

The Dynamics of the Toyota-Astra Hybrid Structure Partnership

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Abstract: *This paper uses the Toyota-Astra partnership in the Indonesian automotive sector as a case study to understand changes in the boundaries of hybrid arrangements. Using Menard's typology of hybrid arrangements, we identify the partnership's initial arrangement as a quasi-strategic center with the Japanese partners holding full control over strategic decisions regarding production. Later, this arrangement changed to an information-based network following the separation of assembly operations from the partnership. Despite this change, Astra's relationship with Toyota's suppliers continues to function under a quasi-strategic center arrangement with a slight adjustment in the allocation of decision rights over production in order to accommodate Astra's growing internal capabilities in component manufacturing. Moreover, this change was followed by the adoption of new relational contracts that made the supplier system resemble more closely to Toyota's original system in Japan.*

Keywords: Automobile, business history, hybrid organisations, joint ventures, relational contracts

JEL Classification: D22, D86, L22, L62, N8

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1. Introduction

Since the publication of *The Economic Institutions of Capitalism* by Oliver E. Williamson in 1985, organisational economics has made rapid progress as a subfield of economics. Nevertheless, this achievement has been based mainly on the study of organisational cases and phenomenon in developed economies. Only recently have researchers applied their analytical tools to organisations in developing economies. Interestingly, evidence from developing economies may yield results that would enrich our understanding beyond existing theories in organisational economics. For instance, Andrabi, Ghatak, and Khwaja (2006) found that low-quality suppliers in the Pakistan tractor manufacturing industry have a greater willingness to invest in buyer

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specific assets than higher quality suppliers, which is the total opposite of assembler-supplier relationships in developed economies.¹

One possible area to make such a contribution is hybrid organisations. Hybrid organisations are organisational arrangements in which two or more partners pool strategic decision rights as well as some property rights while simultaneously keeping distinct ownership over the assets so that they require specific devices to coordinate their joint activities and arbitrate the allocation of payoffs (Menard, 2013). Current research in hybrid organisations focuses on identifying and categorising the characteristics of various hybrid forms but are conducted under static time frame.

This paper provides a dynamic analysis of hybrid arrangements by using the Toyota Astra hybrid structure partnership in the Indonesian automotive sector as a case study to understand the factors behind changes to the boundaries of hybrid arrangements over time. Unlike typical static analysis that focuses on describing the characteristics of a hybrid arrangement within a specified period of the event, dynamic analysis helps researchers in clarifying the sequences of events behind changes or evolution in the boundaries of hybrid arrangements.

The Toyota Astra partnership will be divided into two periods. The first period started with the establishment of Toyota Astra Motor (TAM) in 1971 till 1989. The second period extended from 1990 to 2015, focusing on the transition of the Toyota Astra hybrid structure partnership. There are two discussions regarding the transition period. The first is about Astra International's (AI) decision to develop its internal capabilities in manufacturing automobile components that culminated in the establishment of Astra Otoparts (AOP) in 1997 and the Engineering Development Center (EDC) in 2012. The other pertains to the separation of assembly operations from the partnership through the establishment of Toyota Motor Manufacturing Indonesia (TMMIN) in 2003, preceded by the build-up of the Bank Summa crisis in 1990.

Our analyses of each period underscores various factors that affect the boundaries of the Toyota Astra hybrid structure partnership over time. In the first period, we highlight the difficulties that Toyota Motor Corporation (TMC) faced in replicating its original production system, specifically building long-term supplier relationship between TAM as an assembler and local suppliers. Our analysis of the second period focuses on more factors. One is the effect of capabilities development on the governance structure of the partnership. Although capabilities development influences the governance structure, it does not affect the boundary of the partnership's hybrid arrangement. Another factor is the importance of reliable and trusted partners on the stability of hybrid arrangements.

We will use Menard's (2013a) typology of hybrids to examine this case. Compared with the other methodologies, Menard's typology has three

advantages. First, it analyses hybrid arrangements along with a continuum line of the pure market (assets and residual rights are held by autonomous entities that coordinate their actions through market mechanisms) and pure hierarchy (a centralised entity holds assets and residual rights). Second, Menard characterises the governance structure of hybrids by using two correlated variables: allocation of strategic asset ownership and residual rights, and modes of coordination among partners. Third, this approach is built upon Williamson's theory of hybrid governance structures (Williamson 1975, 1985, 1991) which enables us to analyse the change in hybrid arrangements without diverting from the mainstream transaction cost economics, such as asset specificity, uncertainty, transaction complexity and contract incompleteness.

Aside from the theoretical discussion above, this paper also contributes to the study of the development of the automotive supplier system in Indonesia. The effort to develop the local automotive supplier system started in 1976 following anti-Japanese investment demonstrations and riots in 1974 popularly known as the Malari Incident. The Department of Industry introduced the Compulsory Deletion Program for commercial vehicles (buses, trucks, and minivans) with the expectation that this regulation would result in the development of local components industry dominated by small and medium enterprises like in Japan (Thee, 2012).

The Compulsory Deletion Program was a failure, and the government terminated it in 1993 replacing it with the 1993 Incentive System that allowed assemblers to import components not yet made locally at lower import duties for raising the local content of their cars. Nonetheless, this program was overshadowed by the controversial National Car Program in 1996. Unlike the other programs, the National Car Program provided preferential treatment to the youngest son of President Soeharto, Tommy Soeharto, by allowing his joint venture with KIA Motors from South Korea to import automobile components duty free under the condition that their joint venture could achieve 60% local content within three years (Thee, 2012).

The National Car Program was abolished in 1999, alongside the 1993 Incentive System. In exchange, the government adopted an incompletely knocked-down (IKD) system in 2006 that provided lower import tariffs for sub-components that were not produced locally to encourage the development of local completely knocked-down (CKD) components assembly (Natsuda, Otsuka & Thoburn, 2015). To support the IKD system, the government introduced the Low-Cost Green Car (LCGC) project in 2009, which aimed to expand market demand and create economies of scale for local components industry (Natsuda et al., 2015).

Table 1: Degree of Vertical Integration among Indonesian Assemblers as Measured by Types of Functional Components Manufactured Internally, 1991

Local Business Group	Astra			Indomobil				Krama Yudha	Imora	Bimantara
Foreign Automaker	Toyota	Daihatsu	Nissan - Diesel	Isuzu	Suzuki	Mazda	Hino	Mitsubishi	Honda	Mercedes Benz
Engine	χ	χ	χ	χ	χ	χ	X	χ	χ	χ
Rear Body	χ	χ	θ	θ	χ	χ	X	χ	χ	θ
Chassis Frame	λ	λ	λ	θ	N.A.	θ	Σ	δ	θ	θ
Propeller Shaft and Rear Axle	λ	λ	λ	λ	σ	σ	Σ	δ	θ	σ
Brake System	λ	λ	λ	λ	σ	σ	Σ	σ	λ	N.A.
Clutch System	λ	λ	θ	θ	λ	λ	N.A.	σ	θ	λ
Transmission	λ	λ	λ	λ	λ	λ	Σ	σ	θ	θ

Source: Sato (1996).

Notes:

X = In-house production

 λ = In-group production θ = Imported components σ = Outsourced domestically δ = Other arrangements

Unlike the majority of studies which focus on industry level analysis as illustrated above (see also Witoelar, 1984; Jusmaliani and Ruky, 1993; Aswicahyono, Basri, and Hill, 2000; Tarmidi, 2004; Irawati, 2012; Thee, 2012; and Natsuda et al., 2015), we focus on in-depth firm-level analysis. One immediate advantage of this approach is that it distinguishes firm-level variation from general patterns. As shown in Table 1, there is a stark difference between the Toyota Astra partnership and other partnerships, such as the Mitsubishi-Krama Yudha, Suzuki-Indomobil, Honda-Imora, and Bimantara-Mercedes Benz partnerships.

While most Indonesian assemblers purchase functional parts and components from independent suppliers (including imports),² Toyota Astra produces such components internally through separate joint ventures between TMC's suppliers and AI. In other words, the most successful partnership in the history of the Indonesian automotive sector is an outlier rather than the norm. This firm-level variation has largely been ignored in previous researches, except by Sato (1998) who discusses such a possibility when examining AI's partnership with the Honda motorcycle division.

2. Literature Review

2.1 Hybrid Organisations Typology and Theory

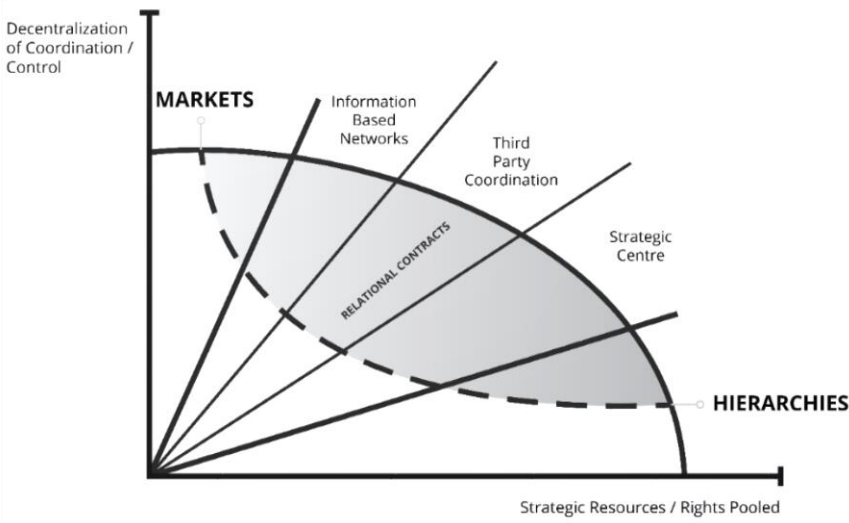
Economists and management scholars have long been aware of the existence of organisations that cannot be described as purely hierarchical or market in form (e.g., Blois, 1972; Richardson, 1972; Eccles, 1981; Mariti and Smiley, 1983; Powell, 1990). However, the theoretical examination of their structures was lacking until Williamson (1991) captured their complexity through his definition of hybrid arrangements by focusing on their governance structures, which exhibit the characteristics of both market and hierarchy forms at the same time.

Nevertheless, Williamson's definition lacked clarity, particularly in distinguishing one form of hybrid from another. As a result, various studies have emerged to fill this gap. Grandori and Soda (1995), for example, classify hybrids according to the degree of formality in their network of coordination (personalised relationships, bureaucratic networks, formal rules, and proprietary networks). Based on transaction cost theory, Oxley (1997) classifies hybrids according to contractual hazards and appropriation (unilateral contracts, bilateral contracts, and equity-based alliances). Using volatility and contract ambiguity as a parameter, Carson, Madhok, and Wu (2006) categorises hybrids as formal and relational. Lastly, Baker, Gibbons, and Murphy (2008) characterise hybrid governance structures using the parameters of property rights theory, such as allocation of ownership, decision rights, and payoffs.

Combining the perspectives above, Menard (2013a) suggests a typology of hybrids that can be defined in two terms. First is hybrids as a continuum of arrangements between pure markets and pure hierarchy. Another is the definition of hybrids as described in the previous section. Using these definitions, he illustrates the governance structure of hybrid organisations in Figure 1 with decentralisation of coordination and control in the vertical axis, and strategic resources and rights pooled in the horizontal axis.³

Furthermore, he categorised hybrids into three major classifications (see Table 2). The first is the strategic center in which all transacting parties allocate strategic assets and decision rights to a central coordinator that has managerial authority to enforce decisions. Next is third-party coordination. In this arrangement, the central coordinator has similar responsibilities to the central coordinator in a strategic center arrangement, but it is a totally independent entity, either a public or private entity, which has no ownership relationship with the transacting parties. Last is an information-based network. This arrangement is close to a pure market system because each transacting party only partially shares strategic assets and decision rights. Moreover, none of these parties has the managerial authority to enforce decisions. Rather, they use a specialised communication channel to coordinate their actions.

Figure 1: Menard’s Typology of Hybrids



Source: Menard (2013a) revised (with permission from Princeton University Press).

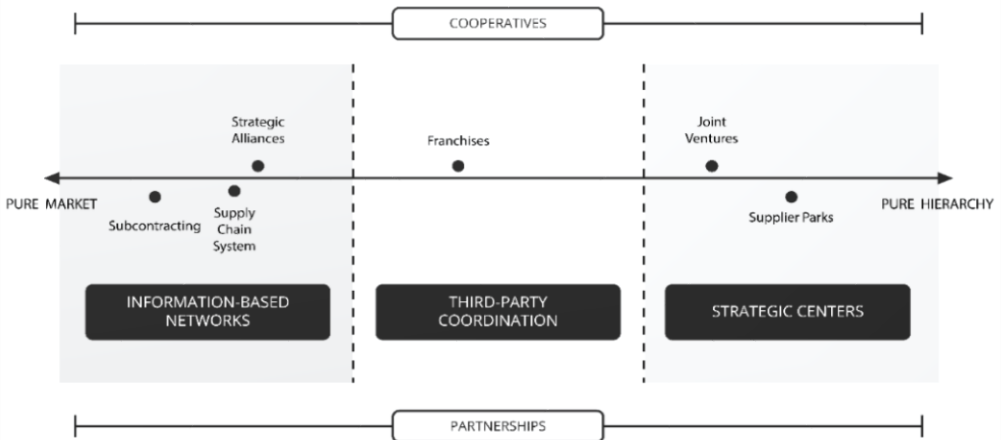
Table 1: Menard’s Definition of Hybrid Organisations According to Modes of Coordination and the Allocation of Strategic Assets and Decision Rights

Organisation Type	Allocation of Strategic Assets and Decision Rights	Modes of Coordination
Pure Hierarchy	Owned by a centralised entity	Intra-firm managerial authority
Strategic center	Strategic assets and decision rights are allocated to a central coordinator that is multilaterally owned by transacting parties	Delegate managerial authority to a central coordinator
Third party coordination	Strategic assets and decision rights are allocated to an independent third party (private or public)	Delegate managerial authority to an independent third party
Information-based network	Partners partially share strategic assets and decision rights	Unified or standardised communication channel
Pure Market	Owned by separate autonomous entities	Price mechanism

Source: Menard (2013a).

Another important feature in Menard’s typology is the influence of relational contracts on the governance mechanism of hybrid arrangements, as illustrated by the shaded lens-shaped area in Figure 1. Relational contract is the term used by economists to describe agreements based on a subjective measure of performance that could neither be fully specified beforehand nor verified after the fact and were thus enforced by the expected value of the future relationship (Helper & Henderson 2014)⁴. Relational contracts in hybrid organisations serve as modes for adjustment and adaptation among transacting parties from non-contractible elements such as changing market and external environments, uncertainties surrounding the outcomes of joint projects, complexity in measurement, etc.

Figure 2: Classifying Various Types of Hybrids with Menard’s Typology



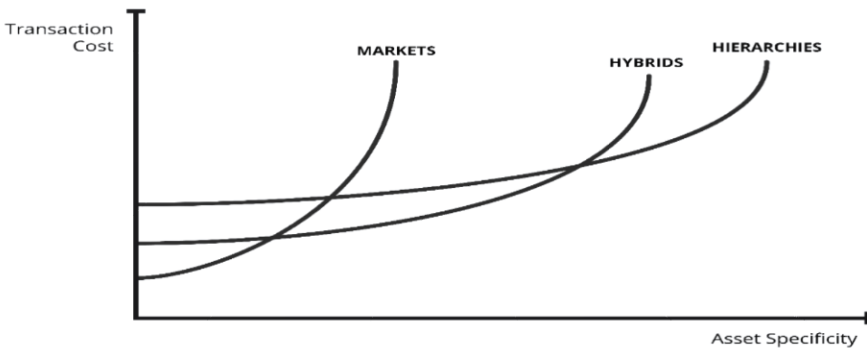
The shaded area of relational contracts in Figure 1 also emphasises the possibility of overlap in the governance mechanisms of hybrid arrangements. The possibility of overlap between various governance mechanisms is better understood with Figure 2 above. Although most hybrid arrangements can be classified in one of the three categories, there are types of hybrid arrangements that are more fluid, mixing the characteristics of two distinct hybrids such as cooperatives and partnerships. This possibility shows the richness of hybrids while reflecting the limitation of existing methodologies in defining their variation.

Table 2: Governance Structure as a Function of Transaction Characteristics.

Transaction Characteristics	Hierarchy	Market
Asset Specificity	High	Low
Uncertainty	High	Low
Complexity	High	Low
Capabilities	Strongly complementary	Weakly complementary

Source: Tadelis and Williamson (2013) and Langlois and Foss (1999)

Figure 3: Choice of Organisational Structures, Transaction Costs, and Asset Specificity



Source: Menard (2013b) revised (with permission from John Wiley and Sons)

Besides using relational contracts as the core of his typology, Menard also tries to relate it with Williamson’s transaction cost theory.⁵ The transaction cost theory states that a firm’s choice of organisational structure is determined by its governance cost, which in turn is affected by transaction characteristics (see Table 3)⁶. When asset specificity is high, for example, firms will organise transaction under a hierarchical firm or strategic center rather than transacting via market or an information-based network because the former is less costly than the latter (see Figure 3). Nevertheless, Menard’s

effort to link his typology with the transaction cost theory is still a work in progress. Despite his best efforts, as shown in Menard (2004, 2013b), Menard is still unable to present a fully developed theory of hybrids. In other words, the theorisation of hybrids remains an exercise.

2.2 Organisational Structures in Automobile Components Production

There are two main organisational systems used in the production of functional automobile components. First is production under vertical integration, which relies on a hierarchical arrangement. This system was first introduced in the United States by Ford, following its success with the Model T (Langlois & Robertson, 1989). US assemblers adopted this organisational structure to avoid hold-up problems from suppliers.

Hold-ups occur in the automotive industry because suppliers need to match their component designs and production processes with assemblers (Teece & Monteverde, 1982). Generally, an assembler will use a long-term contract as a prior commitment to encourage a supplier to invest in buyer-specific assets. However, it cannot define all future contingencies regarding the optimal form of a transaction. Consequently, all future contingencies are subject to ex-post bargaining. During the bargaining process, a supplier could act opportunistically by declining to cooperate with an assembler unless the contract is renegotiated under terms that are favourable to the supplier (Klein, Crawford & Alchian 1978).

This issue is illustrated in the acquisition of Fisher Body by General Motors (GM) in 1926. The GM-Fisher Body case began around 1918 when GM pioneered the closed auto body design and outsourced it to Fisher Body. As GM was its main supplier, Fisher made significant investments to incorporate GM's new design. To encourage this investment, GM gave Fisher an exclusive dealing contract in December 1919, in which GM promised to buy all closed bodies produced by Fisher at cost plus 17.6% for ten years.

Initially, this cost-plus contract worked well. However, it began to deteriorate in 1922 when demand for GM closed body cars increased unexpectedly. From here on, Fisher held up GM by refusing to make additional investments in plants located near GM's plant. Instead, Fisher insisted on producing at its Detroit plant, which increased GM's shipping costs. The reason for this hold-up was that Fisher could reimburse the shipping costs under the cost plus 17.6% clause. Since GM had limited options, it accepted Fisher's terms by financing the plant's construction and leasing it to Fisher. This hold-up resulted in a transfer of profit from GM to Fisher (Klein, 2007). Eventually, GM purchased Fisher and integrated it into its parts division in 1926.⁷

The alternative to production under vertical integration is a long-term supplier relationship. This system was developed in Japan from the mid-1950s until the early-1970s following a rapid growth in domestic demand for automobiles (Nishiguchi, 1994). Unlike vertical integration which relies on hierarchy, long-term supplier relationships rely on relational contracts between assemblers and suppliers. Compared to rigid formal contracts, relational contracts have scope for greater flexibility by taking advantage of subjective performance measures that can be observed by transacting parties but cannot be verified by a third party, such as a court.

According to Aoki (1988) and Asanuma (1989), Japanese assemblers and suppliers share two types of information. First is information regarding a supplier's capabilities to design components. Japanese assemblers obtain this information by setting a stratified rating system that categorises suppliers into three categories. The lowest in the rank are general suppliers that supply components from their catalogues—transacting in a pure market form. The middle ranked are “drawing supplied” (*taiyozu*) suppliers that supply components based on an assembler's design. The top-ranked are “drawing approved” (*shoninzu*) suppliers. This type of supplier makes its designs based on an assembler's rough specifications about a vehicle's performance and receives the highest share of profit among all types of suppliers due to the depth of its buyer-specific investment.

The second type of information shared between assemblers and suppliers concerns the supplier's production capabilities, specifically the lowest cost a supplier can achieve. Unlike a supplier's design capabilities, assemblers obtain this information indirectly through negotiations and incentives for cost-reducing efforts. Initially, an assembler asks a supplier to submit a detailed cost estimate to produce a component. After careful examination, the assembler adds a profit margin to the supplier's cost estimate to form the component price. If the supplier's actual costs are lower than the estimate, the supplier can keep the surplus as a reward for its cost-reduction efforts.

Although sharing information about a supplier's costs and design capabilities is necessary to make a long-term supplier relationship work, it is insufficient without mutual trust between assembler and supplier.⁸ Assemblers and suppliers build mutual trust through repeated interactions, through which they establish a set of cooperative routines.⁹ Table 4 provides an inventory of the cooperative routines TMC shares with its suppliers as a representation of the Japanese automotive industry. According to this table, TMC's supplier shows its goodwill by making buyer-specific investments in engineering and production processes. Similarly, TMC shows its cooperation by giving a “fair” evaluation of TMC's supplier's efforts.

Aside from buyer-specific investments, TMC and its supplier show their commitment to each other by providing technical assistance when problems arise. As a supplement to these cooperative routines, TMC and its suppliers

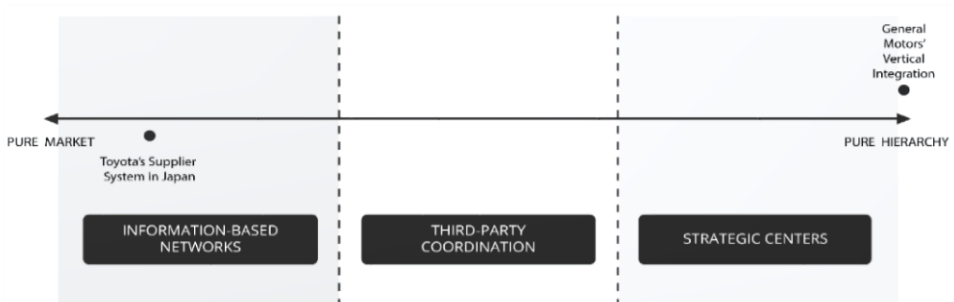
also use a self-enforced punishment scheme to prevent each other from renegeing on their promises. For example, TMC’s supplier could disrupt the operation by delivering a component late or not to specification, if TMC renegeed on a promise.

Table 4: Cooperation, Defection, and Punishment in Supplier Relationships at TMC

Actor	Action		
	Cooperate	Defect	Punish
TMC’s Supplier	<ol style="list-style-type: none"> Invest in engineering and process development skills that will enable the firm to translate approximate specifications into a final component. When problems emerge, work rapidly and effectively to fix them. 	<ol style="list-style-type: none"> Fail to invest sufficient time or attention in responding to Toyota’s requests. Attempt to extract monopoly rent once the relationship is established. 	<ol style="list-style-type: none"> Deliver parts late, or not to specification. Fail to cooperate in the redesign of critical parts.
TMC	<ol style="list-style-type: none"> Allow the supplier to make a “reasonable return” on their investments. When things go wrong, provide resources to the supplier to help fix the problem. 	<ol style="list-style-type: none"> Fail to invest sufficient time or attention in responding to a supplier’s requests. Attempt to extract monopoly rent once the relationship is established. 	<ol style="list-style-type: none"> Cease working with the supplier.

Source: Helper and Henderson (2014)

Figure 4: Classifying GM and Toyota’s Production System with Menard’s Typology



The discussion in this subsection is the benchmark to analyse the dynamics of the Toyota Astra hybrid structure partnership. Therefore, we

frame the discussion under Menard's typology as shown in Figure 4 above. According to Menard's typology, GM's vertical integration system is located at the extreme right, in which the production of GM's functional components is categorised as a pure hierarchical firm. On the contrary, TMC's long-term supplier system is located at the far left under the category of information-based networks. We will use this figure to illustrate the initial position of the Toyota Astra hybrid structure partnership and the subsequent changes in the boundaries of the partnership over time.

3. Analysis of the Toyota Astra Hybrid Structure

The analysis of the Toyota Astra hybrid structure partnership will be divided into two periods: the establishment period that extended from 1971 to 1989 and the transition period that lasted from 1990 to 2015. Our analysis on the first period began with the establishment of TAM and its failure to establish long-term supplier relationships with local suppliers. Then, the analysis will continue with the establishment of a quasi-strategic center as an organisational solution for TAM's failure.

In the second period, we analyse various factors that determine changes in the governance structures and the boundaries of TMC and AI's quasi-strategic center arrangement. The first factor is capabilities development. AI's successful effort in developing its internal capabilities in automobile component manufacturing through AOP changed the governance structure but not the boundary of the quasi-strategic center arrangement. Another is the importance of having reliable and trusted partners. Losing such partners would threaten the stability of the partnership, and this factor is the leading cause for the change in TMC and AI's hybrid arrangement from a quasi-strategic center to an information-based networks.

3.1 Toyota Astra Motor's Failure to Establish Long-Term Supplier Relationships: 1971-1989

Originally, the Toyota Astra partnership was a government project to rescue PN Gaya Motor, an automotive assembly company that was established by GM in 1927 and taken over by the government following GM's exit from Indonesia in 1954. This reconstruction project began in 1969. At that time, the Ministry of Industry asked the founder of AI, William Soerjadjaja, to be the principal investor of the project by providing US\$1 million in investment in exchange for a 60% share of PN Gaya Motor (Sato, 1996).

Initially, AI expected to begin the project through an exclusive dealing with Chevrolet. Due to contract difficulties, AI decided to partner with TMC, which was seeking to enter the Indonesian market for the first time (Chalmers 1988; Sato 1996). Their partnership officially began in 1971 with the

establishment of TAM, a distribution and assembling company with a 51-49% share distribution for AI and TMC respectively.¹⁰

TAM began its operations as a distributor that assembled imported completely knocked-down (CKD) kits with technical assistance in assembly from TMC. Although Indonesian automobile market was still small at that time, which cumulatively accounted for total sales of 250,000 units between 1972 and 1975, or only 62,500 units on average per year, TAM enjoyed strong sales growth as evidenced in Table 5 below. In 1974, for example, it was the leading company in passenger cars (30%) and general-purpose cars (65%) markets. Due to the strong sales performance, AI and TMC agreed to expand their investment by establishing PT Multi Astra, an automobile assembly plant, in 1973.

Nevertheless, AI and TMC’s decision to expand their assembly operation was taken at the wrong time. Despite the rapid real economic growth, the Indonesian economy had experienced a strong inflationary pressure since 1972 (see Table 6). The difficult economic condition resulted in popular discontent that inflamed anti foreign investment sentiment, particularly on Japanese investment, among students and the population. The students argued that competitive pressure from Japanese investment had marginalised pribumi’s (indigenous Indonesian) businesses. The growing anti-Japanese investment motivated the students to hold a demonstration that turned into a riot on 14 January 1974, which is known as the Malari (Malapetaka Lima Belas Januari) incident (Thee, 2010).

Table 3: Market Share of Major Assemblers in Indonesia in 1974-1977 (in percent)

Types	Assembler	1974	1975	1976	1977
Commercial Vehicle	Mitsubishi	48	56	50	40
	Daihatsu	8	7	15	17
	Toyota (TAM)	8	11	14	15
	Datsun	6	6	8	10
	Others	30	20	13	18
	Total (Units)	32,729	45,022	44,517	74,332
Passenger Cars (Sedan)	Toyota (TAM)	30	29	32	26
	Holden	17	13	4	2
	Honda	12	8	17	24
	Volkswagen	12	8	17	24
	Others	29	42	30	24
	Total (Units)	24,697	30,770	24,298	12,879
General Purpose Car (Jeep)	Toyota (TAM)	65	65	47	84
	Volkswagen	18	26	45	3
	Landrover	8	6	5	5
	Others	9	3	3	8
	Total (Units)	2,376	3,081	6,759	5,990

Source: Witoelar (1984)

Table 4: Governance Structure as a Function of Transaction Characteristics

	GDP Growth Rate (at 1973 Prices)	Inflation Rate (Cost of Living Index)
1970	10.9%	9%
1971	6.5%	2%
1972	9.4%	26%
1973	6.8%	27%
1974	7.6%	33%
1975	5.0%	20%
1976	6.9%	14%

Source: Central Agency on Statistics (BPS)

The New Order government under President Soeharto used this momentum to introduce a new restrictive foreign investment policy that required all foreign investment to partner with local business, as well as the Compulsory Deletion Program for commercial vehicles (buses, trucks, and minivans) that force foreign assemblers to buy automobile components from local suppliers in 1976 (Thee, 2012). Besides introducing this policy, the government also took an active role in promoting local companies to Japanese assemblers, specifically to the major players like TMC and Mitsubishi. Nonetheless, this attempt proved unsuccessful, as the government did not take into account the importance of asset specificity in component design as well as in adjusting production processes for developing long-term supplier relationships.

One example of this failure occurred with Inkoasku. Today, Inkoasku is an affiliate of AI that manufactures wheel rims. However, back in the 1970s, it was a local independent wheel rim manufacturer owned by Frits Eman, one of the main supporters of the Compulsory Deletion Program.¹¹ In 1978, the Minister of Industry, Ir. Soehoed, personally recommended Inkoasku to be TAM's first local supplier as part of the localisation program (Doner, 1991). The minister had confidence in Inkoasku's technological capabilities, acquired from its business relationships with German assemblers. At first, TAM was hesitant because it needed to make technical alterations to incorporate Inkoasku's designs. Eventually, TAM agreed to test Inkoasku's product in Japan. The test result was disappointing, and TAM used this result as evidence to refuse the minister's further attempts to promote Inkoasku.¹²

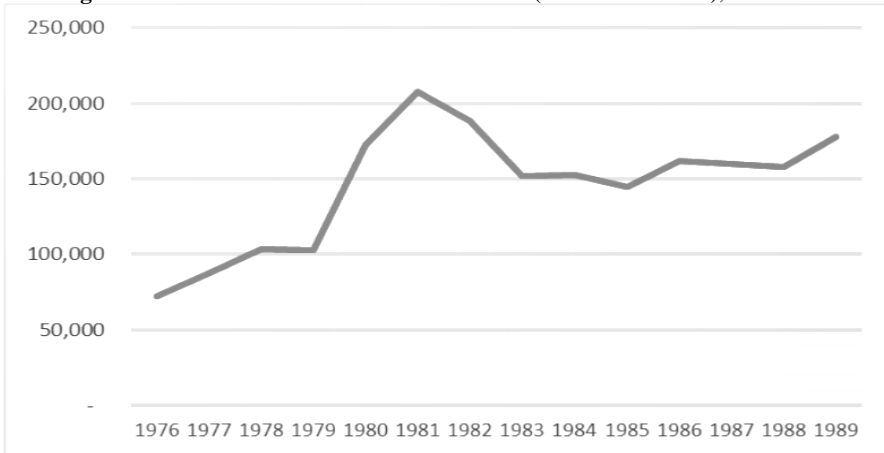
TAM's repeated rejections, however, infuriated the minister, who accused TAM of being uncooperative and displaying bad faith toward the local supplier. To diffuse this situation, TAM agreed to accept Inkoasku's product under the condition that Inkoasku agrees to invite a Japanese wheel rim producer to assist its production, specifically regarding quality control. Eman accepted the proposal but faced difficulties implementing the

agreement, which required Eman to adjust from producing according to the specifications of German assemblers to TAM's specifications. Moreover, this adjustment involved significant financial risk because of asset specificity. In the end, Eman sold the majority of his shares in Inkoasku to AI in 1980 (Doner, 1991; Chalmers, 1988).

The government's advocacy for local suppliers failed because of the reluctance of local suppliers to invest in buyer-specific assets for the assembler. As shown by the example of Inkoasku, buyer-specific investment requires not only technical adjustments in production processes but also financial commitment to implement the adjustment. One problem that can be observed from the Inkoasku case was that such a demand was made on a firm that already had established customers and installed technological capabilities. In other words, the firm faced a sunk cost problem. Therefore, it is possible that it would be easier to build an assembler-supplier relationship with a newly established firm, which we will explore in the next example of Dana-Spicer.

In the late 1970s, following an adjustment of the 1976 Compulsory Deletion Program, the government invited Dana-Spicer, an auto components manufacturer from the US, to develop a locally-based rear axle production joint venture with a local entrepreneur. As an incentive, the government promised Dana-Spicer exclusive rights to supply rear axles to Indonesia (Doner, 1991; Chalmers, 1988). Upon learning of this agreement, Japanese assemblers voiced their objections. Mitsubishi responded by establishing its rear axle joint venture with one of AI's subsidiaries, Inti Ganda Perdana. Worried by the possibility that Mitsubishi's partnership with Inti Ganda Perdana might compromise its business interests, TMC offered Dana-Spicer an opportunity to be TAM's supplier (Doner, 1991).

Similar to the Inkoasku case, TMC asked Dana-Spicer to invest in buyer-specific production capabilities by designing rear axles according to its specifications. To show its commitment, TMC also offered technical assistance to test Dana-Spicer's design compatibility with its vehicles in Indonesia (Doner, 1991). However, Dana-Spicer was unwilling to make a major investment without its local partner's financial participation. Unfortunately, Dana-Spicer's local partner, Mohamad Joesoef, was involved in a costly business dispute over the ownership of a Hilton Hotel with his political patron, Ibnu Sutowo. Since its local partner was unable to contribute to the investment plan, Dana-Spicer approached AI in an attempt to persuade it to participate in the investment. However, AI refused to make a major contribution and demanded Dana-Spicer finance the majority of the investment. Unwilling to commit to a substantial buyer-specific investment by itself, Dana-Spicer withdrew its investment plan for Indonesia in 1984 (Doner, 1991; Chalmers, 1988).

Figure 5: Indonesia Domestic Automobile Sales (measured in units), 1976-1989

Source: The Association of Indonesia Automotive Industry (GAIKINDO), unpublished

The Dana-Spicer example reaffirms the lessons from the previous Inkoasku example. Independent local suppliers, including foreign suppliers partnered with local businesses, had an opportunity to build a long-term supplier relationship with TAM during the early implementation of the mandatory localisation policy but failed because local suppliers were unwilling to invest in buyer-specific assets in component design as well as adjustment in production processes for TAM. There are two possible explanations for this outcome. First is the small domestic market. Compared with the yearly automobile demand in Japan (4 million units) and the US (10 million units),¹³ Indonesia's market size was miniscule (less than 200,000 units prior to 1990, except for 1981 due to a short-lived oil boom as shown in Figure 5 above). Consequently, investment in buyer-specific assets was too costly for independent suppliers because they could lose access to outside markets.¹⁴

Another possible explanation could be the difficulties faced in establishing cooperative routines with independent local suppliers. At that time, long-term supplier relationships were still a new system, and non-Japanese suppliers still had limited knowledge of how the system worked. Given knowledge gap, local suppliers might have interpreted cooperative routines as non-cooperative. For example, they saw subjective performance measures on the quality of their products as an unfair practice that favoured Japanese component makers and asked for the creation of a government-controlled quality certification agency to provide an objective judgment on quality control (Witoelar, 1984). In short, this fact suggests that the

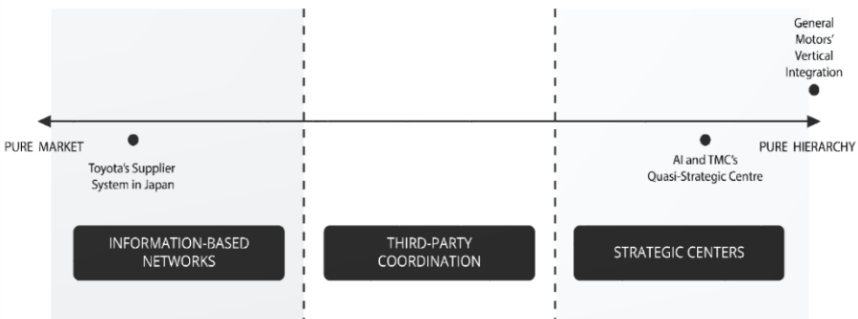
transaction costs of implementing a Japanese supplier system in Indonesia were higher than what was perceived by TMC.

A combination of a small domestic market and difficulties establishing cooperative routines with local suppliers forced TMC and AI to find a new organisational solution. Theoretically, production under a hierarchical firm is the solution to this situation; however, full vertical integration was not possible because Japanese assemblers did not possess the capabilities to manufacture functional components like their US counterparts. Therefore, they needed an alternative hybrid arrangement, preferably one that could incorporate TMC’s Japanese suppliers and still within the scope of Indonesia’s restrictive foreign investment policy.

3.2 Quasi-Strategic Center as an Organisational Solution: 1971-1989

TMC and AI solved their organisational problem by forming a hybrid structure with TMC’s Japanese suppliers that shared the characteristics of strategic center but with some distinct characteristics. The foundation of this structure was laid down during the second half of the 1970s, when AI established two joint ventures with TMC’s major suppliers. One was with Kayaba in 1976, and another was with Denso (formerly Nippondenso) in 1978. The nascent hybrid structure became more developed in the early 1980s, following the establishment of AI’s eight new joint ventures with Aisin, Toyoda Gosei and Topy Industries, among others, in addition to a joint venture with Swedish AB SKF that was not a TMC’s supplier in bearing manufacturing (see Appendix 1).

Figure 3: Classifying AI and TMC’s (including TMC’s suppliers) Quasi-Strategic Center with Menard’s Typology



In the typical strategic center, all strategic assets and decision rights are allocated to a central coordinator that is owned multilaterally by all transacting parties. Furthermore, the central coordinator has managerial

authorities to manage the joint projects. In this case, AI, TMC, and TMC's suppliers jointly owned the physical assets but kept decision rights for production and monitoring separately. Decision rights over production were entirely under the authority of TMC and its suppliers (Butler, 2002). Meanwhile, AI held the rights to monitor the activities and performance of the joint ventures along with the rights to allocate internal resources (financial, personnel, and informational) horizontally across its subsidiaries in its automotive divisions and vertically to the main and divisional headquarters (Sato, 1996). We define this hybrid arrangement as a quasi-strategic center, in which AI acted as a de facto central coordinator over its joint projects with TMC and TMC's suppliers while holding limited managerial authority over production activities (see Figure 6).¹⁵

In exercising its production rights, TMC and its suppliers divided production activities into two categories: shared and unshared. Product development was unshared. TMC and its suppliers did not involve AI in product development because of two reasons. First, AI, like the other local partners in the industry, did not have the required manufacturing capabilities in product development (Nomura, 2003). Second, TMC and its suppliers had different target markets. Unlike AI, which was focused on the national market, TMC sought to develop vehicle models for the regional market, specifically models that would be successful not only in the Indonesia market but also in the markets of other ASEAN nations. This fact was evidenced by the development of the Toyota Kijang,¹⁶ the most popular model in Indonesia. Despite its popularity as a national symbol of the Indonesian automotive industry, TMC developed the Toyota Kijang for the Indonesian and Philippine markets. In the Philippines, it was sold under the brand Toyota Tamaraw. Later, this model was sold to other nations under different brand names, such as Unser in Malaysia, Zace in Vietnam and Taiwan, and Kondor in South Africa (Nomura, 2003).

On the other hand, production management was shared with AI. The main reason was TMC, and its suppliers needed local workforces that could operate Just-In-Time (JIT) production, which, at the time, was still new even for automobile manufacturers from Europe and the US. To support this technological decision, TMC and its suppliers also needed control over decisions regarding human resource management. With this right, they could design appropriate training policies, determine remuneration, and establish a promotion system that complemented the JIT system (Nakamura, 2004; Nakamura, Husodo, and Hadiwijoyo, 2001).

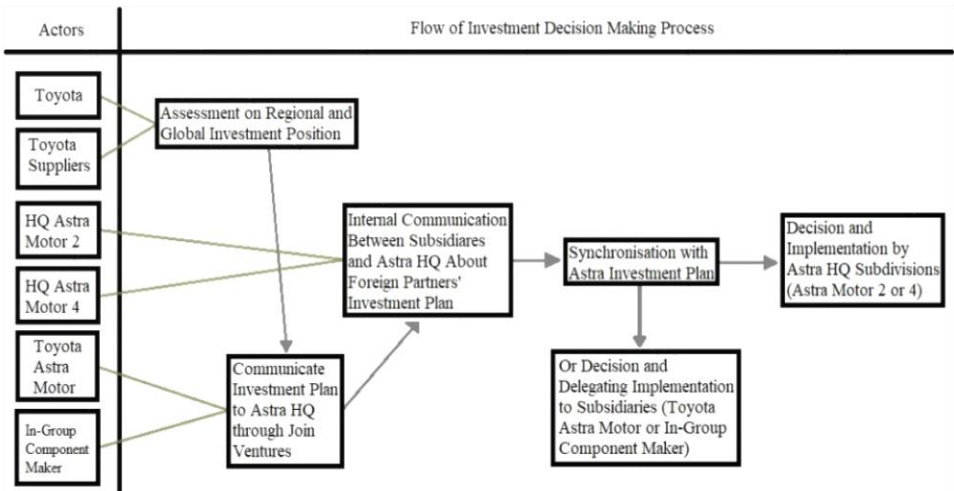
Although AI had limited managerial authority over production activities, AI still could use its right to allocate internal resources as an enforcement device to motivate subsidiary managers, as well as a monitoring tool with TMC and its suppliers. In motivating its subsidiary managers, AI took advantage of its divisional and holding company systems. AI's divisional

system was established as early as 1969, initially to hold sole agencies from TMC, Honda Motorcycle, and its partners in heavy machinery business such as Komatsu and Fuji-Xerox. Later, AI used its divisional system to coordinate the affiliated companies (Sato, 1996). For its automotive business, AI divided its automotive division into three sub-divisions (Butler, 2002):

- Astra Motor One for AI investments with the Honda motorcycle division.
- Astra Motor Two for joint ventures with TMC and component making.
- Astra Motor Three for non-Toyota brands, such as BMW, Daihatsu, Nissan-Diesel, etc.

In monitoring the behaviour of TMC and its suppliers, AI used a different monitoring mechanism that is better understood as multi-stage communication arrangement under the collective decision-making process. We illustrate the process in Figure 7 below by using joint investment decision as an example. In the early stages, TMC and its suppliers would formulate a coordinated global and regional strategic decision in Japan. In formulating a decision, they would assess their investment position in Indonesia relative to their investments in other nations in Southeast Asia, after which they would communicate this decision to AI through their representatives within each joint venture.

Figure 7: Investment Decision Making Process within the Toyota Astra Partnership



Source: Interview with Astra Otoparts Director

At AI's headquarter, the decision would be received by the respective sub-divisions, Astra Motor Two, and be adjusted according to AI's objectives. In some occasions, for example, AI might prefer to allocate more resources to the Honda motorcycle division than to TAM because such decisions would result in higher overall profits for AI.¹⁷ When this condition occurred TAM and TMC managers would negotiate to convince AI that their proposed investment plan was made with AI's interest in mind. If the plan were approved, then AI would determine whether the final investment decision should be carried out directly by AI or be delegated to the subsidiaries.¹⁸

3.3 Reorganising the Quasi-Strategic Center's Governance Structure: 1990-2015

In the previous subsection, we explain the organisational structure of the quasi-strategic center. This hybrid arrangement was chosen as an alternative to the independent assembler-supplier relationship and vertical integration, putting AI in the position of central coordinator with managerial authorities over its joint projects with TMC and TMC's suppliers, but with no authority over production rights. However, the quasi-strategic center had become unsustainable over the years and needed to be adjusted in response to changing circumstances.

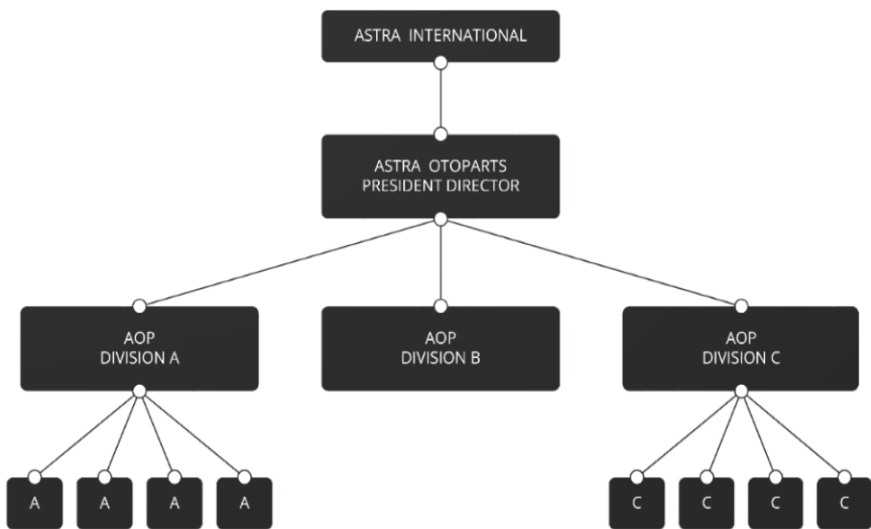
In this subsection, we will discuss the first change that began with AI's move to develop its internal capabilities in component making in the 1990s. In developing its internal capabilities for the first time, AI was using knowledge spillover from its joint ventures with TMC and its suppliers. AI made its first investment in 1990 by establishing Nusametal, an aluminium die-castings manufacturer, without the assistance of its foreign partners. In 1991, AI made another investment on Adiwira Plastik (formerly Federal Adiwira Serasi), a plastic components manufacturer.

However, AI's plan to develop its internal capabilities in component making experienced a setback in 1992, following William Soeryadjaya exit from AI due to the Bank Summa crisis (the exit of William Soeryadjaya from AI will be discussed in detail in the next subsection). Despite the setback, AI was able to proceed with its plan under the leadership of Theodore Permadi Rachmat, AI's President Director and William's nephew.¹⁹ In 1996, AI reorganised its components manufacturing division by merging Astra Pradipta Internusa, a trading company in automobile components, with several subsidiaries, including Nusametal and Adiwira Plastik, into a new company, named Astra Dian Lestari.

In 1997, AI changed the name of Astra Dian Lestari into Astra Otoparts (AOP), making this company AI's new divisional headquarter for its component manufacturing business. The establishment of AOP also eased

the flow of information from its joint ventures with TMC’s suppliers that continued to grow in the 1990s (see Appendix 2).²⁰ To manage its growing components manufacturing business, AOP developed specialised communication groups that consisted of four to six subsidiaries within the same business (see Figure 8 below). For example, one group brought together subsidiaries that produced rubber-based components. By 2015, AOP had six manufacturing groups and 32 subsidiaries (Astra, 2016). To manage the development of AI’s internal capabilities in component manufacturing, AOP established a separated communication channel in 2007 which it labelled as ‘manufacturing operations’ (Astra, 2008). This channel included Nusametal, Adiwira Plastik, and WINTEQ (Workshop for Industrial Equipment), a new division that focused on producing specialised machineries and equipment established in 2006. AOP investment in WINTEQ was important to supply customised machinery that could produce components based on buyer-specific needs (Astra, 2007).

Figure 8: Hierarchical Information Processing within Astra Otoparts, 1997 till now



Source: Astra Otoparts’ Annual Report, various years.

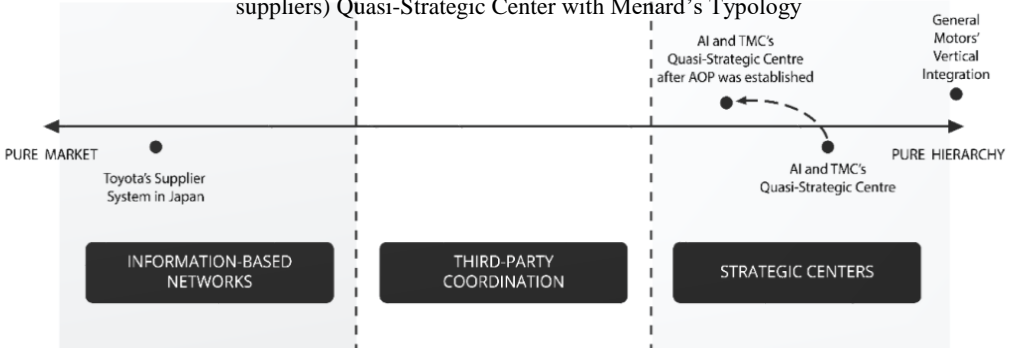
Besides its investment in WINTEQ, AOP also ran a program to develop its capability in product design under the banner of the ‘Mandiri Project’.²¹ For this project, AOP conducted product design activities with Nusametal and Adiwira Plastik and, in some cases, with cooperation from other joint ventures like Indokarlo Perkasa. TMC’s suppliers started to notice AOP’s effort to acquire product design capability during the late 2000s and provided

support by involving AOP in product development activities. Kayaba, for example, jointly designed shock absorbers with AOP in 2009 (Astra, 2010). Akebono, another example, opened a joint venture to produce brake system with AOP in Vietnam in 2011 (Astra, 2012). Following this progress, AOP decided to centralise its product development activities at the Engineering Development Center (EDC) in 2012 (Astra, 2013).

AI's move to develop its internal component making capabilities, specifically capabilities in managing production process and product design under the management of AOP had opened the opportunity for AI to get more involved in component making. As shown by the Kabaya and Akebono examples, TMC's suppliers welcomed AI's participation. They saw AI as a potential partner in the Indonesian market as well as in the Southeast Asia region. Their positive reaction also suggested that AI had been successful in building mutual trust, or new relational contract, with them over the years. Establishing this new relational contract made horizontal knowledge transfer between TMC's suppliers and AOP in component making possible.²²

Although this development had altered the governance structure of the quasi-strategic center, it did not change the boundary of the hybrid structure significantly (see Figure 9 below). AI still did its duty as the central coordinator of the partnership, albeit some of its managerial authorities, including its newly acquired authority over production rights, were delegated to AOP.

Figure 9: Classifying the Reorganisation of AI and TMC's (including TMC's suppliers) Quasi-Strategic Center with Menard's Typology



3.3 Transition Toward an Information-Based Network: 1990-2003

In this subsection, we will discuss the second change, specifically change in the boundary of the partnership's hybrid structure from a quasi-strategic center to an information-based networks. This change happened because of two factors: adverse external events and compatibility in vision between

partners. More interestingly, these two factors also affected one another in succession.

The change was preceded by the Bank Summa crisis in 1992. Legally, Bank Summa had no relationship with AI, but the company was owned by William Soeryadjaya's ambitious elder son, Edward Soeryadjaya. As the eldest son of a family of Chinese descent, Edward believed strongly that he had the responsibility of continuing his father's business and becoming even more successful than him (Borsuk & Chng, 2014). To achieve his ambition, he made high-risk investments in properties using short-term loans from the government and abroad. At first, his investments were successful (Borsuk & Chng, 2014). However, in June 1990 his investments crumbled after the Ministry of Finance decided to hike the interest rate from 15 to 30% in order to cool down the overheated economy. This draconian monetary policy brought many investment projects, particularly in the property sector, to a halt. As a result, Edward faced serious problems rolling over his short-term debt (Borsuk & Chng, 2014).

As a separate legal entity, AI did not have any obligation to rescue Bank Summa. However, William decided to salvage his son's crumbling investments by using his shares in AI as collateral. William's move put the financial health of AI and the whole group at risk (Borsuk & Chng, 2014). The managers disagreed with William's decision, but they had little choice other than to try and minimise the impact of the Bank Summa crisis on AI and the whole group (Sato, 1996). Eventually, however, William's efforts failed, and he was forced to sell his AI shares to various conglomerate groups, mostly to government cronies, and government agencies (see Table 7).

TMC was concerned this development could affect the stability and control of its investments in Indonesia.²³ To mitigate any unwanted developments, TMC decided to buy 8.3 percent of AI's shares from William.²⁴ TMC's concern became a reality in 1996 when the government introduced the National Car (Mobil Nasional) Program that gave preferential treatment to Timor Putra Nasional, a joint venture company owned by the President's youngest son, Tommy Soeharto, and KIA Motors from South Korea, to import automobile components duty free but under the condition that their joint venture could achieve 60% local content within three years.²⁵ The National Car Program not only would jeopardise TAM's plan to introduce a mass-market sedan,²⁶ but also could threaten TMC's control over investment in Indonesia because Tommy planned to use TAM's facilities to assemble his car.²⁷

At first, TMC was able to resist Tommy's plan. The relief, however, did not last long, as the risk heightened following the failure of Putra Sampoerna's attempt to takeover AI in October. In condemnation of Sampoerna's attempted takeover, the State Secretary, Moerdiono, stated that

AI should remain a publicly owned company; a statement followed by a move from one of Soeharto's chief crony, Mohammad "Bob" Hasan, to acquire AI shares through Nusantara Ampera Bakti (Nusamba) in mid-October (Borsuk & Chng, 2014). In February 1997, Bob Hasan was installed as the Chairman of AI and made a controversial statement in March in an interview with Nihon Keizai Shimbun, in which AI would support the National Car Program by supplying parts as well as lending its assembling facilities to Timor Putra Nasional.²⁸

Table 5: Change in Astra Ownership after Bank Summa Crisis

April 1990	
William Soerjadaja and children	77
Investing public	13.2
Astra managers	4.9
International Finance Corporation	4.9
December, 1993	
Delta Mustika	10.7
Toyota Motor (TMC)	8.3
Number 6 Enterprise	5.7
International Finance Corporation	4.9
Bank Ekspor-Impor Indonesia	4.2
Bogasari Flour Mills	4
February, 1997	
Sampoerna Astra Corporation	14.7
Delta Mustika	10.7
Nusantara Ampera Bakti	8.9
Toyota Motor (TMC)	8.3
Indo Astra Boga	8.2
Gentala Sanggrahan	6
August, 2000	
Cycle and Carriage	31.1
Toyota Motor (TMC)	7.7
Norbax Inc.	7.7
GSIC A/CC	5.3
Nusantara Ampera Bakti	3.7
East Resolve Limited	2.5

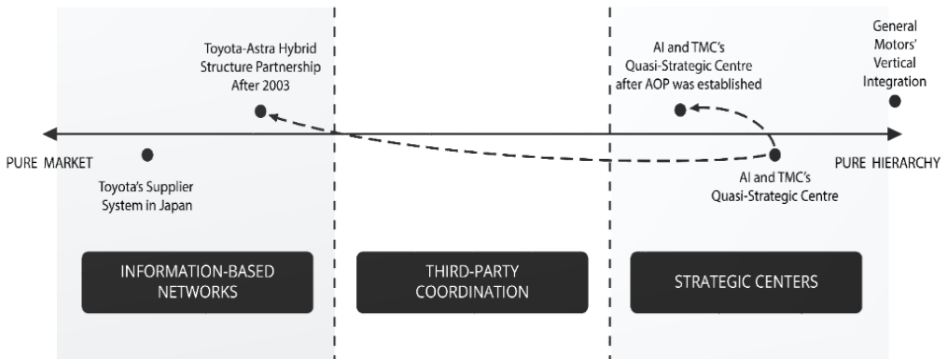
However, Bob Hasan's plan was thwarted by the 1997 Asian financial crisis. In March 1998, AI's consolidated balance sheet recorded a deficit of 2.26 trillion. At the same time, the value of its US\$ 1 billion foreign debts in Rupiah soared due to sharp Rupiah depreciation, from the level of Rp. 2,450 per USD in June 1997 to the level of Rp. 8,300 per USD in March 1998. To handle AI's financial collapse, Theodore Rachmat was reinstated as President Director, albeit he resigned later and gave the position to Rini Soewandi –now Soemarno (Butler, 2002). TMC also sent its representative at TAM, Mikio Nomura, to join the board.²⁹

In 1999, TMC and AI under Rini met an unprecedented challenge, the Indonesian Bank Restructuring Agency's (IBRA) restructuring plan to sell 40% of AI shares that it received from Soeharto's business cronies and conglomerates to solve their debt problems. The challenge was not the plan but the process, in which IBRA used preferred bidder system, rather than open bidding as mandated by Law No.8/1995 on capital markets. However, there was no transparency in the way IBRA chose its preferred bidders.³⁰

IBRA's decision to use preferred bidder in offering Bank Bali to the Standard Chartered and AI to Gilbert Global Equity Partners and Newbridge Capital resulted in a public relation disaster. The preferred bidders exited the bid due to resistance from the companies' board of management.³¹ In AI case, the board under Rini refused Gilbert Global Equity Partners and Newbridge Capital's request for due diligence by requiring them to sign a strict confidentiality agreement that needed approval from TMC and other AI's partners.³² Eventually, IBRA sold AI shares to Cycle and Carriage Limited from Singapore through open bidding. Meanwhile, Rini was ousted and replaced by Theodore Rachmat (Butler, 2002).

However, the new owner could not provide new capital to pay AI's debt.³³ Due to this problem, AI submitted requests to Toyota in April 2002 and Daihatsu in June 2002 to sell its stakes at their joint ventures.³⁴ Toyota accepted Astra request but preferred a reorganisation through spin-off rather than taking the majority shares of TAM. In 2003, AI and TMC signed an agreement to separate the manufacturing and distribution functions in their joint venture by transferring the manufacturing function to TMMIN, in which TMC held 95% shares while keeping the distribution function at TAM without any change in shareholders composition (51% AI, 49% TMC). Both TMC and AI did not disclose the amount of payment for the reorganisation.³⁵

Figure 10: Changes in AI and TMC's (including TMC's suppliers) Hybrid Structure from a Quasi-Strategic Center to an Information-based Network



With the reorganisation, AI no longer serves as the central coordinator. The hybrid structure of the partnership changes from a quasi-strategic center to an information-based network, as shown in Figure 10 above. AI relationship with TMC changes drastically into manufacturer-distributor (TMMIN and TAM) and assembler-supplier (TMMIN and AOP), which is more similar to TMC's original supplier system in Japan. Moreover, AI has no managerial rights over TMMIN. Consequently, TMC could plan its investment in Indonesia without much concerns about AI's opinions.³⁶

Besides having total independence in making its investment plan, TMC also need not be worried about losing managerial control over its overseas investment, as such when TMC had friction with Tommy Soeharto and his cronies. When the friction occurred, TMC was vulnerable to Tommy's ill-motivated hostile takeover plan. By mobilizing his business cronies, Tommy was very close in seizing managerial control over TAM's facilities and perhaps over other facilities owned by TMC's suppliers too. Luckily, for TMC, Tommy's hostile takeover ends because of the 1997 Asian financial crisis. This event shows how damaging the consequence is of losing William Soeryadjaya for TMC's joint ventures with AI.

Despite the change, TMC still regards AI, especially its managers, as a reliable and trusted long-term partner in Indonesia as well as in Southeast Asia. AI's ability to build relational contracts with TMC's suppliers through AOP is an asset for both TMC and TMMIN in expanding TMC's supplier system in Indonesia. This asset becomes more important in this past decade when Japanese mid-tier suppliers began to make huge investment in Indonesia automotive sector.³⁷

4. Conclusion

This paper analyses change in the boundary of the Toyota Astra hybrid structure partnership throughout 1971-1981 and 1990-2015 to understand the factors behind changes in the boundaries of hybrid arrangement. The discussion starts with the establishment of TAM in 1971, focusing on TAM as well as TMC's failures in establishing long-term supplier relationships with local suppliers, as a response to the introduction of the Compulsory Deletion Program for commercial vehicles in 1976. Their failure was the main reason behind AI, TMC, and TMC's suppliers' decision to organise their joint ventures in automobile assembling and component manufacturing under a quasi-strategic center. The main lesson is that it is difficult to replicate any organisational arrangements across countries – no matter how successful the arrangement is in its original country – due to difficulties in replicating relational contracts, or organisational action rules that cannot be specified ex-ante and verified ex-post, that underlie the transferred organisational arrangements.

Our discussion of the 1971-1981 period continues with a description of the characteristics of the quasi-strategic center that shares the characteristics of Menard's strategic center but with its distinct characteristics. AI acted as the central coordinator of the strategic center that oversaw the internal allocation of resources (personnel, finance, and information) within its joint ventures TMC and its suppliers but had limited managerial authority over production activities. Decision rights over production were held by TMC and its suppliers, and they exercised their rights by dividing production activities into two categories: unshared production activity like product design and shared production activity such as production process management. This finding shows the plethora of governance structures of hybrid arrangements, even under a narrow definition of strategic center –which warrants further exploration of the characteristics of hybrid arrangements using Menard's typology.

Our analysis also found that the governance structure is quite flexible. As shown in the discussion of AI's moves to acquire internal capabilities in automobile component manufacturing in the 1990-2015 period, TMC's suppliers were willing to share their decision rights over production with AI through AOP, as an appreciation for AI's effort to acquire such capabilities internally. Nevertheless, this flexibility is conditional, which means that acquiring technical capabilities in component making alone is insufficient. These hard capabilities should be complemented with the development of horizontal relational contracts with TMC's suppliers.

The last part, which took place between 1990-2003 discusses the change in the Toyota Astra hybrid structure partnership from a quasi-strategic center to an information-based network, marked by a transfer of the manufacturing function to TMMIN and keeping the distribution function at TAM. Although the change in Indonesia is driven mainly by instabilities that occurred after TMC lost a reliable and trusted partner in the figure of William Soerjadjaja, a comparison between the Indonesian experience and other Southeast Asian countries' reveal that AI and TMC's reorganisation was part of a bigger trend in the region. In Thailand, for instance, TMC paid 5 billion Bhat for Siam Cement's shares in Toyota Motor Thailand to help Siam Cement Group paid its debt (Terdudomtham, 2004). Now, TMC is the major shareholder with 86.4% shares, while Siam Cement Group is the minority shareholder with 10% shares.³⁸

Interestingly, this trend is not limited to TMC's investment in Southeast Asia. Honda in Malaysia, another example, raised its shares from 49% to 51%. Suzuki, Isuzu, and Daihatsu also made a similar move in various Southeast Asian countries.³⁹ These facts raise a question of how AI and TMC's experiences could be compared with the experiences of other assemblers in Southeast Asia. Did they develop supplier systems similar to TMC in Indonesia? Or did they use different systems based on unique local

circumstances? A comparison with Malaysia's Proton will be another interesting case because it is the only national automobile company that is still operational in Southeast Asia.

Notes

- 1 See McMillan and Woodruff (1999a) and (1999b), Bloom and Van Reenen (2010), Bloom, Sadun, and Van Reenen (2012), Bloom et al. (2013), and Tanaka (2017) for other empirical studies of firm organisations in developing economies.
2. Functional parts and components are automobile components that are vital for the basic movements of a vehicle (travelling, turning, and stopping). I would also like to remind readers that this paper does not discuss non-functional components.
3. The horizontal axis in Menard's typology is built upon the property rights theory. In this theory, the owner holds not only ownership rights over the physical form of the asset, but also the rights on how to use it.
4. Relational incentive contract is another term that is used by economist interchangeably to describe relational contract. Although both terms discuss similar ideas, relational incentive contract has more specific meaning. It is concerned with the incentive mechanisms that underlie relational (non-contractual) relationships. Levin (2003) and Malcomson (2013) provide thorough discussions of relational incentive contracts.
5. See Tadelis and Williamson (2013) for the latest explanation of transaction cost theory.
6. Originally, capabilities were not included in transaction cost economics. However, Langlois and Foss (1999) argue convincingly that capabilities should be considered a transaction characteristic by showing that capabilities can be the source of a transaction.
7. Although many scholars dispute the accuracy of this story, the case is still regarded as a prime example of a hold-up problem. Readers interested in this debate may see Coase (2006) and Klein (2007) for the latest discussion.
8. See also Helper and Sako (1995) for a discussion on trust in the automotive supplier systems in the US and Japan.
9. See Chassang (2010) for a theoretical discussion on building cooperative routines through repeated exchanges.
10. This share distribution was enforced by the government because TAM was registered as a distribution company, requiring the majority of the ownership to be held by a local partner, see Sato (1996), p. 253.

11. For further explanation regarding Fritz Eman's role in Indonesia's localization policy, see Chalmers (1988), pp. 181-183, 204-207, and 239.
12. Chalmers also mentions that Astra held suspicions regarding Eman's motives to monopolize the wheel rim market (p. 198).
13. Japan and US' domestic auto sales data are based on JAMA and Auto Alliance statistics.
14. Andrabi et al. (2006) also found a similar pattern by studying subcontractors engaged in tractor manufacturing in Pakistan. Suppliers, especially of a higher quality, are reluctant to invest in buyer-specific production capabilities because it will limit their flexibility to cater to external markets.
15. In some occasions, the arrangement of giving complete production rights to TMC and its suppliers became the source of tension between AI's managers at TAM and TMC's representative in Indonesia. See Butler (2002), pp. 67-72.
16. *Kijang* means deer in Bahasa Indonesia, but in this context it is an abbreviation of "*kerjasama Indonesia-Jepang*" (Indonesia and Japan cooperation).
17. One TAM manager described this condition as "used as Astra's (AI) cash cows". See Butler *op. cit.*, p. 66.
18. Based on an interview with an Astra Otoparts director. The interview was unrecorded as per the request of the interviewee.
19. See Butler *op. cit.*, pp. 253-266 for the discussion of Astra under Theodore P. Rachmat leadership.
20. See Bolton and Dewatripoint (1994) and Dessein and Santos (2006) for discussions regarding the economic analysis of processing and communication of information within firms. One of their arguments is that economic agents within firms need to specialize in the processing of certain kinds of information. However, extensive specialization in information processing may result in efficiency loss in the form of omitted local knowledge.
21. *Mandiri* means self-reliance in Bahasa Indonesia.
22. According to Sako (2004), horizontal knowledge transfer across suppliers is another important aspect behind Toyota's successful supplier development program.
23. Based on Nihon Keizai Shimbun's article "*Yureru Indoneshia Sangyoukai—Asutora Gurupu Kukyuu.*" January 12, 1993.
24. Based on Nihon Keizai Shimbun's article "*Indoneshia-Asutorasha, Toyota ga Shihonsanka*" June 21, 1993.
25. President Soeharto's preferential treatment to Tommy also sparked a sibling rivalry between Tommy and Bambang Trihatmodjo, the President's second son. Williamson (1996b) from The Jakarta Post

reported that Bambang had forcefully lobbied the Minister of Industry, Tungki Ariwibowo, to include his joint venture with Hyundai Motor Company, Bimantara Citra, in the National Car Program.

26. Based on The Jakarta Post's article "*Toyota Astra to Start Producing Mass-market Sedan.*" April 27, 1996.
27. Based on The Jakarta Post's article "*Timor Car Unlikely to Hit the Road in September.*" May 24, 1996.
28. Based on Nihon Keizai Shimbun's article "*Indonesia no Kokuminshakeikaku, Asutora ga Zemnenshien e—Hasankaichou Kaiken.*" March 19, 1993.
29. The whole paragraph is based on Nihon Keizai Shimbun's article "*Indonesia Jidoushasaioute [Asutora], Shachoukoutaide Keieitatenaooshi.*" June 12, 1998.
30. Based on Tempo's article "*Air Keruh Standard Chartered.*" December 26, 1999.
31. *Ibid.*
32. Based on the Wall Street Journal's article "*US Investor Group Says Astra Tried to Block its Bid.*" December 23, 1999, and Butler *op. cit.*, p. 279.
33. Based on Tempo's articles "*Ancaman Baru Astra*" April 16, 2000 and "*Jalan Menuju Selamat bagi Astra*" June 10, 2001.
34. Based on Nihon Keizai Shimbun's articles "*Asutora, Toyotani Tsuikashusshiyousei—Jidoushagoubenkoukeide Kentou*" April 12, 2002 and "*Asutora, Tsuikashusshi wo Yousei—Goubenaiteno Daihatsuni*".
35. Based on Nihon Keizai Shimbun's articles "*Toyota, Indonesia Genchikoujoukogaishani—Seisansaihen e Shudouken.*" February 20, 2003 and "*Toyota to Asutorasha, Indonesia Goubenkigyounoseizou-Hanbai-jigyounobunshakade Kihongoui.*" February 20, 2003.
36. In an interview with AI's representative director in TMMIN, the interviewee complained about this issue as lack of TMC's willingness to coordinate with AI.
37. See Natsuda *et al.* (2015) for further discussion regarding this issue.
38. Based on Toyota news release, Retrieved from http://www2.toyota.co.jp/en/news/12/11/1108_2.html.
39. Based on Nihon Keizai Shimbun's article "*Jidoushaoote, DounanA(ajia)seisankyotenkogaishaka, Shashu-henkouya toushi—Isshiketteijinsokuni.*" May 26, 2003.

References

- Andrabi, T., Ghatak, M., & Khwaja, A. I. (2006). Subcontractors for tractors: theory and evidence on flexible specialization, supplier selection, and contracting. *Journal of Development Economics*, 79(2), 273-302. <https://doi.org/10.1016/j.jdevec.2006.01.012>.
- Aoki, M. (1988). *Information, incentives and bargaining in the Japanese economy*. Cambridge, UK: Cambridge University Press.
- Asanuma, B. (1989). Manufacturer-supplier relationships in Japan and the concept of relationship-specific skill. *Journal of the Japanese and International Economies*, 3(1), 1-30. [https://doi.org/10.1016/0889-1583\(89\)90029-4](https://doi.org/10.1016/0889-1583(89)90029-4).
- Astra Otoparts Tbk. (2007). *2006 Annual Report*. Retrieved from <http://www.component.astra.co.id/investor.asp?id=2>.
- Astra Otoparts Tbk. (2008). *2007 Annual Report*. Retrieved from <http://www.component.astra.co.id/investor.asp?id=2>.
- Astra Otoparts Tbk. (2010). *2009 Annual Report*. Retrieved from <http://www.component.astra.co.id/investor.asp?id=2>.
- Astra Otoparts Tbk. (2012). *2011 Annual Report*. Retrieved from <http://www.component.astra.co.id/investor.asp?id=2>.
- Astra Otoparts Tbk. (2013). *2012 Annual Report*. Retrieved from <http://www.component.astra.co.id/investor.asp?id=2>.
- Astra Otoparts Tbk. (2016). *2015 Annual Report*. Retrieved from <http://www.component.astra.co.id/investor.asp?id=2>.
- Astra Otoparts Tbk. (2015). *Astra Otoparts Company Profile*. Jakarta, Indonesia: Author.
- Aswicahyono, H., Basri, M. C., & Hill, H. (2000). How not to industrialise? Indonesia's automotive industry. *Bulletin of Indonesian Economic Studies*, 36(1), 209-241. <https://doi.org/10.1080/00074910012331337843>.
- Baker, G. P., Gibbons, R., & Murphy, K. J. (2008). Strategic alliances: bridges between "islands of conscious power". *Journal of the Japanese and International Economies*, 22(2), 146-163. <https://doi.org/10.1016/j.jjie.2008.03.001>.
- Blois, K. J. (1972). Vertical quasi-integration. *Journal of Industrial Economics*, 20(3), 253-272. <https://doi.org/10.2307/2098058>.
- Bloom, N., & Van Reenen, J. (2010). Why do management practices differ across firms and countries? *Journal of Economic Perspectives*, 24(1), 203-224. <https://doi.org/10.1257/jep.24.1.203>.
- Bloom, N., Sadun, R. & Van Reenen, J. (2012). The organization of firms across countries. *Quarterly Journal of Economics*, 127(4), 1663-1705. <https://doi.org/10.1093/qje/qje.029>.

- Bloom, N., Eifert, B., Mahajan, A., McKenzie, D., & Roberts, J. (2013). Does management matter? evidence from India. *Quarterly Journal of Economics*, 128(1), 1-51. <https://doi.org/10.1093/qje/qjs044>.
- Bolton, P., & Dewatripont, M. (1994). The firm as a communication network. *Quarterly Journal of Economics*, 109(4), 809-839. <https://doi.org/10.2307/2118349>.
- Borsuk, R., & Chng, N. (2014). *Liem Sioe Liong's Salim Group: the business pillar of Soeharto's Indonesia*. Singapore: Institute of Southeast Asian Studies (ISEAS).
- Butler, C. (2002). *Dare to do: the story of William Soeryadjaya and PT Astra International*. Singapore: McGraw-Hill.
- Carson, S. J., Madhok, A., & Wu, T. (2006). Uncertainty, opportunism, and governance: the effects of volatility and ambiguity on formal and relational contracts. *Academy of Management Journal*, 40(5), 1058-1077. <https://doi.org/10.2307/20159816>.
- Chalmers, I. (1988). *Economic nationalism and the third world state: the political economy of the Indonesian automotive industry, 1950-1984*. (Doctoral dissertation). Retrieved from Australian National University Retrieved from <https://openresearch-repository.anu.edu.au/handle/1885/10149>.
- Chassang, S. (2010). Building routines: learning, cooperation, and the dynamics of incomplete relational contracts. *American Economic Review*, 100(1), 448-465. <https://doi.org/10.1257/aer.100.1.448>.
- Coase, R. (2006). The conduct of economics: the example of Fisher Body and General Motors. *Journal of Economics and Management Strategy*, 15(2), 255-278. <https://doi.org/10.1111/j.1530-9134.2006.00100.x>.
- Dessein, W., & Santos, T. (2006). Adaptive organisations. *Journal of Political Economy*, 114(5), 956-995. <https://doi.org/10.1086/508031>.
- Doner, R. (1991). *Driving a bargain: automobile industrialization and Japanese firm in Southeast Asia*. Berkeley, California: University of California Press.
- Eccles, R. G. (1981). The quasifirm in the construction industry. *Journal of Economic Behavior and Organisation*, 2(4), 335-357. [https://doi.org/10.1016/0167-2681\(81\)90013-5](https://doi.org/10.1016/0167-2681(81)90013-5).
- Grandori, A., & Soda, G. (1995). Inter-firm networks: antecedents, mechanisms, and forms. *Organisation Studies*, 16(2), 183-214. <https://doi.org/10.1177/017084069501600201>.
- Gibbons, R., & Henderson, R. (2013). What do managers do?. In R. Gibbons & J. Roberts (eds.), *the Handbook of organisational economics* (pp. 680-731). New Jersey: Princeton University Press.
- Helper, S., & Henderson, R. (2014). Management practices, relational contracts, and the decline of General Motors. *Journal of Economic Perspective*, 28(1), 49-72. <https://doi.org/10.1257/jep.28.1.49>.

- Helper, S., & Sako, M. (1995, April). Supplier relations in Japan and the United States: are they converging? *MIT Sloan Management Review* 36(3). Retrieved from <https://sloanreview.mit.edu/article/supplier-relations-in-japan-and-the-united-states-are-they-converging/>.
- Irawati, D. (2012). *Knowledge transfer in the automobile industry: global-local production networks*. London: Routledge.
- Iwamoto, Y. (2002, April 12). Asutora, Toyota ni tsuikashusshiyousei—jidoushagouben-koukeide kentou. *Nihon Keizai Shimbun*, Retrieved from <https://t21.nikkei.co.jp/g3/CMN0F11.do>.
- Iwamoto, Y. (2002, June 6). Asutora, tsuikashusshiwo yousei—goubenaiteno Daihatsu ni. *Nihon Keizai Shimbun*. Retrieved from <https://t21.nikkei.co.jp/g3/CMN0F11.do>.
- Iwamoto, Y. (2003, February 20a). Toyota, Indonesia genchikoujoukogaishani—seisansaihen e shu-douken. *Nihon Keizai Shimbun*. Retrieved from <https://t21.nikkei.co.jp/g3/CMN0F11.do>.
- Iwamoto, Y. (2003, February 20b). Toyota to Asutorasha, Indonesia goubenkigyouno seizou—hanbai-jigyounobunshakade kihongoui. *Nihon Keizai Shimbun*. Retrieved from <https://t21.nikkei.co.jp/g3/CMN0F11.do>.
- Jusmaliani & Ruky, I. S. (1993). *Transfer of technology from the Perspective of Host Countries: A Comparative Study on Japanese Automotive Industry in Indonesia and Malaysia*. Jakarta: Indonesian Institute of Science (LIPI).
- Kagaya, K. (1997, March 19). Indonesia no kokuminshakeikaku, Asutora ga zemenshien e—Hasan kaichou Kaiken. *Nihon Keizai Shimbun*. Retrieved from <https://t21.nikkei.co.jp/g3/CMN0F11.do>.
- Kagaya, K. (1998, June 12). Indonesia jidoushasaioute [Asutora], shachoukoutaide keieitatenashi. *Nihon Keizai Shimbun*. Retrieved from <https://t21.nikkei.co.jp/g3/CMN0F11.do>.
- Kanazawa. (1993, June 21). Indonesia • Asutorasha, Toyota ga shihonsanka. *Nihon Keizai Shimbun*. Retrieved from <https://t21.nikkei.co.jp/g3/CMN0F11.do>.
- Klein, B. 2007. The economic lessons of Fisher Body-General Motors.” *International Journal of the Economic of Business*, 14(1), 1-36. <https://doi.org/10.1080/13571510.601141112>.
- Klein, B., Crawford, R. G. & Alchian, A. A. (1978). Vertical integration, appropriable rents, and the competitive contracting process. *Journal of Law and Economics*, 21(2), 297-326. <https://doi.org/10.1086/466922>
- Komaki. (1993, January 12). Yureru Indonesia sangyokai—Asutora Gurupu kuyou. *Nihon Keizai Shimbun*. Retrieved from <https://t21.nikkei.co.jp/g3/CMN0F11.do>.

- Langlois, R. N., & Foss, N. J. (1999). Capabilities and governance: the rebirth of production in the theory of economic organisation." *Kyklos*, 52(2), 201-218. <https://doi.org/10.1111/j.1467-6435.1999.tb01442.x>
- Langlois, R. N., & Robertson, P. L. (1989). Explaining vertical integration: lessons from the American automobile industry. *Journal of Economic History*, 49(2), 361-375. <https://doi.org/10.1017/S0022050700007993>.
- Levin, J. (2003). Relational incentive contracts. *American Economic Review*, 93(3), 835-857. <https://doi.org/10.1257/000282803322157115>.
- Linbland, J. T., Wee, T. K., Purwanto, B. & Suryo, D. (2002). *Indonesian economic development and Japanese technology*. (Working Paper Series Vol. 2002-9). Retrieved from Asian Growth Research Institute website: http://www.agi.or.jp/user03/927_220.pdf.
- Malcomson, J. M., (2013). Relational incentive contracts. In R. Gibbons & J. Roberts (eds.), *the Handbook of organisational economics* (pp. 1014-1065). New Jersey: Princeton University Press.
- Mariti, P., & Smiley, R. H. (1983). Co-operative agreements and the organisation of industry. *Journal of Industrial Economics*, 31(4), 437-451. <https://doi.org/10.2307/2098340>.
- McMillan, J., & Woodruff, C. (1999a). Dispute prevention without courts in Vietnam. *Journal of Law, Economics, and Organisation*, 15(3): 637-658. <https://doi.org/10.1093/jleo/15.3.637>.
- McMillan, J., & Woodruff, C. (1999b). Inter-firm relationships and informal credit in Vietnam. *Quarterly Journal of Economics*, 114(4), 1285-1320. <https://doi.org/10.1162/003355399556278>.
- Menard, C. (2004). The economics of hybrid organisations. *Journal of Institutional and Theoretical Economics*, 160(3), 345-376. <https://doi.org/10.1628/0932456041960605>.
- Menard, C. (2013a). Hybrid modes of organisation. In R. Gibbons & J. Roberts (eds.), *the Handbook of organisational economics* (pp. 1066-1105). New Jersey: Princeton University Press.
- Menard, C. (2013b). Plural forms of organisation: where do we stand? *Managerial and Decision Economics*, 34(3-5), 124-139. <https://doi.org/10.1002/mde.2578>.
- Menard, C. (2014). Embedding organisational arrangements: towards a general model. *Journal of Institutional Economics*, 10(4), 567-589. <https://doi.org/10.1017/S1744137414000228>.
- Menard, C., & Raynaud, E. (2015). *Ulysses and the Sirens: commitment and control in multilateral hybrid organisation*. (Working Paper). Retrieved from Tilburg University website: http://www.tilburguniversity.edu/upload/60365fe2-b4aa-4124-886b-f617fea9234c_Paper_Raynaud.pdf.
- Monteverde, K., & Teece, D. J. (1982). Supplier switching costs and vertical integration in the automobile industry. *Bell Journal of Economics*, 13(1), 206-213. <https://doi.org/10.2307/3003441>.

- Nakamura, K. (2004). The Toyota Production System in Indonesia. In R. Busser & Y. Sadoi (eds.), *Production Networks in Asia and Europe: Skill Formation and Technology Transfer in the Automobile Industry* (pp. 203-220). London: Routledge.
- Nakamura, K., Husodo, Z. A., & Hadiwijoyo, U. M. (2001). *Management comparison and localization: Indonesia and Japan*. Jakarta: Yayasan Obor Indonesia.
- Natsuda, K., Otsuka, K. & Thoburn, J. (2015). Dawn of industrialisation? the Indonesian automotive industry. *Bulleting of Indonesian Economic Studies*, 51(1), 47-68. <https://doi.org/10.1080/00074918.2015.1016567>
- Nishiguchi, T. (1994). *Strategic industrial sourcing: the Japanese advantage*. New York: Oxford University Press.
- Nomura, T. (2003). Indonesia jidosha sangyo no kaihoukatei (liberalization process of the Indonesian automotive industry). *ShoKei Ronsou*, Vol. 53. Kagoshima Prefectural College: Japan.
- Oxley, J. E. (1997). Appropriability hazards and governance in strategic alliances: a transaction cost approach. *Journal of Law, Economics, and Organisation*, 13(2): 387-409. <https://doi.org/10.1093/oxfordjournals.jleo.a023389>.
- Powell, W. W. (1990). Neither market nor hierarchy: network forms of organisation. In B. M. Staw, & L. L. Cummings (eds.), *Research in Organisational Behavior*, Vol. 12 (pp. 295-336). Greenwich, CT: JAI Press.
- Richardson, G. B. (1972). The organisation of industry. *The Economic Journal*, 82(327): 883-896. <https://doi.org/10.2307/2230256>.
- Sako, M. (2004). Supplier development at Honda, Nissan and Toyota: comparative case studies of organizational capability enhancement.” *Industrial and Corporate Change*, 13(2): 281-308. <https://doi.org/10.1093/icc/dth012>.
- Sato, Y. (1996). The Astra Group: a pioneer of management modernization in Indonesia. *The Developing Economies*, 34(3): 247-280. <https://doi.org/10.1111/j.1746-1049.1996.tb00740.x>.
- Sato, Y. (1998). The machinery component industry in Indonesia: emerging subcontracting networks. In Y. Sato (ed.), *Changing Industrial Structures and Business Strategies in Indonesia* (pp. 107-145). Tokyo: IDE.
- Setyo, D. & Tanjung, L. (2000, April 16). Ancaman baru Astra. *Tempo*, 29(6).
- Solomon, J. (1999, Dec. 23). “US Investor Group Says Astra Tried to Block its Bid,” *Wall Street Journal*. Retrieved from http://www.gilbertglobal.com/news/1999_122399.htm.
- Tadelis, S., & Williamson, O. E. (2013). Transaction cost economics. In R. Gibbons & J. Roberts (eds.), *the Handbook of Organisational Economics* (pp. 159-189). New Jersey: Princeton University Press.

- Tanaka, M. (2017). *Exporting Sweatshops? Evidence from Myanmar*. (Working Paper). Retrieved from The Japan Society of International Economics website: <https://www.jsie.jp/kanto/wp/wp-content/uploads/tanaka170415paper.pdf>.
- Tarmidi, L. T. (2004). Indonesian industrial policy in the automobile sector. In R. Busser & Y. Sadoi (eds.), *Production networks in Asia and Europe: skill formation and technology transfer in the automobile industry* (pp. 95-112). London: Routledge.
- Tarmizi, H. (1996, May 24). Timor Car Unlikely to Hit the Road in September. *The Jakarta Post*, p. 10.
- Taufiqurohman, M., Hidayat, A. & Tanjung, L. (1999, December 26). Air keruh Standard Chartered. *Tempo*, 28(42).
- Taufiqurohman, M., Tanjung, L. & Cahyani, D. R. (2001, June 10). Jalan menuju selamat bagi Astra. *Tempo*, 30(14).
- Terdudomtham, T. (2004). Thai policies for the automobile sector: focus on technology transfer. In R. Busser & Y. Sadoi (eds.), *Production networks in Asia and Europe: skill formation and technology transfer in the automobile industry* (pp. 30-50). London: Routledge.
- Thee, K. W. (2010). Understanding Indonesia: the role of economic nationalism. *Journal of Indonesian Social Sciences and Humanities*, 3 (1), 55-79. Retrieved from <https://dspace.library.uu.nl/handle/1874/203612>
- Thee, K. W. (2012). Indonesia's auto parts industry. In *Indonesia's economy since independence*. Singapore: ISEAS.
- Wada, S. (2003, May 26). Jidoushaote, DounanA seisankyotenkogaishaka, shashuhenkoya touchi—ishshiketteijinsokuni. *Nihon Keizai Shimbun*. Retrieved from <https://t21.nikkei.co.jp/g3/CMN0F11.do>.
- Williamson, O. E. (1975). *Market and hierarchies: analysis and antitrust implications*. New York: Free Press.
- Williamson, O. E. 1985. *The economic institutions of capitalism*. New York: Free Press.
- Williamson, O. E. 1991. Comparative economic organisation: the analysis of discrete structural alternatives." *Administration Science Quarterly*, 36(2), 269-296. <https://doi.org/10.2307/2393356>.
- Williamson, R. (1996, April 27a). Toyota Astra to start producing mass-market sedan. *The Jakarta Post*, p. 8.
- Williamson, R. (1996, April 27b). Bimantara Citra to go ahead with National Car Plan. *The Jakarta Post*, p. 9.
- Witoelar, W. (1984). Ancillary firm development in the motor vehicle industry in Indonesia. In K. Odaka (ed.), *The motor vehicle industry in Asia: a study of ancillary firm development* (pp. 17-84). Singapore: Singapore University Press.

Appendices

Appendix 1: Toyota-Astra In-Group Component Makers Established in 1970-1989

Company Name	Year of Establishment	Component Products	Astra's Partners
PT Century Batteries Indonesia	1971	Batteries	GS Yuasa
PT GS Battery	1972	Batteries	GS Yuasa
PT Kayaba Indonesia	1976	Shock absorbers and motorcycle front forks	Kayaba, Toyota
PT Inkoasku (later merged as Pako Group)	1976 (acquired around 1980)	Wheel Rims (later cylinder heads, master, and parking brake cylinders)	Frits Eman
PT Denso Indonesia (formerly PT Nippondenso Indonesia)	1978	Horns, starters, and injectors	Denso
PT Akebono Brake Astra Indonesia (Previously PT Tri Dharma Wisesa)	1981	Brakes	Akebono (from 1996, previously unspecified Japanese company)
PT Palingda Nasional (later merged as Pako Group)	1981	Wheels	Topy Industries
PT Aisin Indonesia	1982	Hinges, door handles, window regulators, clutches, manifolds, oil pumps, water pumps	Aisin
PT Inti Ganda Perdana	1982	Rear axles and propeller shafts	Mitsubishi Motor, Toyota Motor, JTEKT Corp., Akashi Kikai
PT Wahana Eka Paramitra	1983	Transmission cases and assembly	Toyota Motor
PT Menara Terus Makmur	1986	Forging parts, mechanical jack	Metalart Corp., Kawasaki
PT SKF Indonesia	1986	Deep groove ball bearings	AB SKF
PT Indokarlo Perkasa	1988	Engine mounts, rubber hose, Functional and anti-vibration rubber parts	Toyoda Gosei, Bridgestone

Source: Astra Otoparts Company Profile

Appendix 2: Toyota Astra In-Group Component Makers Established from 1990-2000

Company Name	Year of Establishment	Product	Astra's Partners
PT Astra Otoparts-Nusametal Division	1990	Aluminium die-casting components	None
PT DIC Astra Chemicals	1990	Colourants for plastics, textiles, plywood, and leather	DIC Corp.
PT Federal Izumi Indonesia	1990	Pistons	MAHLE Engine
PT Gemala Kempa Daya	1990	Frame chassis	Mitsubishi Motor
PT Astra Otoparts-Adiwira Plastik Division	1991	Plastic components (air cleaners, back mirrors, head lamps, painting lines, and plastic injections) and seat assembly line	None
PT Astra Daido Steel Indonesia	1994	High grade steel, machining plates, and heat treatment services	Daido
PT Federal Nittan Industries	1995	Engine valves	Nittan Valve
PT Astra Nippon Gasket Indonesia	1996	Gaskets	Nippon Gasket
PT AT Indonesia	1996	Manifolds, flywheels, bearing caps, pulley brackets, pressure plates, retainers, intermediate, timing gear cases, brake cylinders, and gearcases	Aisin Takaoka
PT Nusa Keihin Indonesia	1997	Transmission assembly	Keihin Seimitsu Kogyo
PT Hamaden Indonesia Manufacturing	1997	Horns	Denso

Source: Astra Otoparts Company Profile.