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INTEGRATION CONTRACTS AND ASSET COMPLEMENTARITY: EVIDENCE FROM US DATA *

Paolo Di Giannatale[**], *Francesco Passarelli*[***]

1. Introduction

Segal (2003) investigates the bargaining effects of three categories of integration contracts: inclusion, exclusion and collusion. In his model players integrate all their activities, the ownership cannot be shared over resources and the bargaining game is solved by a random order value (Weber, 1988). Here, we extend this setting: agents may also integrate only a share of their assets and they may have common ownership over resources. As a consequence, even a minority stakeholder can exert some decisional influence on the target as well as two firms can strategically choose which assets to integrate.

Using this approach, we study the profitability of Mergers and Acquisitions ($M\&As$), Minority stake (MS) purchases and Joint Ventures (JV s) according to how a contract changes the players' asset complementarities. Finally, we provide an empirical test for our conclusions.

2. Model

A set of players $N=\{1,\ldots,n\}$ owns divisible assets $A=\{a_1,...,a_n\}$ with control structure $A(S):2^N\rightarrow \mathrm{R}^{|S|}$ where $A(S)$ is the subset of A controlled by a given coalition S. For any subset T of S it is true that $A(T)\subseteq A(S)$ and players can manage the ownership rights over resources by contracting.

All agents play a TU cooperative game (N,v) with characteristic function v evaluating $v(S,A(S))$ any coalition $S\subseteq N$. Each group S forms in all players' random orderings where

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only the relative position of any $j \in S$ changes. Summing over the probabilities of those orderings yields the probability $p(S)$ of S. Solution for game (N, v) is the random order value

$$\phi_i(v) = \sum_{S \in 2^{N \setminus i}} p(S) \Delta_i v(S, A(S)) \qquad \text{for all } i \in N$$

with marginal contributions $\Delta_i v(S, A(S)) = [v(S \cup i, A(S \cup i)) - v(S, A(S))]$. Hereafter, we denote $v(S, A(S))$ by $v(S)$ and we assume $p(S \cup i) = p(S \cup j)$ for any $S \subseteq N \setminus i \setminus j$. Using a second order difference operator $\Delta_{ki}^2 v(S) = \Delta_k v(S \cup i) - \Delta_k v(S)$ (Ichiishi, 1993), a third player k is complementary to i if $\Delta_{ki}^2 v(S) > 0$ whereas it is substitutable if $\Delta_{ki}^2 v(S) < 0$.

In this setting, two players i and j can sign an integration contract, for instance a collusive agreement C, giving i the full control of a share $\lambda \in (0,1]$ of assets a_j. The new control structure over the assets, A^C, changes the characteristic function v into v^C, such that $v^C(S \cup i) = v(S \cup i \cup j^{\lambda})$ if coalition S includes i but not j and $v^C(S \cup j) = v(S \cup j^{1-\lambda})$ if S includes j but not i. Substantially, the k's holdup ability is affected only when entering coalitions $S \cup i$ or $S \cup j$ and the net effect depends on its complementarity with the partners.

As in Segal (2003), no contract can modify the value of the grand coalition and therefore integration is advantageous to the parties if reduces the competitors' expected payoff:

$$\phi_k(v^C) - \phi_k(v) < 0 \tag{1}$$

for any $k \neq i, j$.

3. Mergers and acquisitions

If a firm i gets at least the 51% of j's equities by an $M \& A$ contract, then the full control of resources a_j goes to i (that is $\lambda = 1$). The j's assets are always available to a coalition S even when j is out but not i. Coalition S is now valued $v^{MA}(S) = v(S \cup i \cup j)$ if $i \in S$ but not j and $v^{MA}(S) = v(S \setminus j)$ if $j \in S$ but not i. In new game (N, v^{MA}) player j is dummy and the holdup power of players $k \neq i, j$ changes in accordance with their contributions

$$\begin{cases} \Delta_k v^{MA}(S) = \Delta_k v(S \cup i \cup j) & \text{with } S \cup i \setminus j \\ \Delta_k v^{MA}(S) = \Delta_k v(S \setminus j) & \text{with } S \cup j \setminus i \end{cases}$$

for all $S \subseteq N \setminus i \setminus j$. The externality on k is $\Delta_k v(S \cup i \cup j) - \Delta_k v(S \cup i) = \Delta^2_{kj} v(S \cup i)$ with coalitions $S \cup i$ and $\Delta_k v(S \setminus j) - \Delta_k v(S \cup j) = -\Delta^2_{kj} v(S)$ with coalitions $(S \cup j)$. Being those coalitions equally likely, by inequality (1) player k is damaged if

$$\Delta^2_{kj} v(S \cup i) - \Delta^2_{kj} v(S) < 0. \tag{2}$$

Condition (2) has been derived by Segal (2003) for a generality of collusive contracts. Below, we reinterpret this requirement in terms of pre- and post-integration complementarities amongst partners and competitors, in order to provide a restatement which is empirically testable.

Proposition 1 *An $M\&A$ contract between i and j is profitable if reduces their joint complementarity degree with all competitors.*

Proof. Condition (2) can be rewritten as

$$\Delta_k v(S \cup \{i, j\}) - \Delta_k v(S \cup j) - [\Delta_k v(S \cup i) - \Delta_k v(S)] < 0 \tag{3}$$

where $\{i, j\}$ replaces $(i \cup j)$ and denotes the merged entity after integration. Adding the zero-sum terms $-\Delta_k v(S) + \Delta_k v(S)$ and rearranging, yields

$$\Delta^2_{k\{i,j\}} v(S) < \Delta^2_{ki} v(S) + \Delta^2_{kj} v(S) \tag{4}$$

that should be true for any $k \neq i, j$ and all $S \subseteq N \setminus \{i, j, k\}$. ■

Proposition 1 says that a complete integration of two firms is always profitable if makes competitors less complementary (hence, less indispensable) to the partners, that is if the contract increases the joint bargaining power against rivals.

4. Minority stakes

By a Minority Stake (MS) purchase a firm i gets a share $0 < \lambda < 0.5$ of j's activities. We assume that i can exert a certain influence on j's decisions even if minority stakeholder. Reasonably, this influence is proportional to the purchased stake λ but also depends on additional factors like the threatening ability of the acquiror or the level of his managerial ownership (see for example Butz, 1994 and Hubbard and Palia, 1995).

Let σ give the probability of i imposing his will on j. When it happens, i effectively manages all j's resources, like in $M\&A$s, thus the index σ measures the i's decisional power on j. Correspondingly, $(1-\sigma)$ is the probability that i only controls the minority share λ of j (i can sell this share as he wishes). However, i cannot prevent j from using it, therefore the MS contract is now inclusive.

In a random bargaining, coalitions $S \cup i \setminus j$ are valued $v^{MS} = v(S \cup i \cup j)$ with probability σ and $v^{MS} = v(S \cup i \cup j^{\lambda})$ with probability $(1-\sigma)$, while coalitions $S \cup j \setminus i$ are valued $v^{MS}(S) = v(S \setminus j)$ and $v^{MS}(S) = v(S \cup j^{1-\lambda})$ respectively.

The k's expected contributions are

$$\begin{cases} \Delta_k v^{MS}(S) = \sigma\, \Delta_k v(S \cup i \cup j) + (1-\sigma)\Delta_k v(S \cup i \cup j^{\lambda}) & \text{with} \quad S \cup i \\ \Delta_k v^{MS}(S) = \sigma\, \Delta_k v(S \setminus j) + (1-\sigma)\Delta_k v(S \cup j^{1-\lambda}) & \text{with} \quad S \cup j \end{cases} \tag{5}$$

for all $S \subseteq N \setminus \{i, j, k\}$.

Proposition 2 *Suppose an $M\&A$ contract not profitable. Then firm i may advantageously acquire a minority equity stake of j if the presence of i increases the competitors' complementarity with the target's assets. Moreover, gains from purchase increase with the i's decisional power (σ) on j.*

Proof. Look at the (5). The expected variation in k's payoff is

$$\begin{aligned} &\sigma\left[\Delta_k v(S \cup i \cup j) - \Delta_k v(S \cup i)\right] + (1-\sigma)\left[\Delta_k v(S \cup i \cup j^{\lambda}) - \Delta_k v(S \cup i)\right] \\ &+ \sigma\left[\Delta_k v(S \setminus j) - \Delta_k v(S \cup j)\right] + (1-\sigma)\left[\Delta_k v(S \cup j^{1-\lambda}) - \Delta_k v(S \cup j)\right] \\ &= \sigma\left[\Delta^2_{kj} v(S \cup i) - \Delta^2_{kj} v(S)\right] + (1-\sigma)\left[\Delta^2_{kj^{\lambda}} v(S \cup i) - \Delta^2_{kj^{\lambda}} v(S \cup j^{1-\lambda})\right] \end{aligned}$$

Replacing the difference $\Delta^2_{kj}v(S\cup i)-\Delta^2_{kj}v(S)$ with terms in (4) and imposing requirement (1), we get:

$$\Delta^2_{kj^\lambda}v(S\cup i)-\Delta^2_{kj^\lambda}v(S\cup j^{1-\lambda})>\frac{\sigma}{\sigma-1}\left[\Delta^2_{k\{i,j\}}v(S)-\Delta^2_{ki}v(S)-\Delta^2_{kj}v(S)\right] \tag{6}$$

for all $S\subseteq N\setminus\{i,j,k\}$ and any $k\in N\setminus\{i,j\}$.

Let us denote the LHS of (6) by y and the difference in square brackets of RHS by x. The MS integration is favorable if

$$y>\frac{\sigma}{\sigma-1}x. \tag{7}$$

Being $x>0$ and $\frac{\sigma}{\sigma-1}<0$ by hypothesis, a sufficient condition for (7) is $y\geq 0$:

$$\Delta^2_{kj^\lambda}v(S\cup i)\leq\Delta^2_{kj^\lambda}v(S\cup j^{1-\lambda}).$$

Finally, by (7) the gains from MS increase with σ. ■

On the contrary, in the case where an $M\,\&\,A$ might be convenient, the proposition below provides a sufficient condition for choosing the MS contract.

Proposition 3 *It is preferable to be a minority shareholder whenever the ownership on the target's majority stake reduces the acquiror's complementarity with competitors.*

Proof. Reconsider terms x,y in (7) and suppose $x<0$ (profitable $M\,\&\,A$). Now the (7) implies $y\leq 0$, that is

$$\Delta^2_{kj^\lambda}v(S\cup i)\geq\Delta^2_{kj^\lambda}v(S\cup j^{1-\lambda}) \tag{8}$$

If the (8) holds, both the $M\,\&\,A$ and the MS contracts are profitable but MS is preferable when the externality produced on k is larger:

$$(1-\sigma)y+\sigma\cdot x<x \qquad \Rightarrow y<x \tag{9}$$

With $x, y < 0$, the (9) can be rewritten as

$$\Delta^2_{kj^\lambda} v(S \cup i) - \Delta^2_{kj^\lambda} v(S \cup j^{1-\lambda}) \geq \Delta^2_{k\{i,j\}} v(S) - \Delta^2_{ki} v(S) - \Delta^2_{kj} v(S),$$

which is equivalent to

$$\begin{aligned}&\Delta_k v(S \cup i \cup j^\lambda) - \Delta_k v(S \cup i) + \Delta_k v(S \cup j^{1-\lambda}) - \Delta_k v(S \cup j)\\ &\geq \Delta_k v(S \cup \{i, j\}) - \Delta_k v(S) - \Delta_k v(S \cup i) + \Delta_k v(S) + \Delta_k v(S) - \Delta_k v(S \cup j)\end{aligned}$$

and finally

$$\Delta^2_{k\{i,j^\lambda\}} v(S \cup j^{1-\lambda}) \leq \Delta^2_{k\{i,j^\lambda\}} v(S)$$

for all $k \in N \setminus \{i, j\}$ and $S \subseteq N \setminus \{i, j, k\}$. ■

5. JVs with joint ownership

Two firms i, j can devote a share λ of their assets a_i and a_j to a Joint Venture (JV) controlled at 50%. The JV is a collusive contract on the joint activities $\lambda(a_i + a_j)$ that alternatively applies to i or j, depending on which of the two is dominant in decisions, and this occurs with equal probability $1/2$.

A new game (N, v^{JV}) arises where the entry of k in coalitions $S \cup i \setminus j$ is valued $\Delta_k v(S \cup i \cup j^\lambda)$ if i is dominant and $\Delta_k v(S \cup i^{1-\lambda})$ with dominant j. Correspondingly, for coalitions $S \cup j \setminus i$ the new k's payoff is $\Delta_k v(S \cup j \cup i^\lambda)$ if j is dominant and $\Delta_k v(S \cup j^{1-\lambda})$ otherwise. Since the dominance of i or j is equally likely for any S, a player k is expected to contribute

$$\begin{cases}\Delta_k v^{JV}(S) = \left[\Delta_k v(S \cup i \cup j^\lambda) + \Delta_k v(S \cup i^{1-\lambda})\right]/2 & \text{with } S \cup i\\ \Delta_k v^{JV}(S) = \left[\Delta_k v(S \cup j \cup i^\lambda) + \Delta_k v(S \cup j^{1-\lambda})\right]/2 & \text{with } S \cup j\end{cases} \tag{10}$$

Using the (10), below we derive a sufficient profitability condition for a JV integration.

Proposition 4 *Suppose firms* i, j *forming a* JV *whose assets* $\{i^{\lambda}, j^{\lambda}\}$ *are equally shared. This agreement is profitable if reduces the competitors' complementarity degree with the* JV *resources.*

Proof. By (10) the externality produced by the JV on third parties *k*s is

$$\Delta_k v(S \cup i \cup j^{\lambda}) - \Delta_k v(S \cup i) + \Delta_k v(S \cup i^{1-\lambda}) - \Delta_k v(S \cup i)$$
$$+ \Delta_k v(S \cup j \cup i^{\lambda}) - \Delta_k v(S \cup j) + \Delta_k v(S \cup j^{1-\lambda}) - \Delta_k v(S \cup j)$$

or equivalently

$$\Delta_k v(S \cup i^{1-\lambda} \cup \{i^{\lambda}, j^{\lambda}\}) + \Delta_k v(S \cup j^{1-\lambda} \cup \{i^{\lambda}, j^{\lambda}\}) + \Delta_k v(S \cup i^{1-\lambda})$$
$$+ \Delta_k v(S \cup j^{1-\lambda}) - 2\Delta_k v(S \cup i) - 2\Delta_k v(S \cup j) .$$

Applying condition (1) and after some manipulations:

$$2 \cdot \left[\Delta^2_{ki^{\lambda}} v(S \cup i^{1-\lambda}) + \Delta^2_{kj^{\lambda}} v(S \cup j^{1-\lambda})\right] > \Delta^2_{k\{i^{\lambda}, j^{\lambda}\}} v(S \cup i^{1-\lambda}) + \Delta^2_{k\{i^{\lambda}, j^{\lambda}\}} v(S \cup j^{1-\lambda}) \qquad (11)$$

which is true whenever

$$\Delta^2_{ki^{\lambda}} v(S \cup i^{1-\lambda}) + \Delta^2_{kj^{\lambda}} v(S \cup j^{1-\lambda}) > \Delta^2_{k\{i^{\lambda}, j^{\lambda}\}} v(S \cup i^{1-\lambda}), \Delta^2_{k\{i^{\lambda}, j^{\lambda}\}} v(S \cup j^{1-\lambda})$$

for all $k \in N \setminus i, j$ and $S \subseteq N \setminus \{i, j, k\}$. ■

The RHS and LHS of (11) reveal how much the JV assets are complementary with those of third parties before and after integration respectively. Regardless the presence of i or j, this complementarity should lower once the JV formed. The intuition is that each player k gets looses from i and j's integration if the contract reduces the gains that k enjoys from their common assets, and therefore the two partners can appropriately choose which resources will be devoted to collusion.

6. Complementarity index

We build a complementarity index for firms which are engaged in more than one business line segment. The basic idea comes from the work of Fan and Lang (2000): the

complementarity between two sectors l, m is a simple average of degrees to which the two industries share their inputs and output. Using the Input-Output (I-O) Tables for US, for each pair of NAICS 6-digit sectors l and m the coefficients r_{bl} (for all $b \neq l$) and r_{bm} (for all $b \neq m$) define the values of b's output required to produce 1 dollar's worth of industries l and m respectively, while the coefficients c_{bl}'s and c_{bm}'s give the percentages of l and m's output used by any intermediate industry b, except l, m.

Then the complementarity degree between industries l and m is

$$COMP(l,m) = \frac{corr(r_{bl}, r_{bm}) + corr(c_{bl}, c_{bm})}{2}.$$

We apply this idea also to multiproduct firms. Let us consider two firms i and j belonging to a number $l = 1,...,L$ and $m = 1,...,M$ of sectoral activities respectively. A measure of their complementarity is

$$\begin{aligned} COMP_{i,j} &= (S_{i_1} \cdot S_{j_1})COMP(i_1, j_1) + ... + (S_{i_1} \cdot S_{j_M})COMP(i_1, j_M) \\ &+ ... + (S_{i_L} \cdot S_{j_1})COMP(i_L, j_1) + ... + (S_{i_L} \cdot S_{j_M})COMP(i_L, j_M) \\ &= \sum_{l=1}^{L}\sum_{m=1}^{M}(S_{i_l} \cdot S_{j_m})COMP(i_l, j_m), \end{aligned}$$

where the weights $S_i = \left(S_{i_1},...,S_{i_L}\right)$ and $S_j = \left(S_{j_1},...,S_{jM}\right)$ are the shares of the market operating revenue turnover that i and j draw from their business segments. Since advantages from using i and j's assets together change at the presence of third parties, we also compute the complementarity of i with j when the assets of a group S of competitors are also available. This measure is a weighted average of the index between i and j and the indexes between i and members of S:

$$COMP_{i,S\cup j} = \sum_{k\in\{S\cup j\}} R_k \cdot COMP_{i,k}. \tag{12}$$

In formula (12) each weight R_k is the share of the market operating revenue turnover due to competitor k. By construction, all indexes above belong to the interval $[-1,1]$.

7. Empirical specifications and results

In this section we test the general profitability conditions we have drawn in Propositions 1, 2 and 4. Firstly, we introduce few indispensable complementarity indexes which follow the notation of Section 2. Thus variables CIK and CJK measure the complementarity between each partner and all competitors k s in our sample. $CIJK$ measures the complementarity with those competitors but in the presence of both partners while CIJ gives the asset relatedness between the two partners only.

A treatment dummy T_i specifies the type of contract while the dependent variable ROA (return on assets) measures the financial performance. Since integrations affect the firms' ability in performing, thus we apply the dynamic GMM technique suggested by Arellano and Bond (1991) to account for dynamic effects and the endogeneity issues:

$$ROA_{it} = \alpha_1 ROA_{it-1} + \delta_1 \mathbf{SIZE}_{it} + \delta_2 \mathbf{TC}_{it} + \mu_i + y_t + \varepsilon_{it} \ , \tag{13}$$

where the row vector $\mathbf{SIZE}_{it}$ forms with covariates $SALES_{it}$ (net sales, in natural log), $EMPL_{it}$ (number of employees, in natural log) and their first order lags. Vector $\mathbf{TC}_{it}$ includes interactions of T_i with the time varying complementarity indexes above. Finally, μ and y are firm and time specific effects and ε the disturbance term.

In a second specification

$$ROA_{it} = \alpha_1 ROA_{it-1} + \delta_1 \mathbf{SIZE}_{it} + \delta_2 \mathbf{TC}_{it} + \delta_3 T_i + \delta_4 T_i \times PR_i + \mu_i + y_t + \varepsilon_{it} \tag{14}$$

we add the time-invariant interactions between the integration variable T_i and the associated profitability requirement PR_i associated with that contract. The estimation of (14) follows the Hausman and Taylor (1981) (HT) technique to take into account the correlation between time-invariant regressor and firm effects.

Models (16) and (17) apply to a sample of 8866 US firms that signed a bilateral contract of $M\ \&\ A$ (439 units), MS (6922) or JV (1505) in period 2002-2007. The control group counts 33212 firms which are used to estimate also the Average Treatment effect on Treated (ATT) that arises from satisfying the contract profitability requirements. The ATT is based on the propensity score (Rosenbaum and Rubin, 1983) computed by a probit on vector

$X_{\mathbf{i}} = \{RSF_i, EMPL_i, EV_i, SALES_i\}$, which includes new variables RSF (return on shareholders funds) and EV (enterprise value).

Columns (1)-(3) in Table 1 refer to the specification (13). If no profitability requirement is imposed, then complementarity between the two contracting parties helps to increase returns from cooperation (as expected). On the contrary, complementarities between partners and competitors do not have significant effects unless the profitability conditions from Section 2 are satisfied. The specification (14) for columns (4)-(6) shows that contracting always exerts a positive impact on the performance but, more importantly, this impact is strongly enhanced by the corresponding requirement on complementarities (see estimates for $T \times PR$).

Finally, a further evidence is provided by Table 2. On average, the ROA is 1.7% higher in the first post-integration year for those firms satisfying the required condition, and the boost effect grows over time, up to 2.9% in the fourth year.

8. Conclusions

We show as the profitability of bilateral integrations increases at the presence of well-defined complementarity relationships among partners and competitors. Those requirements find evidence on a sample of US firms and they confirm a general intuition: the more the integrated resources are indispensable to competitors, the larger the gains from agreements. Knowing this, two partners can strategically choose which assets to integrate as well as the most convenient ownership structure.

Appendix

Table 1: Complementarities and post-integration performance.
Dynamic GMM (Arellano-Bond, 1991) and HT (Hausman-Taylor, 1981) estimators.

	GMM			HT		
	(1)	(2)	(3)	(4)	(5)	(6)
Dep. *ROA*	M&A	MS	JV	M&A	MS	JV
$ROA(t-1)$	0.043***	0.098***	0.068***	0.141***	0.080***	0.122***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	0.000)
SALES	0.105***	0.105***	0.105***	0.110***	0.176***	0.110***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	0.000)
$SALES(t-1)$	-0.006**	-0.012***	-0.008***	0.017***	-0.018**	0.015***
	(0.018)	(0.000)	(0.001)	(0.000)	(0.041)	0.000)
EMPL	0.000	0.001***	0.001***	0.001	0.001**	0.001***
	(0.966)	(0.000)	(0.000)	(0.974)	(0.011)	(0.000)
$EMPL(t-1)$	0.000	0.000***	0.000***	0.000	0.000	0.000***
	(0.946)	(0.000)	(0.000)	(0.951)	(0.141)	(0.009)
$T \times CIJ$	0.354***	0.375***	0.378***	0.252**	0.599	0.259**
	(0.004)	(0.004)	(0.003)	(0.024)	(0.432)	(0.022)
$T \times CIK$	2.720	3.635*	0.895	3.019	5.342**	1.385
	(0.707)	(0.067)	(0.781)	(0.537)	(0.016)	(0.467)
$T \times CJK$	0.466	-2.452	0.609	-1.288**	-0.336	0.932
	(0.947)	(0.112)	(0.849)	(0.013)	(0.859)	(0.609)
$T \times CIJK$	-0.266	-5.935	-7.245	-0.695	2.937	0.115***
	(0.487)	(0.127)	(0.173)	(0.364)	(0.401)	(0.000)
T				1.491**	1.157***	1.338***
				(0.018)	(0.000)	(0.001)
$T \times PR$				3.943*	1.264***	0.477*
				(0.078)	(0.000)	(0.077)
AR(1) test (*p*-value)	0.000	0.000	0.000			
AR(2) test (*p*-value)	0.176	0.266	0.165			
Sargan (*p*-value)	0.150	0.230	0.096			

Notes: *p*-values in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 2: Average Treatment Effect (ATT) from integration contracts.
Post-estimation window: 2003-2009.

	$t+1$	$t+2$	$t+3$	$t+4$
ATT	1.710^{***}	1.943^{***}	2.040^{*}	2.900^{***}
$Treated\ (T_i = 1, PR_i = 1)$	1560	1560	1560	1560
$Controls\ (T_i = 1, PR_i = 0)$	17276	18668	18292	9174

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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Sommario

In questo articolo studiamo gli effetti delle strutture proprietarie e della complementarità settoriale sulla performance da contratti bilaterali (M&A, acquisto di Quote Minoritarie e Joint Venture). Deriviamo così delle condizioni di profittabilità basate sul modo in cui l'integrazione modifica il controllo degli asset tra i partner e come ciò influenza la loro posizione contrattuale verso i concorrenti. Poi testiamo le nostre conclusioni su un campione di imprese USA. Costruiamo un apposito indice di complementarità multi-settoriale e time varying per stimare il legame tra compatibilità industriale e performance finanziaria nel tempo.

Abstract

We study the effects of ownership and complementarity on the performance of bilateral contracts (M&A, Minority Stake purchase and Joint Venture). We derive profitability conditions based on how a contract changes the asset control between partners and how this affects their position against competitors. Then we test our predictions on a sample of US firms. We build a multiproduct and time varying complementarity index in order to estimate the link between firms' relationships within industry, and performance over time.

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