control. We voluntarily focused on short term, in order to capture the pure modification of strategic relations implied by mergers. Both efficiencies and commitments will have mid-term effects we are unable to capture. We are neither able to measure which effect dominate in the long run. The overall impact of mergers could only be measured then, as well as the direct efficiency of merger control⁶. However, our results show that, as far as strategic relations are concerned, the expected effect does exist, and is of importance: it is twice the average yearly inflation in our sample.

2 NON FRENCH MERGERS

FIGURE 6



Note: Period: 1990-2001. Number of observations: 10791. Number of sectors: 93. Number of concentrations: 34. The pattern of prices is computed from the results of regressions on differences of monthly sectoral inflation to the average of the sectoral inflation rates. Prices are fixed to 100 twelve month before the merger.

Figure 6 shows the pattern of prices for Phase II non French mergers. Prices are

⁶Merger control also have the indirect effect to act as a deterrent for clearly anticompetitive mergers, such as one between two global leaders.

in constant progression, with no rupture of trend around the merger. Our regression controls for a sector specific path. Thus, this constant progression does not reflect a *constant progression over the period*, but indeed a progression *at the neighborhood of the merger*.

3 SUMMARY

Table 4 summarizes the results of regressions splitting phase I and II mergers. Results for phase I mergers are very close to those for all mergers. It was quite predictable since they represent most of our sample. However, it shows that the effects that emerged in the previous regressions were not driven by the joint use of the two types of mergers. Even though smaller, the impact of phase I mergers is significant. Comparing sectors to adjacent sectors instead of all sectors leads to less significant changes for phase II mergers than it does for phase I. It still biases both slopes to zero for French phase II, but the change is still significant, and hence quite robust. As regards non French phase II, it corrects the coefficient to zero before the merger, but increases it after. However, there is still no significant change in trend.

TABLE 4 : Patterns of prices for phase I and phase II mergers

	vs. all sectors			vs. adj. sectors		
	Before	After	Diff.	Before	After	Diff.
French mergers	-0.49**	0.42*	0.91***	-0.15	0.01	0.17
Phase I	(-2.51)	(1.91)	(3.48)	(-0.79)	(0.05)	(0.62)
French mergers	0.11	1.54***	1.43**	-0.07	1.20**	1.27**
Phase II	(0.23)	(3.15)	(2.18)	(-0.14)	(2.82)	(2.01)
Non French mergers	0.49***	-0.47***	-0.96***	0.36***	-0.36***	-0.72***
Phase I	(4.21)	(-4.73)	(-6.33)	(3.03)	(-3.66)	(-4.69)
Non French mergers	1.10**	1.42**	0.31	0.82*	1.83***	1.00
Phase II	(2.09)	(2.49)	(0.42)	(1.88)	(3.53)	(1.54)
Obs.	10791	10791	10791	10791	10791	10791

Note: Robust OLS estimators. In parenthesis: t-test. 3, 2 and 1 stars respectively mean 99, 95 and 90 percent significance for a symmetric test. Before, After and Differences respectively stand for $\sum_{k=-12}^{-1} \alpha_k$, $\sum_{k=1}^{12} \alpha_k$ and $\sum_{k=1}^{12} \alpha_k - \sum_{k=-12}^{-1} \alpha_k$. French mergers phase I: 169 (165 for the vs. adj. sectors regression). French mergers phase II: 28 (25 for the vs. adj. sectors regression). Non French mergers phase I: 421 (416 for the vs. adj. sectors regression). Non French mergers phase II: 34 (33 for the vs. adj. sectors regression).

VI DIFFERENTIAL IMPACTS OF MERGERS

As stated before, there may exist a large heterogeneity of mergers. We do not have access to sufficient data on the firms involved to infer the influence of their market

powers on the output of the mergers. However, by analyzing phase II mergers, we provided evidence that mergers involving major actors of a market tend to lead to a larger short term effect on prices. However, mergers may also have very different consequences in more or less concentrated or open markets for instance. Market characteristics are elements that are taken into account during the preliminary assessment. For instance, they are undoubtedly aggregated into the decision to enter into phase II. We have access to direct measures of some market characteristics. The proxies for concentration, stability of market shares, etc., we use were described in Section III. Each year, sectors are split into two parts for each indicator, given their initial situation (i.e. the year before) compared to the yearly median of the indicator. Table 5 shows the distribution of cases.

TABLE 5 : Number of cases by categories

	French mergers		Non French mergers	
	Phase I	Phase II	Phase I	Phase II
overall	161	25	413	34
least concentrated	93	14	238	14
most concentrated	68	11	175	20
least steady	97	15	236	11
most steady	64	10	177	23
lower markups	67	11	179	24
higher markups	94	14	234	10
lowest number of players	86	11	189	12
highest number of players	75	14	224	22
least open	110	14	277	20
most open	51	11	136	14
lowest turnover	36	6	80	10
highest turnover	125	19	333	24
least capital intensive	78	10	202	13
most capital intensive	93	15	211	21
lowest proportion of groups	62	14	112	10
highest proportion of groups	99	11	301	24

We run one regression for each criterion, in which we split the mergers into the four categories, and the sectors into two. For each regression, we then estimated eight sets of parameters. For the sake of comparability, we limited our sample to observations where it was possible to build all indicators. These regressions are thus made on a sub-sample of 7663 observations. Even though we made one regression for each criterion, we regroup and present the results by types of mergers, and not by criterion. The complete results are presented in the annexes. Only criteria relevant

for each types of mergers will be presented and commented in this part. It must be kept in mind that the number of mergers considered is sometimes very small in certain categories, especially for phase II mergers. Besides, it must also be kept in mind that these separations are solely univariate.

1 FRENCH PHASE I MERGERS

Table 6 shows the difference of impact of mergers given some market initial characteristics. Overall, the positive slope after the merger on our sub-sample is not significant anymore. However, the rupture in trends is of the same magnitude as before. The negative slope before mergers mainly happens in the steadiest, and on the most capital intensive sectors. On the contrary, mergers in less steady markets and on the least capital intensive are connected to a significant increase in prices after mergers. However, the change in trends does not differ and none of the two criteria does separate markets where mergers might have had different impacts. On the contrary, mergers had a far larger impact on sectors where markups were initially lower. The impact is then twice larger. Markups are generally taken as the best proxy for “competition”. Then, this result could indicate that “not to anticompetitive mergers” have the larger impact on “the most competitive markets”. This interpretation is undoubtedly limited, since those mergers might have entered into phase II, would the market have appeared less competitive. This would then be fully consistent with the results on French phase II mergers. Besides, the effect is also concentrated on the markets where groups are a smallest proportion of the actors. In our view, this proportion captures two effects. First, groups are likely to have multiple activities, and then to interact with the same competitors in different markets. This is expected to favor very grim trigger strategies, and thus collusion. Second, groups are more likely to be active on international markets. Openness does not make much of a difference for French phase I mergers. Then, the fact that the effect only emerges in markets where the proportion of groups is smaller would confirm our intuition on markups.

2 FRENCH PHASE II MERGERS

Table 7 shows the impact of French phase II mergers on our sub-sample. Overall, the impact is smaller than with the whole sample. Nonetheless, the results are qualitatively similar. The effect only occurs in most concentrated sectors, which was the expected result. However, it also only occurs in the steadiest, with an impressive magnitude. Our indicator of steadiness indirectly focuses on quite concentrated markets

TABLE 6 : French Phase I Mergers

	Before	After	Diff.	Before	After	Diff.
All mergers						
coeff	-0.71***	0.23	0.94***	-	-	-
t	(-3.05)	(0.91)	(3.17)	-	-	-
most steady			least steady			
coeff	-1.14***	-0.14	1.00**	-0.36	0.65**	1.01***
t	(-2.73)	(-0.34)	(1.98)	(-1.29)	(2.05)	(2.73)
lowest markups			highest markups			
coeff	-1.26***	0.34	1.59***	-0.37	0.42	0.79**
t	(-2.93)	(0.78)	(2.94)	(-1.45)	(1.58)	(2.39)
least capital intensive			most capital intensive			
coeff	-0.11	0.62*	0.73*	-0.87***	-0.03	0.84**
t	(-0.32)	(1.82)	(1.67)	(-2.59)	(-0.08)	(2.04)
lowest proportion of groups			highest proportion of groups			
coeff	-0.92**	0.33	1.25**	-0.35	0.14	0.50
t	(-2.26)	(0.79)	(2.50)	(-1.22)	(0.47)	(1.34)
Obs.	7663	7663	7663	7663	7663	7663

Note: Robust OLS estimators. In parenthesis: t-test. 3, 2 and 1 stars respectively mean 99, 95 and 90 percent significance for symmetric test (each two classes) or directional (for Left vs. Right). Before, After and Differences respectively stand for $\sum_{k=-12}^{-1} \alpha_k$, $\sum_{k=1}^{12} \alpha_k$ and $\sum_{k=1}^{12} \alpha_k - \sum_{k=-12}^{-1} \alpha_k$.

(it is null if all firms have a small market share). Nevertheless, the effect we capture cannot be solely driven by this, since the magnitude is by no way comparable. Thus, those markets seem quite contestable, and mergers could allow firms in place to move from a situation with very fast decreasing prices, to one of fast increasing ones. Markets where these mergers had a significant impact were not those with the largest markups, but those with the smallest ones. This may be due to autoselection or to the direct filter by competition authorities: large mergers in markets that lack competition may not be considered by the incumbents. More surprisingly, this impact only emerges in the most open markets. One could have expected that foreign firms could constraint domestic firms in most open markets. However, geographical markets may at least be continental for these markets. Then, mergers may reinforce a European wide oligopoly. The impact of these mergers is also concentrated on sectors where the proportion of groups is high. These markets are also likely to be the most open ones, since groups are likely to have more international activities. However, groups are also likely to meet more often in different markets than independent firms. It is thus expected that mergers could then be more anticompetitive in those markets. Besides, the effects of phase II mergers are concentrated mainly on the least capital intensive markets, with a very important magnitude. This is of interest since these markets are also those where scale efficiencies may be the smallest.

TABLE 7 : French Phase II Mergers

	Before	After	Diff.	Before	After	Diff.
All mergers						
coeff	-0.15	0.97*	1.12	-	-	-
t	(-0.28)	(1.75)	(1.57)	-	-	-
least concentrated			most concentrated			
coeff	-0.31	-0.12	0.19	-0.44	1.81*	2.25*
t	(-0.48)	(-0.19)	(0.26)	(-0.46)	(1.93)	(1.67)
most steady			least steady			
coeff	-2.26**	1.88*	4.14***	0.74	-0.06	-0.80
t	(-2.03)	(1.94)	(2.94)	(1.40)	(-0.11)	(-1.37)
lowest markups			highest markups			
coeff	-0.75	1.59	2.34*	0.44	0.40	-0.04
t	(-0.70)	(1.59)	(1.70)	(0.98)	(0.92)	(-0.06)
most open			least open			
coeff	-0.62	2.10**	2.72*	0.58	0.14	-0.44
t	(-0.64)	(2.09)	(1.93)	(1.16)	(0.29)	(-0.80)
least capital intensive			most capital intensive			
coeff	0.78	3.49***	2.71**	-0.08	0.33	0.42
t	(0.87)	(3.25)	(2.00)	(-0.13)	(0.59)	(0.54)
lowest proportion of groups			highest proportion of groups			
coeff	0.72	0.38	-0.34	-1.38	1.93*	3.31**
t	(1.55)	(0.85)	(-0.62)	(-1.36)	(1.79)	(2.39)
Obs.	7663	7663	7663	7663	7663	7663

Note: Robust OLS estimators. In parenthesis: t-test. 3, 2 and 1 stars respectively mean 99, 95 and 90 percent significance for symmetric test (each two classes) or directional (for Left vs. Right). Before, After and Differences respectively stand for $\sum_{k=-12}^{-1} \alpha_k$, $\sum_{k=1}^{12} \alpha_k$ and $\sum_{k=1}^{12} \alpha_k - \sum_{k=-12}^{-1} \alpha_k$.

3 NON FRENCH PHASE I MERGERS

Table 8 shows the results for non French European phase I mergers. The results on our sub-sample are very similar to the previous ones on the whole sample. The effects of these mergers are concentrated on the most capital intensive sectors, and on those with the lowest markups. This effect is far more important on the steadiest markets, and on the most open ones. This last effect was expected, since effects of mergers that did not concern French markets in the first place should mainly have an impact in France if markets were quite interconnected. The proportion of groups acting in the sector also makes a difference here. Groups are more likely to be in relation with foreign firms, and this result is then quite consistent with the one on openness.

TABLE 8 : Non French Phase I Mergers

	Before	After	Diff.	Before	After	Diff.
All mergers						
coeff	0.56***	-0.31***	-0.87***	-	-	-
t	(4.52)	(-2.84)	(-5.47)	-	-	-
most steady			least steady			
coeff	0.80***	-0.44**	-1.24***	0.29**	-0.30**	-0.59***
t	(4.35)	(-2.42)	(-4.75)	(1.97)	(-2.18)	(-3.28)
lowest markups			highest markups			
coeff	0.75***	-0.51***	-1.25***	0.24*	-0.05	-0.29
t	(4.15)	(-2.62)	(-5.59)	(1.73)	(-0.34)	(-1.43)
most open			least open			
coeff	0.81***	-0.52***	-1.33***	0.45***	-0.27**	-0.72***
t	(4.16)	(-2.62)	(-4.51)	(2.90)	(-2.04)	(-3.82)
least capital intensive			most capital intensive			
coeff	0.08	-0.17	-0.25	0.93***	-0.32**	-1.26***
t	(0.58)	(-1.14)	(-1.15)	(5.10)	(-1.97)	(-5.57)
lowest proportion of groups			highest proportion of groups			
coeff	0.01	0.13	0.12	0.69***	-0.55***	-1.25***
t	(0.04)	(0.54)	(0.38)	(4.60)	(-4.17)	(-6.32)
Obs.	7663	7663	7663	7663	7663	7663

Note: Robust OLS estimators. In parenthesis: t-test. 3, 2 and 1 stars respectively mean 99, 95 and 90 percent significance for symmetric test (each two classes) or directional (for Left vs. Right). Before, After and Differences respectively stand for $\sum_{k=-12}^{-1} \alpha_k$, $\sum_{k=1}^{12} \alpha_k$ and $\sum_{k=1}^{12} \alpha_k - \sum_{k=-12}^{-1} \alpha_k$.

4 NON FRENCH PHASE II MERGERS

Table 9 shows a very partitioned picture for non French phase II mergers. The overall pattern is a comparable increase in prices before, and after, mergers. It mainly appears in the least steady sectors, but no effect can be found in the steadiest ones. Interestingly, openness does not play a direct role here. However, many other characteristics play a very important one. These mergers tend to increase prices in markets where the markups are the highest. For these markets, the pattern of prices is very similar to that for French phase II mergers. Phase II mergers would then have the same effects in the less competitive markets, if one believes that markups are a good proxy for competitiveness. Non French phase II mergers also tend to increase prices in the least capital intensive markets. This result is also in line with the one on French phase II mergers. Mergers in the smallest markets would tend to significantly decrease prices, as well as those in markets with a smaller proportion of groups. We have already considered that groups are likely to have multiple interactions with other groups, and that, for this reason, markets with a lower proportion of groups may be more competitive. Then, this last result is consistent with the one on markups.

TABLE 9 : Non French Phase II Mergers

	Before	After	Diff.	Before	After	Diff.
All mergers						
coeff	1.30**	1.12*	-0.18	-	-	-
t	(2.23)	(1.85)	(-0.22)	-	-	-
most steady			least steady			
coeff	0.72	0.36	-0.35	3.31***	3.52***	0.21
t	(1.03)	(0.53)	(-0.39)	(3.26)	(3.21)	(0.15)
lowest markups			highest markups			
coeff	1.75**	0.13	-1.63	-0.33	2.98***	3.32***
t	(2.28)	(0.17)	(-1.63)	(-0.40)	(3.36)	(2.88)
highest turnover			lowest turnover			
coeff	1.50**	1.87***	0.37	0.17	-2.16*	-2.33
t	(2.26)	(2.81)	(0.41)	(0.18)	(-1.81)	(-1.64)
least capital intensive			most capital intensive			
coeff	2.40**	4.76***	2.36*	1.19**	0.10	-1.09
t	(2.02)	(4.86)	(1.69)	(2.09)	(0.15)	(-1.31)
lowest proportion of groups			highest proportion of groups			
coeff	2.27**	-0.69	-2.95**	1.18	1.56**	0.38
t	(2.23)	(-0.74)	(-2.37)	(1.60)	(2.13)	(0.39)
Obs.	7663	7663	7663	7663	7663	7663

Note: Robust OLS estimators. In parenthesis: t-test. 3, 2 and 1 stars respectively mean 99, 95 and 90 percent significance for symmetric test (each two classes) or directional (for Left vs. Right). Before, After and Differences respectively stand for $\sum_{k=-12}^{-1} \alpha_k$, $\sum_{k=1}^{12} \alpha_k$ and $\sum_{k=1}^{12} \alpha_k - \sum_{k=-12}^{-1} \alpha_k$.

CONCLUSION

We find strong evidence of very short term effects of mergers on prices. As far as we know, such results, on such a large number of mergers and sectors are new. The interpretation of these results may be twofold. The first, conservative one, is that price changes before mergers are driven by the imminence of the mergers. At least one party to the merger would manipulate its price, for instance either to pay a lower price for an acquisition, or to obtain a more lenient assessment by competition authorities. The second, optimistic, interpretation is that these types of behaviors are unlikely to be widely spread, and that the patterns of prices should then be interpreted as a causal impact of mergers on strategic relations, and then on prices. As far as we know, no existing empirical evidence is liable to allow to convincingly choose between the two interpretations. It shows that not only prices after mergers, but also those before, are a very challenging line of research.

Longer term effects of mergers include changes in product qualities, economies of scale and scope and many other sorts of *efficiencies*. These efficiencies may be very important. They may even, in some industries, overturn the effect we focus

on (Focarelli and Panetta 2003). However, our results on French mergers show that strategic relations do matter for prices, whatever the interpretation one chooses. We also show that, *on average*, mergers that are notified to competition authorities, especially phase II mergers, do decrease the incentive to compete for domestic firms. As far as merger control is concerned, case by case analysis is the only reliable way to proceed. Competition Authorities shall be specific on the theories of harm they use, and the burden to substantiate the analysis is on them. However, they are then founded to ask for a high standard of proof for efficiencies in order to clear a merger. For mergers that do not generate efficiencies are, for this reason, very unlikely to increase consumer welfare, they are legitimate to require the proof of substantial efficiency gains.

As far as we know, our results on non French mergers are also new, as well as the differential analysis we pursue. Their robustness is to be confirmed by further research on different countries, and on different data. However, they draw an interesting picture. First, mergers in an interconnected economic area have some indirect impact in domestic markets. This impact might be positive for final customers. Overall, this seems to be the case for *prima facie* not too anticompetitive mergers. Would the joined external validity of results for domestic and foreign mergers be verified, which is, at this stage, an open question, the overall welfare effect of these mergers would then be an interesting issue, to be addressed in further research. However, these mergers may also have effects similar to those of domestic mergers if they reinforced an oligopoly in a relevant market that was larger than France. This seems to be the case if the domestic market has high markups, and hence lack of domestic competition, or if the proportion of groups acting in the market is high.

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A NUMBER OF MERGERS

1 SCHEDULE OF MERGERS

TABLE 10 : Schedule of mergers

	French mergers			Non French mergers		
	Overall	Phase I	Phase II	Overall	Phase I	Phase II
1990q1	2	1	1	0	0	0
1990q2	3	3	0	0	0	0
1990q3	0	0	0	0	0	0
1990q4	0	0	0	3	3	0
1991q1	1	0	1	3	1	2
1991q2	1	1	0	1	1	0
1991q3	1	1	0	1	1	0
1991q4	2	2	0	6	6	0
1992q1	2	2	0	1	1	0
1992q2	2	2	0	4	2	2
1992q3	2	2	0	3	3	0
1992q4	2	2	0	2	1	1
1993q1	2	2	0	3	3	0
1993q2	0	0	0	0	0	0
1993q3	4	1	3	6	5	1
1993q4	2	1	1	4	4	0
1994q1	3	3	0	4	2	2
1994q2	6	4	2	4	4	0
1994q3	4	4	0	7	7	0
1994q4	0	0	0	5	5	0
1995q1	3	2	1	9	9	0
1995q2	4	3	1	5	4	1
1995q3	3	2	1	3	2	1
1995q4	4	4	0	4	4	0
1996q1	5	4	1	12	10	2
1996q2	6	5	1	10	10	0
1996q3	6	5	1	11	10	1
1996q4	5	4	1	6	4	2
1997q1	8	8	0	10	9	1
1997q2	8	7	1	5	3	2
1997q3	6	5	1	10	7	3
1997q4	5	5	0	9	8	1
1998q1	8	8	0	6	6	0
1998q2	4	4	0	14	13	1
1998q3	8	7	1	12	12	0
1998q4	6	5	1	10	9	1
1999q1	4	4	0	18	18	0
1999q2	9	8	0	18	18	0
1999q3	5	5	0	15	15	0
1999q4	9	8	1	17	14	3
2000q1	2	2	0	15	13	2
2000q2	5	4	1	14	14	0
2000q3	5	4	1	16	16	0
2000q4	7	6	1	12	11	1
2001q1	2	1	1	12	12	0
2001q2	4	4	0	16	16	0
2001q3	7	5	2	15	14	1
2001q4	5	5	0	15	14	1

Number of mergers notified in each quarter of the 1990-2001 period.

TABLE 11 : Schedule of mergers

	French mergers			Non French mergers		
	Overall	Phase I	Phase II	Overall	Phase I	Phase II
Q1	42	37	5	93	84	9
Q2	52	45	6	91	85	6
Q3	51	41	10	99	92	7
Q4	47	42	5	93	83	10

Number of mergers notified in each quarter of the 1990-2001 period.

2 MERGERS BY SECTORS

TABLE 12 : Mergers by sectors

	French mergers			Non French mergers		
	Overall	Phase I	Phase II	Overall	Phase I	Phase II
10	0	0	0	1	0	1
14	5	4	0	4	3	1
15	17	14	3	32	27	5
17	5	5	0	0	0	0
18	0	0	0	1	1	0
19	1	1	0	1	1	0
20	1	1	0	4	4	0
21	10	9	1	21	17	4
22	2	1	1	0	0	0
24	32	31	1	84	74	10
25	13	11	2	16	16	0
26	13	11	2	18	17	1
27	14	11	3	22	18	4
28	10	7	3	19	18	1
29	17	12	5	44	43	1
31	9	8	1	35	32	3
32	9	8	1	12	12	0
33	7	6	1	4	4	0
34	20	20	0	42	42	0
35	3	3	0	11	10	1
36	2	1	1	5	5	0
41	2	1	1	0	0	0

Number of mergers notified in each sector in the 1990-2001 period.

French Phase I Mergers

	Before	After	Diff.	Before	After	Diff.	Before	After	Diff.
All mergers									
coeff	-0.71***	0.23	0.94***	-	-	-	-	-	-
t	(-3.05)	(0.91)	(3.17)	-	-	-	-	-	-
least concentrated			most concentrated			Left vs. Right			
coeff	-1.06***	0.09	1.15***	-0.34	0.37	0.71	-0.73**	-0.29	0.44
t	(-3.73)	(0.30)	(3.08)	(-0.86)	(0.92)	(1.42)	(-1.56)	(-0.57)	(0.70)
most steady			least steady			Left vs. Right			
coeff	-1.14***	-0.14	1.00**	-0.36	0.65**	1.01***	-0.77**	-0.79**	-0.02
t	(-2.73)	(-0.34)	(1.98)	(-1.29)	(2.05)	(2.73)	(-1.56)	(-1.53)	(-0.03)
lowest markups			highest markups			Left vs. Right			
coeff	-1.26***	0.34	1.59***	-0.37	0.42	0.79**	-0.89**	-0.09	0.80
t	(-2.93)	(0.78)	(2.94)	(-1.45)	(1.58)	(2.39)	(-1.84)	(-0.18)	(1.25)
highest number of players			lowest number of players			Left vs. Right			
coeff	-1.17***	0.14	1.31***	-0.32	0.28	0.60	-0.85**	-0.13	0.71
t	(-2.97)	(0.37)	(2.73)	(-1.10)	(0.80)	(1.55)	(-1.71)	(-0.26)	(1.13)
most open			least open			Left vs. Right			
coeff	-0.51	0.15	0.67	-0.73***	0.21	0.93***	0.21	-0.06	-0.27
t	(-1.11)	(0.32)	(1.11)	(-2.63)	(0.73)	(2.71)	(0.40)	(-0.10)	(-0.38)
highest turnover			lowest turnover			Left vs. Right			
coeff	-0.81***	0.18	0.99***	-0.29	0.60	0.90	-0.52	-0.42	0.10
t	(-3.20)	(0.68)	(3.11)	(-0.55)	(1.12)	(1.28)	(-0.89)	(-0.70)	(0.13)
least capital intensive			most capital intensive			Left vs. Right			
coeff	-0.11	0.62*	0.73*	-0.87***	-0.03	0.84**	0.76**	0.65*	-0.11
t	(-0.32)	(1.82)	(1.67)	(-2.59)	(-0.08)	(2.04)	(1.60)	(1.34)	(-0.19)
lowest proportion of groups			highest proportion of groups			Left vs. Right			
coeff	-0.92**	0.33	1.25**	-0.35	0.14	0.50	-0.57	0.18	0.75
t	(-2.26)	(0.79)	(2.50)	(-1.22)	(0.47)	(1.34)	(-1.14)	(0.36)	(1.19)
Obs.	7663	7663	7663	7663	7663	7663	7663	7663	7663

Note: Robust OLS estimators. In parenthesis: t-test. 3, 2 and 1 stars respectively mean 99, 95 and 90 percent significance for symmetric test (each two classes) or directional (for Left vs. Right). Before, After and Differences respectively stand for $\sum_{k=-12}^{-1} \alpha_k$, $\sum_{k=1}^{12} \alpha_k$ and $\sum_{k=1}^{12} \alpha_k - \sum_{k=-12}^{-1} \alpha_k$.

French Phase II Mergers

	Before	After	Diff.	Before	After	Diff.	Before	After	Diff.
All mergers									
coeff	-0.15	0.97*	1.12	-	-	-	-	-	-
t	(-0.28)	(1.75)	(1.57)	-	-	-	-	-	-
least concentrated			most concentrated			Left vs. Right			
coeff	-0.31	-0.12	0.19	-0.44	1.81*	2.25*	0.13	-1.93**	-2.06*
t	(-0.48)	(-0.19)	(0.26)	(-0.46)	(1.93)	(1.67)	(0.11)	(-1.70)	(-1.34)
most steady			least steady			Left vs. Right			
coeff	-2.26**	1.88*	4.14***	0.74	-0.06	-0.80	-3.00***	1.94**	4.94***
t	(-2.03)	(1.94)	(2.94)	(1.40)	(-0.11)	(-1.37)	(-2.44)	(1.74)	(3.27)
lowest markups			highest markups			Left vs. Right			
coeff	-0.75	1.59	2.34*	0.44	0.40	-0.04	-1.19	1.18	2.37**
t	(-0.70)	(1.59)	(1.70)	(0.98)	(0.92)	(-0.06)	(-1.02)	(1.09)	(1.61)
highest number of players			lowest number of players			Left vs. Right			
coeff	0.09	0.39	0.30	-0.17	2.74**	2.91*	0.26	-2.35***	-2.61**
t	(0.19)	(0.86)	(0.53)	(-0.17)	(2.29)	(1.95)	(0.24)	(-1.83)	(-1.62)
most open			least open			Left vs. Right			
coeff	-0.62	2.10**	2.72*	0.58	0.14	-0.44	-1.20	1.95**	3.15***
t	(-0.64)	(2.09)	(1.93)	(1.16)	(0.29)	(-0.80)	(-1.10)	(1.75)	(2.08)
highest turnover			lowest turnover			Left vs. Right			
coeff	0.08	1.00	0.93	0.03	0.75	0.72	0.05	0.26	0.20
t	(0.16)	(1.59)	(1.29)	(0.02)	(0.63)	(0.44)	(0.04)	(0.19)	(0.11)
least capital intensive			most capital intensive			Left vs. Right			
coeff	0.78	3.49***	2.71**	-0.08	0.33	0.42	0.86	3.16***	2.30*
t	(0.87)	(3.25)	(2.00)	(-0.13)	(0.59)	(0.54)	(0.77)	(2.60)	(1.47)
lowest proportion of groups			highest proportion of groups			Left vs. Right			
coeff	0.72	0.38	-0.34	-1.38	1.93*	3.31**	2.10**	-1.55*	-3.65***
t	(1.55)	(0.85)	(-0.62)	(-1.36)	(1.79)	(2.39)	(1.88)	(-1.35)	(-2.53)
Obs.	7663	7663	7663	7663	7663	7663	7663	7663	7663

Note: Robust OLS estimators. In parenthesis: t-test. 3, 2 and 1 stars respectively mean 99, 95 and 90 percent significance for symmetric test (each two classes) or directional (for Left vs. Right). Before, After and Differences respectively stand for $\sum_{k=-12}^{-1} \alpha_k$, $\sum_{k=1}^{12} \alpha_k$ and $\sum_{k=1}^{12} \alpha_k - \sum_{k=-12}^{-1} \alpha_k$.

Non French Phase I Mergers

	Before	After	Diff.	Before	After	Diff.	Before	After	Diff.
All mergers									
coeff	0.56***	-0.31***	-0.87***	-	-	-	-	-	-
t	(4.52)	(-2.84)	(-5.47)	-	-	-	-	-	-
least concentrated			most concentrated			Left vs. Right			
coeff	0.56***	-0.17	-0.73***	0.57***	-0.59***	-1.16***	-0.01	0.42**	0.43*
t	(3.54)	(-1.32)	(-4.07)	(3.08)	(-3.00)	(-4.05)	(-0.04)	(1.84)	(1.32)
most steady			least steady			Left vs. Right			
coeff	0.80***	-0.44**	-1.24***	0.29**	-0.30**	-0.59***	0.52**	-0.14	-0.65**
t	(4.35)	(-2.42)	(-4.75)	(1.97)	(-2.18)	(-3.28)	(2.26)	(-0.59)	(-2.12)
lowest markups			highest markups			Left vs. Right			
coeff	0.75***	-0.51***	-1.25***	0.24*	-0.05	-0.29	0.50**	-0.46**	-0.96***
t	(4.15)	(-2.62)	(-5.59)	(1.73)	(-0.34)	(-1.43)	(2.32)	(-1.86)	(-3.43)
highest number of players			lowest number of players			Left vs. Right			
coeff	0.68***	-0.16	-0.84***	0.43**	-0.47**	-0.90***	0.24	0.30*	0.06
t	(3.61)	(-1.00)	(-3.66)	(3.12)	(-3.14)	(-4.32)	(1.12)	(1.42)	(0.20)
most open			least open			Left vs. Right			
coeff	0.81***	-0.52***	-1.33***	0.45***	-0.27**	-0.72***	0.36*	-0.25	-0.62**
t	(4.16)	(-2.62)	(-4.51)	(2.90)	(-2.04)	(-3.82)	(1.47)	(-1.07)	(-1.77)
highest turnover			lowest turnover			Left vs. Right			
coeff	0.47***	-0.32***	-0.79***	1.20***	-0.26	-1.45***	-0.73**	-0.07	0.66*
t	(3.39)	(-2.73)	(-4.77)	(3.54)	(-0.68)	(-3.09)	(-2.00)	(-0.18)	(1.32)
least capital intensive			most capital intensive			Left vs. Right			
coeff	0.08	-0.17	-0.25	0.93***	-0.32**	-1.26***	-0.86***	0.15	1.01***
t	(0.58)	(-1.14)	(-1.15)	(5.10)	(-1.97)	(-5.57)	(-4.01)	(0.70)	(3.29)
lowest proportion of groups			highest proportion of groups			Left vs. Right			
coeff	0.01	0.13	0.12	0.69***	-0.55***	-1.25***	-0.68***	0.68***	1.36***
t	(0.04)	(0.54)	(0.38)	(4.60)	(-4.17)	(-6.32)	(-2.49)	(2.59)	(3.78)
Obs.	7663	7663	7663	7663	7663	7663	7663	7663	7663

Note: Robust OLS estimators. In parenthesis: t-test. 3, 2 and 1 stars respectively mean 99, 95 and 90 percent significance for symmetric test (each two classes) or directional (for Left vs. Right). Before, After and Differences respectively stand for $\sum_{k=-12}^{-1} \alpha_k$, $\sum_{k=1}^{12} \alpha_k$ and $\sum_{k=1}^{12} \alpha_k - \sum_{k=-12}^{-1} \alpha_k$.

Non French Phase II Mergers

	Before	After	Diff.	Before	After	Diff.	Before	After	Diff.
All mergers									
coeff	1.30**	1.12*	-0.18	-	-	-	-	-	-
t	(2.23)	(1.85)	(-0.22)	-	-	-	-	-	-
least concentrated			most concentrated			Left vs. Right			
coeff	2.32***	2.18**	-0.14	0.53	0.30	-0.24	1.79**	1.88*	0.09
t	(2.84)	(2.02)	(-0.11)	(0.72)	(0.42)	(-0.24)	(1.69)	(1.49)	(0.06)
most steady			least steady			Left vs. Right			
coeff	0.72	0.36	-0.35	3.31***	3.52***	0.21	-2.60***	-3.16***	-0.56
t	(1.03)	(0.53)	(-0.39)	(3.26)	(3.21)	(0.15)	(-2.17)	(-2.47)	(-0.34)
lowest markups			highest markups			Left vs. Right			
coeff	1.75**	0.13	-1.63	-0.33	2.98***	3.32***	2.09***	-2.86***	-4.94***
t	(2.28)	(0.17)	(-1.63)	(-0.40)	(3.36)	(2.88)	(1.83)	(-2.47)	(-3.29)
highest number of players			lowest number of players			Left vs. Right			
coeff	0.97*	0.71	-0.26	2.15*	2.11*	-0.05	-1.18	-1.40	-0.21
t	(1.70)	(1.08)	(-0.31)	(1.77)	(1.92)	(-0.03)	(-0.88)	(-1.10)	(-0.13)
most open			least open			Left vs. Right			
coeff	0.77	0.80	0.03	1.40**	1.29*	-0.11	-0.63	-0.49	0.14
t	(0.73)	(0.85)	(0.02)	(2.11)	(1.66)	(-0.12)	(-0.51)	(-0.41)	(0.09)
highest turnover			lowest turnover			Left vs. Right			
coeff	1.50**	1.87***	0.37	0.17	-2.16*	-2.33	1.33	4.03***	2.70***
t	(2.26)	(2.81)	(0.41)	(0.18)	(-1.81)	(-1.64)	(1.16)	(2.99)	(1.64)
least capital intensive			most capital intensive			Left vs. Right			
coeff	2.40**	4.76***	2.36*	1.19**	0.10	-1.09	1.21	4.67***	3.45***
t	(2.02)	(4.86)	(1.69)	(2.09)	(0.15)	(-1.31)	(0.92)	(3.93)	(2.16)
lowest proportion of groups			highest proportion of groups			Left vs. Right			
coeff	2.27**	-0.69	-2.95**	1.18	1.56**	0.38	1.08	-2.24**	-3.33**
t	(2.23)	(-0.74)	(-2.37)	(1.60)	(2.13)	(0.39)	(0.86)	(-1.91)	(-2.12)
Obs.	7663	7663	7663	7663	7663	7663	7663	7663	7663

Note: Robust OLS estimators. In parenthesis: t-test. 3, 2 and 1 stars respectively mean 99, 95 and 90 percent significance for symmetric test (each two classes) or directional (for Left vs. Right). Before, After and Differences respectively stand for $\sum_{k=-12}^{-1} \alpha_k$, $\sum_{k=1}^{12} \alpha_k$ and $\sum_{k=1}^{12} \alpha_k - \sum_{k=-12}^{-1} \alpha_k$.