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Supply Chain Incentive Alignment: The Gap between Perceived Importance and Actual Practice

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ABSTRACT

Incentive alignment is discussed as one of the key factors for successful implementation of supply chain management. However, there is a lack of empirical research regarding implementation as well as evaluation of the effects of alignment mechanisms in practice. The purpose of this study is therefore to explore and describe the current practice and to identify gaps of Supply chain incentive alignment. The study is an explorative and descriptive survey study based on forty-eight responses from members, supply chain officers, of the Swedish Supply chain panel. The theoretical lenses are based on literature discussing incentive alignment in supply chains, e.g. principal-agency theory and supply chain contracting, but also on literature discussing internal process based management and rewards for goal congruence. The study shows a clear gap between perceived importance and realized practice of both external (inter-organizational) and internal (cross-functional) incentive alignment. Very few of the existing sophisticated coordinating mechanisms proposed in theory were used to any significant extent. In fact, the internal incentive structures seem to counter act, and not support, supply chain orientation. This finding relates not only to non-logistics departments but also to functions in "the logistics family". The major challenge, both externally and internally, is to be able to define incentives that drives behavior in the right direction. The study clearly shows gaps between practitioners' intent and current practice, and it provides a broad range of more sophisticated and coordinating mechanisms than the ones mainly used today.

Keywords: *incentive alignment, goal congruence, cross functional, group incentives, supply chain integration, silo thinking*

1. INTRODUCTION

Even though Supply Chain Management (SCM) and related topics, such as SC integration and SC collaboration, have been discussed since the 1980s as ways to improve performance and profitability, few articles provide empirical evidence of their successful implementation (Stevens, 1989; Narayanan and Raman, 2004; Naslund and Hulthen, 2012; Stevens and Johnson, 2016; Porter, 2019). Managers discuss collaboration and integration much more than they actually practice them (Bowersox *et al.,* 2000; Bagchi and Skjoett-Larsen, 2003). A major challenge in SC integration is that it involves both integrating processes among key members of the SC (*external integration*), as well as integrating cross-functional business processes (*internal integration*) within the firm (e.g., Ellinger, 2000; Pagall, 2004; Simatupang and Sridharan, 2005; Lambert *et al.,* 2005; Trkman *et al.,* 2007; Fawcett *et al.*, 2008; Grubic *et al.,* 2010; Richey *et al.*, 2010; Cook *et al.,* 2011; Schoenherr and Swink, 2012; Msimangira & Venkatraman, 2014; Enz and Lambert, 2015; Fawcett *et al.*, 2015; Ralston *et al.*, 2015). *External integration* relates to the extent to which companies establish collaborative relationships, share information, and coordinate external integration activities with both suppliers and customers (Narasimhan and Kim, 2001; Gunasekaran, 2004). *Internal integration* is the extent to which business functions work cooperatively and interact through cross-functional process integration to resolve conflicts and achieve mutual goals (Pagell, 2004; Danese *et al.,* 2013; deSouza and Haddud, 2017). Theoretically, integration that extends beyond functional silos and firm boundaries should provide value for customers in terms of higher quality, enhanced service level, and lower costs (Ralston *et al.*, 2015; Wong *et al.*, 2011).

A fundamental aspect of successful external and internal integration is that different organizational subunits should *work in the same direction*—their incentives aligned, and their functional goals are congruent. Risk and reward sharing are argued by many authors as the key factors for the successful implementation of SC management (e.g., Cooper *et al.*, 1993; Cooper *et al.*, 1997; Motwani *et al.*, 1998; Bowersox *et al.*, 2000; Mentzer *et al.*, 2001; Lee, 2004; Fawcett *et al.,* 2008). Other researchers describe this phenomenon as supply chain incentive alignment (e.g., Bagchi and Skjoett-Larsen, 2003; Agrell *et al.*, 2004; Lee, 2004; Narayanan and Raman, 2004; Simatupang and Sridharan, 2005, 2008; Fugate *et al.*, 2006; Norrman, 2008; Lundin and Norrman, 2010). Supply chain incentive alignment is argued to be one of the key antidotes for the successful implementation of SCM and external integration; misaligned incentives often cause excess inventory, stock-outs, incorrect forecasts, inadequate sales efforts, and even poor customer service (Narayanan and Raman, 2004). For internal integration, incentives, such as internal organizational evaluation, and a mutual reward system are often used to improve alignment (Ellinger, 2000; Pagell 2004; Fawcett *et al.*, 2015). Improving alignment can reduce the problems caused by the functional silo phenomenon, leading to increased integration and cross-functional collaboration. In turn, this could lead to enhanced company and SC performance.

However, what is the current practice in terms of the implementation of ideas and antidotes for external and internal integration a decade after these concepts have been highlighted in SCM research? Do gaps still exist between the perceived importance and actual practice of supply chain incentive alignment? The purpose of this study is to explore and describe the current practice and gaps in supply chain incentive alignment. In the following section, we discuss related literature. We then present the methodology and results of our study. Finally, we discuss our conclusions, as well as avenues for future research.

2. THEORETICAL LENSES

2.1 External Integration, Supply Chain Incentive Alignment, and Contract Mechanisms

One problem with risk and reward sharing in SCs is that companies might prioritize their own interest instead of the entire SC's, despite the fundamental vision of SCM that companies should focus on the *SC as a whole* (Agrell *et al.*, 2004). SC members are torn between making decisions based on a local (organizational) perspective vis-a`-vis a global (SC) one. Measurements and incentives make companies prioritize organizational goals instead of the channel goal (Simatupang and Sridharan, 2005). A lack of aligned incentives is one of the factors that create SC discontent (Simatupang and Sridharan, 2005). In a large empirical study, Narayanan and Raman (2004) find that companies did not act in ways that maximized the network's profit. Consequently, the SCs performed poorly. They (p. 94) argue that "a supply chain stays tight only if every company in it has reasons to pull in the same direction."

Narayanan and Raman (2004) recommend three types of solutions to redesign incentives: contract-based (changing contracts to reward partners for acting in the SC's best interest), information-based (gathering or sharing information that was previously hidden), and trust-based solutions (using intermediaries or personal relationships to develop trust with SC partners) (see e.g., Fawcett *et al.*, 2017). Simatupang and Sridharan (2005) recommend antidotes, such as mutual objectives, appropriate measures, information sharing, decision synchronization, incentive alignment, and streamlined processes. Narayanan and Raman (2004) argue that companies should explore contract-based solutions before they use other approaches, as contracts are quick and easy to implement. Monetary incentives could be developed or modified to induce SC partners to behave in ways that are best for everybody. Bowersox *et al.* (2000) also propose that financial linkages should be created to make firms dependent on mutual performance, and encourage risk and benefit sharing by detailing how rewards and penalties are to be appropriated across partner firms. Risks, costs, and rewards of doing business should be distributed fairly, but managers find it tedious and time consuming to define roles, responsibilities, and accountability for businesses that they do not manage directly (Narayanan and Raman, 2004).

Several researchers in the operations research stream of literature suggest the use of contracts to solve misalignment problems (e.g., Lee and Whang, 1999; Cachon, 2002; Agrell *et al.*, 2002). Different contract mechanisms are modeled to gain insights into how contracts could affect incentives for coordination and different performance measures (Tsay *et al.*, 1998; Cachon, 2003; Leng and Zhu, 2009; and Hezarkhani and Kubiak, 2010; Eng-Larsson and Norrman, 2014). Tsay *et al.* (1998) classify SC modelling literature focused on contracts into eight streams based on different contract clauses, such as *pricing, minimum purchase commitment, quantity flexibility,* and *lead times.* In this literature, the least sophisticated contract mechanism (and the most commonly used one in practice) is *wholesale price,* which means that the buyer simply pays a *fixed price per unit* (Tsay, 1999; Anupindi and Bassok, 1999; Lariviere and Porteus, 2001). Because of its simplicity, this contract mechanism does not provide significant incentives for more advanced coordination. Another common contract mechanism, also without a significant incentive to improve SC coordination, is to give *volume discounts.* In fact, Lee *et al.* (1997) discuss how *promotions discount* could create bullwhip effects. Agrell *et al.* (2004) compare the traditional *cost-plus contract* for outsourcing services in the telecom industry with other types of contract mechanisms and find that it does not provide relevant coordination incentives. However, Cachon (2003) is convinced that SC performance can improve if firms coordinate by contracting on a set of transfer payments such that each firm's objective is aligned with that of the SC. Examples of payment types are *quantity flexibility agreements* (Tsay, 1999; Nandi, 2016) and the *revenue-sharing scheme* (Cachon and Lariviere, 2005; Dana and Spier, 2001). Dana and Spier (2001) show empirical evidence of how a successful *revenue-sharing contract* contributed to the increased availability of and higher profit for all members of an SC. Other ways to incentivize partners are to use penalties and bonuses (sticks and carrots), preferably defined in service level agreements (Liang and Atkins, 2013).

Researchers using a more qualitative approach (e.g., Brun and Moretto, 2012; Cooper and Ellram, 1993) also present sophisticated mechanisms for sharing risk and rewards in an SC. Cooper and Ellram suggest that alignment can be achieved in three ways: *cross-owning equity, incentive schemes* and *investments in joint assets*. The sharing of risks and rewards is common in certain Japanese industries, in which companies cross-own equity interests in one another. Thus, if one company does well, all companies benefit directly because they are financially tied beyond the bounds of an ordinary business relationship. Cusumano and Takeishi (1991) describe another feature of Japanese contracting and pricing practices: *semi-annual price reduction* throughout the model life cycle. This practice is based on the idea that suppliers should be able to reduce their costs through experience and continual efforts to improve product design, materials, and manufacturing methods. Norrman (2008) shows other empirical examples from the high-tech industry using more advanced structured agreements, such as *minimum purchasing commitment*, but he also discusses how *forecast accuracy* and *cost for excess/obsolete materials* are important issues to address and align. In more advanced collaboration types, such as *VMI* and *CPFR* (e.g., Barratt, 2004), some examples of contractual issues to consider are *who takes ownership of the inventory* and *who manages* it. Obviously, various combinations distribute risk and responsibilities differently (Ståhl Elvander *et al.*, 2007).

Principal agency theory is another theoretical lens that has the contract as the unit of analysis (e.g., Jensen *et al.*, 1976; Eisenhardt, 1989). This theory has clearly inspired researchers, such as Simatupang and Sridharan (2005) and Narayanan and Raman (2004), to highlight incentive alignment issues, such as hidden action, hidden information, and badly designed contracts. In principal agency theory, the optimal choice of contract type depends on the information available and on the uncertainty structure of the situation, the risk attitudes of the actors, the alignment of the actors' objectives, and the cost of monitoring and enforcement of the contract. For choosing contract type, Rapp and Torstensson (1994) highlight (**Figure 1**) the two dimensions of a) whether there are relevant and measurable result variables and b) whether there is low uncertainty in terms of how activities are performed. Based on these dimensions, the behavior-based contract type (e.g., normal salary) or the outcome-based contract type (bonus linked to performance) could be chosen. Following principal agency theory also, *performance-based contracting* (see e.g., Selviaridis and Norrman, 2015) has been increasingly discussed in research and practice, especially in industries in which service is of growing importance. Coordination toward joint SC goals could increase by focusing on performance and outcome. However, behavior-based or outcome-based contracts are not appropriate when the relevant result variables for measuring the outcome do not exist, or when activities/behavior cannot be clearly monitored and connected to the results. This kind of uncertainty (in which it is both difficult to measure outcome and to monitor activities) exists in long global SCs, in which components and systems interrelate with one another, and pinpointing the causes of certain problems or how they can be measured is difficult (e.g., corporate social responsibility [CSR] issues).

Rapp and Torstensson (1994), based on Ouchi (1979), propose more sophisticated mechanisms, such as *social control* or *group incentives*. These mechanisms mean that an individual agent is paid based on the outcome of a group of agents, and this group of agents themselves is allowed to monitor one another and select whom they trust to include as group members (social control). Thus, the principal incentivizes or penalizes the entire group.

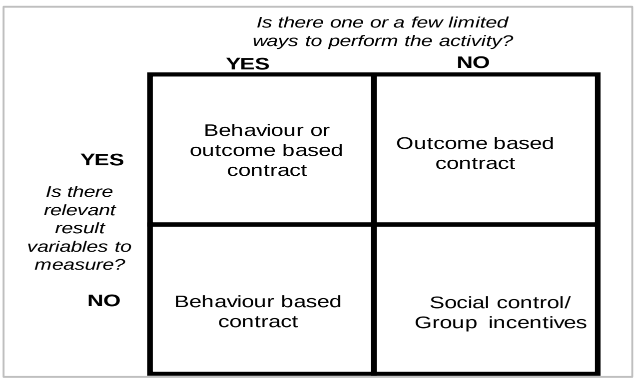


Figure 1 Different contract types fitting different situations
Source: Based on Rapp & Torstensson, 1994, p. 17

Van Hoek and Weken (2000) describe the original set-up for smart cars in which *group incentives* were used. The suppliers were not paid until the core coordinating company was able to test the final car's *quality* and could *sell it* to customers. A supplier was not paid for any individual component if it did not meet the quality inspection and was assembled, and no supplier was paid until the entire car had the passed the final quality inspection. Examples of the contract mechanisms discussed above are summarized in **Table 1**.

Table 1 Examples of contract mechanisms discussed in supply chain literature

Example of contract mechanisms	Examples of references
Wholesale price, cost per unit	Tsay *et al.* (1998), Anupindi and Bassok (1999), Lariviere and Porteus (2001)
Volume discount	Tsay *et al.* (1998)
Promotions discounts	Lee *et al.* (1997)
Price based on cost-plus	Agrell *et al.* (2004), Norrman (2008)
Price reduction over time	Cusumano and Takeishi (1991)
Revenue sharing	Dana and Spier (2001), Cachon and Laviere (2005)
Performance-based contracting	Liang and Atkins (2013), Selviaridis and Norrman (2015)
Supplier paid when the final product is sold	van Hoek and Weken (2000)
Quality-based payment	van Hoek and Weken (2000)
Other group incentives	Torstensson and Rapp (1994)
Direct investments	Cooper and Ellram (1993), Fawcett *et al.* (2008)
Minimum purchasing commitment	Tsay *et al.* (1998), Norrman (2008)
Forecast accuracy	Norrman (2008)
Penalties or bonus for bad delivery service	Liang and Atkins (2013)
Cost for excess/obsolete material	Norrman (2008)
Risk/gain sharing contracts	Dana and Spier (2001), Cachon *et al.* (2001)
VMI suppliers' own stock	Barratt (2004), Ståhl Elvander *et al.* (2007)
Consignment stock	Ståhl Elvander *et al.* (2007)

2.2 *Internal Integration and Rewards for Goal Congruence*

The alignment of functions, such as sales, marketing, and operations, is advocated to serve customers in a way that ensures product availability at the least cost and asset investments; in turn, this helps achieve successful internal integration (Stank *et al.*, 2011). However, cross-functional integration and collaboration are poorly understood and markedly rare (Ellinger *et al.*, 2006). Van Hoek *et al.* (2008) argue that research about aligning logistics with peer internal functions is limited. The general lack of a cross-functional, process-oriented approach has been discussed for a long time in research with labels, such as *silo thinking* (Rummler and Brache, 1991; Stevens, 1989; Spekman *et al.*, 1998; Ellinger, 2000; Barratt, 2004; Gimenez and Ventura, 2005; van Hoek and Mitchell, 2006; Ellinger *et al.*, 2006; Fawcett *et al.*, 2008; Richey *et al.*, 2010; Fawcett *et al.*, 2015; Hulthen *et al.*, 2017), *turf protection* (Ellinger, 2000; Fawcett *et al.*, 2008; Fawcett *et al.*, 2015), *pockets of power* (Bowersox *et al.*, 2000), *the Great Divide* (Bowersox *et al.*, 2000; Richey *et al.*, 2010), and *territories* (Fawcett *et al.*, 2015). Still, many researchers point out that internal cross-functional integration is difficult to implement in practice (e.g., Cook *et al.*, 2011; Ralston *et al.*, 2015; Fawcett *et al.*, 2015). One problem is the traditional organizational structure, which results in different ways of thinking and divergent values of the functional areas (Stank *et al.*, 2011; Piercy and Ellinger, 2015). Even though Shapiro (1977) discussed the problems caused by different cultures, personalities, goals, and rewards in various functions over 40 years ago, these problems seemed equally relevant and significant today.

Conflicting goals, divided into different *incongruent functional objectives*, result in functions pulling in different directions; as a result, these goals act as inhibitors of collaborative behavior (Ellinger *et al.*, 2006). Discussing strategic misalignment, such as goal incongruence and misaligned metrics, Fawcett *et al.* (2015) agree with this assertion. Performance measurements tend to reward functional behaviors and are often in conflict across functions (Enz and Lambert, 2015). Therefore, they emphasize the importance of measuring the financial outcomes of cross-functional initiatives. Similarly, Barratt (2004) recommends common goals and objectives. Ellinger *et al.* (2006) propose *joint accountability* for outcomes, such as by giving *mutual rewards* for success and *mutual responsibility* for expectations to facilitate collaborative behavior.

Other researchers argue that internal integration is difficult, as it requires *changes in organizational structure* and *changes in incentive systems* (Bowersox *et al.*, 2000; Gimenez and Ventura, 2005; Richey *et al.*, 2010). Ellinger *et al.* (2000), as well as van Hoek and Mitchell (2006), argue that one example of what firms should do to promote integration is to improve the *reward system*. Ellinger (2000) explicitly focuses on a mechanism called *organizational evaluation and reward system*. Other authors who stress the importance of incentives for internal integration are van Hoek and Mitchell (2006), van Hoek *et al.* (2008), and Stank *et al.* (2001).

The major takeaway from this research stream is that different functional goals should be aligned and rewards (incentives) for goal congruence should exist to achieve cross-functional internal integration.

2.3 Interrelation of External and Internal Integration

External and internal integration influence each other (Gimenez and Ventura, 2005), but there are various views on the relationship between these two. Some researchers argue that internal integration should precede external integration, as it can have a positive effect on the business performance of individual firms within an SC in terms of enhanced product/service offerings, growth, and profitability (Stevens, 1989; Croxton *et al.*, 2001). However, other authors believe that external integration, demonstrated by interaction with suppliers and customers, can stimulate internal integration (Halldórsson *et al.*, 2008; Rodrigues *et al.*, 2004). Another approach, as suggested by Richey *et al.* (2010) and Gimenez and Ventura (2005), is that organizations should focus simultaneously on external and internal integration, as they are interlinked. This view corresponds with that of Stank *et al.* (2001) in that the firms with the best practices work simultaneously with external and internal integration. Finally, Hoek and Mitchell (2006) ask why the focus is on external integration when companies are not aligned internally: should one learn how to crawl before learning how to walk? Van Hoek and Mitchell argue that internal misalignment can explain why SC efforts often do not fully deliver or even fail.

Despite numerous suggestions regarding supply chain incentive alignment during the last decade, both related to external and internal integration, empirical research on this topic is lacking. The literature has proposed several different mechanisms (**Table 1**) to improve external integration through incentive alignment, with the lack of internal goal congruence being stressed as a key issue for cross-functional internal integration. However, to our knowledge, little research has empirically examined the degree to which different mechanisms are implemented in practice. Research is lacking both in terms of practitioners' perceptions of incentive alignment and detailed knowledge of implementation in practice. Our goal is to understand the degree to which different proposed aligning mechanisms are used and to identify potential major gaps that need to be addressed.

3. METHOD

This study is of an explorative and descriptive nature. For this kind of study, Forza (2002) recommends collecting data through an exploratory survey with experts in the field. Furthermore, the exploratory survey is a commonly method used in SC and operations management research (e.g., Hubner *et al.*, 2016). An exploratory survey is appropriate for discovering new facets of the phenomenon under study and can provide a basis for more in-depth survey research. It can also help uncover or provide preliminary evidence of association among concepts.

3.1 Construction of The Survey

The survey explored different aspects of supply chain incentive alignment, with a specific focus on the mechanisms for external integration, as described in the literature. The survey investigated the degree to which different mechanisms were used, both upstream and downstream in the SC. Questions regarding goal congruence for internal cross-functional integration were added to understand the level of internal incentives in order to reduce the functional silo problem. The survey was initially reviewed by one academic and one practitioner to evaluate the appropriateness and functionality of the questions (Forza, 2002). Feedback was used to modify the survey instrument. The main questions of the survey focused on the following issues:

- How important is incentive alignment between different important partners in your SC? How well developed is your company in this area?

- To what degree does your company use different contract mechanisms for important products you buy (or important suppliers)?
- To what degree does your company use different contract mechanisms for important products you sell (or important customers)?
- How important is the internal alignment of different functions' incentives (bonuses, key performance indicators for promotions, etc.) to improve your company's SC performance? How well developed is your company in this area?
- To what degree do the different functions/departments in your company have an incentive structure that supports (not counteracts) your SCM work?
- Which are the three main challenges you face in relation to supply chain incentive alignment?

Respondents were asked to answer these questions on a seven-point Likert scale (with 1 = not important/to a low extent and 7 = very important/to a high extent).

3.2 Data Collection and Sample

This study was a part of a larger panel study with a Swedish supply chain panel. This panel was created by inviting managers in large Swedish manufacturing and retail companies to participate in a series of explorative and descriptive web surveys. The officers were identified through their membership in logistics professional organizations, through Internet sources, and via personal networks. A criterion for membership in the panel firms was that the respondent should be a high-level senior officer in the field of logistics or SC management. Consultants, logistics service providers, or non-profit organizations were excluded. In total, 70 companies and respondents originally signed up for the panel. An advantage of the panel was that unlike traditional random surveys, all respondents agreed to answer the study, and they were all experts with significant theoretical and/or practical experience in the area. Over the years that the panel worked, the respondents sometimes changed job or position, or they were on leave— something that could not always be tracked by the software tool used for distributing the questionnaires and collecting answers. Thus, the actual number of respondents varied between surveys. In total, six different web survey studies were conducted with the panel. The surveys explored and described the current status of important SC issues, such as SC strategy, SC measurement, SC decision synchronization (with a focus on S&OP), supply chain incentive alignment, SC information sharing, and SC risk management.

This study on supply chain incentive alignment was the fourth one we conducted. Forty-eight of the panel's 70 members answered this survey, which was equivalent to a response rate of 68.6%. A total of three reminders were sent out. To assess non-response bias, we compared early versus later respondents (Armstrong and Overton, 1977). The first 15 respondents who answered within four days were classified as *early respondents,* whereas the last nine respondents who answered after one month were classified as *late respondents*. The results from the t-tests revealed no significant difference among the answers in the survey between the two groups. Therefore, it seems that nonresponse bias does not pose a significant problem for this study.

4. RESULTS

4.1 Importance and Status of Incentive Alignment

The panel members indicated that incentive alignment is important, both internally and from an SC perspective. However, their responses also showed that the companies are not very developed in terms of addressing incentive alignment (**Figure 2**). On a seven-point Likert scale (with *1=not important/to a low extent and 7=very important/to a high extent*), the mean of importance for supply chain incentive alignment was 4.43 (standard deviation [std]: 1.41), whereas the mean of the company's current status was only 2.72 (std: 1.48). A paired t-test was used to compare importance versus the company's own status of incentive alignments. This indicates statistical significance at $p<0.001$ (two-tailed test). The companies also stated that in cases in which they have actively designed an incentive structure, it is with the first tier. While 56% have not actively designed incentives, 28% have done it with first-tier suppliers, 24% with transport providers, and 14% with first-tier customers. No company has designed incentives related to second-tier suppliers or customers.

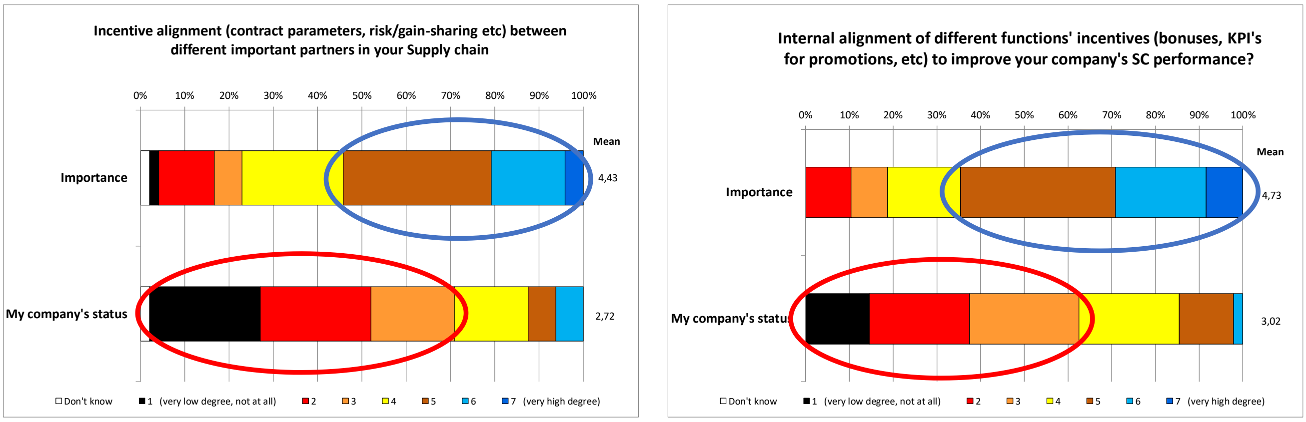
Regarding internal integration, the overall result was similar. While it was considered to be important (mean: 4.73, std: 1.38), the degree of implementation was low (mean: 3.02, std: 1.31). The t-test for internal integration also indicated strong statistical significance between perceived importance and the companies own status.

4.2 Interorganizational Incentive Alignment—Upstream

We likewise investigated the degree to which different contract mechanisms were used by the companies to incentivize alignment between themselves and their important suppliers (selling important products). As most companies differentiate relationships, the purpose was to focus on important relationships in which the probability for more sophisticated mechanisms (giving incentives for coordination) should be higher. The results clearly show (**Figure 3**) that the use of more sophisticated mechanisms is very limited. The dominant mechanism, even in the context of important suppliers/products, is the traditional and simple mechanism of *price per unit (wholesale price)*. A statistical comparison (t-test) between the use of *price per unit* and all other mechanisms (see Appendix) shows that *price per unit* (wholesale price) is more significantly used than the other surveyed mechanisms (see the Appendix).

A similar comparison between *volume discount* and all other surveyed mechanisms shows that it is also more significantly used than all the other mechanisms, except for two (see the Appendix). One mechanism that seems to be slightly more used by some panel members and not significantly less used than *volume discount* is *minimum purchase commitment.* It is clearly a more sophisticated mechanism that could drive behavior in a more risk/reward-sharing mode.

Two other mechanisms, *promotions* and *cost-plus*, are significantly less used than *volume discount*, although they are used to a high degree by certain respondents. It should be noted that some studies argue that these mechanisms drive SC behavior in a direction that, in many cases, is counterproductive from an SCM perspective (e.g., creating bullwhip effects or increasing cost). Another observation is that negatively oriented penalties (e.g., for poor delivery accuracy, lead time, or quality) seem to be used to a higher degree than bonuses if suppliers perform well. This indicates that companies prefer using sticks more than carrots to incentivize their suppliers. Group incentives are hardly used at all. Sales-based payment, in which suppliers are paid first when the final products are sold, is almost never used. (An exception was respondents getting it from their customers.) Quality-oriented group incentives, in which suppliers are not paid until the quality of the final product is confirmed, are slightly more popular. While a limited number of companies use this mechanism to a very high degree, most companies do not use it at all.



*Mean of **Importance** 4.43 (std 1.41), Mean **Current status** 2,72 (std 1,48).*
t-test: statistical significance (p-value) at 0.000 ->
significant difference at p<0.001 (two-tailed test).

*Mean of **Importance** 4.73 (std 1.38), Mean **Current status** 3,02 (std 1,31).*
t-test: statistical significance (p-value) at 0.000 ->
significant difference at p<0.001 (two-tailed test).

Figure 2 Importance versus current status of supply chain incentive alignment and internal alignmnent.

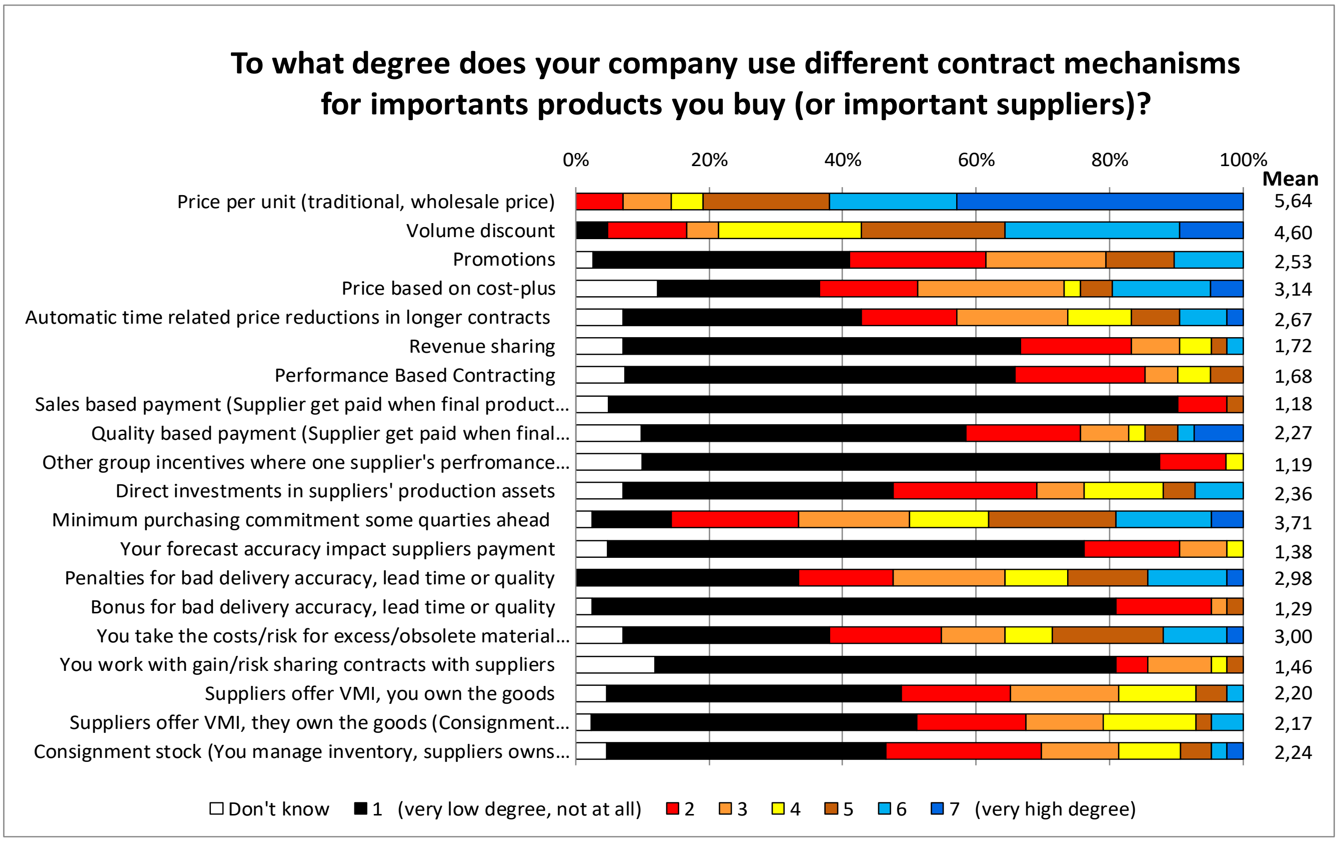


Figure 3 Use of different contract mechanims with important suppliers

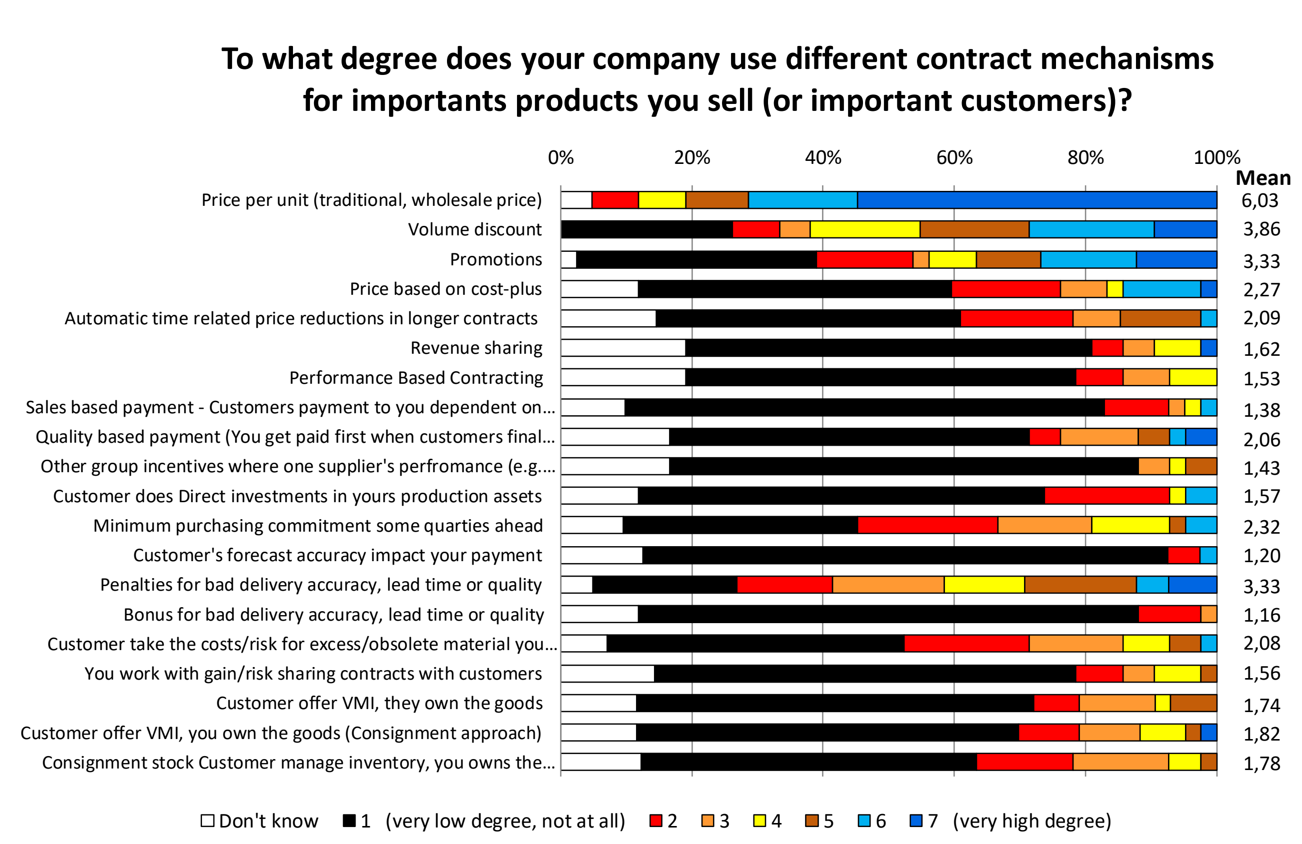


Figure 4 Use of different contract mechanims with important customers.

4.3 *Interorganizational Incentive Alignment—Downstream*

We also investigated the degree to which different contract mechanisms were used by the companies to incentivize alignment with their important customers. As relationships are normally differentiated, the purpose was to focus on the most important relationships in which the probability for the use of more sophisticated mechanisms (giving incentives for coordination) should be higher.

The low implementation of sophisticated mechanisms to incentivize alignment in SCs downstream is evident in the collaboration upstream with important customers (**Figure 4**).

In fact, the pattern seems even stronger, meaning that coordination is lower and sophisticated mechanisms are used to an even lesser degree. For many aspects, the number of uncertain respondents (*don't know*) is also higher, which in itself could indicate that the respondents have lower awareness of the commercial interfaces with customers than with suppliers.

The traditional and simple mechanism of (wholesale) *price per unit* is even more commonly used upstream than downstream. While *volume discount* is also common, it is less commonly used with customers than upstream with suppliers. On the other hand, promotions seem to be used more frequently. Penalties are also quite commonly used. However, only a small number of respondents utilize mechanisms designed for risk and reward sharing to a high degree. The number of respondents implementing these to a low degree is even higher. Examples of incentive mechanisms in which risk and reward sharing can be found are *minimum purchase commitment* and *customers' accountability for bad forecasts*.

4.4 *Internal Cross-Functional Incentive Alignment*

The results on the degree to which different departments were using incentive structures to support and not counteract SCM were disappointing. Surprisingly enough, not even traditional *logistics family* departments, such as transportation, purchasing, warehousing, and logistics/SCM, seem to have a strong average use of reward systems promoting SCM and driving goal congruence (**Figure 5**). In fact, the companies seem to be divided into two groups: those that have counteracting structures and those that have supporting structures. For surprisingly many, these departments also used reward structures with incongruent functional objectives that were counteracting the more holistic approach.

Similarly, other important functions for SCM, such as sales, marketing, finance, product development, and R&D, were perceived to mainly have goals and incentives that conflict with SCM. Very few SC executives found internal incentives that are supportive of SCM in these functions. We also note that quite many respondents (working as senior logisticians/SCM in leading positions) did not know much about other functions' incentive systems, which in itself is proof of the limited cross-functional knowledge in this area. This lack of mechanisms and rewards for driving goal congruence and cross-functional integration, in turn driving the opposite behavior, indicates that companies have forgotten the important aspect of implementing measures to reduce silo thinking.

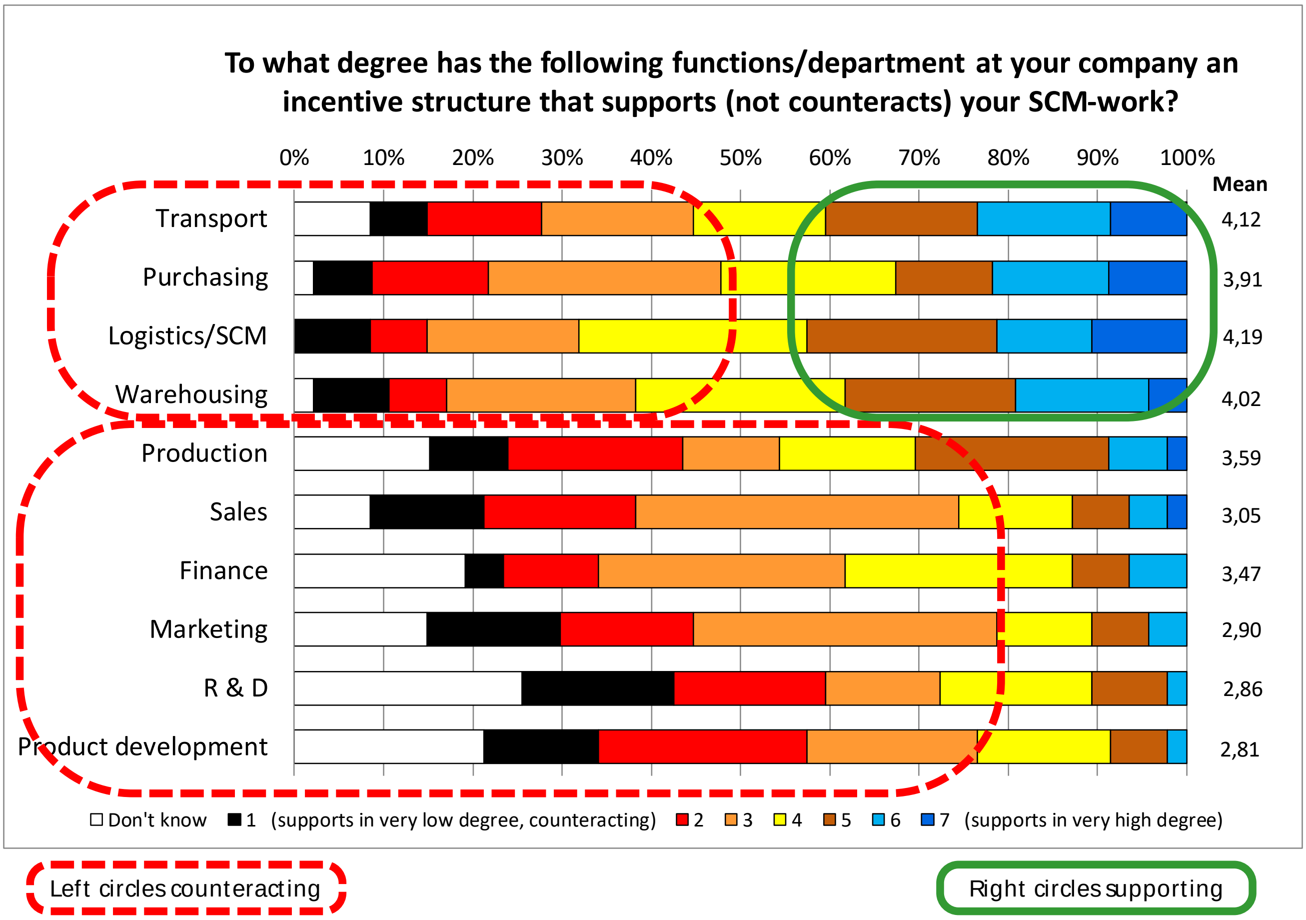


Figure 5 Use of different internal incentives supporting or contradicting SCM work

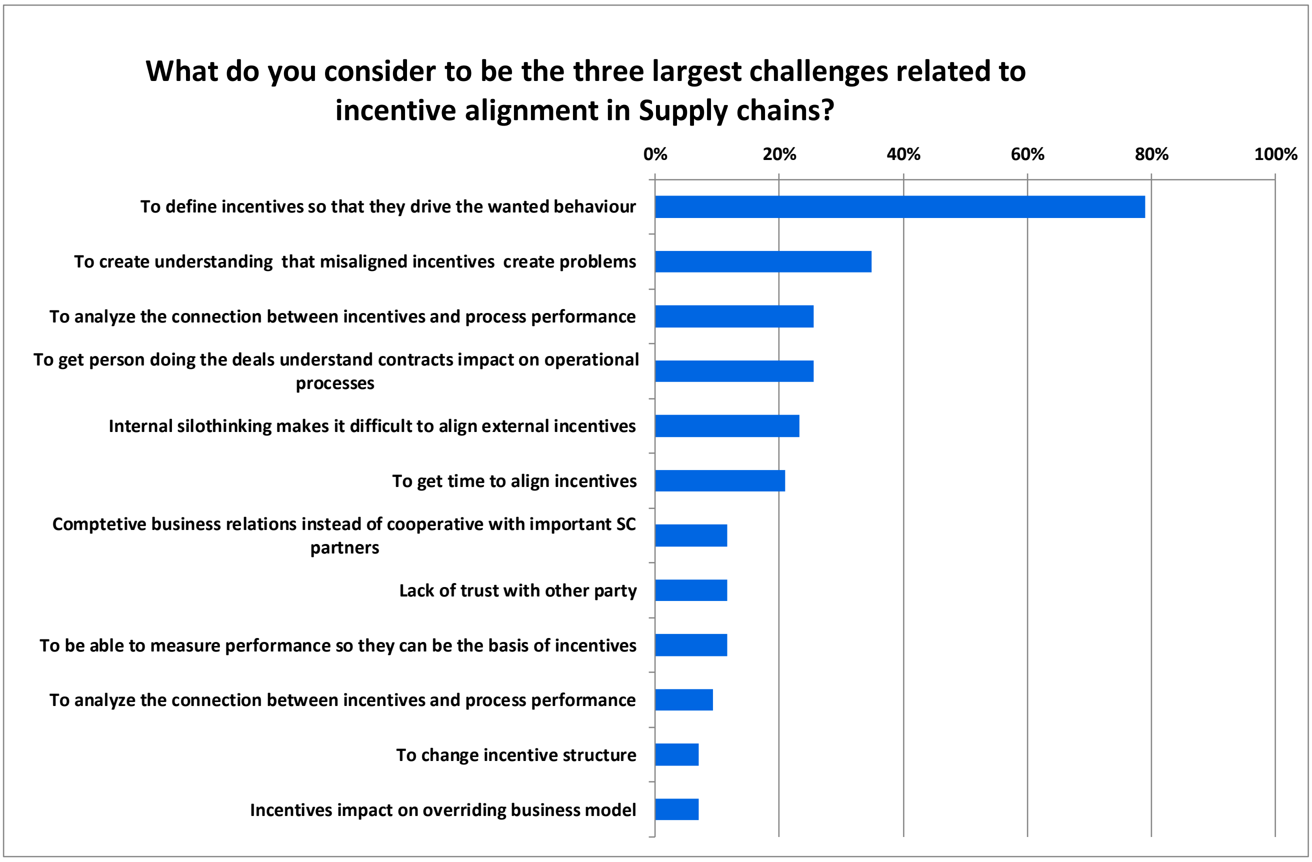


Figure 6 Twelve major challenges related to supply chain incentive alignment

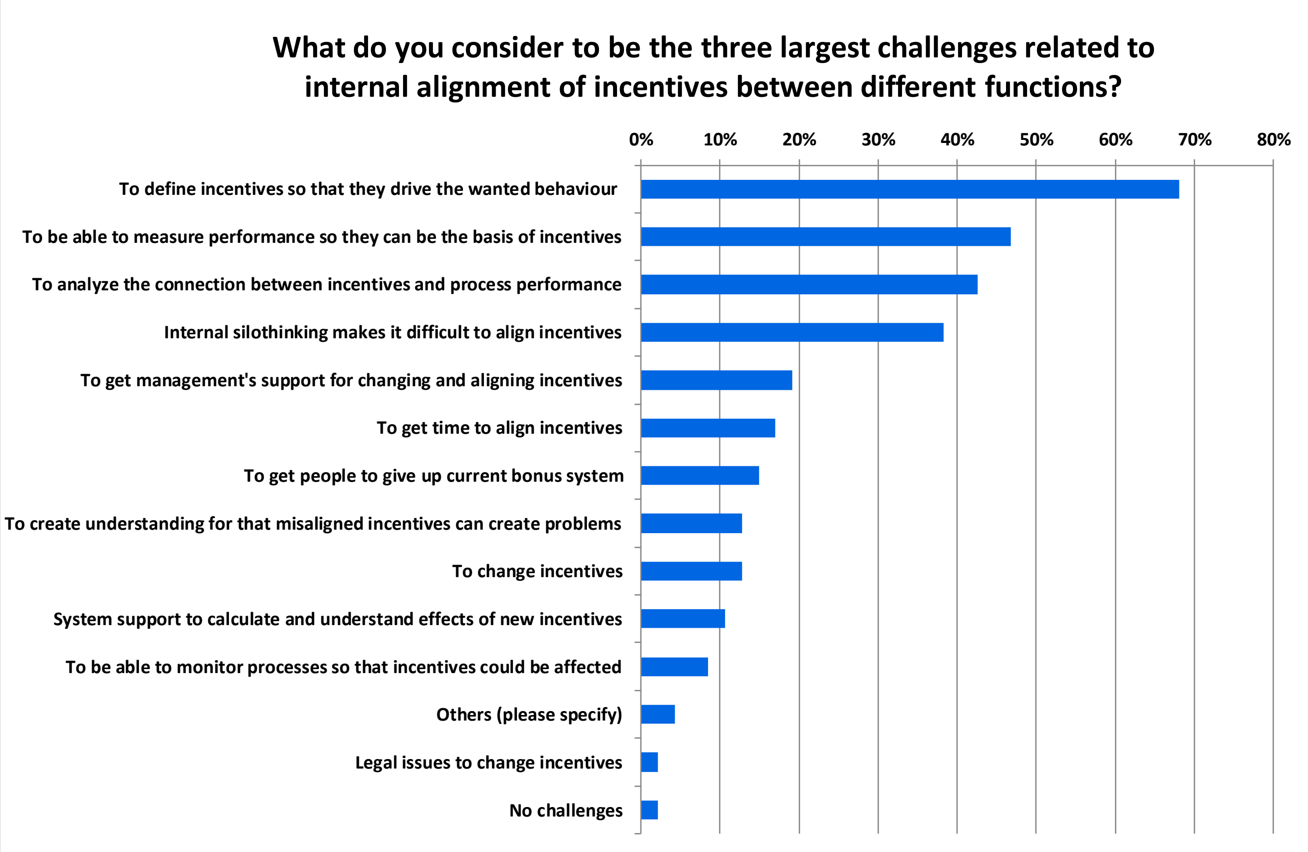


Figure 7 Major challenges related to internal incentive alignment

4.5 Challenges

To understand how the gaps can be bridged, the respondents were asked to identify the three main challenges (out of 21) in aligning incentives in the SC (**Figure 6**) and achieving internal incentive alignment (**Figure 7**). The most important challenge in both areas is *how to define incentives so that they will drive the desired behavior*. In the inter-organizational context, almost 80% ranked this among their top three challenges. The second most important challenge was *to create the understanding that missing incentive alignment could create problems*, especially among employees involved in negotiating and contracting. The respondents indicated that those employees making the deals did not fully understand the impact of the different contract mechanisms on operational processes. Other common problems were to *understand the connection between incentives and performance* and *to allocate time for incentive alignment*. Interestingly enough, the fifth most important challenge was *the internal silo thinking*, which supports the theoretical discussion that external integration is dependent on internal integration.

Similar to the case for SC alignment, the main challenge for internal alignment was how incentives can be defined. The second major challenge was *how to measure performance so it could be the basis for giving incentives*. The third one was *how to analyze the connection between the incentive and [the] wanted performance*. The fourth most important challenge, ironically, was *the degree of silo thinking that makes it difficult to align incentives*. The challenges are mostly similar between supply chain incentive alignment and goal congruence for internal integration. One difference is the difficulty in creating awareness and understanding among employees when it comes to external alignment. This aspect is emphasized for external alignment, whereas internally, the connection to performance measurements is more emphasized.

5. DISCUSSION, LIMITATIONS, AND PROPOSITIONS

This study finds that supply chain incentive alignment and the rewards for internal goal congruence are still not developed areas in practice despite being academically discussed for decades (e.g., Cooper *et al.*, 1993; Ellinger *et al.*, 2000; Mentzer *et al.*, 2001; Lee 2004; Narayanan and Raman, 2004; Simatupang and Sridharan, 2005, 2008; Lundin and Norrman, 2010; Fawcett *et al.*, 2015). This research contributes to both academia and practice by empirically exploring and describing the current use of different mechanisms and practices in the industry. Another contribution is the collection of different incentive mechanisms discussed in published research.

The identified gap between how important practitioners perceive *supply chain incentive alignment* and *rewards for internal goal congruence* versus current practices also indicates a significant potential to improve SC integration. The practice today is that simple mechanisms, such as *price per unit* and *volume discount* (Tsay *et al.*, 1998), are much more commonly used (even for important relationships) than more sophisticated mechanisms. Applying more sophisticated, coordinating mechanisms (Tsay *et al.*, 1998; Cachon, 2003; Narayanan and Raman, 2004; Simatupang and Sridharan, 2005) could enhance risk and reward sharing, as well as drive behavior towards increased SC integration. Even though a few sophisticated mechanisms are used, companies generally seem to prefer utilizing sticks rather than carrots. The use of group incentives (Rapp and Torstensson, 1994), for example, is very limited, even though these kinds of coordinating mechanisms work well in certain SC contexts.

The use of more sophisticated and coordinating incentives is slightly more common upstream than downstream. In addition, incentive alignment is only addressed with the first tier of customers or suppliers. We could not find any evidence of incentive alignment in SC in which second-tier suppliers or customers are incorporated. Thus, our study supports the idea that most SCM work in practice is currently focused on dyadic relationships and not on the extended SC.

Regarding cross-functional internal integration (Ellinger *et al.*, 2006; Stank *et al.*, 2011), it is also considered important for inter-organizational external integration (Stevens, 1989; Croxton *et al.*, 2001). Even though silo thinking has been a known problem for decades (e.g., Rummler and Brache, 1991; Spekman *et al.*, 1998; Ellinger, 2000), we still find counterproductive rewards and incongruent goals (Fawcett *et al.*, 2015) in functions, such as sales, marketing, finance, product development, and R&D. While this might not be entirely surprising, it is more unexpected that many companies have counterproductive incentive structures even in functions within the *logistics family*. As logisticians claim that they drive process orientation within and between companies, the first step should be to increase the goal congruence between functions. This study confirms the existence of conflicting functional goals, the lack of joint accountability (Ellinger *et al.*, 2006), and the lack of process-oriented rewards (Enz and Lambert, 2015). This research also highlights the link between incongruent goals and internal incentives. This leads to our first proposition:

Proposition I: *To close the gap between the perceived importance and actual practice of supply chain incentive alignment, logisticians should reduce internal silo-thinking by creating congruent internal goals within logistics departments and enabling cross-functionality.*

To close the gap between perceived importance and actual practice, both practitioners and researchers need to reflect on the major challenges. The second most important challenge in the inter-organizational context, for example, is *to create the understanding that missing incentive alignment could create problems*. One of Narayanan and Raman's (2004) key steps to address this problem is that companies must first acknowledge that this issue exists. The present study confirms this by reinforcing it as an important aspect.

Similarly, when it comes to the most important challenge for both internal and external alignment, *how to define incentives so that they will drive the desired behavior*, this issue is known but not addressed in practice. Correspondingly, a key challenge for internal alignment is still (Ellinger *et al.*, 2000; van Hoek and Mitchell, 2006) *how to measure performance so that performance measures could be the basis for providing incentives*. As we see a lack of implementation and use in practice, as well as limited research on implementation and use, our next propositions are as follows:

Proposition II: *The behavior of different misaligned incentives and their effects must be better understood by practitioners in order to close the gap between the perceived importance and actual practice of supply chain incentive alignment.*

Proposition III: *Knowledge of how to both define and implement sophisticated incentives (that drive wanted behavior) must be developed in order to close the gap between the perceived importance and actual practice of supply chain incentive alignment.*

Likewise, the importance of the design of performance metrics and more process-oriented performance measurement systems has been discussed since the 1990s. Neely *et al.* (1999), for example, raised this issue in his four phases of the performance measurement lifecycle: there is a need to extend focus from the design phase to the phases of implementation, use, and maintenance of the systems. We therefore advocate for more research regarding implementation and use, pioneering practice, barriers, and lessons learned in overcoming implementation barriers. Through this, we also think that this stream of research would increase its practical relevance. Our fourth proposition is as follows:

Proposition IV: *Process performance must be better measured, and congruent performance goals must be linked to incentives in order to close the gap between the perceived importance and actual practice of supply chain incentive alignment.*

This study has limitations. It is based on an explorative panel study with 48 answers, thus reducing its opportunities to test hypotheses and theory. However, unlike traditional survey studies, a panel approach also has advantages because all the respondents are known, and all are experts in the field. As a result, we believe that we can identify clear patterns and highlight interesting observations. Furthermore, the propositions can be further tested in broader studies. The current geographical limitation to Sweden may have influenced the results based on culture, business practice, and other factors. Conducting global studies that compare the use of incentive alignment and internal rewards in different countries would therefore be interesting. Likewise, a relevant avenue for future research is to obtain a deeper understanding of pioneering practice, for example, related to the use of more sophisticated mechanisms or even group incentives, by using case studies. Group incentives could be studied in the context of CSR; for instance, people issues (e.g., child labor) in the production processes are difficult to observe when suppliers are far away.

Finally, we observed that internal silo thinking was a major challenge for both supply chain incentive alignment and internal goal congruence. A limitation of this study is that it does not fully investigate the interrelation between external and internal integration and the impact of incentives; this is certainly an area where more knowledge and research are needed.

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APPENDIX A

Table 2 Comparison of the degree to which different contract mechanisms are used (versus price per unit). (7-point Likert scale, 1=used to a very low degree/not at all, and 7=used to a very high degree)

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Price_unit - Volume_discount	,35714	,87851	,13556	,08338	,63091	2,635	41	,012
Pair 2	Price_unit - Promotions	,97436	1,11183	,17804	,61395	1,33477	5,473	38	,000
Pair 3	Price_unit - Price_Costplus	,97436	1,11183	,17804	,61395	1,33477	5,473	38	,000
Pair 4	Price_unit - Auto_time_price_redu	,51220	1,20669	,18845	,13132	,89307	2,718	40	,010
Pair 5	Price_unit - Rev_sharing	1,14286	1,09481	,16893	,80169	1,48402	6,765	41	,000
Pair 6	Price_unit - Perf_based_contracting	1,19512	1,10044	,17186	,84778	1,54246	6,954	40	,000
Pair 7	Price_unit - Sales_payment	1,39024	,91864	,14347	1,10028	1,68020	9,690	40	,000
Pair 8	Price_unit - Quality_based_payment	,92683	1,14870	,17940	,56425	1,28940	5,166	40	,000
Pair 9	Price_unit - Other_group_incentives	1,22500	1,07387	,16979	,88156	1,56844	7,215	39	,000
Pair 10	Price_unit - Direct_investments	,95238	1,12515	,17361	,60176	1,30300	5,486	41	,000
Pair 11	Price_unit - Min_purchasing_commit	,61905	1,08093	,16679	,28221	,95589	3,712	41	,001
Pair 12	Price_unit - Your_forecast_accuracy	1,30952	,99971	,15426	,99799	1,62106	8,489	41	,000
Pair 13	Price_unit - Penalities_for_bad_delivery	,88095	,80251	,12383	,63087	1,13103	7,114	41	,000
Pair 14	Price_unit - Bonus_for_bad_delivery	1,42857	,80070	,12355	1,17906	1,67809	11,563	41	,000
Pair 15	Price_unit - Your_take_the_costs	,76190	1,16472	,17972	,39895	1,12486	4,239	41	,000
Pair 16	Price_unit - You_work_with_gain	1,04762	1,12515	,17361	,69700	1,39824	6,034	41	,000
Pair 17	Price_unit - Suppliers_offer_VMI	1,04762	1,12515	,17361	,69700	1,39824	6,034	41	,000
Pair 18	Price_unit - Suppliers_offer_VMI_they_own	1,11905	1,08656	,16766	,78045	1,45764	6,675	41	,000
Pair 19	Price_unit - Consignment_stock	1,07143	1,02154	,15763	,75309	1,38976	6,797	41	,000

APPENDIX B

Table 3 Comparison of the degree to which different contract mechanisms are used (versus volume discount). (7-point Likert scale, 1=used to a very low degree/not at all, and 7=used to a very high degree)

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Volume_discount - Price_unit	−,35714	,87851	,13556	−,63091	−,08338	−2,635	41	,012
Pair 2	Volume_discount - Promotions	,61538	,87706	,14044	,33108	,89969	4,382	38	,000
Pair 3	Volume_discount - Price_Costplus	,61538	,87706	,14044	,33108	,89969	4,382	38	,000
Pair 4	Volume_discount - Auto_time_price_redu	,14634	1,06210	,16587	−,18890	,48158	,882	40	,383
Pair 5	Volume_discount - Rev_sharing	,78571	1,02495	,15815	,46632	1,10511	4,968	41	,000
Pair 6	Volume_discount - Perf_based_contracting	,82927	1,07010	,16712	,49150	1,16703	4,962	40	,000
Pair 7	Volume_discount - Sales_payment	1,02439	,90796	,14180	,73780	1,31098	7,224	40	,000
Pair 8	Volume_discount - Quality_based_payment	,56098	1,07352	,16766	,22213	,89982	3,346	40	,002
Pair 9	Volume_discount - Other_group_incentives	,87500	1,11373	,17610	,51881	1,23119	4,969	39	,000
Pair 10	Volume_discount - Direct_investments	,59524	1,06059	,16365	,26473	,92574	3,637	41	,001
Pair 11	Volume_discount - Min_purchasing_commit	,26190	1,12747	,17397	−,08944	,61325	1,505	41	,140
Pair 12	Volume_discount - Your_forecast_accuracy	,95238	,90937	,14032	,66900	1,23576	6,787	41	,000
Pair 13	Volume_discount - Penalities_for_bad_delivery	,52381	,91700	,14150	,23805	,80957	3,702	41	,001
Pair 14	Volume_discount - Bonus_for_bad_delivery	1,07143	,77752	,11997	,82914	1,31372	8,931	41	,000
Pair 15	Volume_discount - Your_take_the_costs	,40476	1,19060	,18371	,03374	,77578	2,203	41	,033
Pair 16	Volume_discount - You_work_with_gain	,69048	1,11504	,17205	,34300	1,03795	4,013	41	,000
Pair 17	Volume_discount - Suppliers_offer_VMI	,69048	,99971	,15426	,37894	1,00201	4,476	41	,000
Pair 18	Volume_discount Suppliers_offer_VMI_they_own	,76190	,90553	,13973	,47972	1,04409	5,453	41	,000
Pair 19	Volume_discount - Consignment_stock	,71429	,99476	,15349	,40430	1,02427	4,653	41	,000

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