# REINVENTING THE HIERARCHY

# THE CASE OF THE SHELL CHEMICALS CARVE-OUT

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# Reinventing the Hierarchy:
# The Case of the Shell Chemicals Carve-out

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## Abstract

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Key words: Management control, Transaction cost economics, Case research

# Reinventing the Hierarchy:
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## 1. Introduction

At the end of 1998, Shell announced a major restructuring of its chemical business. This restructuring involved a divestment of about 40% of Shell's portfolio within the ensuing year through the sale of individual businesses to third parties. The announcement was the start of an intense and difficult process that became known as the chemicals carve-out. Divestment required disentangling of highly integrated production sites into separate packages of activities that could be sold as individual, stand-alone businesses. It also forced an incisive redesign of the governance structure. Whereas before the restructuring, sites operated under unified Shell ownership, the new situation required a control structure to accommodate several owners on one site, and to handle the vast amount of transactions between the new owners and the remaining Shell businesses on that site.

This paper reports on this carve-out process and –particularly- on the related control issues at the Hoogvliet site in the Netherlands. Our analysis shows that many of the problems encountered by Shell in this process are strongly related to the difficulties involved in defining boundaries in production processes that are heavily interdependent and that, consequently, require close coordination and careful integration. In fact, the degree of interdependence was such that the individual entities created through the carve-out could never really act autonomously, their operation being profoundly locked-in between upstream and downstream stages owned by others. Much of the control structure that evolved can be understood as being designed to support sequential and coordinated adaptation and to mitigate the vulnerability to self-seeking behaviour by the other parties to the arrangement that arises as a result of interdependence. These issues are central to the perspective of Transaction Cost Economics (TCE; Williamson, 1975, 1985, 1996), and this case study provides an illustration of the relevance of TCE in explaining control structure design (Ouchi, 1980; Speklé, 2001; Spicer and Ballew, 1983; Tiessen and Waterhouse, 1983). But it does that in a rather peculiar way. TCE reasoning would predict that in the circumstances of the case –in which asset specificity is paramount- hierarchical governance would prevail because of its superior ability to foster coordinated adaptation (Williamson, 1985, 1996; cf. also Mahoney, 1992). However, Shell opted for hybrid arrangements instead. A prima facie, this may be taken to undermine TCE's status, one of its paradigmatic predictions being challenged by the evidence of the case. But this study reveals that the ultimate governance structure mimics hierarchical governance in many important ways. Thus, Shell abandoned the hierarchical structure, only to reinstall it in the guise of a hybrid.

The remainder of this paper is organized in three main sections. Section 2 reports on the facts of the case and provides some details on our methods. Section 3 introduces TCE and analyses the case from this theoretical perspective. Section 4 discusses the analysis and findings.

## 2. The Shell Chemicals carve-out

### 2.1 Methods

During the period of time covered in this study, one of the authors worked as a Business Economist with Shell at Hoogvliet, and was deeply involved in the carve-out process. At the end of 1999, he was appointed Finance Manager of one of the carved-out entities, which was subsequently sold to a third party. He remained with that entity for several months to facilitate the transition to new ownership. After that, he returned to Shell. Thus, our insights have been gained from one of us being deeply immersed in the organization studied, and from being personally involved in the events described here. This permitted unrestrained access to data and informants, and greatly facilitated interpretation of what transpired. On the other hand, this involvement could have introduced some bias in the account. After all, the carve-out was an absorbing and sometimes painful process, putting considerable stress on the organization and the participants. However, in this study we focus not so much on the social side of the process, but more on the structures that resulted and the associated control issues. These are less susceptible to subconscious bias. We also took care in checking the observations against formal documents and other data, and we asked and received comments from several insiders on our original manuscript. Additionally, the role of the other author -acting from greater distance- has been instrumental in mitigating an all too personal account.

### 2.2 Some background

Shell has been a player in the chemicals industry since 1929, mainly in the USA and Western Europe. Oil and gas being important raw materials for the chemicals industry, the move into chemicals was a rather natural step for an oil company, and integrating oil refining and chemical production had synergetic effects in respect of availability and flexibility of feedstock supply. Shell's chemical activities grew rapidly with the rise of the petrochemical industry in the 1950s, and since that time, Shell has been an important actor in the bulk market for petrochemicals. Over the years, the portfolio expanded to include speciality products. However, by the end of 1998, Shell announced a major restructuring of the portfolio. Only businesses where Shell had a competitive market share and a record for growth would be retained, whereas other businesses were to be sold to outside buyers. This implied a stronger focus on base chemicals and a reduced exposure in speciality products. The divestment decision affected about 40% of the chemicals portfolio.

At the time of the announcement, the chemical activities were organized in a matrix structure, in which Product Business Units (PBUs) of Shell Chemicals Ltd. were responsible for managing the product portfolio worldwide and across sites, whereas regional Operating Companies (OpCos) were responsible for operational site management[1]. A typical petrochemical site provides production facilities, utilities, and services for several PBUs in the chemicals

[1] Shell Chemicals Ltd. and the matrix structure were established in 1998 –only one year before the carve-out exercise. Prior to 1998, the chemical businesses were structured as regional companies.

business, but also for Shell's oil activities. Figure 1 provides a simplified description of such a site.

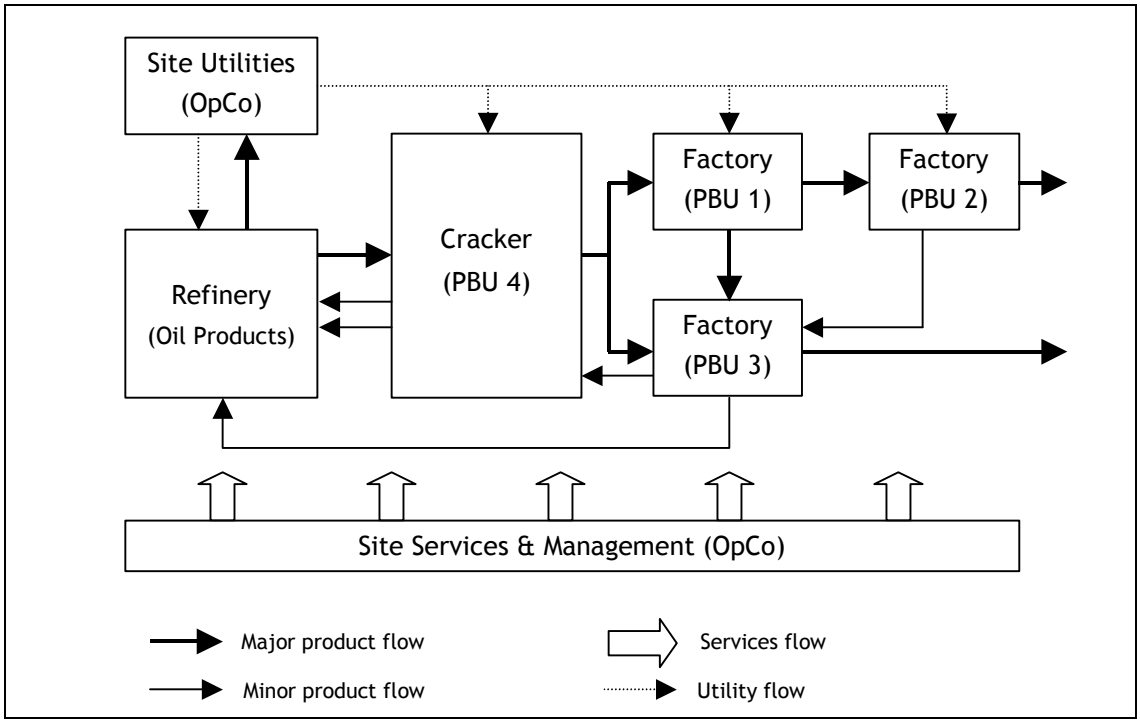


*Figure 1: Simplified illustration of a petrochemical site*

The figure illustrates that on a typical site, there are multiple product flows between several factories that are part of different PBUs and legal entities. A by-product of a process in one factory may be the main feedstock (raw material) for another factory, whereas all factories use the same site utilities (e.g. electricity, water, and steam) and share a number of services provided by the OpCo (e.g. warehousing, tanks, office buildings, maintenance, etc.). A significant part of these flows were fixed in the sense that it would not have been possible to operate a production unit without guaranteed access to upstream or downstream units, either for reasons of a technological nature (technological inseparability), or because recourse to alternative sources of supply and demand would have been prohibitively costly. Thus, operations were highly integrated, and there was a high level of interdependence between operating units on a site. Divesture of parts of the portfolio required the identification and definition of viable packages of assets, services, product flows, and other resources that could be sold as separate businesses to third parties. Or to use Shell's own terminology: businesses needed to be 'carved-out' of the larger structure.

### 2.3 The carve-out process

The divestment was unprecedented within the industry, and Shell Chemicals itself had no experience with a restructuring operation of this nature and impact. It was clear from the outset that the restructuring was extremely complex, involving a multitude of difficult issues in the areas of portfolio choice (which businesses were to remain with Shell and which would

be offered for sale), package boundary definition (what is part of the business to be divested, how does this business interact with other businesses on site, which materials flows and services are necessary to run the business, who is going to provide these, etc.), legal affairs (contractual arrangements, establishing new legal entities), intellectual property (patents, trade secrets), human resources (reconfiguring employment contracts, retirement benefits), safety regulations (assuring compliance of new parties to Shell's safety standards and policies), and the like. But there also was serious time pressure deriving from Shell's public commitment to complete much of the restructuring within the year 1999. Thus, Shell needed a project structure that: (1) brought together the required areas of expertise so that all relevant aspects and dimensions were adequately covered; (2) facilitated interaction and learning between and within the areas to ensure rapid development and accumulation of specialized, process-specific know-how; and (3) could act fast so as to realize the ambitions within the time horizon of less than a year. This was done by installing a multi-layer matrix structure that combined functional expertise, product-related knowledge, and site-specific know-how and experience. Figure 2 sketches this structure.

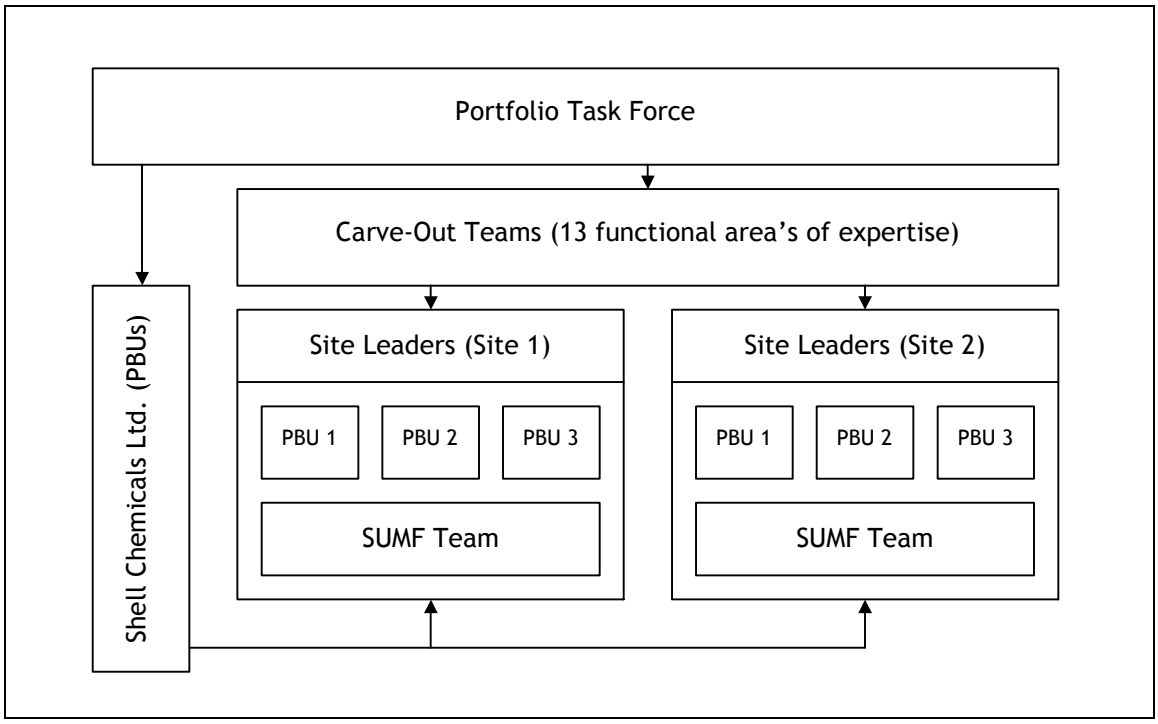


*Figure 2: The carve-out organization*

At the level of the PBUs that were to be divested, site teams were formed that were responsible for initial boundary definition of the activities at a particular site. At Hoogvliet, four such teams were created: (1) Resins; (2) Elastomers; (3) Carilon; and (4) Polystyrene. The task of these teams was to prepare viable packages that could be sold. This involved sometimes arduous negotiations with PBUs that remained within Shell (so-called foundation businesses), particularly around issues of feedstock. Consider for instance the technical set-up for the production of rubbers (PBU Elastomers). Basically, the set-up converts a raw stream of isoprene (also known as C5) into isoprene rubbers. This is done in a sequential

process, involving several production units. The first unit converts the raw C5 into an isoprene feed that is converted into rubbers in subsequent units. The first unit is owned by a foundation PBU but is an integral part of the set-up to produce rubbers. But the isoprene feed is also used for other purposes not related to the production of rubbers. The Elastomers PBU argued that a viable package includes the basic preparation unit, whereas the foundation PBU claimed that unit to be indissolubly connected with its own activities, and that divesting it would destroy value for Shell. Usually, arguments such as these could not be settled with hard evidence, and the process became very much a political one. Feedstock costing and pricing was also problematic. Feedstock for a particular unit often arises as a joint product in a production process in an upstream unit. Joint cost allocation methods are always arbitrary (Thomas, 1980) and, consequently, open to controversy. In the absence of relevant market prices -which was not uncommon- pricing needed to be based on costs and became similarly contentious. This inherent ambiguity, coupled with the overwhelming complexity of the operation, triggered the need for additional assurance, and independent auditors were asked to perform due diligence investigations. Considering that the packages were based on numerous assumptions, allocations, and informal agreements, it is hardly surprising that auditors were very cautious, and were often reluctant to provide official assurance. As a result, assurance costs were substantial.

The carved-out packages also required definition of site-specific services to which access should be provided. Site services were referred to as SUMFs (Services, Utilities, Materials, and Facilities). Prior to the carve-out, SUMFs were somewhat opaque. It was not entirely clear which SUMFs were provided, and which parts of the site benefited. SUMFs were seen as just another site overhead, and their costs were allocated to the collected site business in a way that bore only rough correspondence to actual consumption. That was fairly unproblematic in the original situation of unified ownership (see, however, note 3), but now SUMFs needed to be reorganized to increase transparency and to allow their inclusion in the packages. On some occasions this required technical adjustments, as for instance the installation of steam meters to track steam use. It also involved a redesign of the accounting information system. SUMFs had to be offered to the new owners on a commercially sound basis. Where free markets for comparable services existed, SUMFs could be configured in relation to these market equivalents. However, many SUMFs lacked a meaningful market benchmark and had to be provided on a cost-plus basis, in which costs were calculated using some form of activity based costing not previously employed. All this became the task of the SUMF team, which was responsible for unravelling SUMFs and for linking specific SUMFs to specific users so as to provide input for the boundary definition efforts of the PBU teams.

Site leaders formed a steering committee to coordinate and supervise site teams (PBU-teams and the SUMF team). Access to functional expertise (e.g. legal affairs, finance, tax, HSE (Health, Safety and Environment), information technology, feedstock, etc.) required in the carve-out process was available through global carve-out teams. These teams kept track of the process from their functional perspective, assuring a structured, consistent and informed approach, and supplying advice, guidelines, templates, draft contracts and the like to the teams operating on the level of the PBUs and the sites. Their role was particularly important because of the need to create a reasonable degree of uniformity within businesses and across sites to be prepared for the likely event that one party would acquire businesses

operating on several sites. At the apex of the entire operation was the Portfolio Task Force; a team of senior executives specifically held responsible for the quick and successful completion of the portfolio restructuring.

### 2.4 The new governance structure

Before the carve-out, the Hoogvliet site operated almost entirely under unified Shell ownership[2], and its control structure can roughly be described as one large bureaucracy (in the fairly neutral meaning attached to that term by for instance Mintzberg, 1983, and Ouchi, 1980). Although the site harboured assets and businesses owned by multiple legal entities (OpCos, Shell Chemicals Ltd., Shell Oil Products), in the end the assets, businesses and entities were all part of the Shell group, and they were managed and controlled as such. The restructuring operation changed this quite dramatically, and the unified organization was supplanted by a structure of (quasi-)autonomous entities, bound together by a multitude of contractual arrangements. This observation not only holds for the divested businesses and their relations with Shell-owned parties on the site, but it also applies to (parts of) the relations between businesses that remained with Shell. This is perhaps most evident in the SUMF area. Whereas previously, SUMFs operated as cost centres, their costs being absorbed in a rather inarticulate way by the entire complex, they were now asked to act as businesses themselves. Although this new commercial orientation was prompted by the creation of outside demand (i.e. the new owners), it spilled-over to internal transactions as well. As a result, internal transactions acquired a more pronounced arm's length flavour[3].

The bulk of the contracts between Shell and the owners of the divested business were related to SUMFs, feedstock, and operational management. SUMFs were divided into long-term and short-term arrangements. A short-term SUMF was only offered for one year. After that year, the buyer had to find another supplier for that service (e.g. payroll or logistics services). Long-term SUMFs mostly related to site-specific assets and services required by all parties on the site, be they Shell-owned or otherwise. These included for instance site utilities like electricity, water, and steam. Contract durations for long-term SUMFs were either set at three years (reflecting the maximum duration allowed by EU competition law), or were left unspecified. Feedstock contracts and operating arrangements usually spanned a period of at least five years. As may be expected from the intricate nature of the transactions, contracts were complex and lengthy, and meticulously specified rights and obligations of the parties. But they also contained provisions not frequently found in autonomous party contracting, particularly relating to dispute resolution and joint planning.

On several occasions, contracts between Shell and the divested businesses provided for the establishment of a joint committee of representatives of both parties to which to refer

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[2] There were some exceptions. A few third parties already operated on the Hoogvliet site before the carve-out as a result from joint venture activities or previous asset sales.

[3] This was an expected –and welcomed- by-product of the carve-out exercise. In the original situation, SUMFs were not particularly high on the managerial agenda. They were approached rather phlegmatically, at least partly because management lacked the information critically to assess costs and benefits. Shell believed that the increased transparency of services and costs would heighten management's involvement in this field, and would increase efficiency.

disputes. This committee was expected amicably to resolve disputes. Should this committee be unable to settle the differences, there was a steering committee to act as a court of appeal. This steering committee comprised senior representatives of both parties and was -again- held to try to solve the problem amicably. If all this were to fail, the agreements stipulated third party arbitration.

Many contracts also featured joint planning and a reliance on annual plans and budgets. The third party owner would provide quarterly forecasts of production, whilst Shell prepared budgets for operating expenses. Thus, quantities and prices were not decided upon and fixed in the contract, but were subjected to annual negotiations, allowing for flexibility and sequential adaptation to conditions as they evolved. The budgets and plans required approval of the joint steering committee, and the approved budget was subsequently paid to Shell in monthly instalments. Formats of budgets and individual line items were specified at length in the contract appendices. Deviations from plan and budget again required joint committee approval, and payments were adjusted for actual costs at year-end. These costs were subjected to buyer's monitoring, and several contracts specified audit rights, allowing parties to perform audits on areas that were part of the agreement.

A number of important quality dimensions of the transactions were also left unspecified in the contracts, requiring parties to negotiate these as time went by. Parties were expected to decide annually on a set of targets for key performance indicators (KPIs), e.g. accident frequency rate, lost time injury rate, plant production rate, plant on-stream factors, quality performance, and fixed cost management. These KPIs were linked to compensation through a variable pay incentive scheme.

## 3. Analysing governance: a Transaction Cost Economics perspective

### 3.1 Some theoretical backgrounds

TCE seeks to uncover the economic mechanisms that explain institutions of governance and their habitat. The main thrust of TCE's perspective is that a specific institutional arrangement is chosen to govern a specific transaction because that arrangement offers some distinctive set of control devices that is uniquely tailored to the control needs of that transaction. Thus, TCE submits that transactions differ in respect of the contractual problems to which they give rise, whilst organizational forms differ in their problem-solving ability, so that alignments between the two can be explained by explicating the efficacy and efficiency of the match.

According to TCE, modelling contracting-related human behaviour must make allowance for bounded rationality and opportunism. Bounded rationality refers to man's limited cognitive and computational ability. Opportunism is "self-interest seeking with guile" (Williamson, 1985: 47), which may include calculated efforts to mislead and deceive. Given bounded rationality and opportunism, the nature and magnitude of contracting problems are associated with the characteristics of the transaction in question. Transactions can be scored discriminatingly on three dimensions: (1) asset specificity; (2) uncertainty (including complexity, which is similar to uncertainty in its effects); and (3) frequency. Asset specificity denotes the presence of opportunity losses that arise if the investments made to support the transaction are to be put to alternative uses or users. Uncertainty refers to the degree of specifiabil-

ity of intended performance and predictability of (the influence of) the environment within which the contract is to be executed. Frequency can do without a definition; it has no peculiar connotations in TCE.

Basically, contracting problems are problems of adaptation. Uncertainty and bounded rationality jointly determine when and why the need to adapt is likely to arise, whereas asset specificity in conjunction with opportunism explain when and why achievement of successful adaptation cannot be taken for granted. Uncertainty inhibits the ex ante specification of required performance in a comprehensive, state-contingent way. Bounded rationality of course aggravates this problem. Therefore, contracts are bound to be incomplete, and increasingly so when uncertainty rises. However, information on the desirable properties of the transaction and on the actual state of nature may become available during the process of contract execution. This new information allows contractual gaps to be filled and activates the need to realign contract execution with emerging insights. Yet gap filling and realignment are not self-enforcing but may require renegotiation. These renegotiations are not necessarily cooperative because of opportunism. The room for such behaviour depends on the degree of asset specificity and on the existence of information asymmetry. Asset specificity refers to the size of the opportunity losses that will be incurred in case of premature termination. The value of these losses is -in absence of sufficiently powerful safeguards- exposed to the risk of opportunistic expropriation, and hence provides a measure of the potential gains from opportunism and of the intensity of the incentive to engage in such behaviour.

Economic actors try to cope with problems of contracting by means of organization, i.e. by adopting appropriate organizational arrangements to govern their transactions. At a generic level, TCE defines three distinct modes of governance: (1) markets; (2) hybrids; and (3) hierarchies (or internalization). These alternative governance structures differ in the control mechanisms they employ to safeguard contract execution and to achieve successful adaptation. Market governance derives control from free competition. The hybrid form of governance is typically based on explicit, long-term contracts in conjunction with additional safeguards to assure compliance. Hierarchical governance attains control primarily by means of authority, internal incentive structures, and monitoring. But the structural options also differ in respect of costs. These include the costs of drafting, negotiating, and safeguarding the transaction, but also the (opportunity) cost of failures to align the transaction with changing circumstances. TCE's main theme is that transactions -which differ in their attributes- are aligned with governance structures -which differ in their costs and competencies- in a discriminating, economizing way.

### 3.2 Comparing hybrids and hierarchies

The term hybrid governance refers to long-term contractual relations between autonomous parties. It differs from market control in that the hybrid form offers additional transaction-specific safeguards such as hostage arrangements and specialized dispute settlement institutions that serve to advance compliance to the provisions of the contract. Hostages are investments or transfers of wealth, the full value of which can only be recovered in case of successful contract execution. They curtail the potential gains from opportunistic defection, thus providing a safeguard against such behaviour.

Hybrids are associated with transactions of moderate asset specificity and limited uncertainty. The market's invisible hand breaks down when asset specificity increases, because rising asset specificity implies erosion of competition and increasing switching costs. Then, a stronger contractual tie-in is required, and the hybrid form offers this. However, hybrid governance is especially vulnerable to uncertainty. Increasing uncertainty lessens the comprehensiveness of the contract, and leaves more to be decided on as time goes by. In a hybrid governance regime, adaptation to contingencies that were not foreseen at the time of contract specification usually requires renegotiation and mutual consent. That, of course, takes time, and if parties to a hybrid agreement are negotiating a response to one disturbance only to be hit by another, failures to adapt predictably arise (cf. Williamson, 1996: 116). Moreover, such renegotiations provide an arena for opportunistic behaviour, especially in conjunction with substantial asset specificity and information asymmetry. Although the hybrid has access to additional safeguards such as hostages and arbitration, these are usually imperfect and cannot fully prevent costly haggling and maladaptation. And the autonomy of the parties in a hybrid arrangement is not particularly conducive to communication, information sharing, and the development of a mutual understanding.

When governance structures are needed that more reliably secure adaptive, cooperative attitudes and actions when it comes to filling the contractual gaps, hierarchical governance may be appropriate. The hierarchical solution is to evade conflicts of interest between contracting parties by releasing the link between compensation and the direct outcomes of the transaction. This practice establishes quite a large zone of indifference that supports cooperation and in which choices and changes can be implemented by simple managerial fiat. The reliance on managerial discretion offers decision-making flexibility and permits sequential adaptation to events as they unfold. Moreover, the hierarchy has superior communication and monitoring properties. These derive from shared experience and more congenial interaction, and support converging perceptions and a deeper and subtler common understanding of what goes on (Williamson, 1975). However, internalization is no panacea. As compared to hybrids and –particularly- markets, the hierarchical incentives to adapt are relatively flat. Their compensation being relatively unaffected by performance, actors in a hierarchical setting may be somewhat slow to act on changing circumstances. And on a more general note, managerial coordination, the required administrative apparatus and information systems are obviously quite costly to apply.

### 3.3 An analysis of the case

As is quite clear from the case description, many of the arrangements between Shell and the divested units involved transactions that display strikingly high levels of asset specificity. For instance, many of the long term SUMFs were related to indispensable site utilities like electricity, water, and steam. For these utilities, a real separation would not have been feasible for technical or economic reasons. Here, a monopolistic situation arises in which Shell is effectively the only supplier available. This monopoly is more or less bilateral, for the production capacity retained to service the buyer has no alternative uses outside the set of current consumers –at least not in the short run. Similar degrees of asset specificity were present in matters of feedstock and operations. The Resin business for instance was bought by a so-called financial buyer who lacked the organization and the expertise to run the business

by itself. This buyer entered into an agreement with Shell in which Shell remained the operator of the factory on behalf of the new owner. As before, parties become locked-in and bilateral dependency arises. The buyer can only take over operations at the expense of considerable cost. Shell on the other hand has invested in specialized human and physical assets to perform its operator role. These investments are not easily redeployed. Thus, whereas the carve-out operation resulted in multiple parties that were independent in a formal sense, they remained in fact heavily dependent upon one another, and they needed a structure to support ongoing adaptive and responsive mutual coordination to events as they unfolded. In the original situation, hierarchical governance provided the necessary mechanisms. The typical hybrid form is less able to handle adaptation, and the actual contractual arrangements show parties to be aware of this problem in that these arrangements differ from standard hybrids in a number of significant ways.

Firstly, the contracts seem to acknowledge the impossibility comprehensively to fix mutual responsibilities and obligations in advance. Important dimensions such as prices, quantities and quality (KPIs) were largely left open in the contracts, their values being decided on in annual negotiations. The contracts did, however, stipulate how these negotiations were to be conducted (e.g. procedures, budget formats), thus more or less setting the stage for subsequent gap filling. Secondly, the contracts showed a concern for non-cooperative behaviour, or more generally, for the possibility of conflict –either driven by opportunism or arising from sincere differences in perceptions or opinions. The dispute settlement structure was established on that account. This structure was designed to contribute to benign conflict resolution. In a typical hybrid, dispute settlement is left to an arbiter, or sometimes to the court. Third party arbitration and -especially- court ordering are very much institutions of last resort, only called upon when things really go out of hand (Williamson, 1979). The two bipartite committees provided for in the contracts (the joint committee and the steering committee) differ from arbitrage and court ordering in that they are more accessible, and are better positioned to reconcile differences before they become full-blown conflicts. Also, these internal committees have access to intimate internal experience and knowledge –some of which cannot easily be communicated to outsiders-, and their decisions are likely to reflect a fuller understanding of what is at stake.

It is interesting to note that these governance devices are essentially copied from the hierarchy. Coordination through sequential planning and budgeting and internal conflict settlement are at the heart of hierarchical governance, and Shell can be said to have imported hierarchical elements into its new hybrid structure to alleviate this structure's disadvantages in respect of adaptability and conflict resolution. As a result, the new hybrid appears to replicate many of the strong points of the governance structure that obtained before the carve-out. But the reverse is also true, and the new structure copies the hierarchy's typical weaknesses too. In general, the hybrid enjoys a potential advantage over the hierarchy in respect of incentive intensity. This term refers to "the degree to which a party reliably appropriates the net receipts (which could be negative) associated with its efforts and decisions" (Williamson, 1996: 378). Higher incentive intensity stimulates a more vigilant attitude and a higher propensity to act on changing circumstances. However, the reliance on mutual decision-making and the general orientation towards compromises as found in this case are likely to dull incentives, and Shell's hybrid is hardly less given to bureaucratic inertia

than the typical hierarchy. To be sure, the carve-out operation seems to have increased overall incentive intensity. This was basically achieved through the increased transparency of SUMFs described in section 2, which allowed clearer accountability in this area and a stronger orientation on results. But this effect is essentially independent of the move towards hybrid governance, for it was also experienced within the remains of Shell's hierarchical control structure where a shift was made from relatively flat, inward-looking machine control to a structure with more market-oriented arm's length control characteristics (cf. Speklé, 2001). And there is no indication that Shell's hybrid arrangements differ significantly from comparable internal arrangements in respect of incentive intensity.

The overall conclusion seems to be that the new hybrid structure mimics the hierarchy in almost all fundamental respects (i.e. cooperative adaptation, conflict resolution, and incentive intensity), and that it must be expected to operate in a basically hierarchical way. However, although this may be true in normal, business-as-usual circumstances, it is less clear how the structure will perform in more strenuous conditions and over a longer period of time. What will happen if changing circumstances require some major adjustment in regular business patterns? Will joint planning still be amicable? In Shell's relations with the new owners, adaptation seems to be governed to a large extent by habitual notions of reasonableness and equitableness. Whereas these may be meaningful concepts in stable conditions, they easily become elusive when they must be applied in a different context. And what about incentives to invest? Many assets being allocated to joint purposes, subsequent investment poses intricate distribution issues as to the costs and benefits. These issues may lead to an impasse, resulting in underinvestment[4] (cf. for instance Baiman and Rajan (2002) for a survey of the relevant literature). And what will happen at contract renewal negotiations? The restructuring being a recent event, these questions cannot be answered from actual experience. But there is little reason to be unreservedly optimistic.

## 4. Discussion

The details of this case and the subsequent analysis suggest two broad issues that warrant additional discussion. The first relates to the observation that a conspicuously hierarchical control structure arose even though the original intention of the carve-out was to externalize businesses that were no longer considered to fit strategy. The second has to do with control structure efficiency: if the result of the carve-out operation is a control structure that is basically a copy of the original one –but an expensive one to make, and a somewhat flawed one too- why did Shell go through with it? Consider these in turn.

For transactions that score high on asset specificity, TCE predicts hierarchical governance to prevail, especially when uncertainty as to future developments require flexibility and

[4] In the Shell-case, such 'hold-up hazards' may particularly easily become real because many contracts are of the cost-plus type. Suppose Shell encounters an opportunity to invest in some set-up that would lower the operating costs of a particular SUMF without affecting its value. The contract may require Shell to pass on part of the cost savings to the third parties operating on the site. If Shell is to bear the full cost of the investment, its willingness to make that investment decreases.

responsiveness. In the transactions at stake in the case, both attributes are present to a significant degree. Nonetheless, Shell opted for hybrid governance. A prima facie, this seems to be at odds with TCE's logic, and may cast some doubt on TCE's informative power. On deeper reflection, however, the case reveals that the actual structure mimics hierarchical governance in many important ways. If judged by the outcome alone, it is almost as if Shell deliberately sought to reproduce hierarchical governance as closely as possible. This, however, was not the case. On the contrary, rather, the carve-out operation was in fact intended to remove non-core businesses from the Shell sphere as rigorously as feasible. Against this background, the resulting structure with its still intimate ties with the carved-out businesses may well have disappointed Shell. Then, the case –rather than being recalcitrant- actually offers quite strong support for TCE's position in that it provides a telling illustration of the pervasive need to get the structure right (Williamson, 1998) –'right' being inherently hierarchical when asset specificity is paramount and uncertainty is substantial[5].

But then, why did Shell go through with it? After all, the carve-out turned out to be a very costly operation, involving considerable expenses (e.g. adjustments to logistical and administrative systems, due diligence investigations, benchmark studies, legal advice, etc.), as well as significant opportunity costs –mainly because the carve-out absorbed the larger part of management's and staff's attention for about a year. Why would Shell want to fund such a complex and arduous operation when the outcome is very much a replication of what was already there? We do not wish to make a thorough evaluation of the wisdom of Shell in this matter. Neither do we have the data required to perform such an evaluation. We do, however, want to suggest and discuss a few factors that may be relevant here.

One possible factor is of a psychological nature. Duhaime and Schwenk (1985) argue that divestment decisions generally are complex and ambiguous, and that such decision processes are characterized by cognitive simplification for reasons of bounded rationality. The use of simplifying heuristics, however, may introduce biases in the decisions which may help to explain why actual decisions may appear questionable when studied with the benefit of hindsight. Drawing from the organizational behaviour and cognitive psychology literatures, they argue that decision makers may become trapped in a course of action, thereby losing sight of alternatives ('single outcome calculation') and becoming unable to reconsider their choices, even in the face of negative feedback ('escalating commitment'). We cannot rule out the possibility that Shell's behaviour is to some extent an instance of this. However, the relevance of this potential explanation seems limited in the Shell case. Although from a control point of view (at least at the individual site level) it can be argued that Shell would perhaps have been better off had it preserved its hierarchical control structure, the evidence of the case suggests that Shell actually was well aware of the problems inherent in its preferred course of action, and that it did take appropriate action to alleviate these problems

[5] An alternative explanation would be that the new structure resembled the original one merely as a result of Shell's inability to break away from long-standing habits and routines. This, however, is not very convincing, if only because it cannot account for the new owners' apparent acceptance of the structure. Surely, *they* did not bear the burden of custom, and the most plausible reason for the new owners to accept the arrangement is that it must have made sense to them.

-the incorporation of the hierarchical elements in the intendedly hybrid structure may be interpreted as such. Shell was definitely not running blind.

Another factor that needs attention becomes apparent when considering the limitations of our study. It must be emphasized that our study was restricted to one site only, and that our focus has been on governance issues at the level of that particular site. It is entirely possible, though, that there were in fact positive effects for Shell as a whole, perhaps in the form of enhanced strategic focus at higher management levels and better returns on management, improved capital allocation, et cetera. At least, there is a large literature suggesting that there are limits to manageable diversification, that many divestments are in fact driven by the need to reduce diversification, and that reduced diversification (i.e. enhanced focus) has a positive effect on subsequent performance (cf. for instance Bergh, 1995; Hoskisson and Turk, 1990; Johnson, 1996; Markides, 1995). In this respect, it is interesting to note that the general public seemed to like the idea; the common thread in newspaper coverage of the carve-out being that it was about time for Shell to restructure its portfolio.

But the case also shows that reduced diversification does not always come easy. Our study indicates that Shell encountered a difficult dilemma in which strategic intentions and control needs interact in a complicated way. Thus, whereas our observations suggest that Shell intended to craft a sharp and clean exit from parts of the chemicals industry, our analysis implies that Shell was unable to realize this ambition for reasons of a control nature, forcing Shell to maintain strong ties with the businesses it no longer wanted. Although this probably overstates the case, one may even argue that these ties were so strong that the carved-out businesses effectively remained an integral part of Shell's strategy. Be that as it may, our study does indicate that control considerations may encumber strategic choice, and may drive a wedge between strategic intent on the one hand, and actual strategy as inferred from organizational actions, beliefs, and decisions (cf. Dermer, 1988; Mintzberg, 1978; Mintzberg and Waters, 1985) on the other. This more or less inverts the classic notion of structure-follows-strategy (Chandler, 1962), and emphasizes that the reverse may also be true. Actual strategy may be sticky and relatively insensitive to changing managerial agendas because of –in this particular case- the pervasive control demands that derive from asset specificity and that operate as an exit barrier[6]. The structure that ultimately arose may then be thought of as some form of compromise between strategic intentions (possibly reinforced by shareholders demanding increased focus) and control considerations. It is conceivable that the adopted structure was in fact the best one available, because in spite of its costs and deficiencies, it may well have been the one that least affected the integrity of Shell's strategic intentions.

[6] In descriptive studies of divestments, it has often been noted that unit interdependence is an exit barrier and negatively affects the propensity to divest (cf. for example Duhaime and Grant, 1984, and Harrigan, 1985). Our study seems to offer an explanation for this empirical observation, suggesting that the idea of control considerations as (also) an antecedent of strategy may have meaning beyond the limits of this particular case.

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