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C-TPAT and Supply Chain Effectiveness

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ABSTRACT: There have been many unprecedented changes in the Customs-Trade Partnership Against Terrorism (C-TPAT) program in the 18-years of its existence. C-TPAT is a layer in the U.S. Customs and Border Protection's (CBP) multi-layered cargo enforcement strategy. C-TPAT program is a partnership program focused on cargo security made possible through close cooperation with international supply chain stakeholders. The efficiency of supply chains directly impacts supply chain disruptions, operational waste due to operating inefficiency, and revenue loss. This research will gather data on the benefits of C-TPAT and how this program focuses on supply chain risks ranging from cybersecurity to terrorism financing, supply chain safety, and supply chain efficiency. Supply chain efficiency is paramount in moving cargo from one point to another and achieving sustainable competitive advantage. A partnership with C-TPAT offers greater control over security implementation, reduced transaction costs, reduced inspections, and expedited shipment processing. Such a process can potentially increase business security performance and overall firm performance.

KEYWORDS: C-TPAT, supply chain security, efficiency, performance

Introduction

Over the last 20 years, there has been an opaque and confusing relationship between supply chain security and supply chain efficiency. Supply chain efficiency is best defined by specific metrics, KPIs, and variables that merge into an effectively transparent and cost-efficient method of delivering goods overseas. More specifically, supply chain efficiency is best summed up as "a system of organizations, resources, activities, people, information and technology involved in moving a product from a supplier to a customer" (Food Engineering 2010). Inherent in every international supply chain are risks. Fuel costs, theft, strikes, seizures, equipment shortages, and import delays, to name a few. Successful supply chains must adapt to changing needs and continuous improvement. The Customs-Trade Partnership Against Terrorism (CTPAT) forges the public-private partnerships needed to improve international supply chain security with supply chain partners. C-TPAT addresses and minimizes global supply chain risks such that entry into the United States is done quickly, securely and, in a more efficient manner versus cargo cleared by non-C-TPAT certified companies.

C-TPAT

The C-TPAT program was implemented by U.S. Customs & Border Protection (CBP) in 2001 as one of many possible solutions to lessen terrorist threats in a post-911 world. An all-volunteer program, C-TPAT has many published benefits for member companies who subscribe to, document, and maintain, the program's minimum-security requirements (MSRs) in their supply chains. According to recent CBP information, over 11,400 members have achieved at least Tier 3 status within the program. The government data also highlights that 53 percent of U.S. cargo by value imported into the country belongs to C-TPAT member companies (CBP Virtual Trade Week 2020).

The program has seen many changes and operational iterations over the last 20-years of its existence. Most notably, the 2020 changes were made to the minimum-security requirements, whereby CBP added two new sections addressing cybersecurity and

agricultural threats (CTPAT: Customs Trade Partnership Against Terrorism 2021). The C-TPAT was intentionally implemented to reduce and eliminate the ability of terrorists to infiltrate the U.S. mainland with a weapon of mass destruction. In doing so, CBP requires each member company to aggressively monitor their supply chain vendors' trade and logistics practices to leverage a 360-degree sense of security that CBP can use if doubt exists while clearing cargo. C-TPAT certified companies must assemble and document their supply chains on an annual basis to be conferred member status, commensurate with the individual sections of the MSRs.

C-TPAT and Supply Chain Efficiency

It only stands to reason that C-TPAT has a legitimate place in any supply chain efficiency conversation because the objective of C-TPAT program is to bestow benefits that have a direct relationship to effective supply chain management. While the program encompasses risk reduction measures throughout the global supply chain, the heart of the program focusses on the few hours or days that CBP physically takes possession of the cargo for inspection and duty appraisement purposes. The main benefits bestowed to C-TPAT members are fewer inspections and exams, front-of-the-line priority of members' shipment, and priority access to CBP in the event of a national emergency. The issues that will be addressed in this literature review will include research on supply chain risks, supply chain efficiency and the correlation with a competitive advantage, C-TPAT membership advantages, and organizational performance based on C-TPAT and supply chain efficiencies.

Supply Chain Risks

There are enumerable articles on supply chain risk, especially concerning terrorism affecting supply chain management. According to several supply chain references, terrorism and terrorist attacks on global supply chains account for roughly 16 percent of yearly logistics transactions. In 2016, there were over 346 direct attacks on company supply chains, which averages 3.7 per week (Khan, Akhtar & Merali 2018). There is a cost associated with securing the global supply chain. Transactional security and counter-terrorism activities drive the increases in securing a sales transaction due to terrorism and the risk of supply chain delays. Insurance and surety costs have risen as well in place of the global increase in terrorist attacks on the supply chain.

Other supply chain risks include interstate conflict, which occurs when states, countries, or regions are at odds and supplies must pass through them. These conflicts affect everything from the free flow of materials, supplies, and even labor. Government collapses also have far-reaching effects on a supply chain and can lead to slowdowns in countries where they may be political unrest. Supply chain partners also pose potential security risks as the network grows more prominent. From Proprietary software to billing information, data gets carried through the supply chain and becomes vulnerable to hacking, spoofing, and digital theft.

Risk is defined as "the variation in the distribution of possible outcomes, their likelihood, and their subjective values." Zhao, Baofeng, and Sun (2013) assert that risk results from variable uncertainties and can be related to negative outcomes, specifically the inability to meet customer supply requirements. The global supply chain risks are frequently tied to several conditions, namely a firm’s intensified outsourcing activities, international competition, the hunger for on-time delivery, technological advances, and shortened product life cycles.

According to Kumar, Boice, and Shepard (2013), there are two separate supply chain risk forms: disruption risk and operational risk. Disruption risks are risks relative to events such as bankruptcy, natural disasters, and terrorist attacks. Operational risks are risks to customers' supply and demand operations and their comparative uncertainties. Disruption

risks are fortunately rare but difficult to predict and even more challenging to manage. While operational risk can be mitigated through effective supply chain management, additional risks include supply risk, process risk, demand risk, and technology risk. However, among the various aspects of supply risks, supply-demand risk may be the most important because even more companies expect their suppliers to make just-in-time deliveries.

It is essential to evaluate all aspects of supply chain partners' performance, including price, product quality, and service but most importantly, risk factors of uncertainty, vulnerability, and possible disruption of supply.

Supply Chain Efficiencies and C-TPAT

Supply chain managers have focused primarily on metrics that depict increased throughput, velocity, and risk reduction. This has typically been the "sweet-spot" for logisticians and supply chain designers; however, C-TPAT enhancements have focused on the trade compliance managers. Prior research has dedicated much time and focus on C-TPAT improving supply chain security and not overall effectiveness and performance. C-TPAT design dictates that firms become actively aware of their global supply chain partners' security measures and logistics activities. These activities must be accurately documented and published in the member's C-TPAT portal each year to maintain certification and become validated (C-TPAT Portal 2021).

A firm's partnership with C-TPAT offers greater control over security implementation, reduced transaction costs, reduced inspections, and expedited shipment processing. Transaction costs are reduced for participating C-TPAT member partners via reduced wait time and variability, and border crossings (Furia et al. 2011).

While the program encompasses risk reduction measures throughout the global supply chain, the heart of the program focuses on the few days leading up to the point where CBP physically takes possession of the cargo for inspection and duty appraisement purposes. The main benefits bestowed to C-TPAT members are fewer inspections and exams, front-of-the-line priority of members' shipment, and priority access to CBP in the event of a national emergency. C-TPAT's directives and best practices create an environment for cost-savings through greater transparency among vendors, suppliers, and logistics providers. Given a member's steadfast adherence to C-TPAT program recommendations, a firm can enjoy reduced CBP inspection rates. Typically, CBP averages between four and six percent inspection rate for non-C-TPAT companies. For C-TPAT members, that rate goes down to between one and three percent, depending on the cargo and any identified threats (O'Connell 2009). According to CBP, C-TPAT members are 3.5 times less likely to incur a security or compliance examination (Global Trade 2019). This translates into fewer delays and handling expenses for logisticians, which directly translates into supply chain savings and overall efficiency.

C-TPAT's successful joint efforts between CBP and member partners offer several benefits, among these are (1) long-term cooperation, (2) the ability to share risk, (3) joint production of products and services, and (4) mutual gain between partners (Hodge & Greve, 2007).

Organizational Performance

Supply chain practices are a set of activities performed by companies to reduce costs and achieve a competitive advantage. Companies can gain a competitive advantage when selecting the right supply chain practices and partners and agree on the same goals of improving performance and having better coordination among all activities. Supply chain competitiveness or competitive advantage was a concept popularized by Michael Porter in 1980 and encompasses the tasks necessary to create a differentiated position and deliver customer value while achieving cost advantages (Gamble et al. 2016).

As defined in this study, a supply chain is a formal partnership process and/or collaboration across external organizations. C-TPAT program is a partnership focused on cargo security made possible through close cooperation with international supply chain stakeholders. The collaboration between partners creates opportunities for enhanced coordination, communication, and collaboration. The simplification that occurs when there is supply chain integration leads to identifying any duplication of activities that do not add value. From the operational side, a partnership with C-TPAT can potentially increase supply chain performance in tasks such as work processes, joint activities, and decisions that are collectively performed by different departments. From the information side, increased performance can occur in the areas of forecasting and planning, intra-and inter-firm supply chain communications, and technologies such as electronic data interchange, automatic replenishment, and warehouse management systems (Frohlich 2002).

To compete as a multinational firm, there needs to be an integration of logistics and transport systems that together can use their core competencies and share the risks. A supply chain disruption can directly negatively impact a firm's supply chain performance, further disrupting the achievement of goals and objectives (Closs and McGarrell 2004, 8). C-TPAT is a partial extension of Container Security Initiative (CSI), a requirement to remain compliant with C-TPAT is that shipping firms meet several criteria, including container security, physical access controls, personnel security, procedural security, information technology security, business partner requirements as well as an overall security assessment (Barnes and Oloruntoba 2005; United Nations Conference on Trade and Development 2006; Marlow 2010; Kim 2011). Thai (2009) found that adding the following 13 dimensions to supply chain security are critical to successfully manage overall security and performance: well-structured security policies, security risk assessments, risk-based security mitigation strategies and plans, communication and consultation, security monitoring, continuous security improvement, specific organizational structures, leadership commitments, employee involvement and empowerment, security training, and security incident handling and reporting. Ensuring the integration of the latter security management dimensions and the C-TPAT requirements is an important step to ensure increased performance and to sustain a competitive advantage.

Discussion

International trade leads to global supply chains. Globalization and trade create risks and vulnerabilities in supply chain management. The risks encountered correlate with the size of the supply chain and the number of partners involved. Supply chains are as strong as the most vulnerable member of the supply chain. Supply chain risk management (SCRM) is an approach to evaluate, recognize, rank, and mitigate potential disruptions. SCRM is divided into two approaches, the first is for comprehensive risk management and the second approach focuses on disruptions (Azad et al. 2012; Christopher and Peck 2004; Craighead et al. 2007; de Matta 2016; Tang 2007; Xu et al. 2015). Disruptions include security and terrorism (Sheffi 2001).

Organizations such as C-TPAT ensure the global security of supply chains by monitoring risks and disruptions while improving operational performance (Mortimer 2004). It will be necessary for companies to continue operating in an efficient manner, and to do so, they must identify strategies for different types of risks. There need to be corrective approaches for risks such as the cost of increasing or decreasing inventories, capacity, flexibility, and responsiveness. While the implementation of security initiatives incurs an additional cost on organizations, supply chain security management and a potential partnership with C-TPAT has several benefits, including a reduction in theft, cybercrime, counterfeit goods, damage to goods, terrorism, and smuggling (Organization for Economic Cooperation and Development 2003; Gutierrez and Hintsa 2006; Martens et al. 2011). C-

TPAT certification benefits businesses by speeding up inspections, reducing costs, and increasing partner and customer satisfaction (Sheu et al. 2006), while increasing supply chain visibility (Diop et al. 2007). We live in an era where competitive advantage depends on globalization, shorter product lifecycles, multifaceted networks, and where offshoring and outsourcing must be part of a company's strategy.

To meet the demands of an interconnected and global supply chain platform, there must be an ongoing evaluation of security performance to improve overall security. Moreover, companies need to consider participation in organizations such as C-TPAT or similar organizations. It will be imperative to improve information security through security management activities such as encryption and coding data, regular backups of commercial data, and the protection of all commercial data from unauthorized access. Cook (2003) and Voss et al. (2009) found that partner relationship management was vital to supply chain security success. Overall, the research gathered points to the same findings of Cook, Voss et al. (2009), asserting that collaboration between partners enhances a firm's supply chain security competencies and improves the overall financial, safety, and customs clearance performance

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