

THE DIVERSIFIED FIRM: NON FORMAL THEORIES VERSUS FORMAL MODELS

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Abstract

The paper analyses critically the theoretical approaches which try to explain the emergence and growth of diversified firms. While the outstanding theory is still heavily based on non formal analysis, some recent contributions have introduced formalised models. It is argued that a further development of formal theories could be very important for a deeper understanding of the complex phenomenon of multimarket production. Moreover, formal models could be extremely useful in order to build some precise hypotheses to be tested in sound empirical works.

JEL: L1, L2

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1. Introduction

Most firms operate in more than one market: diversification strategies are well widespread in all countries and the fortunes of a relative small number of diversified companies have considerable repercussions on the economic activity of the home country and, if they go multinational, of the foreign countries as well. Several explanations of diversification have been put forward, but there have been very few attempts at developing formal theoretical treatments¹.

The utility of formal models should be reflected in the possibility of obtaining some clear predictions to serve as a useful guide for empirical works on the emergence of diversification in the first place and on the effects on firms' performance and market structure. This problem is particularly important in this area, since empirical works have been generally not well specified and unsuccessful to discriminate between the different views.

The few and somewhat recent formal models available will be discussed and contrasted with the main non-formal theoretical explanations which have been advanced for understanding the extent and the patterns of diversification strategies. The interrelationships between technology, firms' *strategic behaviour* and the characteristics of the different industries provide a joint explanation for diversification and for the evolution of industry structure.

At the end of the analysis we should be able to improve our understanding of why firms diversify or dediversify. In particular, the work should highlight the efficiencies and inefficiencies deriving from alternative diversification strategies, as well as the effects the introduction of new technologies, the evolution of markets, or variations in firms' competitive behaviour are likely to have on strategies, on performance and market structure. Section 2 reviews the traditional theories of diversification, and discusses some puzzles which are still open to different interpretations. Section 3 digs deeply into formalised models. Their utility for a deeper understanding of diversification strategies is emphasised in section 4. Section 5 concludes.

2. Non-Formal Theories of the Diversified Firm

Montgomery's review of the theoretical and empirical literature on the causes and effects of diversification (1994) highlights three principal motivations behind the decision of a firm to undertake a multioutput production:

a) *The resource (or efficiency) view*

In the process of growth firms accumulate resources that can be potentially employed in several activities; when the core business of the firm cannot grow anymore, they can be used in new activities (Penrose, 1959). Examples of such assets are R&D and advertising investments, labour skills, managerial capabilities, know-how: they should be to a certain extent indivisible and have a nature of quasi-public inputs within the firm². Moreover, there should be some obstacles, such as the presence of transaction costs, to their purchase or selling via the market mechanism, so that it appears convenient to internalise the new activities (Teece, 1980 and 1982). Each firm by activating some particular assets develops specific core competencies. The latter strengthen its position in the primary markets and lay the foundations for widening the range of goods to be manufactured (Collis and Montgomery, 1995). The choice between related and unrelated diversification is then linked to the relative specificity or generality of firms' resources. In particular, the accumulated technological knowledge may be more or less suitable to be used for producing new goods. A localised knowledge limits the scope for diversification, while a more general technical competence may be consistent with broader diversification strategies. If the possibility to diversify depends on firms' accumulated competencies, the above pattern of diversification is to a certain extent path-dependent and endogenously determined by the technological choices firms made at an earlier date (Antonelli, 1995; Teece et al., 1994; Patel and Pavitt, 1997). The two way relationship between resources and product diversification has been discussed by Wernerfelt (1984). In particular, while on the one side the availability of resources may push firms to enter new industries, on the other side firms which manufacture different goods may develop new resources. The latter may

¹ This explains why in traditional textbooks diversification is either ignored (Tirole, 1988) or superficially treated (Martin, 1993).

² However, Levy and Haber (1986) stressed that a diversified firm enjoys an advantage even if the input has not the characteristics of a joint asset. It is sufficient that it is sharable, i.e. "transferable between uses, but [which] may be used in producing only one output at a time" (p.293).

lay the foundations for new diversification waves towards industries where the link with the original set of firms' resources may gradually disappear. Grandstrand (1998) digs into depth in the complex relationship between *resource diversification* and *business diversification*, with the aim of developing a theory of the technology based firm.

b) The agency view

In firms with ownership in the hands of shareholders and ruling power in the hands of managers, the latter may follow diversification oriented growth strategies in order to increase their power and prestige (Marris, 1964). Due to an information advantage, managers may maximise their own objectives without being too much constrained by the shareholders' objectives (profit maximisation). Cash generated in the firms they rule can be used for entering new industries instead of being given to the shareholders (free cash flow hypothesis). Since they are generally more risk averse than shareholders and cannot reduce the risk by diversifying their work, managers may direct toward risk reducing conglomerate diversification (Ahimud and Lev, 1981, Mantell, 1998)³.

c) Market power view

Diversified firms may increase their market power by cross-subsidisation activities: a market strength in one particular industry may be used to sustain low price strategies in other industries with tougher competition (deep pocket). For the diversified firm it could be easier to undertake predatory strategies. First, diversified firms have higher internal sources of finance and can sustain a low price strategy for a long time (long purse story). Second, a predation in one market may be used to build a reputation which reduces the costs of predation in other markets (multimarket reputation). Levy (1989) added to these two cases the increased possibility for a diversified firm to transfer assets internally. This third property may render a diversified firm less vulnerable as a prey too. Hilke and Nelson (1988) contrast the latter statement by arguing that a firm which has the possibility to transfer assets to a new market should have a greater incentive to exit a predated market⁴.

³ In the absence of managerial motivations, there is no a risk reducing reason for diversification, as shareholders can diversify their portfolio of shares by investing in different companies.

⁴ However, it is not clear why the firm has to exit a market if there are good prospect of making future profits in it. Moreover, the authors do not explain why a profitable opportunity such as that of producing the new good has not been fully exploited before the predation.

Another way to increase firms' market power is the multimarket contact hypothesis (MMC) (Scott, 1993, Bernheim and Whinston, 1990), following which firms meeting in several markets have a greater incentive to devise and sustain collusive agreements. As we will discuss later in more detail, multimarket contact generates ex-post an incentive to collude. However, a firm enjoying a monopoly position in one market ex ante could find it more profitable not to enter another market already occupied by a monopolist. This is the genuine hypothesis of mutual forbearance which leads to the formation of 'spheres of influence' (Edwards, 1955) in which players recognise the supremacy of a particular firm in a market and concentrate their activities in other markets.

d) Institutional Motives

Recently, another motive for diversification emerged in the literature, even if its explanatory power is limited to cases in which there are significant policy distortions, such as in developing countries. Gemawat and Khanna (1998) highlighted the role of such distortions, which may assume the form of specific tax codes, regulatory procedures, collusive practises with bureaucrats, in influencing the decision of a firm to operate in different markets. This diversification is then not driven by pure efficiency reasons, but it is motivated by the possibility to reach scope economies in rent seeking activities, as well as by the opportunities and the incentives given by the legal system of norms and procedures. When the country undergoes a transition towards a more competitive environment (liberalisation, deregulation), firms which diversify following this view are pushed towards return to the core strategies, and largely diversified business groups are not sustainable anymore⁵.

2.1 ***Problems with traditional theories***

The above theoretical motivations underline causes and effects of *diversification which are not mutually exclusive*, so it is not surprising that empirical works have found it difficult to differentiate among them. In particular, diversification strategies undertaken by growth-oriented managers may on the one side generate economies of scope and on the

⁵ However, Khanna and Palepu (1998) argue that this might not be the case in the absence of a parallel development of market intermediaries, such as the market for capital, for labour, for financial activities, and so on.

other side increase firms' market power. Similarly, efficiency driven diversification might create as a by product more multimarket contact with consequent more opportunities for collusion. However, it is possible to *individualise some inconsistencies* between them:

- *related versus conglomerate diversification*: depending on the specificity of the resources to be employed, diversification might direct towards more or less related activities, but systematic conglomerate diversification is inconsistent with efficiency reasons, while it might be consistent with theories sub b), c) and d). Related diversification is also inconsistent with the risk reduction hypothesis, since similar activities are subject to similar shocks (Jovanovic, 1993)⁶;
- *relative share of secondary activities*: in order for the market power motivation to be effective, firms' market shares in the secondary markets should be relatively high;
- *performance*: theories sub a) and c) are both consistent with good performance results, while the agency view can explain why diversified firms make less profits and have a lower market value. The discrimination between explanations a) and c) cannot rely on measures such as profits or price cost margins, as has been made in many past studies. Conversely, high prices are more appropriate to detect the presence of market power while higher productivity levels are closer to the resource view explanation.
- *mode of diversification*: diversification via acquisition is more likely to reflect motivations sub b) and c) while diversification via internal growth is probably more linked to the exploitation of some firm specific assets. From a different perspective, a firm may have the total control of the new activities by establishing wholly owned subsidiaries, or it may look for the collaboration of other established firms by means of shared ownership agreements. Joint ventures, for example, are more likely to be formed in accordance with motivations sub a) and c).

When undertaking empirical analysis, we should keep into mind the above inconsistencies and exploit them in order to judge which theory is in the best position for explaining the empirical regularity which is being uncovered.

⁶ However, it has been argued that systematic or undiversifiable risk is lower for related diversifiers, since they can better respond to negative shocks (Montgomery and Singh, 1984, Lubatkin and Rogers, 1989).

The agency view is a theory of disequilibrium in itself and has a positive appealing, but it is less useful as a theory investigating if and where firms should diversify. The market power explanation alone is not appealing as a cause of diversification but together with other explanations might be important to ‘complete the picture’ of what lie behind firms’ strategies. On the other side, the resource view seems persuasive as a normative theory of what firms should do, given particular technological and demand conditions and given the specific market structures of the industries in which they are operating.

2.2 *A recent puzzle: overdiversification and return to the core*

There is a strand of literature which suggests that diversification might be ‘more loosely’ driven by imperfections in the capital markets or by managers’ ‘mistakes’. Both explanations have been used by Markides (1995) in interpreting the waves of diversification during the sixties and the seventies in the US and the refocusing strategies starting from the eighties. He suggested that each firm (again in an informal way) has an optimal level of diversification. The latter depends on its specific assets and on the capabilities of its managers on the one side, and on the characteristics of the economic environment, which gives opportunities and imposes constraints, on the other side. The optimal level may shift over time, according to variations in firm and market characteristics. It is possible that a firm is ‘overdiversified’ because managers overestimated their capabilities of running a wide range of activities (the ‘hubris hypothesis’). Similarly, overdiversification could be due to a stock market which was overestimating the value of diversified firms. When the stock market turns out to be more efficient in assessing firms’ strategies (Bhide, 1990) or when managers improve their learning of how to rule organisations, firms dediversify. While there is evidence that the stock market was reacting negatively to diversification strategies and positively to refocusing strategies in the 80’s (Morck et al., 1990; Comment and Jarrel, 1995; Daley et al, 1997; Lang and Stulz, 1994), Servaes (1996) found that diversified firms were destroying value only in the 60’s, but the valuation in the stock market of diversified and non diversified firms was not different in the 70’s. This suggests that managerial motivations can play a role for explaining why firms were diversifying in the 60’s notwithstanding these strategies were destroying value in the market, but it is not clear why

in the 70's diversification was not destroying the value of the firm anymore⁷. However, contrary to Servaes (1996), Klein (1997) found that in a smaller sample of large conglomerates firms were positively valued in the sixties and negatively valued in the first 70's.

Together with firms which are refocusing at each period there are firms that are diversifying in order to reach their optimal level. Markides found that largely diversified firms were dediversifying by exiting marginal and unrelated activities while diversifying firms were entering related markets. Is return to the core voluntarily undertaken by firms or it is the result of an improvement in monitoring capabilities of the market for corporate control? Denis et al. (1997), Berger and Ofek (1995 and 1996), Baghat, Shleifer and Vishny (1990) present evidence for the latter explanation, finding that diversification was driven by market discipline events such as acquisition attempts, financial distress, etc.

2.3 *The conglomerate firm*

Are conglomerate strategies, by pooling unrelated activities, always inconsistent with efficiency reasons? Contrary to this statement, Kay (1992 and 1997) argues that conglomerate firms are more sheltered against threats that are specific of a particular market or activity. Moreover, if there is soft selection in the environment and if firms are to a certain extent locked in their past strategies, conglomerate firms have no incentive to dediversify. Williamson (1992) underlines the advantages for diversified firms to construct internally a miniature capital market. In fact a multidivisional firm (M-form), which can benefit from an information advantage with respect to subjects operating in the external capital markets, is more able to allocate resources towards the more profitable divisions. Another case in defence of conglomerate strategies is relative to firms which operate in emerging markets (Khanna and Palepu, 1997 and 1998). In fact, by operating in a range of industries firms may "imitate the functions of several institutions which are present only in advanced economies" and enjoy different benefits: they may build a reputation for quality products and services, which can be used to sell products unrelated to the core business;

⁷ The non negative market valuation in the seventies might explain why diversification increased significantly in that period: the conflict between managers and shareholders was less pronounced. In the 60's, managers' objectives seemed to prevail while in the 80's shareholders' objectives seemed to induce less diversification and refocusing.

they can train their own workers with efficiency improvements; they can use their reputation for raising more easily and at a lower cost new capital.

However, following Teece et al. (1994), the conglomerate firm lacks competencies at the corporate level and is a transitional form which can survive just because of a weak external pressure. Similarly, Davies, Rondi and Sembenelli (1997) argue that an increase in the level of competition, such as the one driven by the European Integration, should stimulate each firm to concentrate on its core business. Finally, Bhidé (1990) insisted in the improvements in the efficiency of the external capital markets in determining the return to the core wave in the 80's. It appears then that, far from being based on structural efficiency advantages, conglomerate strategies may be pursued due to the lack of competition, to the presence of underdeveloped financial markets, or the permanence and effectiveness of collusive behaviour.

2.4 The effects on applied works

This section contains the core of the traditional theoretical literature on diversification. Empirical studies in this area have found it difficult to specify hypotheses which unambiguously identify a particular theory. In some circumstances⁸ applied economists specify clearly that their results are open to different interpretations, while in most of the works this problem, while present, is not directly recognised by authors. The next paragraph focuses on formal models. As it will be argued, it is our opinion that their use can do a great job in overcoming some of the theoretical weaknesses individualised in the present section. Moreover, they can be extremely helpful for devising some precise hypotheses to be tested in sound empirical works.

3. Formal models

Having discussed the main theoretical contributions to the problem of diversification in broad terms, the attention will now focus more specifically on formal models and their predictions. There is a great variety of models: some of them do not focus directly on diversification strategies, while others concentrate on very specific cases of multiproduct activity and can hardly be used for making inferences about diversification in

⁸ See, for example, Montgomery and Wernerfelt (1988, p.631), Lang and Stulz (1994, p.1278), Scott (1989, p.44), Wilson (1992, p.179), Hughes and Oughton (1993, p.220).

general. On the whole, however, we strongly believe that they are extremely useful for reducing the above theoretical gap.

3.1. *Economies of scope and the efficiency advantages of diversified firms*

Economies of scope (Panzar and Willig, 1981) measure “the cost advantage for firms of providing a large number of diversified products as against specialising in the production of a single output” (Bailey and Friedlander, 1982, p.1025) and provide a *technological reason* for the existence of multioutput firms. Cost advantages generally arise from i) a joint utilization of inputs for producing more goods (for example, a sheep from which it is possible to obtain wool and meat); ii) inputs which have to a certain extent the nature of public goods (such as human capital which is applicable for producing different outputs).

Baumol, Panzar and Willig (1982) analyse theoretically costs in a multiproduct firm. First, a technology may exhibit multiproduct economies of scale (ray scale economies if the product mix does not change and product specific economies of scale if it changes). Second, it can incorporate economies of scope when the cost of producing goods 1 and 2 jointly is less than the costs of separate production:

$$C(y_1, y_2) < C(y_1, 0) + C(0, y_2)$$

Both product specific economies of scale and economies of scope contribute to determine the presence of ray economies of scale. If the effect of economies of scope is higher than the effect of product specific economies of scale the cost function is said to exhibit transray convexity⁹.

However, the fact that one input may efficiently be used for producing more goods does not mean that firms have necessarily to internalize all the productions. For example, it could be possible to sell the services of the input through the market. If one wants to explain the emergence of diversified firms, the argument based on economies of scope has to be reinforced by introducing some transaction costs which render the use of the market mechanism as relatively inefficient (Teece, 1980 and 1982).

⁹ Basically this property says that if we hold a weighted measure of the aggregate output constant, a diversified firm has always lower costs than the weighted costs incurred by the specialised firms. With two goods and weights a and $(1-a)$: $[a C(y_1) + (1-a) C(y_2)] > C [a y_1 + (1-a) y_2]$.

The presence of *economies of scope* might explain why firms decide to undertake a multioutput production into related areas. While this theory is consistent with the resource view of diversification, it cannot account for the fact that some firms remain specialised, while other firms diversify. Moreover, firms often follow a sequential pattern of entry, while the presence of technological economies of scope would foresee the instantaneous production of the different goods. However, the basic ingredient of the presence of economies of scope has been introduced in several of the models which will be discussed in this section.

3.2 *Principal-agent and contract theories*

3.2.1 *Moral hazard, self selection and risk aversion*

Marshall et al (1983) examine the principal agent relationship between owners and rulers of the firm. Managers are assumed to be more *risk averse* than shareholders and try to limit the amount of the effort they have to exert. Shareholders have to give them appropriate incentives in order to obtain the desired level of effort. Since effort is *not directly observable*, incentive schemes are to be linked to the performance of the firm. Diversification towards non correlated or negatively correlated activities can be beneficial for two reasons. First, it is associated with a lower variance of returns, so that shareholders may monitor managers' capabilities and effort in a better way. Second, managers may reduce their level of risk and obtain a less volatile outcome for a given level of effort.

Aron (1988) reaches similar conclusions in a slightly different context. Managers have skills and abilities that can be employed in more markets (not necessarily related). The 'effective input' of the manager depends on his talent (which is observable), his effort and on the capital invested on the firm. Shareholders choose the incentive contract and the amount of capital to invest. When the firm is diversified in two markets which are not perfectly correlated, shareholders benefit of two observations and may pay a lower incentive in order to induce managers to exert a particular level of effort, because the risk the latter face is reduced.

Taking these results together, there is a *moral hazard* explanation of why firms might undertake unrelated diversification, even if managers do not have a preference for

growth¹⁰. What should we expect if the managers hold equity interests (inside ownership) in the firm? Ahimud and Lev (1981) argue that managers should diversify to reduce their personal risk. Denis et al. (1997), analysed empirically this issue. They found that in the eighties the above incentive was important only for very large stakes, while small insider ownership was associated with reduced levels of diversification. We think that these results are consistent with Aron's model. The moral hazard problem is in fact reduced when managers have direct stakes in the firm. Diversification may result to overcome the moral hazard problem (in this case shareholders' interests prevail) or to reduce the risk of being stuck to a particular market (in this case managers' interests prevail). At intermediate levels of managerial involvement, however, effort is guaranteed, and diversification might well be limited.

Rose (1997), building on the work of Hagerty and Siegel (1988), argues that it is not necessary to assume unobservable effort and moral hazard in order to consider the incentives for diversification. Diversification may emerge as well if incentive schemes are linked to the performance of the firm. When *effort is observable* moral hazard is not possible: nevertheless a diversified firm captures high skilled managers (self-selection) because it is more likely for them to obtain higher average outcomes, and in turn a higher compensation. Rose (1992) relaxed also the assumption of risk aversion on the part of managers as a condition for diversification. When manager's behaviour is *observed* and managers are *risk neutral* diversification may still be optimal because of a new effect: the reduction of the likelihood of bankruptcy. When a firm is far from the event of bankruptcy, the expected returns from a given level of effort are high. Finally, Choi and Merville (1995) add to the principal agent scheme above the fact that diversified firms have to monitor the behaviour and the performance of their subsidiaries. The fact that managers of the parent company have to monitor over subordinates reduces the incentive to diversify into unrelated markets, in that the latter are more difficult to monitor as compared to related markets.

It appears clear that these models do a great job in *correcting the principal argument advanced by the managerial view of diversification about the conflicting interests*

¹⁰ While these models point to unrelated diversification, the genuine managerial view is not clear in differentiating between related and unrelated diversification.

of managers and shareholders, and the resulting diversification strategies followed by the former at the expense of the latter.

3.2.2. Efficiency of workers

From the analysis of the relationships between shareholders and managers, and between top managers and subordinate managers, the focus turns now to the interaction between managers and workers. Rotemberg and Saloner (1994) develop a model in which narrow business strategies (such as specialisation or a limited degree of related diversification) stimulate workers to undertake innovative activities. Workers may exert an effort level of d and come out with an innovative idea with a probability Q . If the idea is implemented they get a payment of k . The value of the idea is g in term of increased revenues for the firm (with $gQ > d$), and the employees will exert effort whenever $kQ > d$; the optimal incentive for them is to receive a payment of $k = d/Q$. Let us assume now that the same idea leads to two potential outcomes (increased revenues of g with probability Q' and z with probability Q'' , with $g > z$). The first best $k = d/(Q' + Q'')$ is achieved if *i*) $z(Q' + Q'') \geq d$, that is when z (and g) is greater than k . If *i*) does not hold but *ii*) $gQ' \geq d$ holds, the worker put effort and receives $k = d/Q'$. The idea is implemented only if it gives returns equal to g (since $g \geq k$ but $z < k$)¹¹. If both *i*) and *ii*) are not satisfied, workers do not exert effort at all.

The main point of the above model is the following: if ideas have more than one application it is more difficult for workers to be motivated. Rotemberg and Saloner apply their framework to the case in which firms manufacture two products. Let us assume that workers in activity i make innovations that can be only applied in i (with a value of j), while workers in activity j make innovations that can be applied in j with a value of g , but also in i with a value of z . They show how it is optimal to implement winning ideas in j also in i , with the consequence of supplanting better ideas (that is ideas with a higher absolute g value) developed in i . The result is that the incentive constraints (that is the necessity to reward workers for their innovative ideas) in the case of multioutput production might deter innovation in some activities. The firm finds it better to implement an inferior idea which costs relatively less than motivating the research for superior ideas. The authors demonstrate in this setting that two specialised firms can be more innovative and perform

¹¹ In fact since *i*) does not hold $z < d/(Q' + Q'')$. Since $k = d/Q'$, $z < d/(Q' + Q'') < d/Q' = k$.

better than a diversified firm. Innovative firms require narrowness while firms which are not innovative do not suffer from the above incentive problem and may be well diversified. They argue also that innovative firms might have higher *accounting profits* just because the ex-ante investments in innovative effort are not computed in the balance sheets. The accounting profits of imitative firms may on the other side be lower, but *economic profits* might be the same of innovative firms.

3.3 Strategic motivations for diversification

Diversification strategies may also be driven by strategic considerations. While economies of scope underline technological links between products, the presence of demand links renders output decisions even more interrelated. The several models treating multioutput production in a context of imperfect competitive markets are discussed in the subsections below.

3.3.1 Economies of scope and the transmission effect in other markets

Bulow et al. (1985) consider the case of a monopolist in market *i* (firm A) operating also as a duopolist in market *j*. They show that changes in the conditions of market *i* could hurt the monopolist because of the induced change in the rival's (firm B) strategy in market *j*. Let us assume an increase in the demand for good *i*. The case of economies of scope and strategic substitutes is beneficial to firm A, while the case of diseconomies of scope and strategic substitutes is harmful. The opposite can be said if goods are strategic complements¹².

With joint economies of scope an increase in the demand in market *i* implies an increase in the quantity sold in market *j* as well (because firm A's marginal cost decreases). If goods are strategic substitutes this leads to a decrease in firm B's marginal profitability, to the benefit of firm A. An increase in the quantity sold in market *i* is also affecting potential entrants in market *j*. If there are economies of scope marginal costs are reduced and firm A is in a stronger position, while the opposite happens if we allow for

¹² A product is a strategic substitute if the marginal profit of firm B is decreasing in the strategic variable (price, output) chosen by firm A, so that a more aggressive play (low price, high output) by A lowers B's profitability. A product is strategic complement if a more aggressive play of firm A is increasing the marginal profit of firm B. Quantities are generally considered as strategic substitutes and prices as strategic complements (Tirole, 1988).

diseconomies of scope. Since an increase in the demand in the primary market will benefit firm A's relative position in the secondary market if there are economies of scope, both profits and the market share increase. It is not surprising then that the empirical literature has found it very difficult to discriminate between the market power and the efficiency explanations.

Bulow et al. deal with the mutual forbearance case too. Spheres of influence may occur just because it is optimal for a firm not to enter another monopolistic market, as far as the other firm has not entered its own market. On the other side multimarket contact may result just because it is optimal to enter after its own market has been invaded. If there are diseconomies of scope, for example, an expansion in another market renders the entering firm more vulnerable. Moreover the incumbent firm in the entered market will have a reduced quantity and so a greater incentive to enter the other market. The above example explains entry deterrence without introducing necessarily concepts such as tacit collusion and threat of retaliation. So, if firms can correctly foresee the consequences of their actions, with diseconomies of scope we should expect specialised production. However, in a repeated game context, Dixon (1994) showed how inefficient diversification can emerge due to the impossibility to coordinate towards the pareto optimal equilibrium.

3.3.2 Competition intensity and economies of scope

Instead of having a monopolist which also operates in a duopoly market, one can think of a situation in which a firm competes with a duopolist in market *i* and with another duopolist in market *j*. As compared to its two rivals, the multiproduct firm may enjoy a better position by exploiting economies of scope. This issue is explored by Cantos- Sanchez et al. (1998). In particular, the authors are interested in evaluating the effects of the transmission of competition intensity across markets. With respect to the situation of one multiproduct firm competing in two markets with two single product firms (concentrated structure), an alternative situation in which there are two duopoly markets with specialised firms (fragmented structure) is found to be characterised with lower total profits, lower consumer surplus and consequently lower welfare. This happens because in a concentrated structure the diversified firm may activate economies of scope, which benefit consumers notwithstanding the higher market share for the multiproduct firm and the lower level of profits for the single product firms. Moreover, in a concentrated structure the introduction

of more competition in one market may prove to be harmful for welfare. For example, when a single product firm prices at marginal cost (and behaves more competitively as compared to the previous Cournot game) it increases its market share to the damage of the diversified firm. The latter loses profits also in the other market, since the two markets are linked through the cost function. If economies of scope are very high, the welfare may be lower than the one occurring in the previous concentrated structure. The authors use their model to challenge two common beliefs: a) that a fragmented structure is better than a concentrated one; b) that the introduction of more competition in a concentrated structure is always welfare improving.

3.3.3 *Demand relationships*

While Bulow et al. (1985) and Cantos-Sanchez et al (1998) are interested in the effects of economies or diseconomies of scope, Encaoua et al. (1986) concentrated on the demand relationships between products¹³. In particular, they compare a situation in which there are two markets and two single product duopolists in each of them, with a situation where only two diversified firms are present (they meet twice in the two markets). If products are demand complements diversification leads to higher quantities and lower price cost margins (PCMs). If goods are demand substitutes high prices can be charged and the PCM will be raised with multiproduct firms. The authors investigate the relationship between diversification and global market power as summarised by an aggregate Lerner index for the whole economy. Market power is increasing (decreasing) with diversification in the case of demand substitutes (complements). The relationship is not a causal one since diversification and market power are both determined by cost and demand conditions. If there are no links between demands, as with conglomerate diversification, the multiproduct strategy is not related to the aggregate Lerner index.

3.3.4 *Information asymmetries and signalling*

Chen (1997) presents a model where firms enjoy private information about their costs and about the level of demand in their primary industry. By diversifying, and by

¹³ In the case of a diversified monopolist and a specialised duopolist discussed by Bulow et al. demand complements and strategic substitutes are increasing the marginal profitability of the monopolist. Complementarity in demand and economies of scope have then a similar effect.

choosing between related and unrelated diversification, they strategically deliver their private information. The latter can be used to gain market power with respect to rivals in an oligopolistic setting or to deter entry in a monopolistic framework. In a perfect capital market the author argues that a high demand in the primary industry implies that firms prefer to enter new markets by raising debt, while with a low demand firms find it optimal to raise equity¹⁴. Assuming that low costs in one market imply also low costs in other related markets and viceversa, low cost firms undertake related diversification through debt if demand is high or equity if demand is low. Unrelated diversification may be undertaken by high cost firms through equity if demand is low, conveying the information that the primary market is not attractive. Notwithstanding in a world of perfect information related diversification is always better than unrelated diversification, Chen suggests *a possible rationale behind conglomerate diversification* in a world of imperfect information. He shows also that the signalling motivation may explain related diversification that otherwise is not attractive (when demand is very low).

This model has some clear predictions:

- we should expect a aggressive behaviour in the primary market after related diversification but not after unrelated diversification (which is signalling high costs and low demand);
- related diversification would predict higher profits than unrelated diversification;
- without diversification and the inherent signalling advantage, single product firms cannot convey information on costs (or they may give the implicit information that they have high costs and that demand is high) and enjoy a lower market power.

3.3.5 *Entry into new markets and sequential diversification*

Aron and Lazear (1990) analyse the problem of the introduction of new products. They argue that the latter are more likely to be introduced by new entrants or by non-dominant firms already present in the industry. This is because for dominant firms new lines may have negative repercussions on the sales of already existing products (cannibalisation), or because of the presence of diseconomies of scope. After

¹⁴ Chen maintains that for a firm with prospects of a low demand future profits are likely to be low: consequently it prefers new equity to new debt. While the cost of financing in the two alternatives is the same due to the presence of a perfect capital market, the choice of equity is signalling that demand is low.

the new product has been introduced, however, dominant firms imitate and start manufacturing it.

Deneffe (1993) provides another explanation of why established firms may enter a new market with a delay as compared to new entrants. The crucial feature here is the existence of cost externalities, both in the form of learning by doing (future marginal costs negatively correlated with actual values of production) and in the form of experience that may be transferred to new products (a typology of economies of scope that links actual volumes of good x to future marginal costs of good y). According to Deneffe's model, firms may delay entry into a new market in order to build experience to reinforce their position in the primary market (experience effect) and to increase the competitiveness in the new market (relatedness effect). Non-diversified firms do not have the possibility to benefit of the above two effects and may enter early. An important feature of the above model is that it is able to *explain by cost considerations why firms diversify sequentially*. In fact, following the traditional economies of scope argument firms should produce a different set of goods from the start, that is they should be borne as diversified or specialised firms.

3.3.6. *Strategic investments in R&D and in flexible technologies*

Zhang and Zhang (1996) examine a firm's incentive to invest in cost reducing R&D in a two stages multimarket duopoly context. In the first stage firm A invests in R&D and reduces the marginal costs of producing the good x , while in the second stage firms A and B play a Cournot game in markets x and y . The authors show that for good x the strategic effect of investing in R&D is stronger than in the single-output duopoly case. Moreover, a firm's strategic decision in market x influences also market y . If there are economies of scope, firm A's market share in industry y increases, while the opposite result occurs with diseconomies of scope. As to market x , an R&D investment increases firm A's output independent of scope economies.

Roller and Tombak (1990) deal with the ex-ante incentives to invest in a flexible technology, as opposed to a less flexible (dedicated equipment) one. The former may be used for manufacturing two goods with interrelated demands. Their model shows how flexible technologies in the first stage are chosen by both firms (with resulting multimarket contact) if (i) markets are bigger; (ii) the difference in fixed costs between

the flexible and the dedicated equipment is low; (iii) products are not close substitutes (that is they are highly differentiated).

Dixon (1994) extends the previous model to the case of diseconomies of scope. Absent the possibility of collusion and provided that fixed costs of entering a new market are small enough, *multimarket contact is endemic* even if one allows for diseconomies of scope. According to his model, firms may direct towards flexible technologies even if dedicated technologies (that is technologies which are specific to a particular product) would have been more profitable. What drives this result is the fact that, even in the presence of diseconomies of scope, there is an incentive to enter a market not already entered by the rival.

Oliva and Batiz (1998) develop a model in which congeneric integration of firms emerges due to the effect of R&D synergies. Starting from two duopolies (4 firms), the authors analyse the incentive for firms to engage in mergers and ending with a two market duopoly (2 firms). Conglomerate firms (merged firms in their model) have cost functions which benefit of synergies stemming from R&D spillovers (R&D expenditures borne for product q_1 are reducing product q_1^* 's marginal cost, and similarly R&D efforts borne for developing product q_1^* are lowering q_1 's marginal cost). However, there are costs to be borne to adopt and implement technologies, as well as to complete the merging operations. In their model economies of scope emerge when the cost savings due to R&D synergies are higher than the sum of the fixed costs of the merger and the implementation costs for technology adoption. The model shows that conglomeration (merger across markets) may result even if there are diseconomies of scope. On the other side, *when there are economies of scope, there can be synergy traps* in which firms merge but they earn less profits as compared to the profits which would have been granted had they remained independent. This is the case when high synergies, while leading to the exploitation of economies of scope, are also determining and increase in the quantity and a decrease in the price. The final effect can be that of generating gross profits which are not sufficiently high to recover the fixed costs of the merger. While Dixon (1994) has shown that with *diseconomies of scope* inefficient diversification and multimarket contact may emerge, the results of this model suggest that, notwithstanding the presence of economies of scope, inefficient multimarket contact may emerge (with lower profits as compared to independent firms). As in Dixon

(1994), the option of remaining specialised is not available because of the incentive for firms to enter each other market (in this specific context by merging with the firm already operating in it) if they believe that the other firms will not enter.

3.4 *Repeated games and multimarket contact*

It is well known that in oligopoly a collusive outcome is not sustainable if the game is not repeated and some punishment mechanisms devised and enforced. The multimarket contact hypothesis argues that it is easier to reach collusion when the same firms compete in more than one market, because the punishment strategy is more effective. If collusion is not sustainable in market *i* but is sustainable in market *j*, by operating in the latter it may be possible to reach the co-operative outcome in both markets. The equilibrium levels of quantities after collusion are such that each firm reduces its market share in the industry in which it was stronger and increases the share in the other industry¹⁵.

Bernheim and Whinston (1990) analyse the problem formally in a repeated game context, finding that with i) identical firms; ii) identical markets; iii) a constant returns to scale technology, the MMC is not important in enhancing collusive pricing (this is known as the *irrelevance result*). If collusion is not sustainable in market *i* and market *j* is identical, for example, it is not possible to use the higher potential for collusion in one market to win the resistance to collusion in the other market (pooling of incentive constraints).

Let us discuss the implications of differences between markets. Firms may operate simultaneously in rapidly growing markets and slowly growing markets because the higher potential of collusion in the former (due to higher losses of non co-operating in the future periods after a deviation) may counterbalance the low potential for collusion in the latter. Similarly, they can operate in markets in which a deviation is observed with a lag (or with a certain degree of uncertainty about its nature) by using the enforcement power from markets characterised with more observability and rapid responses. Finally, if there is uncertainty about the conditions of future demands (Rotemberg and Saloner, 1986) by operating in markets that at present have a low level of demand firms may sustain collusion

¹⁵ Phillips and Mason (1992) confirmed this result in an experimental investigation. They found that conglomeration tends to reduce (increase) co-operation in markets where co-operation is relatively easy (difficult).

also in markets that at present have a high level of demand. Incidentally, this is another explanation of why firms may operate in markets with negatively correlated shocks different from the risk reduction hypothesis¹⁶. The previous examples were relative to the relaxation of the assumption of identical markets. If on the other side firms have cost asymmetries they may develop ‘spheres of influence’ in which each firm becomes more important (and at the limit produces only) in the market in which it is more efficient. The assumption of infinite repetition is not necessary in order to achieve collusion. Harrington (1986) showed in a context of a finitely repeated game that collusion may be sustainable in a multiproduct oligopoly by applying punishment strategies in every market after a deviation. If there is more than one Nash equilibrium in market *i* (one of which is pareto dominating) and one Nash equilibria in market *j* (the Cournot-Nash one), for example, it is possible to sustain the co-operative outcome (which is not a Nash equilibrium in market *j*) in both markets with the threat to return to the inferior Nash equilibria after a deviation. Co-operation can be maintained up to the last round¹⁷.

The simple observation that multimarket contact facilitates collusion is not however equivalent to saying that firms diversify in a similar range of industries in order to *reach purposively collusive agreements*, as has been sometimes maintained in some of the non-formal literature. We have in fact discussed models in which MMC arises in the presence of economies of scope (Oliva and Batiz, 1998), or even in the presence of diseconomies of scope (Dixon, 1994), and this was the result of strategic interactions between firms, rather than attempts at reaching higher opportunities to collude.

Some scholars have tried to model the cross market reactions in standard static oligopoly models, through the help of conjectural variations parameters (Feinberg, 1984, Hughes and Oughton, 1993). In particular, Hughes and Oughton (1993) extended the model by Encaoua et al (1986) in order to check for the possibility of collusion across markets. One result they found was that the negative effect of demand complementarity on PCMs could be outweighed by the presence of some degree of collusion.

¹⁶ We have already seen however that Aron’s model points to a non perfect correlation of returns, not necessarily to a negative one.

¹⁷ In the last round it is not possible to be punished. Consequently, the collusive outcome, which is not a Nash equilibrium, is not sustainable anymore.

3.5 *Asymmetries in efficiency*

Bianco (1997) develops a model in which firms that are relatively inefficient in each single market can survive only with a multioutput production, by exploiting synergies between markets. There are two kinds of synergies: managerial capabilities that can be exploited in related markets (a manager is able to run two related activities in a similar way, so that a firm with high costs in market i has also high costs in market j , and viceversa) and economies relative to the characteristics of the goods (technological savings or benefits deriving from sharing common channels of distribution). In both cases specialised firms turn out to be those who are very efficient in one market but inefficient in the other market so that economies of scope (or managerial synergies) are not large enough to win the efficiency differential. Diversified firms may alternatively be very efficient or very inefficient in both markets. In the latter case diversified firms are less profitable than undiversified firms but this is due to technological and organisational conditions *not to diversification per se*. The common result in empirical studies that the market is valuing diversified firms less than specialised ones¹⁸ may be explained by asymmetries in the cost function between firms and not by value reducing diversification strategies undertaken by opportunistic managers.

Roller and Desgagne (1996) are not directly interested in explaining diversification but their model of multiproduct duopoly can be compared to the previous one. Here managers have limited capabilities and effort can be directed towards one or two goods. The higher the effort dedicated to good i (t_i) the lower the effort remaining for good j ($1 - t_i$). If there are ex-ante asymmetries between two oligopolists (firms A and B) about the level of effort to put in good i ($t_i^A \neq t_i^B$) and if one allows for managerial resistance to change (organisational inertia), firm asymmetry is exacerbated ex-post. The fact that managers have limited capabilities implies that each firm should concentrate on the good for which it is relatively efficient (lower level of t_i). However, in the presence of economies of scope or with the possibility to exploit managerial skills in more than one market (as in Bianco's analysis), firm asymmetry may either be reduced or increased. This depends on the ability for the firm with relative inefficiency in good i to activate two productions.

¹⁸ This is generally done with a chop-shop approach, that is by considering the performance of the diversified firm and the average performance of a benchmark sample of firms which match by type and by size the industries in which the firm is active.

4. An overall assessment

We are well aware that some of the models discussed in section 3 treat limited cases of diversification (private information on demand and costs, applicability of ideas to more than one product, etc.) while other have not been introduced to directly discuss diversification. Taken together, however, we think that they can give clearer predictions and more interesting insights than the ones coming from the non-formal literature reviewed in section 2. Some critical points are worthwhile to be summarised at this point:

- *Endogeneity*: for many different models diversification strategies, the performance of diversified firms and the level of concentration are endogenously determined by technological conditions, by demand characteristics, by firms' competitive behaviour;
- *Dynamics*: dynamic changes in patterns of diversification may be linked to the fact that firms try to reach their equilibrium level of diversification, or that they shift towards a new equilibrium after changes in the external environment, or in the technology, or in the demand conditions, occur;
- *Related versus unrelated diversification*: while most models assume or point towards related diversification, conglomerate diversification appears consistent only with principal agent motivations, with Chen's model and with the multimarket contact theory (if the presence of diseconomies of scope is not counterbalancing the advantages of more collusion);
- *Asymmetries*: according to the resource view, diversification should be directed towards related industries and should be reflected in higher profits. However, if we observe opposite patterns, they are not necessarily evidence of the presence of the disequilibrium situations suggested by the traditional managerial explanation: asymmetries in efficiency (Bianco, 1996) or biased accounting procedures (Rotemberg and Saloner, 1994), for example, might explain lower profits, while asymmetries in information between rivals (Chen, 1997) and inside the firm (Aron, 1988; Rose, 1997) might account for unrelated diversification. Asymmetries between demands or between firms' characteristics are also needed to overcome Bernheim and Winston (1990) irrelevance result and asymmetries in managerial capabilities are behind the model developed by Roller and Desgagne (1996) too.

5. Conclusions

We started by highlighting that economists' efforts to explain diversification strategies have used mainly non formal theories, and that this has been reflected in not well specified empirical works. Some formal theoretical treatments, partially developed for reasons other than the analysis of diversification, emerged in the literature in the mid eighties but i) they have not been developed or/and ii) they have been ignored in empirical studies. More recently, the exigence of using formal theoretical analysis seems to be acknowledged by a series of scholars (Bulow et al, Bernheim and Whinston, Chen, Bianco, Aron, Rotemberg and Saloner) who addressed diversification from different angles (oligopoly and other imperfect market models, repeated games, asymmetric information, principal agent theory, contract theory). We believe that this path is worth to be following.

The explanation of diversification is not an easy task. Each theory, amongst the ones available, may be successful in explaining at least some types of diversification, and different theories might be consistent with an observed pattern of diversification. However, this is not to say that all theories are equally important and that there is not room for differentiating among them.

In the empirical literature low profits of diversified firms have been associated with managerial motivations but the above analysis suggests that this might not be the case. Similarly, multimarket contact has been sometimes seen as a strategy purposively undertaken in order to increase collusion and profits (Scott, 1993). A deeper analysis suggests that MMC is more likely to be the result of strategic interactions between rivals. Starting with two single product monopolies, a high degree of tacit collusion *ex ante* is likely to result in specialised firms, according to the mutual forbearance hypothesis; a low degree of collusion *ex ante* on the other side is likely to give diversification and MMC *ex post*. Profits of specialised firms might be high due to collusion *ex ante*, while profits of diversified firms with MMC may be high with respect to diversified firms without MMC due to collusion *ex post*. In both cases, however, the key explanatory variable is collusion and not diversification.

Diversification has recently drawn an increasing attention because of the widespread phenomenon of refocusing or return to the core in the 80's, after the conglomerate waves of the 60's and 70's. The financial approach to diversification seems to

have been the only one addressing this phenomenon with a series of papers that focused on managerial mistakes and on imperfect and immature stock markets and markets for corporate control. We believe that the industrial organisation approach has something to say to this regard and might be used as an alternative or complementary explanation. Changes in the degree of competition and in the relative size and growth of markets might be responsible for diversification and dediversification patterns. This could be particularly relevant in Europe, where the completion of the Single Market seems to have stimulated firms to reorganise their multimarket and multicountry activities.

Other than being interesting per se, diversification patterns, as part of firms' strategies, have repercussions on the structure of industries. While most of the empirical literature focused on why firms may decide to diversify or dediversify and on the effects diversification is likely to have on firms' performance, formal models have interesting implications for market structure too (monopolies with mutual forbearance, oligopolies with or without multimarket contact, concentrated versus fragmented structures). A better understanding of the reasons behind firms' conduct implies also a more complete analysis of the evolution of market structure.

References

- Ahimud, Y. and Lev B. (1981) 'Risk reduction as a managerial motive for conglomerate mergers', *Bell Journal of Economics*.
- Antonelli, C. (1995) '*The economics of localized technological change and industrial dynamics*', Kluwer Academic Publishers.
- Aron, D. (1988) 'Ability, moral hazard, firm size, and diversification', *Rand Journal of Economics*.
- Aron D. and Lazear E. (1990) "The introduction of new products", *American Economic Review*, AEA Papers and Proceedings, 421-426.
- Bailey E.E. and Friedlander A.F. (1982) 'Market structure and multiproduct industries', *Journal of economic literature*, 1024-1048.
- Baumol W.J., Panzar J., Willig R. (1982) '*Contestable markets and the theory of industry structure*', San Diego, CA: Harcourt Brace Jovanovich.
- Berger P. and Ofek, E. (1995) 'Diversification's effect on firm value', *Journal of Financial Economics*, 37, 39-65.
- Berger P. and Ofek, E. (1996) 'Bustup takeovers of value-destroying diversified firms', *Journal of Finance*, 1175-1200.
- Bernheim D. and Whinston M. (1990) 'Multimarket contact and collusive behaviour', *Rand Journal of Economics*.
- Bhagat S., Shleifer A. and Vishny R. (1990) 'Hostile takeovers in the 1980's: The return to corporate specialisation', *Brooking papers on economic activity*, 1-59.
- Bhide, A. (1990) 'Reversing corporate diversification', *Journal of Applied Corporate Finance*.
- Bianco M. (1996) 'Diversification and synergies: effects on profitability', *London School of Economics discussion papers*.
- Bulow, J., Geanakoplos J. and Klemperer P. (1985) 'Multimarket oligopoly: Strategic substitutes and complements' *Journal of Political Economy*.
- Cantos-Sanchez P., Moner-Colonques, R. and Sempere-Monerris, J.J. (1998) "The effects of scope economies on competition intensity across markets", *paper presented at the EARIE Conference*, Copenhagen.
- Chen, Y. (1997) 'Multidimensional signalling and diversification', *Rand Journal of Economics*.
- Choi Y. And Merville L. (1995) 'Monitoring, Diversification and managerial incentive contracts' *Economic Letters*.
- Collis and Montgomery, C. (1995) 'Competing in resource strategies in the 1990's', *Harvard Business Review*.
- Comment R. and Jarrel G. (1995) 'Corporate focus and stock returns', *Journal of Financial Economics*, 37, 67-87.
- Daley L., Mehrotra V., Sivakumar R. (1997) 'Corporate focus and value creation. Evidence from spinoffs', *Journal of Financial Economics*, 45, 257-281.
- Davies S., Rondi L., Sembenelli A. (1997) 'European Integration and leading firms' entry and exit strategies', *working paper CERIS n.10*, Turin.
- Deneffe D. (1993), 'Cost externalities and corporate diversification', *International Journal of industrial organisation*, 11, 261-282.

- Denis D., Denis K., Sarin A. (1997) 'Agency Problems, Equity Ownership, and Corporate diversification', *Journal of Finance*, 52, 1, 135-160.
- Dixon H. (1994) 'Inefficient diversification in multi-market oligopoly with diseconomies of scope', *Economica*.
- Edwards C.D. (1955) 'Conglomerate Bigness as a source of Power' in Business Concentration and Price Policy, NBER conference report, Princeton University Press.
- Encaoua D., Jacquemin A. and Moreaux M. (1986) 'Global market power and diversification' *The Economic Journal*.
- Feinberg R.M.(1984) 'Mutual Forbearance as an Extension of Oligopoly Theory', *Journal of Economics and Business*.
- Ghemawat P. and Khanna T. (1998) "The nature of diversified business groups: a research design and two case studies", *The Journal of Industrial Economics*, XLVI, 1, 35-61.
- Grandstrand O. (1998) "Towards a theory of the technology-based firm", *Research Policy*, 27, 465-489.
- Hagherty K. And Siegel D. (1988) 'On the observational equivalence of managerial contracts under conditions of moral hazard and self selection', *Quarterly journal of economics*.
- Harrington J.(1987) 'Collusion in multiproduct oligopoly games under a finite horizon' *International Economic Review*.
- Hilke J., and Nelson, P.B. (1988) 'Diversification and predation', *Journal of Industrial Economics*, 1, 107-111.
- Hughes K., Oughton C. (1993) "Diversification, Multimarket Contact and Profitability", *Economica*, 60, 203-224.
- Jovanovic B. (1993) 'The diversification of production' *Brooking Papers on economic activity*, 197-247.
- Kay N.M.(1992) "Markets, false hierarchies and the evolution of the modern corporation", *Journal of Economic Behavior and Organization*, 17, 315-333.
- Kay (1997) '*Patterns of corporate evolution*', Oxford University Press.
- Khanna T.and Palepu K. (1997) 'Why focused strategies may be wrong for emerging markets', *Harvard Business Review*, 41-51.
- Khanna T. and Palepu, K. (1998)"Policy shocks, market intermediaries, and corporate strategy: the evolution of business groups in Chile and India", *mimeo, Harvard Business School, Boston*.
- Klein P.G. (1997) "Were the conglomerates inefficient? A reconsideration", *mimeo, Department of Economics, University of Georgia*.
- Lang L. and Stulz R. (1994) 'Tobin's q. corporate diversification and firm performance' *Journal of Political Economy*, 102, 1248-1280.
- Levy, D.T. (1989) 'Predation, firm-specific assets and diversification', *Journal of Industrial Economics*, 2, 227-233.
- Levy, D., Haber, L.J. (1986) 'An advantage of the multiproduct firms. The transferability of firm-specific capital', *Journal of Economic Behaviour and organisation*, 7, 291-302.
- Lubatkin M. and Rogers R.C. (1989) "Diversification, systematic risk and shareholder return: a capital market study extension of Rumelt's 1974 study", *Academy of Management Journal*, 32, 454-465.

- Mantell, E. H. (1998) "The effect on firm output after its acquisition by a pure conglomerate", *Journal of Economic Behavior and Organisation*, 36, 487-501.
- Markides C. (1995) *'Diversification, Refocusing, and economic performance'* MIT Press.
- Marshall W., Jawitz J. and Greenberg E. (1983) 'Incentives for Diversification and the structure of the conglomerate firm' *Southern Economic Journal*.
- Marris (1964) *'The economic theory of managerial capitalism'*, New York Free Press
- Martin S. (1993) *'Advanced Industrial Economics'* Basil Blackwell.
- Montgomery C. (1994) 'Corporate Diversification' *Journal of Economic Perspectives*.
- Montgomery C. and Singh H. (1984) 'Diversification, strategy and systematic risk', *Strategic Management Journal*, 5, 181-191.
- Montgomery C. and Wernerfelt B. (1988) 'Diversification, Ricardian Rents, and Tobin's q', *Rand Journal of Economics*, 4, 623-632.
- Morck R., Shleifer A. Vishny R. (1990) 'Do managerial objectives drive bad acquisitions?', *Journal of Finance*, 45, 1, 31-48.
- Oliva M.A. and Batiz L.A. (1998) "A model of Conglomeration and Synergy Traps", *Discussion Papers Series*, working paper 232, Departament d'Economia i Empresa, UPF.
- Panzar J.C. and Willig R. (1981) 'Economies of scope', *American Economic Review*, 2, 268-272.
- Patel P., Pavitt K. (1997) 'The technological competencies of the worl's largest firms: complex and path dependent, but not much variety', *Research Policy*, 26, 141-156.
- Penrose E. (1959) *'The theory of the growth of the firm'*, Basil Blackwell.
- Phillips O, and Mason C. (1992) 'Mutual forbearance in experimental conglomerate markets', *Rand Journal of Economics*.
- Roller L.H., Tombak M.M., (1990) 'Strategic choice of flexible production technologies and welfare implications', *Journal of Industrial Economics*, 4, 417-431.
- Roller L.H. and Desgagne B.S. (1996) 'Asymmetry in Cournot Duopoly', *mimeo*.
- Rose D. (1992) 'Bankruptcy risk, firm-specific managerial human capital, and diversification', *Review of Industrial Organisation*, 7, 65-73.
- Rose D. (1997) 'Do firms diversify because managers shirk? A reinterpretation of the principal agent model of diversification', *Review of Industrial Organisation*.
- Rotemberg J. and Saloner G. (1986) 'A supergame theoretical model of price wars during booms' *American Economic Review*.
- Rotemberg J. and Saloner G. (1994) 'Benefits of Narrow Business Strategies' *The American Economic Review*.
- Scott J.T. (1989) "Purposive diversification as a motive for merger", *International Journal of Industrial Organisation*, 7, 35-47.
- Scott J. (1993) *'Purposive diversification and economic performance'*, Cambridge University Press.
- Servaes H. (1996) 'The value of diversification during the conglomerate merger wave', *Journal of Finance*, 1201-1225.

- Teece D. (1980) 'Economies of scope and the scope of the enterprise', *Journal of Economic Behaviour and Organisation*, 1, 223-247.
- Teece D. (1982) 'Towards an economic theory of the multiproduct firm' *Journal of Economic Behaviour and Organisation*, 3, 39-63.
- Teece D., Rumelt R., Dosi G., Winter S. (1994) 'Understanding corporate coherence. Theory and evidence', *Journal of Economic Behaviour and Organisation*, 23, 1-30.
- Tirole J. (1988) '*The Theory of Industrial Organisation*' The MIT Press.
- Wernerfelt B. (1984) "A resource-based view of the firm", *Strategic Management Journal*, 5, 171-180.
- Williamson O.E. (1992) "Market, hierarchies, and the modern corporation. An unfolding perspective", *Journal of Economic Behavior and Organisation*, 17, 335-352.
- Wilson T. A. (1992) "An analysis of profitability of Businesses of diversified companies", *Review of Industrial Organisation*, 7, 151-185.
- Zhang A. and Zhang Y., (1996) 'Stability of a Cournot-Nash equilibrium: the multiproduct case', *Journal of Mathematical Economics*, 26, 441-462.

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