

Exchanging Competences in Strategic Alliances: a Case Study of Cosan and Shell biofuel venture

1 Introduction

The ProÁlcool Governmental Program changed the history of fuel in Brazil. Created as an alternative due the oil crisis in the 70's, the sugar/ethanol agribusiness chain had its peak in the period of 1980 to 1986, subsequently losing ground to petroleum due the falling prices of the barrel ranging from US\$ 12 to US\$ 20 from 1986 to 1995 (Biodiesel.br, 2011). However, the new context of climate change issued a new warning sign to automotive chain. A new era for renewable fuels in the world and was started in Brazil was represented by the creation and launch Flex Fuel technology in March 2003: hybrid engines powered by gasoline and ethanol.

Ethanol comes from several sources; however there is a demonstrably superior in their efficiency: the sugar cane, due to its higher concentration of biomass per hectare and a higher degree of fermentation. Currently there are 7 million hectares planted in the Southeast, Midwest, South and Northeast, placing Brazil as the world's largest producer, with an industrial processing of sugar and ethanol comprising about 415 dams across the country. This sector has been growing 10% per year since 2003 and having as basis the Brazilian fleet of cars, is composed of 92% cars Flex (UNICA, 2010).

Given the need for capital and economies of scale to achieve better results in recent years since before the 2008 crisis, there was a consistent movement of mergers and acquisitions in this sector. Currently has five major groups with a grinding capacity of more than 15 million tons per year: Raizen, Louis Dreyfus, Tereos Petrobras, ETH and Bunge. Moreover, major oil companies have implemented the strategy of diversification in its business as a preventive measure to the rising cost of oil. The spot price of a barrel of Brent crude oil crossed the \$ 100 threshold in January 2011, generating Meaningful impacts in supply chains worldwide. There are several alternatives to replace the oil being tested and marketed, but no other has been so successful on a large scale as the abuse of ethanol from sugar cane.

Aware of the need to diversify their business, Royal Dutch Shell has undertaken a survey on the market of renewable sources in order to invest in promising businesses at large. The result was the establishment of a joint venture with the Brazilian market leader in the production of ethanol, Cosan. The strategic alliance established in February 2011 has just begun, but already started its operations with greatness. Are 23 plants, 16 billion gallons of ethanol, 4500 jobs and \$ 26 billion net revenue (COSAN RI, 2011).

Joint ventures (JV) arrangements are known as efficient and low risk compared with acquisitions and greenfield strategies for internationalization or diversification, and these incentives

central Cosan and Shell, respectively. In the center of this alliance is the exchange of knowledge between two market leaders, who focus on one hand the exploration technology of biomass fuel and another fuel distribution.

From the standpoint of incentives, the resulting joint venture as a business appears logical and promising, but has important challenges to its governance. The central question of this paper is to discuss how the JV's with knowledge transfer should be governed in order to create value for their parental companies. This paper analysis the case of Raízen, the resulted joint venture between Shell Royal Dutch and Cosan, based on documentary research and interviews with Cosan's Investor Relations employees.

This article has five sessions including this introduction. In the second session, the theoretical framework is presented discussing the origins of the alliances as a source for value capture and the governance challenges of hybrids forms. The third session presents a panorama of the ethanol market in Brasil and in the worlds. The four session presents and discuss the case in focus, the Cosan and Shel joint venture. The conclusions are presented in the fifth session.

2 The governance modes, the core competences and the strategic alliances

The framework herein presented seeks to frame a theoretical discussion around the transaction cost economics (TCE) and related literature that poses predictions for strategic alliances in a knowledge sharing relationship.

In this first section, it is brought to light fundamental concepts of the TCE and its relationship with other theoretical frameworks as Resource Based View (RBV) and Porter's positioning theory. In the second session, a discussion is presented concerned with TCE's and RBV's approach for alliances, in special joint ventures. The challenges related to mechanisms of governance are discussed in the final session.

2.1. Strategizing, economizing and the dynamics capabilities of the firm

In the modern strategy management literature, the Transaction Cost Economics has conquered an important position to explain the existence and boundaries of the firm and derived issues as the institutional environment, allocation of rights, governance mechanisms and the firm growth. Grounded in the Coase seminal paper, The Nature of the Firm, highlights the Coase's concerns about the Economics tradition:

“Mainstream economics, as ones sees it in the journals and the textbooks and in the courses taught in economics departments has become more and more abstract over time, and although it purports otherwise, it is in fact little concerned with what happens in the real world”(Coase, 1998, p. 72)

Searching for answer about the real nature of the firm, Coase (1937) concluded the mainstream economics' concept of the firms as a production function was not able to explain broadly the limits of a firm. Coase's theory proposed that the resources are not allocated only by the price mechanisms; instead it is dependent on the entrepreneur-co-ordinator.

The Williamson's version of TCE made a link between the transaction costs economics and firm strategy by the demonstration (Williamson, 1993) that economizing on transaction costs is the best strategy. The theory is grounded in the alignment principle between transactions attributes and the modes of governance. Williamson (1996) stated that there are some sources of transactions costs such as the attributes of the transaction – the degree of specific investment, the level of uncertainty and the frequency, and also the behavioral hypothesis of limited rationality and potential opportunism. In order to minimize those contractual hazards and coordination problems the businessman may seek for a mode of governance in order to reduce transaction costs.

Therefore Foss (2003, p. 141) affirmed that "TCE had very little to say about competitive strategy, that is, issues relating to positioning in an industry and defending such a position". Also, Nickerson (1997) points out that TCE approaches the transaction as the foundational element to determine a firm's choice of structure, but "has little to say about which strategy, which accompanying transactions, and which investments a firm should undertake".

Williamson (1996) argues that there are two perspectives to approach the business strategy: strategizing and economizing. He argues that economizing is much more fundamental than strategizing once the second one "will rarely prevail if program is burdened by significant cost excesses in production, distribution, or organization." In his understanding, however, both are complementary.

In this path, Nickerson (1997) proposes a positioning-economizing theory of strategy that portends integration of three approaches: transaction cost economics, the resource-based view and Porter's strategic positioning analysis. The contribution of the papers consists in stimulating researchers and managers think out of one box, aggregating concepts that are proved mixable.

When a firm is concerned with value creation and value appropriation, the RBV gives deep attention to the interaction of this process. Foss (2003) attests that in a world of positive transaction costs it's costly to capture and protect value. It's also correct to say that sustain competitive advantage implies in *ex ante* and *ex post* costs related to develop and protect resources that are valuable, rare and costly to imitate and substitute.

According to Teece (1998) competitive advantage can be assigned not only to the ownership of knowledge assets, but also to the ability to combine those with other assets needed to create value. This assumption is one of the central arguments of the dynamic capabilities view of the firm. Combining can implicitly means developing alliances in order to achieve competences needed to

expand the firm's profits. The firm's knowledge encompasses all tangible and non tangible resources it may hold. Those resources include all firm-specific assets related to its technological competences, the knowledge of customer needs and supplier capabilities.

The author also points out that "assets can be the source of competitive advantage only if they are supported by a regime of strong appropriability or are non-tradable or "sticky." (Teece, 1998, p.141).

The competitive advantage might appear when those assets are not easy to be purchased or sold in the market as standard commodities are. Knowledge, locational assets and competences are of this kind. The main assumption is that those assets are difficult to replicate, which implicates in a source of competitive advantage.

"When it is inherently easy to replicate and intellectual property protection is either unavailable or ineffectual, then appropriability is weak." (Teece, 1998, p. 141)

Williamson (1996) presents the specific assets as a source of integration. When a asset can be redeployable for a second use, it might be sold easily. Rather, when the specific asset cannot be redeployable, it may generate a hold up situation and in order to minimize the transaction costs for ex post disputes, the firm might prefer integrate asset specificity holder. Several empirical works has showed the validity of this argument, as the seminal article of Benjamin Klein, Robert Crawford, and Armen Alchian (1978) about the General Motors' acquisition of Fisher Body in 1926. In this case, the authors highlight a example of opportunistic behavior by contracting parties due to the presence of firm-specific investments.

Beside the physical assets, Williamson (1996) always indicates other 5 classes of asset specificity distinctions: a) site specificity, b) human specificity, c) dedicated assets, d) brand name capital and temporal specificity. Jointly with uncertainty and frequency, those transaction dimensions are the fundamental milestone to the TCE approach for make or buy decision.

Once markets and hierarchies are polar modes, hybrid modes – various forms of long term contracting, reciprocal trading, franchising and the like – presents intermediate values in four features comparing to the other modes. It preserves autonomy, there is a bilateral dependence, and also a flexibility to adapt to the other firm, but it may face incentives problems. The next session discuss the hybrid form, specially the strategic alliances as a path to access specific assets.

2.1. The strategy to seek new markets: the role of the alliances

In Penrose (1995) the firm is a collection of productive resources, human and non-human resources. This concept exceeds the mainstream economic theory of the firm, that considers the firm as a set of supply and demand function. As Coase (1937), Penrose (1995) was concerned to the real world and poses the distinction between the firm and the market: 'firms and markets are both, in

their different ways, networks of activity, but the difference between them is crucial to an understanding of the nature of the economy as a whole'

The difference was primarily related to "central managerial direction" presented in the firms. The administrative coordination and "authoritative communication" are not available in the market and they are a firm-specific resource.

The boundaries of the firm for Penrose (1995) are moreover related to the internal resource than exogenous causes of growth as demand condition or capital raising. In fact, a firm is more defined by its resources instead of its products. Whether the resources can be potentially used, demand cannot limit a firm's expansion.

Therefore, Penrose (1960, p.1) does not ignore the exogenous impacts in firm's growth as she states

'growth is governed by a creative and dynamic interaction between a firm's productive resources and its market opportunities. Available resources limit expansion; unused resources (including technological and entrepreneurial) stimulate and largely determine the direction of expansion. While product demand may exert a predominant short-term influence, over the long term any distinction between 'supply' and demand' determinants of growth becomes arbitrary'

The firm may use its managerial capabilities in order to capture the external environment opportunities in a manner that its growth will be determined by the rate at which experienced managerial staff can plan and implement plans.

If the intention is to grow the firm, there are several strategies that can be adopted and which are not necessarily focused on the pursuit of monopoly power. The modern firm used strategic alliances in order to capture capabilities and resources of other companies that can lead to sustainable competitive advantages. The increase of market power might be a consequence. Also according to Penrose (1996)

corporate alliances or cooperative arrangements, as driven 'not necessarily by monopolistic intent but as a means of gaining mutual access to resources such as technology, regional markets and information services' (Penrose, 1996,p. 1722).

The dynamic capabilities view of the firm proposes the acquisition of new competences through organizational learning and an important tactic to obtain it is the strategic alliance. Therefore, which can be the incentives for strategic alliances?

Mowery *et al.* (1996) points out the joint ventures were formed primarily to exploit natural resources, but only after the 70's the alliances became widespread in technology-intensive industries. There are several incentives to alliances be formed: a) access to capital markets, b) internationalization, c) acquisition of technological and other complex capabilities from partner companies. This last incentive has showed to be more cited in the researches in this field.

In TCE literature, the economizing incentive will determine the contracting level of the alliances. Considering the asset specificity argument of Williamson (1996), the hybrid forms can be strongly tied as joint ventures when the firms are searching for combining specificities and take economizing advantages from hierarchy or markets modes. Therefore, Williamson (1996) associates the hybrids forms moreover as a contracting mode and uses franchising as an example. In this case, the franchising contracting creates a coordination incentive in order to protect the specific investments in processes and brand. Although there will be more costs control and local adaptation comparing to hierarchy mode, cost-effective procurements will be reduced comparing to market mode.

Related to equity Joint Ventures, which means those formed whenever two or more sponsors bring given assets to an independent authority company and receive contributions from the profits earned, Hennart (1988) distinguishes them by two types: a) scale JV: two or more firms enter together on similar moves as forward or backward vertical integration, horizontal expansion or diversification and b) Link JV: constitute a vertical investment for one of the parties, and a diversification for the other. Those forms suggest that hierarchical coordination presented by the equity option was preferable in comparison to spot markets or contracts, and distinguishes from hierarchy mode once control over the JV is shared with other firms.

Hennart (1988) also argues that the presence of inefficiencies in intermediate market is thus a necessary condition for JV's to emerge. There are some sorts of inefficiencies: access to raw materials or components, knowledge, distribution and loan capital. As Teece (1998) argues, the author also arguments the difficulty to trade knowledge in the market. In the case of link JVs, those arise to combine different types of knowledge. But is this knowledge transfer effective? Mowery et al (1996) find out that equity joint ventures appear to be more effective vehicles for transferring complex capabilities than are contract-based alliances due the hierarchical coordination. The results were based on empirical research and econometric models testing the casual relationship between technological overlap, R&D intensity and size and the citation of a firm's patents by the alliance partner.

Although JV's are reported extensively in prior studies as successful hybrid forms for economizing purposes such as knowledge transferring, a range of issues arise when it comes to discuss its governance mechanisms, which will be theme of the next session.

2.2. Hybrids forms and the challenging issues

The concept of corporate governance has been increasingly widespread in the Brazilian market. It is based on the principles of transparency, equity, accountability (accountability) and ethics. The Brazilian Institute of Corporate Governance (IBGC, 2010) defines the concept as follows: "These

are the practices and relationships between investors / shareholders, board of directors, officers, independent auditors and the supervisory board, in order to optimize performance the company and facilitate access to capital."

The issue of separation of ownership and control in modern organizations was brought to discussion by Berle and Means (1933), and now occupies a central position in developing the theory of the firm, as is highlighted by Demsetz and Lehn (1985). From the seminal work of Spence and Zeckhauser (1971) and Ross (1974), scholars of science organizations began to pay attention to the development of so-called "Agency Theory" later developed by Jensen and Meckling (1976), Fama and Jensen (1983). The agency problem is an essential element within the contractual view of the firm, brought by Coase (1937). The "Agency Theory" is central to the issue of corporate governance. The principal-agent relationship is always conflicted when a particular individual (agent) acts on behalf of another, called the "principal", and the goals of both does not fully coincide. Thus, an employer / employee, or shareholder / executives, the "principal" seeks to implement a structure of incentives and monitoring in order to align the interests of the agent to his interests.

In essence the practice of good corporate governance is the need of economizing in "agency costs", searching for long-term interests. Organizational models that emerge from partnerships like JV are very sensitive to conflicts of governance. On one hand this kind of alliance can provide lower costs of scale and scope, in the other, additional agency costs can be decisive for the stability of the alliance. Mc Cahery and Vermeulen (2009) point to studies that highlight JV rupture, especially in cases of societal arrangements with majority and minority party.

Menard and Raynaud (2010) define the JV's as complex hybrid forms where some rights and some assets are assigned with associated payoffs to a `Strategic Center` while parent firms hold main assets and rights. In this case, the author explains, supposing two firms,"1 and 2 , and four assets (A,a, B,b), with A and B highly specific assets related to the core activity of 1 and 2, respectively and remaining with their boundaries, while a and b are assets valuable only if used jointly. Each firm holds full decision rights, D_a and D_b , while rights d_a and d_b , require coordination". It's expected that the agents sharing the control will be prepared to private monitoring the conflicts and ambiguities revealed ex post and that this will require renegotiations and adaptations. Therefore, Menard and Raynaud (2010) identified that in cases where the authority is shared by members of collective ventures, they might as well endorse a voting procedure to exercise their control rights. Cost will emerge as costs of collective decision-making, but they might be smaller than those of ex post enforcement/monitoring cost or yet public ordering (judicial system) for disputes.

Efficiency in agency relationships (better alignment) emerges when some assumptions are presented:

1. Agents have no hidden information (absence of information asymmetry). The principal knows what constitutes effective action and what product is expected.
2. The principal has complete information about the actions and results.
3. The agents act at low risk (and are aware that the payment received is a result of the alignment with principal interests).

On this basis, the challenges for the JV may occur motivated by the unlikely symmetry of information between the parties. Additionally, the principals in a JV can be "agents" in their respective parent companies, characterizing a situation of a double agency problem. So often the conduct of these officers is guided by the hidden agendas of their companies to the detriment of the common agenda of the JV in which they act as principal.

A balanced relationship should mitigate, through private ordering, possible risks of contract breaches. In practice the "shareholder agreements" in JV alliances constitute an essential mechanism for reducing agency conflicts. This agreement should encourage ways to create a relationship of mutual interdependence, sustained by self-regulating norms and reputational issues that align the interests of the parties in the alliance.

As other challenges in knowledge transfer alliances, Mowery *et al* (1996) argue that cultural differences and distance might be obstacles for the governance effectiveness of the JV.

3 Method

The research consisted in a qualitative and exploratory method to build the case study. Three sources were used to gather information: bibliographical, documental and interviews. Data related to the joint venture and the biofuel sector were collected from internet sources as Cosan website and documents of sector associations as UNICA and the Ministry of Agriculture. Previous papers that explored biofuels were also investigated and used to build the institutional environmental analysis. In order to complement the documental research, interviews were conducted with employees of Cosan's Investor Relations Department focusing three aspects: a) the nature and incentives of the joint venture, b) competitive advantages acquired and created, and c) governance issues.

4 The biofuel panorama

Biofuel is the name used to describe fuels that are formed by biomass. Among the most common sources are ethanol, biodiesel, methane and coal.

Worldwide, the production of biofuels has been motivated by the war of Yom Kippur on the 70. The Organization of Petroleum Exporting Countries (OPEC) decided to increase oil prices by 70%

in order to embargo the United States, which supported Israel. The primary effect of this measure adopted by OPEC was the support for programs focused on diversification of energy sources. Among the new options for fuel use, biofuels emerged for energy security in affected countries (GORREN, 2009).

After that episode dozens of countries began to seek for renewable energy sources to replace fossil fuels. According to Filho (2007) global demand for energy will grow 40% by 2020. For the author, among the factors that should further enhance the production of biofuels are: "deficit between supply and energy demand growth, declining reserves of fossil fuels, uncertainty in supply, increasing environmental pressures, demand for sustainable and economically viable energy sources"(FILHO, 2007, p.16).

The trend of growth in the biofuels industry is already manifested in consumption levels. Data released by the Brazilian Ministry of Mines and Energy (MME) show that global consumption will increase from the current 1.1 million barrels per day (63.8 billion liters / year) to 4.4 million barrels per day (255.3 billion liters / year) by 2035. Several countries around the world are implementing policies for biofuel production.

The United States, through the Energy Policy Act, and the European Union, through the Plan of Action of bio-fuels, have set targets to increase the use of bio-fuels. These initiatives were especially motivated by the context of high oil prices, the increased risks in the supply of oil and, especially, for environmental problems.

In the case of the United States, ethanol from maize is a major investment in biofuels. To meet the growing demand for ethanol, there is an extensive investment program to increase the production capacity of the fuel. The production structure has consolidated in the corn belt as well the new investments. With these investments, the capacity of ethanol production would increase from approximately 12.9 billion liters in 2004 to more than \$ 18 billion in 2012 (FIGUEIRA; BURNQUIST, 2006)

With greater production capacity, there was a stimulus to the use of biofuel in the country. The mixture of ethanol (by volume) in gasoline rose 1.5 percent in 2002 to 3.8 percent in 2006, representing a consumption of 20.4 billion liters. In January 2011, the Environmental Protection Agency of the United States allowed the use of 15% ethanol. Before, the mixture was allowed at 10%. In Europe, the mixing rate is 10% with perspectives to increase to 15% (KUTAS; AMARAL, 2007).

According to Oliva (2007) The biodiesel production in Europe represents more than 3600 million liters per year and the main sources are canola, sunflower and soybean. Alcohol fuel has a much smaller market than the biodiesel in the European Union valued at US\$ 2 billion a year, but growing. Total demand is expected to reach 12.3 billion liters in 2010 (WSJ, 2011).

It is estimated that the United States and Brazil remain the largest producers and consumers of biofuels. The U.S. will account for 38% of global consumption of biofuels in 2035 - a decrease in relation to the current 45% - while Brazil will be responsible for 20% of global consumption of biofuels in 2035 - a reduction compared to 28% now -. The reduction is due to the expectation on the entry of new countries consumers of biofuels in this period (MME, 2011).

Just as there are estimates of entry of new countries in the production chain of biofuels, there is also the expectation of producing new products. They are called non-conventional biofuels or biofuel-edge.

Projects of unconventional biofuels will enter the market from 2020, primarily in OECD countries. These unconventional fuels will account for 36% of total use of biofuels in OECD countries in 2035 and only 5% of total use of biofuels in countries outside the OECD (MME, 2011).

Production in Brazil is not recent, occurring since the '20s, when vegetable oils were used as material geared to production. In 1938, it was launched the first Brazilian aid policy for biofuel by Law No. 737, which determined the ethanol blend in all gasoline in the country. Today, Brazil is the largest ethanol producer in the world. To Cetrulo (2010) current investments in the sector might lead the country to a strategic position. The potential for ethanol production in Brazil led to reduce in the dependence on international oil market, appropriating benefits from the energy autonomy. These benefits are easily verified when analyzing the economic crises caused by periods in with high fluctuations in oil prices and also due to ambiguity of the petroleum availability in the medium and long term. (CETRULO, 2010, p. 13)

Brazil is aware of the potential that biofuels represent in terms of growth. Thus, the sugar cane must occupy more space among the Brazilian lands. One of the reasons cited to explain the current scenario is the recognition of the quality / sustainability of ethanol. The estimate, according to UNICA (2011), is that in 2015/2016 the production cycle of cane sugar will overpass the 829 million tons and to 1038 billion in 2020/2021. The growth has a direct impact on the volume of biofuel produced in the country, but also represents gains in renewable energy.

As the Table 1 shows, Brazil will increase from 46.9 billion liters of ethanol in 2015/2016 to 65.3 billion in 2020/2021. This represents a 39% increase in production in the period of five years. Investments in the sector should represent gains either in bioelectricity. Today, the average share is 6% in the Brazilian energy matrix. It is estimated that by 2012 the percentage more than double, reaching 15%.

Brazilian scenario demonstrates that the commitment of government in agro and biofuels chains is based mainly in the growing importance given from U.S. and European Union governments. Brazil should not loose of its sight the opportunity to remain a leader in this segment

contributing actively to the technical and political debate, with proposals and initiatives to bridge the challenges.

Table 1. Brazilian Ethanol Production Estimates

Alcohol (billions of liters)	2015/2016	2020/2021
Domestic Demand	34,6	49,6
Exporting Surplus	12,3	15,7
Bioenergy (MW Average)	11.500	14.400
Share in the Brazilian energy matrix (%)	15%	15%

Source: MME, 2011

Considered one of the most competitive sectors in the world, the ethanol business is facing an important merger and acquisition movement.

Oil companies have made acquisitions or alliances with equity stakes in the ethanol market. In 2008 Petrobrás Biofuels was formed as an arm of the industry group Petrobrás. Its market share of ethanol began in late 2009 with the purchase of 40% of Total Sugarcane Industry in Minas Gerais. In 2010, Petrobrás Biofuels and Tereos Group, the third largest sugar producer in Europe, announced a strategic alliance to jointly invest in Guarani, the fourth largest processor of sugarcane in Brazil, forming Tereos International, becoming the fourth largest producer of ethanol the world, producing 490 million liters (Petrobrás, 2010).

The Beyond Petroleum (formerly British Petroleum), the third largest oil producer worldwide, began its investments in renewable energy in 2000. In 2008, acquired 50% of Tropical plant located in Góias and most recently in March 2011, the control of CNAA plant, moving from 32nd to 21th place among the largest producers of sugar and ethanol. The focus of this study is the largest of all these operations led by two great players, Cosan and Shell, and it will be detailed in the next session.

5 The case in focus: Cosan and Shell

Cosan, one of the largest producers / exporters of sugar and ethanol in the world and largest producer of electricity from sugar cane bagasse, was founded in the 30s, specifically in 1936, with construction of the Usina Costa Pinto in Piracicaba, Sao Paulo.

From the 80's began the process of expansion based primarily on acquiring companies. In 2005, Cosan had shares traded on the Novo Mercado da Bolsa de Valores de Sao Paulo (Bovespa). In 2007, the group's actions were listed on the New York Stock Exchange, which made the firm the first Brazilian company to control securities traded directly on the NYSE. A year later, in 2008, has completed the acquisition of Esso Brasileira de Petroleo SA, acquiring the assets and distribution of fuels business and the manufacture and distribution of lubricants and aviation fuels business from Esso in Brazil, including the license to use the Esso and Mobil brands.

Nowadays COSAN holding participates in 8 economic segments: sugar and ethanol production, fuel distribution, power generation, lubricants, logistics and land.

The company defines its field of operation as follows: "It is part of the solution in this new context of sustainable development. Invests in technology, plant, harvest, produces and distributes power to the people (food) for cars (fuel) and houses (electricity). Produces energy for life"

Shell is a leading oil and gas company in the world. It also holds businesses in producing liquefied natural gas, products for converting gas into liquids, development of sustainable biofuels and wind power projects.

The group's history began about 200 years, when Marcus Samuel opened a business of import and export of sea shells from the Far East. The trade was then assumed by Samuel's sons, Mark and Sam Junior.

It was in 1886 that the format of the old business began to change. With the arrival of the internal combustion engine was no increase in demand for transport fuel. Leveraging the expertise in shipping, the brothers Samuel hired a fleet of ships powered by steam to carry crude oil. They revolutionized the transportation of oil with the maiden voyage of its first tanker, the Murex. In 1892, the tanker Murex was the first to transit the Suez Canal in Central America. In 1897, the company was named Shell Transport and Trading Company and used a mussel shell as its logo. In 1907, Shell Transport in the East has merged with Royal Dutch Petroleum and led to Royal Dutch Shell Group. Currently the company operates in over 90 countries with over 101,000 employees. In Brazil, Shell has subsidiaries since 1913. In the country, the company works in fuel retail, aviation, lubricants, marine, chemicals, supplies and fuel distribution.

In February 2011, Cosan SA and Royal Dutch Shell announced an equity joint venture operation called Raízen. The resulted Joint Venture is one of the five largest company in Brazil by revenue, with a market value estimated at U.S. \$ 12 billion, approximately 40,000 employees, 23 sugar plants (Sao Paulo, Mato Grosso do Sul and Goias), 4,500 service station, more than 500 convenience stores, 53 distribution terminals and a presence in 54 airports in the aviation fuel business. It will occupy a position among the most competitive companies in the area of sustainable energy in the world.

Raízen will be responsible for the production of more than 2.2 billion gallons of ethanol per year to serve domestic and foreign markets. Besides ethanol, the current 23 mills produce 4 million tons of sugar and has 900 MW of installed capacity of electric power production from sugarcane bagasse. In the fuel area, the joint venture will market approximately 20 billion liters for the segments of Transport, Industry, and its network of 4,500 service stations.

The shareholders expect to have a production mix of 50% from sugar and 50% from ethanol until 2016 and after that, reach 60% for ethanol production. The strategy to grow is based on acquisitions of plants and expansion of the group's plants.

In the distribution sector, Raízen was born as the third player, behind Ultra Group and Petrobrás. In two years, Raízen intends to convert all Esso's service stations into Shell branded units, which can bring Raízen as the second in the downstream business ranking.

5.1 The background: what were the incentives?

Shell's interest in a possible alliance with Cosan initiated with Peter Voser when he was the Chief Financial Officer (CFO) in Royal Dutch Shell. However, at that time, mid-2005, Cosan saw no reason for partnership. The discussions began only in 2007, in the moment when Cosan had already begun the process of purchasing the fuel distribution operations of Exxon Mobil in Brazil. The negotiations had significantly advanced when Peter Voser was appointed Chief Executive Officer (CEO) in 2009.

Shell's incentives for the alliance were aligned to a strategic goal: to expand its activities in renewable fuel with high efficiency. The choice for Cosan was based on its leadership position in the sugar and ethanol market, considering the particular raw material, the sugar cane.

Since 2002 Shell has a stake in Iogen Corporation in line with the strategy to amplify its presence in the market for biofuels. Shell and Iogen are cooperating on commercialization of cellulosic ethanol. Iogen is a manufacturer and marketer of enzyme products for application in processes that hydrolyze or modify natural fiber, and those products can be applied for the pulp and paper, grain, brewing, textile and animal feed industries (Iogen website, 2011). In the company Codexis, Shell owns around 50% of participation in its capital since 2007. Through a research program, Shell aimed to shorten the timeline for deployment of the Iogen technology for biofuels on a commercial scale.

In the other hand, for Cosan, the JV was driven primarily by four factors:

- Generate scale in distribution of fuel, increasing its network that had began with the acquisition of Exxon's operation
- Have access to international markets
- Obtain financial leverage
- Acquire knowledge on new technologies for the ethanol 2nd generation

As a net debt amounted to US\$ 2.5 billion, Raízen received an injection of US\$ 1.6 billion in the form of royalties relating to the Shell brand licensing for Cosan in 10 years. Internationalization will be made possible through the sale of ethanol in countries where Shell

operates. Shell is a major fuel producer and trader player in the world and the world's largest integrated oil companies.

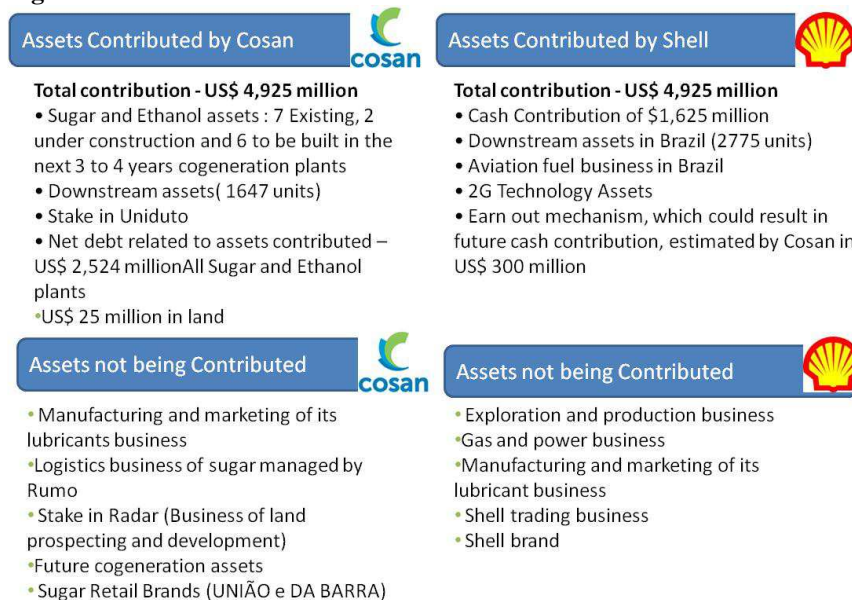
Shell also contributed to Raízen its participation in Iogen and Codexis, which allows the JV access 2nd generation technologies for extracting ethanol from high performance biomass as sugarcane bagasse. Figure 1 describes the assets contributed and not contributed by Cosan and Shell for the joint venture Raízen.

In five years, the JV intends to raise its crushing capacity in 65%, amplify the cogeneration in 44%, launch the 2nd generation of ethanol and grow the ethanol trading in 136%.

Both firms expand their competences through the JV. The growth of the two parent firms was motivated not only by exogenous factors as the climate pressure and the rising oil prices, which affected other players as well, rather the apparent commitment with the internal resources as a starting point of their competitive advantages. As a result, the power of market arises due the greatness of both companies.

The main incentive relies on the assessment of new competences by the two firms. Indeed, the exchanging knowledge emerged from the alliance reflects the sharing of core competences of each firm. The JV will benefit from the Cosan's knowledge of ethanol production and distribution over the country as well Shell's knowledge of fuel production, trade and retailing and also Iogen's and Codexi's biofuels 2nd generation technology.

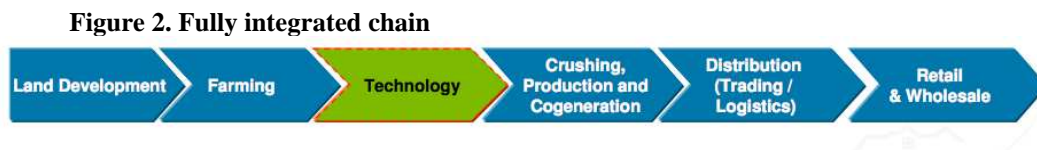
Figure 1. Transaction Overview



Source: COSAN RI, 2011

Considering the JV types proposed by Hennart (1988), Raízen can be fitted in the Link type, once it constitutes a vertical investment for Cosan and a diversification for Shell. The decision for the JV against other governance modes as hierarchy or market, can be understood as a way to economize in transaction costs and also to jointly protect specific investments in process and brand.

The Figure 2 illustrates the full integration of ethanol chain in the JV creation, resulting in cost effective procurement as stated by Williamsom (1996).



Source: Cosan RI, 2011

5.2 Sharing competences: the resulted competitive advantages

Although it is a new organization, the Raízen holds the experience of its shareholders. It is a national organization that benefits from having the products and solutions portfolio of a global leader in fuel production and distribution, and a global player in the ethanol and sugar market.

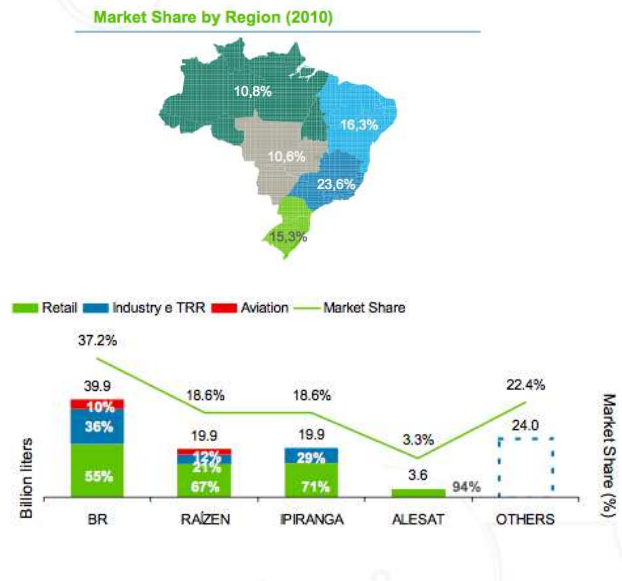
For the investor, Cosan (2011) highlights the alliance benefits:

- Increased competitiveness in the biofuels and fuels distribution businesses
- Broader access to ethanol consumer markets
- Substantial growth perspectives
- Building of a unique platform to develop second generation technology
- Improvement of debt ratios through capital injection and potential increase of cash generation
- Improved business intelligence
- Access to the highest standards in corporate management

The synergies are several, but few are more profound:

1. Internationalization: Cosan can take advantage for the Shell's downstream structure around the world, in order to trade premium products form ethanol as already traded in Brazil as V-Power Ethanol and aviation fuels;
2. Scale from the integrated structure: Raízen amplifies Shell's and Cosan's downstream network, and can trade ethanol to the competitors, as well buy fuel from others oil companies, searching always for the best bargain. Figure 3 illustrates the Raizen market share and volume sold.

Figure 3. Market share and volume sold.



Source: Cosan RI, 2011

3. Knowledge and technology transfer: from land development, going to farming, technology, crushing, production and cogeneration to trading and fuel retailing, Raízen benefits from the knowledge of the core competences of both parent companies. Specially, Raízen will have a R&D dedicated to the development of and access to new generation technologies of biofuels production and extraction.
4. Brand equity: In 2014 all the Esso's service stations (1700) will be converted into Shell brand accounting for an investment of US\$ 50 million. The Shell brand was licensed to Raízen for a 10 years period.

According to Cosan's documents for the investors, the net present value of all synergies account to US\$ 2 billion earned from: a) commercial synergies for greater volume, unified pricing policy and sell of premium products (US\$ 700 mi), b) financial synergies with improvement in the credit rating, refinancing of contributed debt and reduction in the average cost of debt (US\$ 200 mi), c) logistics, distribution and trading synergies from reduction of freight costs, Optimization of distribution terminals, centralized commercialization of ethanol (US\$ 850 mi), and d) conversion of service stations synergies (US\$50 mi).

The observable competitive advantage arises from the combination of several specific assets from the parent firms that cannot be redeployable efficiently without losing value for its specific use. As Teece (1998) states the competitive advantage can be assigned to the ability to combine knowledge assets needed to create value. Besides the knowledge, the JV holds other specific assets as a source of value creation:

a) dedicated assets and site specificity: the ethanol production from sugarcane has its specificity and Brazilian producers had showed its superiority in productivity and biomass exploitation, which

captured Shell's and others players attention. Those assets are dynamic capabilities once it evaluates constantly and in the JV case will grow further based on 2nd generation technology,

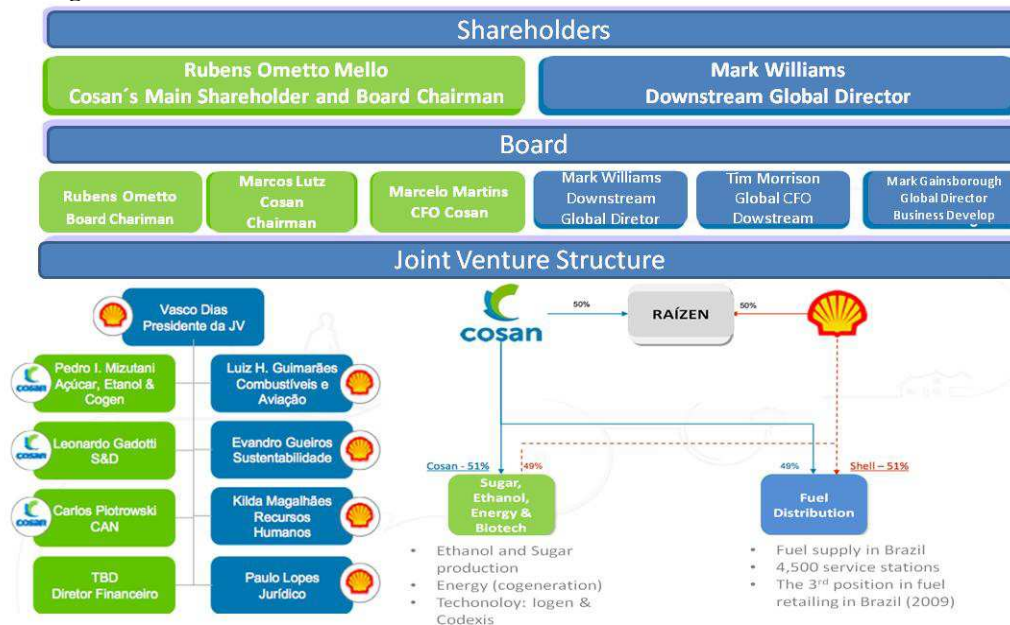
b) brand name: Shell build a reputation that is stated in its full integrated chain for oil production, trading and retailing. The JV will benefit from this reputation in order to economize in transaction costs whether it had to establish contracts by itself. JV might take advantage of relational contracts and all the explicit and tacit knowledge embedded in the downstream processes and routines.

5.3 The governance mechanisms and the challenges

As analyzed in the other two prior sessions, Raizen represents a hybrid form based on bilateral dependence and in a central strategic authority. The economizing incentives also brought out other costs, as monitoring and controlling costs to avoid agency problems.

Figure 4 shows the equal sharing of authority, either in the formation of the management board, with equal numbers of members from each partner company, as in the constitution of the new business areas that are now headed by former employees of partner companies in their respective knowledge areas.

Figure 4. The Governance Structure



Source: COSAN RI, 2011

Following the principles of the corporate governance, the JV has just begun its operation. Therefore, the agents may face some governance challenges related to the decision rights allocation mechanisms and even the coordination of the assets used jointly. Some challenges are discussed below:

1. The double agency problem: the board might bring to decision matters related to the parent companies more than those related to the JV. This can happen once the members are agents of the parent firms and their main incentive are linked to those firms more than the JV.
2. Agent and principal as shareholders: Rubens Ometto Mello is the main shareholder and also chairman of the Cosan's Board and is located in Brazil. In the other hand, Mark Williams is the global CEO for the Shell's downstream business and it is located in United States. Clearly, there are different incentives for each shareholder. The possible asymmetry information between the two shareholders might be solved by the JV chairman, who is a former Shell employee. It's expected that he might monitor and control the other partner influence and knowledge of Brazilian market that lacks for the Shell's shareholder. As point out by Mowery *et al* (1996) cultural differences and distance should be taken into account as obstacle for governance effectiveness.
3. Lock up and Buy Options: After 10 years, Shell can exercise the right to buy the half or the totality of Cosan's shares in the JV. In the 15th year, the two parties can mutually exercise their options, which are: Cosan has the rights to buy the totality of Shell's share or the Shell's participation on the sugar, ethanol and power business, whether Shell intends to keep the downstream business in the JV. The lock up period will be extended for six years after the JV's creation, which means that neither Cosan, or Rubens Ometto or Shell can't transfer their shares in the JV. Once these agreements were established, the knowledge transferring issues might appear important to be analyzed.

During the ten-years first period of the JV both companies can benefit from the scope and scale economies, as well the competences developed as dynamic capabilities. After that, Shell has the preference to buy the Cosan's part in JV. This might point out for different incentives for each company. Shell has more interest of appropriating and developing new technologies for biofuels than appears to Cosan in this arrangement. Whether Shell exercise its buy option in the tenth year, the company will become the world largest producer and retailer of biofuels (ethanol or others biomass sources). In other hand, Cosan will be transformed into a diversified company with business in the areas of lubricants, lands, sugar trading and, logistics, and also turned into a Raízen's buyer and supplier. Are all ambiguities of this incentive disalignment considered in the JV agreements? Those issues should be controlled and monitored for both company in order to avoid future disputes.

Although the issues discussed here are abstraction for the future based on theoretical and prior empirical research, Raízen has undertaken a leadership position in the ethanol world market, showing the planning and vision of both partners.

6 Conclusion

In this paper, a joint venture between two major players in the fuels market, Cosan and Shell Royal Dutch was analyzed through the lens of TCE and dynamic capabilities theoretical framework. The central point for the merger was the partner's incentives to reach new markets, capture value through scope and scale economies and mainly jointly use specific and valuable assets. Those elements characterizes a hybrid form that appeared to be the more effective governance mode to appropriate and continuously develop knowledge economizing in transaction costs comparing to market and hierarchy modes.

Raízen was born as an important player in the world energy sector. For this matter, it might use its competitive advantages to continue enlarge and aggregate more valuable resources. As Penrose (1995) stated, the firm's growth will be determined by the rate at which experienced managerial staff can plan and implement plans. In hybrid forms, the managerial staff corresponds to a central authority shared by the two partners. And at this point, governance mechanism for better rights allocation should be undertaken.

Raízen has some challenges ahead related to the control and monitoring agents' behavior, considering the two-part organism formed by distinctive organizational culture, tacit knowledge and long-term incentives. Therefore, the study case presents a current successful joint venture, that exhibits market power and a well-structured corporate governance. Are hybrids the dominant form to organize transactions in a market economy due its efficiency in settle down conventional transaction frictions more evident in the polar modes? This can be the central question for further studies in this complex theme.

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Exchanging Competences in Strategic Alliances: a Case Study of Cosan and Shell biofuel venture

In a competitive world, the way a firm establishes its organizational arrangements may determine the enhancement of its core competences and the possibility of reach new markets. Firms that find constraints in expand their markets once their skills can be applied just for one type of market may find in the alliances a competitive form of capture value. The hybrids forms of organization

appeared as an alternative to capture value and manage joint assets mainly when the market and the hierarchy modes don't present any yields for the competitiveness of the firm. Therefore, this form may present other challenging issues as the allocation of rights and principal-agent problems. The biofuel market has presented a strong trail of changes in the last 10 years. New arrangements intra-firms have appeared as a path to participate or survive in a world level competition. Given the need for capital and economies of scale to achieve better results in recent years since before the 2008 crisis, there was a consistent movement of mergers and acquisitions in this sector. Currently there are five major groups with a grinding capacity of more than 15 million tons per year: Raízen, Louis Dreyfus, Tereos Petrobrás, ETH and Bunge. Using a case study of the Cosan and Shell alliance in the Brazilian biofuel market, this paper analyses the governance mode and challenges issues raised by the strategic alliances when firms intend to reach new markets through the exchange of core competences. The article was based on documentary research and interviews with Cosan's Investor Relations employees. Through the lens of TCE, RBV and dynamic capabilities theoretical approaches, the main questions evolving hybrids forms are discussed. The case study analysis illustrates the hybrid arrangement as a middle form to organize the transaction neither in the market nor in the hierarchy mode, rather in more flexible commitment agreement with a strategic central authority. These characteristics led to an organism with bilateral dependence with favorable conditions for developing dynamics capabilities. However, those conditions might rely on partner's long term interest in the joint venture.

Key words: *biofuel, joint venture, governance, hybrids forms*