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# Concurrent sourcing as a termination safeguard

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**Abstract:** This paper discusses the conditions under which concurrent sourcing is an effective safeguard. Relying on the transaction cost and the resource-based theories, we develop a conceptual model to argue that concurrent sourcing shortens the period that a buyer needs in order to internalise production and thus, it shortens the period in which an external supplier is able to hold-up a buyer. Concurrent sourcing also allows for short run expansion of production and reduces costs of lost customers. However, when complementarities and diseconomies of scale make concurrent sourcing an efficient choice for a buyer, the same complementarities and diseconomies of scale also weaken the threat that the internal production unit may replace the external supplier.

**Keywords:** concurrent sourcing; parallel production; safeguards.

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## 1 Introduction

Concurrent sourcing is a term used by Parmigiani (2007) to describe the phenomenon where a firm simultaneously buys and makes the same good or service. Concurrent sourcing has also been labelled plural sourcing (Puranam et al., 2013) and plural governance in industrial purchasing (Heide, 2003), whereas plural forms and plural forms of governance refer to both upstream and downstream combinations of different governance structures (e.g., Krzeminska et al., 2013; Menard, 2013; Rimbach et al., 2015; Schnaider et al., 2018). Several researchers have documented the existence of concurrent sourcing, (e.g., Nordigården et al., 2014; Heide et al., 2014) and recent reviews of the literature identify a number of different explanations for the existence of concurrent sourcing (Raynaud et al., 2019; Rimbach et al., 2015; Mols, 2010). In this emerging research, different synergies are identified (e.g., Raynaud et al., 2019; Meiseberg, 2013). These synergies arise when the external supplier and the internal production unit positively affect each other and increase performance. One of these synergies is concurrent sourcing as a safeguard. This safeguard is the credible threat to switch to a singular governance structure. Hence, concurrent sourcing is the threat that the internal production unit and the external supplier may replace each other either by in-sourcing or out-sourcing. This safeguard helps buyers avoid hold-up and lowers suppliers' opportunistic behaviour (Mols, 2017).

Most researchers have referred to Porter (1980) for theoretical arguments for this plural form safeguard (e.g., Michael, 2000; Puranam et al., 2013). Puranam et al. (2013, p.1151) add that their model "capture the intuition that increasing levels of sourcing in one mode increase … the credibility of the threat of replacing sourcing in the other mode." So the theoretical basis for the plural form safeguard seems to be ideas of market power (Porter, 1980) and the assumption that internal production signals an ability to integrate if necessary (Michael, 2000).

However, empirical observations question the existence of such plural form safeguards. For example, Vanneste and Frank (2012) observe that firms are reluctant to terminate their internal production, and this reluctance affects the behaviour of the internal production unit. Bradach (1997) observe that in a downstream context franchisors do not terminate relationships with franchisees. Instead, they may prevent franchisees from adding additional stores or restaurants. Other observations indicate that the strength of the plural form safeguard towards suppliers increases with a higher internal production (e.g., Mols et al., 2012), and Michael (2000) finds that the plural form lowers litigation.

While these contributions shed light on the conditions under which it might be efficient or not to use concurrent sourcing as a safeguard; they do not develop these aspects to a larger extent and remain limited to particular contexts and applications.

This paper seeks to address these issues by scrutinising concurrent sourcing as a safeguard and by pushing the model in Mols (2017) a step further. More specifically, it explores the following questions: What are the economic explanations for the safeguarding effect of concurrent sourcing and how does this safeguard affect performance? What affects the strength of concurrent sourcing as a safeguard? And what are the limits of this safeguard? The paper starts by reviewing the literature about plural forms as safeguards. Based on a model developed by Puranam et al. (2013) the paper identifies different factors that affect the cost of concurrent sourcing and the cost of full

vertical integration. Finally, it analyses how these factors limit the use of concurrent sourcing as a safeguard. Implications are also offered.

## 2 Theoretical background

Transaction-specific assets have lower value when used in other transactions or by other users, and transaction cost theory predicts that transaction-specific investments need to be safeguarded. A safeguard is usually a long-term contract. For high asset specificity internalisation of the transaction is the efficient safeguard (Williamson, 1996). As noted by Mesquita and Brush (2008, p.785) inappropriate governance mechanisms lead to losses, haggling, and negotiation inefficiencies when owners of specific assets trade with opportunistic partners. Simple transactions involving non-specific investments do not need a safeguard. With non-specific assets it is easy to switch suppliers, and the assets do not lose their value. Therefore, transactions with no asset specificity are efficiently governed by the market (Williamson, 1985).

Several authors have noted that if a buyer establishes an internal production unit, it provides an alternative source of supplies for the buyer, and it may take less time and be less costly for the buyer to expand the internal production capacity compared to a situation without internal production. Therefore, the plural form makes it possible to credibly threaten external units to be replaced with internal production if they act opportunistically (Menard, 2013; Porter, 1980; Dutta et al., 1995). With a plural form safeguard, the external supplier will be less likely to exploit the investments in transaction-specific assets, and if the buyer is held-up, the buyer can mitigate the negative consequences by terminating the relationship and instead produce internally.

Dutta et al. (1995, p.195) argue that the internal production is a signalling device that makes it clear to the external units that the firm '… is in a better position to replace …' the external units if necessary. Michael (2000) echoes this when he argues that in a downstream context it is more important with a dispersion of the internal units. The dispersion of internal units shows the external units that the firm is present, able, and committed to internalise. So according to Michael (2000) it is not so much the proportion of integrated activities, as it is the visibility that is important for the effectiveness of the safeguard. Furthermore, Michael (2000) argues that ownership of some units is the strongest possible signal of commitment, and Heide (2003, p.22) adds that concurrent sourcing also lowers the degree of asset specificity of the buyer's investments.

Puranam et al. (2013) view the safeguard as a complementarity and postulate in their model that the marginal benefit of procuring a good from the market depends on the level of in-house production, and vice versa. This emphasises that concurrent sourcing lowers the propensity of the external suppliers to act opportunistically compared to a situation where the firm has no internal production. Hence, concurrent sourcing provides a special safeguard, which is more than a mix of the safeguards provided by the individual governance structures. In other words, they assume that there are safeguarding spill-overs. For these spill-overs to be effective, the buyer, the internal production unit, and the external suppliers all have to be aware of each other.

Whereas the literature is explicit about the presence of a signalling effect of concurrent sourcing, it does not answer questions like: Can all firms use concurrent sourcing as a safeguard, and when is it not efficient to use concurrent sourcing for

safeguarding transaction specific assets? In the following we identify the factors affecting the usefulness of concurrent sourcing as a safeguard.

### *2.1 The economics of concurrent sourcing as a safeguard*

In contrast to most of the existing literature, (e.g., Porter, 1980), we base our economic explanations on arguments from the most prominent theories in strategic sourcing decisions (Giunipero et al., 2019): the resource-based theory (e.g., Dierickx and Cool, 1989), the transaction cost theory (Williamson, 1996) and an economic model developed by Puranam et al. (2013). In line with the sourcing literature, we treat these approaches as complementary (Gulbrandsen et al., 2009; Brewer et al., 2014) to understand the plural form as an effective safeguard.

In transaction cost theory a safeguard lowers the pay-off from opportunistic behaviour and thus discourages opportunistic behaviour, especially when there are specific assets to be secured. However, a safeguard, such as concurrent sourcing, is also costly, and when the costs of a safeguard increase, then firms are likely to rely on alternative safeguards such as the hierarchy, long-term contracts or hostages. For some buyers, concurrent sourcing and full vertical integration may not even be economically feasible, and therefore concurrent sourcing is not an efficient safeguard.

There are two main benefits of concurrent sourcing as a safeguard. First, concurrent sourcing reduces the cost to the buyer in the period from a supplier tries to hold-up the buyer until the buyer has internalised the production. In this hold-up period, the buyer may have to accept increases in suppliers' prices and reduced product quality. Second, concurrent sourcing is a strong signal that the buyer is able to internalise production and thereby replace the supplier. Compared to a pure contractual safeguard, concurrent sourcing requires less documentation about violations of agreements with the supplier and thus, the costs of the formal legal system is avoided. The punishment of the opportunistic supplier takes the form of a reduction in quantity bought from the supplier. Therefore the effectiveness of the safeguard depends on how much profit the supplier loses, when the buyer buys less from her.

## 3 The hold-up period

Concurrent sourcing shows the supplier that it is technically possible for the buyer to internalise production, and in case of a hold-up, the response will be to internalise. Therefore, a relevant question is how concurrent sourcing (compared to external sourcing) reduces the cost of internalising all production of a component.

Concurrent sourcing reduces the time period in which the buyer is held-up by the supplier. Internalising half of the production may reduce the cost of hold-up by halving both the time of the hold-up and the quantity needed from the external supplier. So without concurrent sourcing the firm incurs the cost of $C = pyt$, where $p$ is the price increase per unit caused by the hold-up, $y$ is the quantity bought from the external supplier, and $t$ is the number of time periods that a quantity has to be bought from the external supplier. With internal production of half the quantity needed the cost of the hold-up is $p(y / 2)(t / 2) = 1/4(pyt)$. So concurrent sourcing may reduce the cost of a hold-up significantly, when it reduces the time period of the hold-up. Furthermore, the

smaller the quantity bought from the external supplier, the faster and less costly for the buyer to internalise all production.

In the above it is assumed that the time needed for internalising production is proportional to the quantity of production that is internalised. However, it may take more or less time to internalise production. For example, time compression diseconomies could be significant when establishing the first production capacity (Dierickx and Cool, 1989). If there are barriers to imitation (Peteraf, 1993) such as time compression diseconomies, and the buyer has no internal production, then it will be costly or impossible to replace an external supplier in the short run. This means that concurrent sourcing may be necessary for a buyer to maintain the option to internalise.

Proposition 1 The more internal production, the less time it takes to replace an external supplier by internal production.

Concurrent sourcing reduces the cost of lost business. Often customers do not contribute equally to a firm's profit, and for some firms a substantial percentage of their customers are unprofitable (e.g., Niraj et al., 2001). Customers may be profitable because they have a high willingness to pay. Other customers may be important because the firm has made a contractual commitment to supply them and may experience economic fines in cases where delivery is not on time. By use of concurrent sourcing, the buyer can continue to supply the important and profitable customers even if an external supplier refuses to deliver, reduces quality or increases prices. So with concurrent sourcing a hold-up by an external supplier may only have a weak effect on the buyer's profit.

Proposition 2 The more internal production, the less revenue is lost if an external supplier fails to deliver.

In the short run a buyer is not able to expand physical and human capital such as machines and experienced labour. As a buyer tries to replace external suppliers with internal production she adds costly overtime, extra shifts, and higher wages to the employees. Furthermore, a more intensive use of capital also increases costs. This results in diseconomies of scale, when a buyer expands production in the short-term. However, the cost of expanding internal production is likely to be lower, the more internal production the buyer has already established. For example, the overtime per employee and the extra shifts will be lower for a firm with a large internal production compared to a firm with a small internal production. A firm with a small production capacity may only be able to increase production with a few units and hence, it may be impossible to replace an external supplier.

Proposition 3 The more internal production, the lower the costs of replacing an external supplier (by internal production) in the short run.

Proposition 4 The more internal production, the stronger concurrent sourcing is as a safeguard for the buyer.

This indicates that concurrent sourcing is an efficient safeguard of specific assets of the temporal type. With these assets, the problem is primarily to find alternative suppliers in the short run.

## 4 A cost model of concurrent sourcing

The costs of concurrent sourcing and of vertical integration to the buyer and the supplier determine the efficiency of concurrent sourcing as a safeguard for the buyer. When the costs to the buyer of using concurrent sourcing and vertical integration are low, and it is very costly to the supplier, when the buyer decreases the quantity bought from the supplier, then it is an efficient safeguard for disciplining suppliers to behave non-opportunistically. However, this leads to the next question: when is concurrent sourcing an efficient way to increase suppliers' costs of opportunism and when is it too costly?

Since concurrent sourcing is a governance structure for which the buyer's response to supplier opportunism is to internalise production, (e.g., Puranam et al., 2013), we analyse the cost of both concurrent sourcing and the cost of internal production in order to understand concurrent sourcing as a safeguard. We look at the costs for both the buyer and the external supplier. For this purpose we take a starting point in a full information optimisation model developed by Puranam et al. (2013). In their model a buyer is making x and buying the rest y from external suppliers, and total quantity sourced is $q = y + x$.

Average unit cost of internal production x is given by $c(x, y) = \left( m - k_1 y + \frac{i}{2} x \right)$.

Average unit price paid to a supplier for y is given by $p(x, y) = \left( b + \pi - k_2 x + \frac{e}{2} y \right)$.

Total cost for the buyer is $C(x, y) = xc(x, y) + yp(x, y)$.

The parameter $m$ is volume independent and includes both production and transaction costs of internal sourcing. The parameter $b$ is also volume independent, and it represents the production and transaction cost of the average price paid per unit when sourcing from an external supplier. The parameters $k_1$ and $k_2$ capture knowledge and incentive complementarities between the internal production and the external supplier. For example, benchmarking and transfer of knowledge between internal production and external suppliers may reduce costs. Diseconomies of scale are captured by the parameters $i$ (internal production) and $e$ (external sourcing).

For our purpose, the safeguard provided by concurrent sourcing is not part of the complementarities, and we introduce two new parameters $\pi$ and $s$. The parameter $\pi$ is the external supplier's unit mark-up. This unit mark-up plus the volume independent unit cost $b$ gives a new parameter $s = \pi + b$. We also assume that first the external supplier sets a mark-up $\pi$, then she announces $s$, and then the buyer knows $p(x, y)$. Afterwards, the buyer chooses the $x$ and $y$, which minimise C($x$, $y$). This means that the supplier's profit is $y\pi$.

Following Puranam et al. (2013) we set $q = x + y = 1$ and all parameters are assumed larger than zero. C($x$, $y$) is minimised when:

$$y^* = 1 - x = \frac{i + (k_1 + k_2) - (b + \pi - m)}{e + i + 2(k_1 + k_2)} \tag{1}$$

When $(b + \pi - m) \geq (i + k_1 + k_2)$ then the hierarchy is efficient for the buyer, and when $(b + \pi - m) \leq -(e + k_1 + k_2)$ then the market is efficient (cf. Puranam et al., 2013).

The external supplier's profit $y\pi$ is maximised when:

$$\pi^* = \frac{i + k_1 + k_2 - b + m}{2} \tag{2}$$

And the buyer chooses:

$$y^* = \frac{i + (k_1 + k_2) - (b - m)}{2(e + i + 2(k_1 + k_2))} \tag{3}$$

### *4.1 The buyer's costs*

To punish supplier opportunism, the buyer has to buy less than the amount $y^*$, which is optimal for the external supplier and for the buyer given $\pi^*$. Instead the buyer will produce more internally, i.e., increase $x$ and decrease $y$ accordingly. This costs the buyer: $C(x, y) - C(x^*, y^*)$. If the buyer internalises all production then $y = 0$, and $x = 1$. Compared to the choice $x^*$ and $y^*$, the buyer incurs extra cost of:

$$\begin{aligned} C(1, 0) - C(x^*, y^*) &= (y^*)(m - s) \\ &\quad + (y^* x^*)(k_1 + k_2) - y^{*2}\frac{e}{2} + y^{*2}\frac{i}{2} + (x^* y^*) i \end{aligned} \tag{4}$$

With full vertical integration, external production is reduced by $y^*$ and consequently internal production is increased with $y^*$. This increase costs.

Firstly, the costs are increased because the buyer is no longer able to exploit the lower unit independent production cost of the external supplier. Therefore costs increase with: $(y^*)(m - s)$. Thus, buyer's costs of full vertical integration increase when $m - s$ increases. Therefore the higher the unit cost of internal production and the lower the unit cost of using external suppliers, the more will it cost the buyer to internalise all production, and the weaker is concurrent sourcing as a safeguard. Since $s^* = b + \pi^*$ this may be separated into two parts. First, the stronger the capability of the external supplier, the lower is $b$, and the more it costs the buyer to fully internalise production. Second, the higher the markup $\pi$ demanded by the external supplier, the less it costs the buyer to internalise all production. We also note that an increase in $\pi$ makes it efficient for the buyer to produce more internally.

So concurrent sourcing is a safeguard because it shows to the external supplier that increases in the unit mark-up $\pi$ will be countered by a decrease in the quantity bought from the external supplier. Hence, compared to a situation where concurrent sourcing is not used by the buyer, concurrent sourcing more clearly demonstrates that a raise in supplier prices leads to a reaction.

Secondly, full vertical integration also increases costs because it removes the complementarities $(y^* x^*)$ $(k_1 + k_2)$. Thus, the stronger the complementarities $(k)$, the higher the costs of full vertical integration compared with the optimal level of internal production and external sourcing. Hence, stronger complementarities increase the relative cost of full internalisation, and therefore the stronger the complementarities the weaker is concurrent sourcing as a safeguard.

Thirdly, the part $\left(-y^{*2}\frac{e}{2}\right)$ is the external supplier's diseconomies of scale that are avoided and therefore reduce the costs of full vertical integration. Hence, the stronger the diseconomies of scale of external supplier production ($e$) the less will it cost to fully internalise production for the buyer. Therefore, stronger diseconomies of scale in external production strengthen concurrent sourcing as a safeguard.

Finally, the supplier's diseconomies of scale are replaced by possible diseconomies of scale in internal production. They increase cost with: $\left(y^{*2}\frac{i}{2}+\left(x^{*}y^{*}\right)i\right)$. In other words, the stronger the diseconomies of scale of internal production ($i$), the more it will cost to fully internalise production for the buyer. Therefore, the stronger diseconomies of scale in internal production, the weaker concurrent sourcing is as a safeguard.

When a high internal production relative to supply from external suppliers is optimal, i.e., when $y^*$ is low, then it will not be costly for the buyer to internalise production. Consequently, the lower $y^*$ is, the lower are the costs of full vertical integration compared to the costs of concurrent sourcing. Therefore the prediction is that the higher internal production $x^*$ and the lower $y^*$, the stronger is concurrent sourcing as a safeguard. However, $x^*$ is not immediately observable by the external supplier, and a high $x$ may be a false signal. Furthermore, significant complementarities and diseconomies of scale make it efficient with a relatively high $x^*$, but it may also make it costly to further internalise production and thus, lose the complementarities. In these cases a high internal production $x^*$ does not give credibility to a threat of replacing an external supplier.

While complementarities and diseconomies of scale of internal production make concurrent sourcing efficient, they also increase the costs of full vertical integration and hence they weaken concurrent sourcing as a safeguard. Hence, when, i.e., $k_1$, $k_2$ are high both the buyer and the external supplier have an interest in using concurrent sourcing and avoiding complete internalisation. So when the safeguard is most needed to reduce transaction costs in a concurrent sourcing arrangement, the threat of further internalisation is less credible.

Proposition 5 Stronger complementarities and internal diseconomies of scale make the threat of internalising less credible.

Proposition 6 The weaker the complementarities, the stronger is concurrent sourcing as a safeguard.

Proposition 7 The less diseconomies of scale in internal production; the stronger is concurrent sourcing as a safeguard.

Proposition 8 The stronger the relative internal production capabilities, the stronger is concurrent sourcing as a safeguard.

### *4.2 The external supplier's costs*

The external supplier loses profit when y is set lower than $y^*$. When the internal production $x$ is increased and $y$ is decreased accordingly, the cost to the buyer increases less than the profit lost by the external supplier. Hence, when ($e \geq i$) and for ($x < 1$), then

$\frac{dC}{dx} < \pi^*$, i.e., the marginal cost for the buyer of increasing $x$ is lower than the external supplier's marginal loss of profit ($\pi^*$), when internal production ($x$) increases, and external supplier sales ($y$) decreases. If the buyer chooses not to source from the supplier, then $y = 0$ and the supplier loses:

$$\left(y^* - y\right)\pi^* = y^*\left(\frac{m-b}{2}\right) + \left(\frac{1}{2}y^*\right)(k_1 + k_2) + \left(\left(\frac{1}{2}\right)y^*\right)i \tag{5}$$

Thus, internalisation of production by the buyer lowers supplier profit more, the stronger the complementarities ($k$), the larger the diseconomies of scale of the internal producer ($i$), the stronger the capabilities of the external supplier (lower $b$), and the weaker the buyer's internal capabilities (higher $m$).

### *4.3 When the buyer sets the price*

In the previous analysis we have assumed that the external supplier sets the mark-up $\pi^*$, and therefore sets the price. In a situation where the buyer sets the mark-up unilaterally it may be set close to zero, and the price offered to the external supplier results in zero profit to the external supplier. Since the two situations, where one of the parties set the mark-up and the price unilaterally represent two extremes, we expect results between these two extremes.

### *4.4 Transaction specific investments*

Transaction specific assets lose value when deployed to alternative uses or alternative users (Williamson, 1985). In the extreme, a product or service is produced only by idiosyncratic investments, and all the assets lose their value if the production is terminated. Hence, the external supplier's transaction specific investments are sunk costs, and after the investment they do not enter the optimisation problem directly. However, the investments lower supplier production costs $b$ whereas $\pi^*$ and $y^*$ increase. This means that the external supplier now loses more when the buyer internalises a larger share of her requirements.

A buyer may also invest in transaction specific assets in the relationship with an external supplier, and these investments also reduce $b$. So transaction specific investments in a buyer-seller relationship increase the difference between $b$ and $m$. On the other hand, buyer's transaction specific investments related to internal production lower internal production costs ($m$) and reduce differences in production costs.

## 5 Asymmetric information and ambiguity

Firms in a buyer-seller relationship do not have full information, and it may be difficult for them to assess the level of all the parameters in the model. Hence, Menard (2013) argues that firms choose plural forms because, e.g., they cannot assess the precise level of asset specificity, and they face uncertainties that make it difficult to identify the efficient way to monitor transactions.

However, concurrent sourcing also eliminates uncertainties. Hence, it demonstrates that a buyer has the necessary capabilities for producing a component internally. This signals that a buyer's internal production is able to replace an external supplier. Furthermore, it shows that the assets owned by a buyer do not lose all their value when the relationship with an external supplier is terminated.

The model [equation (1)] predicts that lower internal production costs ($m$) and supplier's higher production costs and mark-ups ($s$) lead to a higher proportion of internally produced components. Thus, a higher proportion of internally made components is a sign that a buyer has relatively low unit production cost. Consequently, a high internal production relative to external supplier's production sends a signal that the supplier has set a mark-up ($\pi$) that makes the external supplier more costly than internal production.

When an external supplier estimates a buyer's costs of internal production ($m$) to be much higher than they really are, then the supplier may set a mark-up ($\pi$) that is so high that it is efficient for the buyer to internalise. By internalising only a part of the production a buyer signals to an external supplier that $\pi$ should be lowered. However, the strength of the signal depends on the amount of internal production. A very small internal production may signal that it is costly to internalise, and therefore the buyer prefers to buy from the external supplier despite a high mark-up.

## 6 Size of external supplier

A buyer may buy from one large external supplier or several smaller external suppliers. With many smaller suppliers it will be less costly for a buyer to replace one of the external suppliers with internal production. For a small supplier a termination of a relationship with a buyer may shut down his business. Hence, the consequence for the small supplier is more severe than for the buyer. Thus, concurrent sourcing is probably a more efficient safeguard, when a buyer sources from small, risk averse suppliers.

## 7 Conclusions and discussion

This paper has argued that for understanding concurrent sourcing as a safeguard five questions have to be answered.

First, what does concurrent sourcing cost the buyer? There are many alternative safeguards available (e.g., Buvik and Anderson, 2016; Hanson and Henkel, 2020). If concurrent sourcing is less costly to the buyer than alternative safeguards, then the buyer will use it to reduce costs. The use of concurrent sourcing does neither demonstrate that the buyer threatens the supplier with full vertical integration nor that full vertical integration is an efficient response to supplier opportunism. If the buyer is not able to vertically integrate, then concurrent sourcing is not a safeguard.

Second, what does full vertical integration cost the buyer? The more vertical integration increases the costs to the buyer, the less likely is the buyer to take this step. Therefore, the costs of vertical integration determine how credible concurrent sourcing is as a threat of full vertical integration, and consequently how credible concurrent sourcing is as a safeguard. Financially weak buyers may not be able to use concurrent sourcing as

a safeguard, because the threat of vertical integration will not be believed by the suppliers.

Third, what does concurrent sourcing as a safeguard cost the external supplier? The external supplier loses business that is internalised by the buyer. Transaction specific assets may lose some of their value, and the fear of lower future sales to the buyer may lead the supplier to lower prices. If the external supplier lowers prices as a reaction to concurrent sourcing then the buyer has been able to appropriate a larger share of the value created in the relationship with the supplier (Michael, 2000).

Fourth, what does full vertical integration by the buyer cost the external supplier in terms of lost profit? If the assets are idiosyncratic in the relationship with the specific buyer, then the assets lose all their value when the relationship is terminated. The larger the loss to the external supplier, the larger is his punishment for haggling, high prices, or opportunistic behaviour.

Fifth, to what extent does concurrent sourcing reduce the cost to the buyer in the period from a supplier tries to hold-up the buyer until the buyer has internalised production? The larger the cost effects caused by for example time compression diseconomies, the more effective is concurrent sourcing as a safeguard.

When the cost of changing the proportion of internal/external supplier production is high for all agents, then the governance structure is stable. If the cost of change is small to one agent, but high to another agent, then the structure is unstable, and the agent with the low cost will try to appropriate a larger proportion of the value creation in the buyer-seller relationship (Williamson, 1985). Empirical results indicate that concurrent sourcing is a stable solution (e.g., Parmigiani, 2007), and therefore it is likely that the cost of changing the mix of internal/external supplier production is relatively high.

The termination safeguard is not necessarily effective towards internal production units. As indicated by e.g., Vanneste and Frank (2012) the existence of an external supplier does not have a strong effect on the internal production units. Firms are reluctant to terminate their internal production, and this reluctance affects the behaviour of the internal production units.

Even when concurrent sourcing solves the hold-up problem for the buyer, it may not be chosen because it hurts the relationship with external suppliers. For example, it has been shown that concurrent sourcing may be a means to put downward pressure on prices (Beladi and Mukherjee, 2012), and when the external supplier's assets are idiosyncratic, only long-term contracts or the hierarchy offer the supplier protection of her assets. Therefore, external suppliers are not likely to accept concurrent sourcing, when their investments are transaction specific.

Contractual safeguards reduce ex-post opportunism by offering protection against opportunism. With low uncertainty, a contract provides stability and minimises ex post transaction cost, because haggling is reduced, once the contract is signed. It does not reduce ex-ante opportunism and haggling. However, unforeseen environmental changes may result in costly renegotiations of long-term contracts (Williamson, 1996). The safeguard provided by concurrent sourcing is different. It sends a signal before contract renewal, and thus it works to minimise ex-ante haggling compared to contract-based singular governance structures. It also offers a safeguard during renegotiations, because of the threat available in case there is a need for changes in the contract.

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