

Supplier Firm Value Capture Trajectories in Global Value Chains Which Complementary Assets Matter?

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SUPPLIER FIRM VALUE CAPTURE TRAJECTORIES IN GLOBAL VALUE CHAINS: WHICH COMPLEMENTARY ASSETS MATTER?

Felix Maile and Lindsay Whitfield

September 2025



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ABSTRACT

Did the emergence of large transnational suppliers alter the value capture dynamics in globalized production, or do ‘strategic partners’ remain in a subordinated position to lead firms that control access to end markets? We show that the Global Value Chain literature faces methodological and conceptual constraints in answering this question and seek to resolve these issues through the proposed Complementary Assets approach, combining insights from entry barriers in globalized industries to explain how supplier value capture trajectories are a function of the complementary assets they create to match lead firm product strategies. With few options to establish sustained entry barriers, apparel suppliers largely compete in commoditized products leading to large orders with small profit margins. The paper explains how some apparel suppliers obtain both high volumes and high profit margins by supplying lead firms that pursue a non-commoditized product strategy and offering complementary assets that are not easily emulated by other apparel suppliers.

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1. INTRODUCTION

The rise of large, transnationally organized ‘mega-suppliers’ has fueled a debate on shifting power and governance dynamics in GVCs. Since the early 2000s, a set of transnational first tier suppliers (transnational FTS hereafter) across manufacturing industries such as apparel, automotives and electronics has emerged. Over time, smaller suppliers became large corporations, operating with multi-billion revenues, a global footprint, and advanced technological and design capabilities. As these firms began to coordinate their own far-flung supply chains, some authors suggest that this set of firms obtained more bargaining power both towards lead firms and vis-à-vis their own suppliers. These scholars conclude that GVCs had transformed towards ‘multipolar’ governance structures beyond lead firms as the sole organizers (Appelbaum, 2008; Raj-Reichert, 2019). According to Yeung (2016), ‘strategic partnerships’ with lead firms were the essential mode for supplier firms to leave their subservient position and capture more value. Gradually, subordinated suppliers from South Korea, Taiwan, and Singapore used their acquired technological and managerial capabilities to become strategic partners in segments with higher barriers to entry and more value capture. In some cases, these East Asian firms became market leaders in new industrial niches, or even challenged incumbents by using their market knowledge to become lead firms.

Other contributions are more skeptical towards the proposition that technological capabilities and higher production volumes per se increase bargaining power and value capture of supplier firms. In technology-intensive industries such as semiconductors and pharmaceuticals, lead firms increasingly outsourced research and development steps and the related financial risks, but they also limited further upgrading of the very same (strategic) suppliers by reducing the flow of information and blocking their access to end markets through lobbying for regulatory barriers (Fuller and Ramirez, 2024). Further research concludes that even gigantic production volumes of mega suppliers and strategic partnerships can correspond with very small profit margins. In their study of Foxconn’s financial statements during the 2000s, Froud and colleagues (2014) indicate that Apple dictated the contract prices, which is illustrated in the substantial divergence in the profit trajectories of these two firms.

However, both sides provide insufficient firm-level data on whether transnational FTS capture more value vis-à-vis the lead firms with which they interact. Furthermore, we do not know whether and to which degree certain capabilities and strategic actions of transnational suppliers result in value capture. Contributing to this debate, or even seeking to resolve it, this paper identifies the factors that determine the value capture of transnational FTS. In doing so, it builds on and advances the ‘profit from upgrading’ framework by Sako and Zylberberg (2019) and work in the GVC literature emphasizing barriers to entry and competition as determining profitability.

The Complementary Assets approach that we propose in section 2 situates supplier firm value capture trajectories within the competitive global industry dynamics that shape the strategies that lead firms pursue to sustain or create product markets, which in turn define which types of complementary assets supplier firms need to provide for lead firms to implement their product strategies at a given point in time. The ability of supplier firms to respond to lead firms' product market strategies and to build the required complementary assets can put them in a position where they wield higher bargaining power and force lead firms to make concessions in terms of profit sharing. However, whether supplier firms are able to extract such concessions depend on how many other supplier firms have these 'specialized' complementary assets, and thus on the barriers to entry vis-à-vis other suppliers. This combination of specialized complementary assets linked to lead firm product market strategies combined with high barriers to entry to building such assets explains variation in value capture outcomes across supplier firms. Thus, whether transnational FTS achieve 'relative' value capture (higher profit margins vis-à-vis lead firms) and not just 'absolute' value capture (high profit volumes based on large sales volumes but low profit margins) depends on whether they have specialized complementary assets.

What 'specialized' means, and thus which complementary assets matter for supplier firms to capture a greater share of aggregate profits created in global supply chains, depends on the competitive dynamics and lead firm strategies in a particular industry and can change over time. For this reason, they have to be specified for each globalized industry. In this paper, we do that for the global apparel industry, which is significant because the literature on apparel GVCs has been characterized by similar debates on whether transnational apparel FTS have been able to capture value through their strategic partnership with apparel brands and retailers. Our contextualization of the Complementary Assets approach for the global apparel industry in section 2 is based on an iterative theory-building process, in that it incorporates the findings from our empirical study of global apparel brands and retailers as well as transnational apparel FTS. The competitive dynamics since 2005 have led global apparel brands and retailers to pursue two different product strategies to remain competitive. Most apparel brands and retailers have sought growth through expansion in commoditized products linked to fast fashion, for which they need transnational FTS that have large-scale production capacity in several geographical locations and a high-level of production efficiency in garment assembly to provide short lead times and thus speed to market. A second product strategy pursued by some apparel brands is to escape the high competition among brands and retailers by creating new products, which are thus not (yet) commoditized, through intensive marketing strategies linked to new product segments such as athleisure or invigorating existing ones through the notion of 'high tech' apparel products in sportswear and outdoorwear. This lead firm strategy requires suppliers that have a combination of integrated synthetic fabric-apparel production with tacit knowledge that facilitates the rapid scaling of new products, which during the period 2005 to 2022 few transnational apparel FTS were able to offer, allowing them to capture a greater level of the profit margins in these new product segments.

Sections 3 and 4 of the paper provide the empirical evidence for this argument. Section 3 elaborates the competitive dynamics in the global apparel industry since 2005, when the Multi-Fiber Agreement governing the quota system in global trade ended and competition among suppliers increased significantly. It is based on our understanding of buyer-supplier relationships developed through more than 100 interviews with lead firms, suppliers and industry experts that were conducted at supplier firms' headquarters, subsidiaries and global industry summits between 2020 and 2024. Through a novel mixed methods approach, we then connect the value capture trajectories for a group of the largest transnational apparel FTS from Hong Kong, South Korea, China, and Taiwan with the underlying complementary assets they developed, for the period 2005 to 2022. Using financial data on gross profit volume and gross profit margins, section 4 shows that the majority of the transnational apparel FTS in our group captures 'absolute' value, but that 'relative' value capture is much harder. Using document analysis combined with semi-structured interviews, we identify which specialized complementary assets underpinned the relative value capture trajectories of transnational apparel FTS.

2. Conceptualizing value capture in the global apparel industry

Transnational FTS have been a key agent in globalizing the apparel industry, but there have been different approaches to investigating the distributional outcomes of buyer-supplier relationships, giving rise to debates and contradictory positions in the literature. The early contributions on apparel global supply chains stressed the importance of functional upgrading by supplier firms in order to increase their profitability. Gereffi (1999) presents the upgrading story of Hong Kong, Taiwanese, and South Korean apparel manufactures from garment assembly, to sourcing all inputs and shipping the final products to buyers (full package), and then to product design. The shift to full package suppliers was quite novel in the 1990s, as newly emerging retailers and branded marketers required it. Gereffi (1999) assumed that functional upgrading from CMT to full package to product design to brand ownership would lead to more value capture by supplier firms. However, already by the early 2000s global conditions changed as branded manufacturers disappeared and full package became more of a standard expected by buyers. Apparel GVC studies focusing on functional upgrading showed that taking over more functions in supply chain management and design became a minimum requirement for suppliers to stay in global supply chains or to expand their business but did not necessarily lead to higher value capture (Gereffi and Bair, 2003; Tokatli, 2013; Zhu et al., 2019). However, these studies did not explicitly define value capture and measure it empirically.

The phase-out of the Multi-Fiber Agreement quota system in 2005 stimulated consolidation among apparel supplier firms in East Asian countries and led them to play a key role in expanding global supply chains. These East Asian firms acquired functions not captured in the functional upgrading typology such as pioneering new sourcing locations, logistics, inventory

management in buyer countries, and even forecasting consumer demand (Appelbaum, 2008; Azmeh and Nadvi, 2014). These contributions outline the 'growth story' in terms of revenue and functions of a small set of transnational supplier firms, but none of them measures the implications of the new organization of transnational suppliers on their value capture. The end of the quota system in the global trade regime created a more perfectly competitive global market for apparel suppliers, and after China joined the WTO in 2001, Chinese apparel suppliers led to a rapid increase in the number of overall suppliers. Apparel GVC studies have debated the impact of this shift in global market structure on the bargaining power of supplier firms towards buyers, leading to two conflicting positions.

Some scholars argue that the high degree of competition among suppliers increased buyers' bargaining power, resulting in a supplier squeeze where buyers increased the requirements that suppliers have to fulfill (shorter lead times, and shifting order size and product specifications at short notice) but paid suppliers the same or lower unit prices (Anner 2019, 2020, 2022; Nathan et al., 2022). To substantiate this claim, Anner (2020) provides empirical data from Bangladesh's apparel export industry that outlines corresponding processes of increased oligopolistic market structures and power imbalances at the factory level, but not causality. He also suggests that all supplier firms were affected equally by the supplier squeeze. Thus, Anner's analyses do not recognize supplier firms' agency or variation in outcomes across suppliers, nor potential variables that may explain that variation. Nathan and colleagues (2022) come to similar conclusions as Anner based on their survey data from the Indian apparel industry. They show that supplier firms which are larger in size and have more technological sophistication are able to secure higher order volumes from buyers and hence overall profits, but that the related productivity gains are captured by buyers. However, the authors leave open the possibility that supplier firms could capture more value towards buyers by shielding themselves from competition in a particular segment through innovations that involve unique tacit knowledge or intellectual property rights.

Other scholars argue that large transnational supplier firms were able to secure more functions and orders from buyers and created economies of scale in their production, which allowed them to capture more value at the expense of workers, whose real wages did not rise according to productivity gains (Kumar, 2020; Nachum and Uramoto, 2021). However, these authors do not consider whether suppliers' productivity gains are then captured by buyers. Methodologically, these studies use selective firm-level evidence that supports their core argument, from which they then draw conclusions on value capture for the entire apparel export industry in the country. The experiences of individual firms in the study are generalized without an analysis and explanation of firm-level differences.

As shown, there is no agreement on the definition of value capture, nor on its measurement. This makes coming to conclusions about the factors explaining value capture outcomes difficult. Thus, we first need conceptual clarity on what value capture looks like, and then we need to conceptualize the basis for firm-level differences in value capture outcomes and their drivers.

We distill three generic forms of supplier firm value capture from the existing literature: *marginal value capture*, *absolute value capture*, and *relative value capture*. Marginal value capture is where supplier firms operate with small and volatile order volumes and low profit margins (meaning they can incur losses on some orders). Absolute value capture refers to the entirety of profits realized from the supplier firm's apparel export manufacturing operations and is calculated by summing up the gross profits from all buyer orders. An absolute value capture strategy is predominately based on expanding *profit volumes* through obtaining more orders from buyers, while the underlying gross margins may remain on a low level. Therefore, the logic of absolute value capture is capturing value *vis-à-vis* other suppliers by taking orders from competing supplier firms. Relative value capture refers to the *profit margins* of an apparel supplier. The margin represents the difference between the full package unit price (or CMT unit price) received on all orders from buyers and the firm's production costs. The relative value capture provides insights on the extent to which supplier firms can capture value *vis-à-vis* buyers. Given that apparel supplier firms can operate multiple subsidiary factories across various countries, conceptually and methodologically we focus on the headquarter level.

Our Complementary Assets approach to understand the causal drivers for these different value capture outcomes combines insights from contributions on entry barriers in globalized industries with our in-depth understanding of the power and value capture dynamics in the global apparel industry. The framework is inspired by a number of contributions that seek to theorize the causal mechanisms behind value capture outcomes in globalized industries (Rikap, 2018; Sako and Zylberberg, 2019; Durand and Milberg, 2020; Schwartz, 2022; Bair and Mahutga, 2023; Ramirez and Fuller, 2024). Despite their different theoretical framings, these contributions have a common emphasis that creating *barriers to entry* are the central mechanism through which lead firms and suppliers capture profits in globalized industries. Indeed, this point was made already in the early literature analyzing global supply chains. Gereffi and Korzeniewicz (1994, p. 4) argued that 'profitability shifts from node to node according to competitive pressures', and thus' "industry" is not always a motor of development', as high competition in certain manufacturing segments can lead to low profitability. Kaplinsky and Morris (2000) elaborated that the competitive pressures are a function of barriers to entry, with lower barriers to entry leading to higher competition and thus lower profits. However, these early works did not elaborate on the concrete assets and activities that embody these entry barriers.

Later work, especially by Durand and Milberg (2020) and Schwartz (2022), argues that intellectual property rights such as patents, trademarks or copyrights create the highest barriers to entry and thus the lowest competition (even leading to monopoly situations) and largest profits. Their focus was on lead firms in global supply chains. However, their data on the link between intellectual property rights portfolios and profit streams draws on aggregated global data or sectoral data, and hence lacks the explicit proof of causality between an intellectual property right portfolio and higher value capture at the firm-level.

Sako and Zylberberg (2019) emphasize innovation more broadly as the source of profitability, drawing on work by business studies and management scholars that sought to nuance the argument that innovations by firms always lead to competitive advantage by specifying the conditions under which innovation leads to greater profitability. The key again is barriers to entry, understood as barriers to imitating the innovator, but the argument can be broadened to apply to any firm which has a competitive advantage because of the particular capabilities and assets that it has. Thus, Sako and Zylberberg (2019) apply these ideas to explain how supplier firms in global supply chains can capture a greater share of the aggregate profit created, arguing that upgrading in global supply chains should be conceptualized as a type of innovative activity. They point to three factors that shape barriers to entry and thus protect against imitation and thus competitive pressures and profitability: (1) the ability to appropriate innovations through intellectual property rights, which they argue depends on the appropriability regime in specific locations as a result of legal institutions; (2) whether a supplier is providing a product or service in a pre-paradigmatic technology or one in which the technology has matured and dominant designs are in place; and (3) whether a supplier has specialized complementary assets that are critical to buyers and characterized by mutual or unilateral dependence. Importantly, Sako and Zylberberg (2019) argue that complementary assets become more important for profitability the weaker the appropriability regimes and the more established the technological paradigm, which we interpret to mean both mature technologies and lack of technological change.

We argue that these insights do not just apply to supplier firms but also to lead firms, and that the issues of weak/strong appropriability from innovations that block imitation by other firms and the pre-paradigmatic/paradigmatic stage of the technology apply at the level of the globalized industry. Appropriability and stage of the technology shape the global competitive dynamics of a particular industry and may evolve over time, for example depending on the extent of technological change in the industry. Sako and Zylberberg (2019) hint at this point, in their industry examples, but do not elaborate it theoretically.

Our Complementary Assets approach advances the framework of Sako and Zylberberg (2019) by putting the competitive dynamics of globalized industries at the center of the causal drivers. These competitive dynamics shape the strategies of lead firms in creating barriers to entry vis-à-vis other lead firms to generate or sustain product markets, which in turn shape the value capture trajectories of their supplier firms. We argue that whether complementary assets are ‘specialized’ depends both on lead firm business strategies (and thus what assets they need) and the barriers to entry (which limit imitation by other suppliers). It is the limited number of suppliers (or even a monopoly) with these specialized assets that gives the supplier the ability to capture more value vis-à-vis its buyers. Because competitive dynamics differ across globalized industries, and potentially over time, they must be specified for specific industries and time periods. Only then can we identify what constitutes ‘specialized’ complementary assets that enable supplier firms to capture greater value vis-à-vis buyers. In the rest of this section, we do this for the global apparel industry.

The global apparel industry has a weak appropriability regime for both lead firms and suppliers, and mature technology underpins both apparel design and production. The technology used in apparel design and production is mature and has not experienced significant technological change, which means that brands and retailers cannot create barriers to entry through establishing a novel (pre-paradigmatic) base or application technology or a paradigmatic design standard, as we have seen it in the electronics industry. Furthermore, there are very limited opportunities for brands and retailers to use intellectual property rights to protect a garment design from imitation. Given that patents do not cover all features of a garment, competitors can easily work around designs of competing brands and retailers and reverse-engineer these with marginal differences, without infringing on intellectual property rights, which Zara and Shein have done on a regular basis (Tokatli 2008; Hall 2024). Even if a firm is sued, by the time the case is settled, firms have moved on to new designs. Hence, stable revenue and profit streams through intellectual property rights protection, as in the case of the pharmaceutical industry, is virtually absent in the apparel industry. As a result, apparel brands and retailers aim to create entry barriers by differentiating themselves through constantly launching new designs (several times a year, minimum 10-12 collections) to remain relevant for customers and secure future revenues (Taplin, 2014). But this kind of entry barrier is constantly and rapidly dissipating. Thus, apparel brands and retailers struggle to create long-term barriers to entry, and thus imitation happens quickly.

Despite this high competition, some apparel brands and retailers are highly profitable. In 2022, the top 10 firms had an average gross margin of 52 percent (Capital IQ database, 2023). The reason for this paradox of low entry barriers in combination with high profit margins can be found in distinct firm strategies. The first strategy is about sustaining product markets through high volume low-cost, commoditized product segments (denim, shirts, trousers, etc.), which is the 'fast fashion' model pioneered in the early 2000s and became associated with Zara, H&M and Forever 21, but which entered the sourcing and marketing strategies of all major brands and retailers. The barriers to entry are a combination of building brand loyalty through marketing expenses, the expansion of the distribution network to offer the same products across multiple geographies, and what Taplin (2014, p. 256) called a 'responsive supply chain' that combines volume availability and speed to market at a certain minimum quality and low costs. A second strategy pursued by a small set of apparel brands is to develop new product markets, which means products that are not (yet) commoditized and thus brands can combine high sales volume with high retail price points.

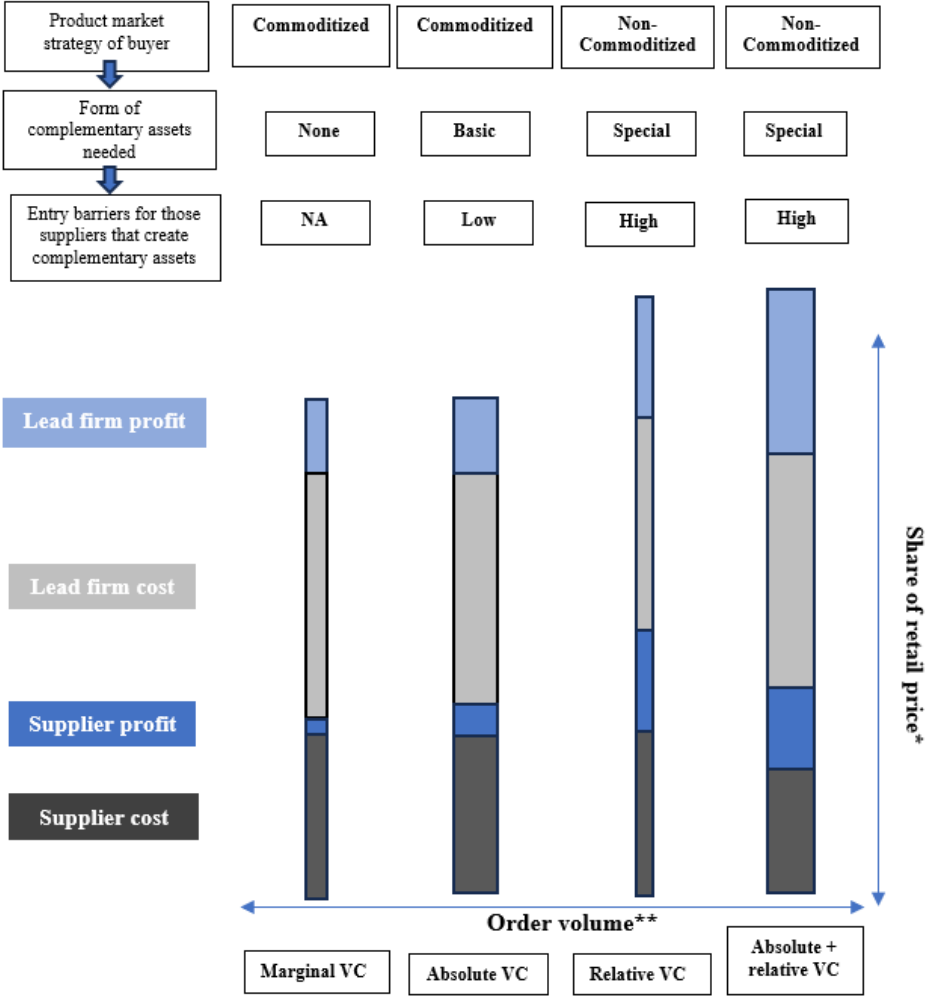
These two product market strategies have important implications for supplier firms. There are complementary assets that help apparel brands and retailers sustaining a commoditized product market, and there are complementary assets that support them in the creation of a new, non-commoditized product market. Distinguishing between these two types of complementary assets is important because they create different levels of entry barriers vis-à-vis other suppliers, and hence the type of value capture trajectory. These apparel-specific competitive dynamics lead to four possible value capture trajectories among supplier firms,

as illustrated in Figure 1. The vertical axis represents the distribution of costs and profits between lead firms and suppliers, whereas the horizontal axis represents the order volumes for this kind of value capture trajectory.

An apparel supplier firm will have marginal value capture if it does not possess any complementary assets that are relevant to its buyers' product market strategy (left side of Figure 1). These firms will face perfect competition with a large pool of similar firms that are able to produce commoditized products, as Bair and Mahutga (2023) predict. Supplier firms with marginal value capture secure their participation in the GVC through flexible and precarious labor regimes that lower their unit labor costs, which are however captured by lead firms through low unit prices, which Rikap (2018, p. 45) and Schwartz (2022, p. 92) observe in other industries as well. In the apparel industry, marginal value capture occurs predominantly by small firms that are peripheral suppliers to large apparel brands and retailers in commoditized product markets. Therefore, they only receive small residual orders and thus have low overall efficiency at the factory, as the factory does not run at capacity consistently. However, even some transnational FTS can fail to secure sufficient orders if they stop being strategic suppliers for their buyers, or if their buyers' product markets stop growing. It is also the case that some subsidiary factories of transnational FTS may only be peripheral suppliers and thus there is marginal value capture at that particular factory, while there is absolute value capture in terms of the overall portfolio at the headquarter level.

Supplier firms are able to pursue an absolute value capture trajectory if they possess complementary assets providing a wide range of basic apparel products to large volume buyers. The complementary assets required are large scale capacity, the related machinery in cutting and assembly, and a trained labor force with high efficiency levels. It further includes 'responsive' supply chains with regional input sourcing and a multi-country sourcing portfolio where buyers can choose among different production locations of the supplier based on speed to market and tariff considerations. Despite the capital-intensive investments to achieve these 'basic' complementary assets, we observe that there are more than a dozen transnational apparel FTS that have these assets. As a result, apparel buyers can switch to another supplier (or threaten to switch) for a given order volume, reducing the bargaining power of these transnational FTS and leading to downward pressure on unit prices that they receive. Thus, these suppliers grow in terms of production volumes and overall revenue, but the profit margins on orders remain on a low level.

Figure 1: Causal Drivers of Types of Supplier Value Capture in the Apparel Industry



Notes: *The length of each bar represents the share on the final retail price of the specific product. ** The width of each bar represents the order volume of the product line.

The apparel buyers with non-commoditized product market strategies tend to be in sportswear, outdoorwear and athleisure, and their new products depend on technical functions of fabrics, such as Nike’s ‘Tech Fleece’ jackets and Lululemon’s ‘Align’ yoga pants. The entry barriers vis-à-vis other lead firms are created through specialized marketing and some form of novel quality features, mainly around using fabric that has a special tech function (i.e. thermal or moisture control, stretchability). For this type of product market strategy, apparel brands need suppliers that possess fabric capabilities in addition to the high volume/decent quality/low price parameters required for fast fashion. The apparel brand may develop the fabric function in-house and own the patent, but their supplier firms must have the specialized machinery and the tacit knowledge to implement this fabric innovation on the factory floor. We observe that only a few supplier firms have these capabilities at a given point in time.

We see that some transnational apparel FTS operate with higher profit margins for specific product categories where they can leverage advanced production capabilities, but the end market size for these products tends to stagnate or decline, for example with men's dress shirts, leading to smaller orders and falling efficiency levels. Ultimately, these transnational FTS that operate in these higher-end product segments seek to enter product categories that allow them to capture higher margins while also growing their order volumes. Therefore, the 'relative value capture trajectory' in Figure 1 should be regarded as a theoretical option that may not exist in practice. Supplier firms cannot subsist on relative value capture alone, as they need large orders.

Instead, what we observe is an *absolute and relative value capture* trajectory where supplier firms grow in volume but also have high profit margins for specific product lines. Transnational apparel FTS with the 'specialized' complementary assets that apparel brands need to bring new, high unit price products to market that allows those suppliers to capture both high order volumes and profit margins, as brands are forced to share their margins. However, there is a tendency that once brands scale up production of new products, and thus give larger orders to these suppliers, they put pressure on suppliers for lower prices and seek to find alternative suppliers with similar capabilities, yet these margins remain above those commoditized products.

The next section provides evidence on the competitive dynamics in the global apparel industry from 2005 to 2022 as well as differences in lead firm business strategies around commoditized and non-commoditized products. It also explains how growth in the global apparel industry provided opportunities for transnational apparel FTS to emerge and capture absolute value, but also the constraints on relative value capture. Section 4 then presents evidence to show that there is variation in the value capture trajectories among these transnational apparel FTS, based on a sample of the largest transnational apparel FTS. Some transnational FTS in the sample fell into marginal value capture, most sustained absolute, and only a few were able to capture absolute and relative value capture. We demonstrate that the transnational FTS that were able to capture relative value did so because they possessed specialized complementary assets and supplied high growth apparel brands with non-commodified product market strategies.

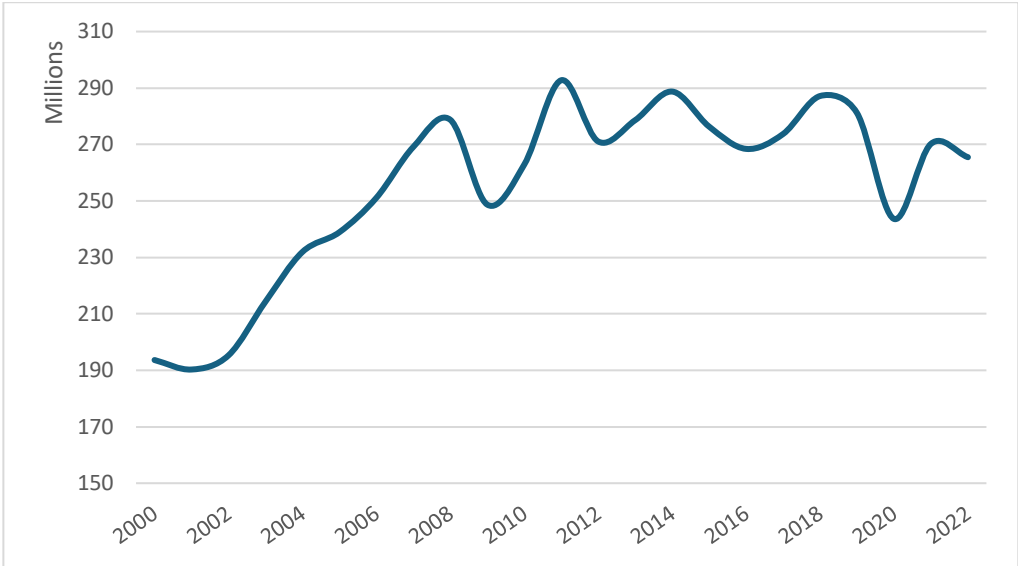
3. Competitive dynamics in the global apparel industry and lead firm strategies

Our analysis of the broader development of the global apparel industry since the turn of millennium shows that it has been conducive for absolute value capture, if supplier firms coupled with the right kinds of buyers, as not all buyers grew equally in size. At the same time, the increasing profit margins of the top apparel brands and retailers suggest that relative value capture became increasingly challenging. This section elaborates on the different trajectories

among apparel brands and retailers and the implications for transnational apparel FTS value capture trajectories.

The apparel GVC literature notes that the number of suppliers that competed with each other increased massively in the 2000s (Kumar, 2020; Bair and Mahutga, 2023). Less noted, however, has been the substantial growth in the main apparel end markets indicated by the steep increase in global apparel exports in the 2000s, which remained on this high level during the 2010s, as shown in Figure 2. Therefore, at least in the 2000s, supplier firms became more interchangeable but competed in a growing and large market, which provided opportunities to increase absolute value capture.

Figure 2. Global apparel exports, 2000-2022, million USD (in 2000 constant prices)



Source: UN COMTRADE (2023). Apparel exports cover all HS 61 and HS 62 codes.
Note: Values are inflation-adjusted, using the price level of the year 2000 as baseline. CPI for inflation was retrieved from US Bureau of Labor Statistics. <https://www.bls.gov/>

Central to the expansion of the apparel industry were transnational apparel FTS which grew rapidly in size since the early 2000s. These firms distinguish themselves from smaller local manufacturers by operating a global network of assembly factories that add up to high revenues at the group level beyond USD 100 million turnover per year. Transnational apparel FTS obtained large volumes of orders by catering apparel brands and retailers with the same products from at least two different regions. Transnational FTS were the key agents to implement the sourcing and growth strategies of buyers by establishing new sourcing locations (such as Ethiopia, Haiti, Myanmar) and developing a local supply chain through co-investments with their fabric and component suppliers.

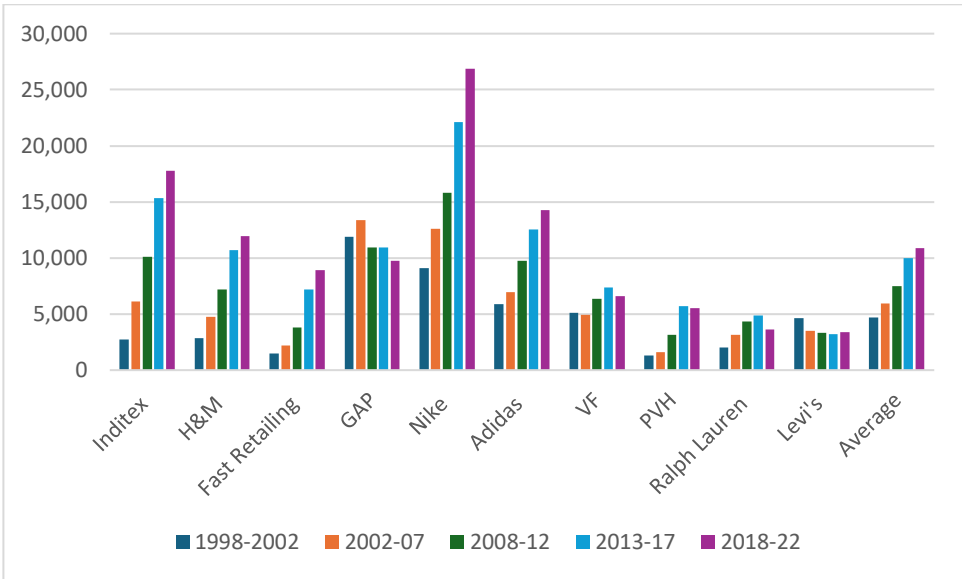
We estimate that there are currently around 30 such transnational apparel FTS, which are mainly headquartered in China, Hong Kong, South Korea, Sri Lanka, and Taiwan. This number excludes a range of large supplier firms from China, Bangladesh, and India, which produce in high volumes but have a production portfolio that is limited to one country or region. For

instance, there is a large number of Chinese firms that invested in Vietnam since the early 2010s. However, the principal purpose of these investments was to access lower labor costs and circumvent the tariffs to the US that have been in place since 2018. Therefore, these firms do not operate a global production portfolio for specific buyers, as transnational apparel FTS do.

Coupling with the largest apparel brands and retailers was more conducive for apparel suppliers to achieve absolute value capture, because their sales volumes grew at a much faster pace than the industry average. While all of today’s largest apparel brands and retailers were established prior to the 1980s, it was the rapid growth period from the early 2000s onwards that generated their incumbent status. Thus, we focus on the largest ten apparel brands and retailers by revenue and analyze data that sheds light on how these top apparel buyers shaped the conditions for their suppliers’ absolute and relative value capture trajectories.

Figure 3 displays the average revenue of the ten largest apparel retailers and brands. Between 2000 and 2022, the average revenue of these apparel brands and retailers doubled, but it is important to distinguish between individual firms. Activewear firms such as Nike and Adidas grew rapidly based on a global expansion of their market footprint. The growth curve of Nike became even steeper after 2008, which is in stark contrast to the sluggish post-financial crisis growth of the overall industry. Fast fashion specialty retailers Inditex, H&M, and Fast Retailing (Uniqlo) had similar growth trajectories. In contrast, former industry leaders such as Levi’s and GAP stagnated amidst competition. These different trajectories of lead firms are important to understand the value capture trajectories of transnational apparel suppliers.

Figure 3. Top 10 listed apparel retailers and brands, revenue (million USD), 1998-2022 (in 1998 constant prices)

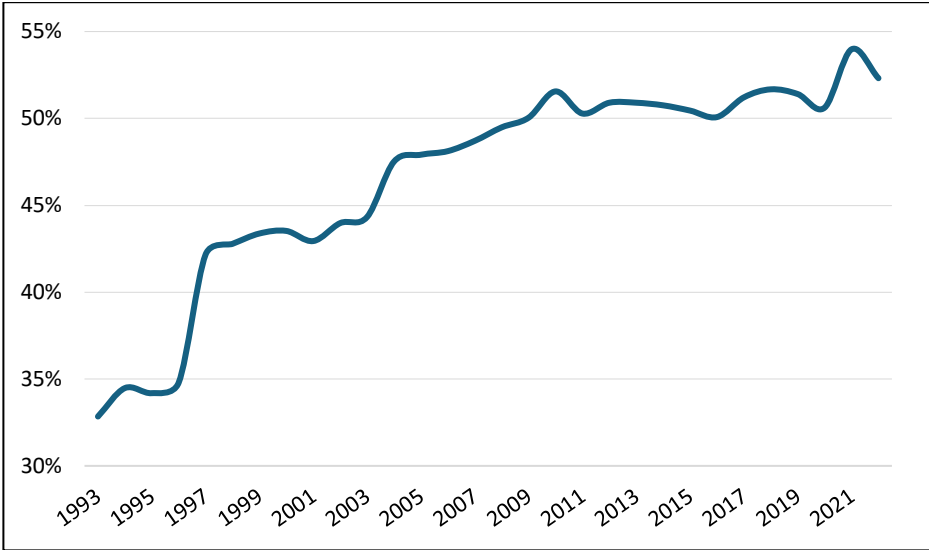


Source: Capital IQ database (2023).

Note: Values are inflation-adjusted, using the price level of the year 1998 as baseline. CPI for inflation was retrieved from US Bureau of Labor Statistics. <https://www.bls.gov/>

Conditions for suppliers to increase their relative value capture vis-à-vis buyers deteriorated because the top apparel brands and retailers lifted the profit margins on their sourcing costs substantially, as shown in Figure 4. In 1993, when the global quota system was still in place and competition at the supplier level was lower, the average gross margin of the top ten apparel brands and retailers was only 33 percent, which allowed for more relative value capture by suppliers. This changed between the mid-1990s and mid-2000s, when the annual gross margins of these brands and retailers grew rapidly to more than 50 percent until the early 2010s, a level at which they have remained, with their average gross margin at 52 percent in 2022.

Figure 4. Value capture of top 10 Apparel Retailers and Brands: Average Annual Gross margins, 1993-2022

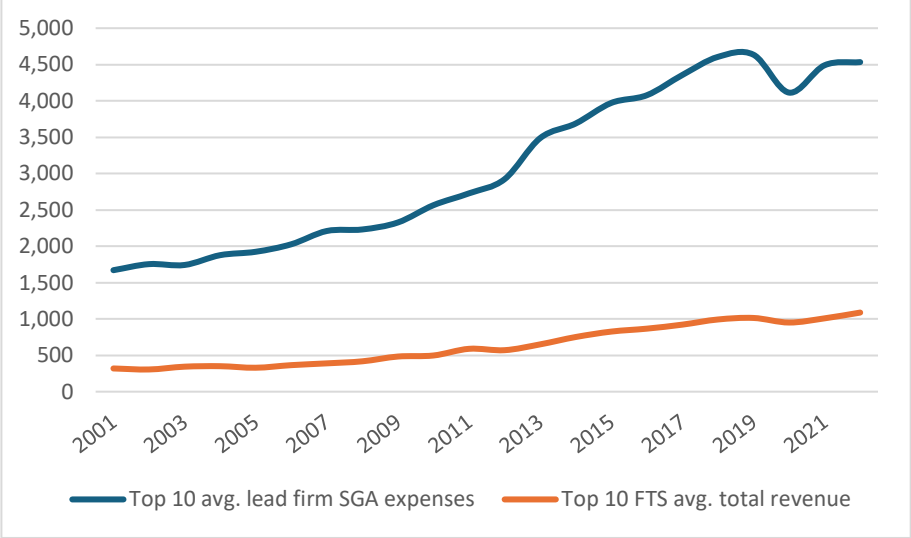


Source: Capital IQ database (2023).

Note: Gross profits = Total revenues – costs of goods sold (COGS) (which are sourcing costs in the case of apparel lead firms).

To understand the kind of assets that apparel brands and retailers possess to defend their incumbent status vis-à-vis transnational apparel suppliers, we analyzed data on selling, administrative and general expenses (SGA). These reflect all investments related to distribution networks and marketing campaigns that aim to create and sustain brand loyalty. Figure 5 depicts the average annual SGA expenses of the largest 10 apparel brands and retailers (blue line), in relation to the average total revenue of the top 10 transnational apparel suppliers that are part of our firm case studies (orange line). It shows that on average lead firms’ SGA expenses exceeded the overall revenue of our case study FTS by a factor of four. Therefore, even the top transnational apparel suppliers faced an immense investment cost entry barrier to compete with lead firms in the sales segment. Building up their own brand to challenge the incumbent status of lead firms was a very difficult option for even the largest transnational apparel FTS.

Figure 5. SGA expenses of top 10 apparel buyers compared to avg annual revenue of top 10 transnational apparel suppliers (million USD), 2001-2022 (in 2001 constant prices)



Source: Capital IQ database (2023).

Note: Values are inflation-adjusted, using the price level of the year 2001 as baseline. CPI for inflation was retrieved from US Bureau of Labor Statistics. <https://www.bls.gov/>

4. Value Capture Trajectories of Transnational Apparel FTS

Our sample of transnational apparel FTS for measuring and explaining value capture trajectories includes 12 firms. These firms were selected based on several criteria. To ensure a certain minimum size, we focus on firms that have achieved at least 300 million USD revenue at some point during that period. To ensure that we capture profit streams from business relationships with global apparel brands and retailers, we focus on supplier firms that obtained at least 75 percent of their revenues from apparel exports. Therefore, we excluded a number of large Indian suppliers that had high revenues but obtained a large share of their income from domestic retail operations. Finally, and most importantly, we could only include firms that were publicly listed, as we could only obtain consistent profit data for those firms that publish their profit data. The final set includes 12 transnational FTS: two firms from China (Shenzhou, Fountain Set), four firms from South Korea (Youngone, SAE-A, Hansae, Hansoll), four firms from Taiwan (Eclat, Macalot, Nien Hsing, Tainan), and two firms from Hong Kong (Crystal, Luen Thai).

The analysis demonstrates variation across these firms’ trajectories, with 2 firms falling into marginal value capture by 2022 while 7 maintained absolute value capture and 3 achieved the absolute plus relative value capture trajectory. The second part of the section demonstrates why some firms were able to achieve relative value capture, by comparing the business strategies and complementary assets of 8 firms for which we were able to collect in-depth qualitative data: 5 with absolute value capture (SAE-A, Hansae, Hansoll, Crystal, Luen Thai) and 3 with absolute and relative value capture (Eclat, Shenzhou, Youngone).

4.1 *Measuring absolute and relative value capture*

Measuring firm-level value capture rarely occurs in the GVC literature, perhaps because there is not a common understanding of the concept of value. There are varying notions of value capture: rent derived from scarce resources, share of value added on a product, or processes of value extraction based on labor exploitation (Havice and Pickles, 2019). The most useful contribution on measuring firm-level value capture was made by Kaplinsky and Morris (2000), who discuss three indicators of value capture among firms. The first measure they propose is return on net assets, which includes equity, reinvested profits and outstanding payments due from debtors. Their second indicator compares a firm's profit with the total profits accruing along the chain, but they note that this data is hard to obtain. The third measure captures a firm's mark-up on sales, referred to as gross profit volume and gross profit margin, which accrue from the difference between the production costs of a company (referred to as 'costs of goods sold' in the firms' financial statements), and the sales revenue generated.

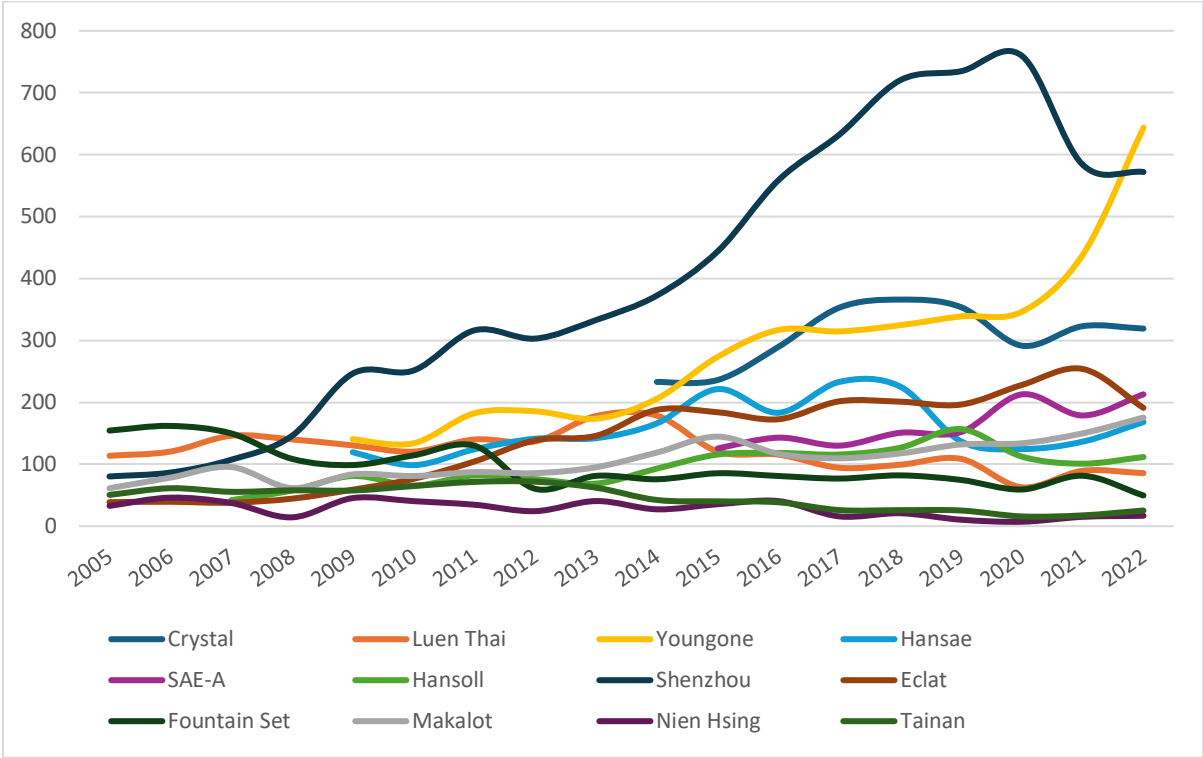
We argue that using gross profit measures is the most compelling way to calculate and compare the value capture among firms. Thus, we use gross profit volume to measure absolute value capture, and gross margins to measure relative value capture. For a lead firm that outsources all its production, gross profit volume represents the value generated from the differences between all sourcing costs and all sales to consumers. For a supplier firm, the gross profit volume represents the difference between the entire production costs of their apparel products, and the sum of prices they receive from all lead firms they cater within a financial year. A higher gross profit margin indicates that a supplier can bargain prices vis-à-vis the lead firm in its favor.

We acknowledge that there are certain challenges when it comes to using annual consolidated gross margins as a measure for supplier firm value capture vis-à-vis lead firms. As gross margins do not entail a breakdown of production costs, one could argue that a higher margin is simply based on lowering labor costs and therefore value capture vis-à-vis labor, and not the lead firm. Equally, because the gross margin does not display the margins of individual lead firm orders, there could be high variation among different buyers. Yet, based on our understanding of the apparel industry, we think that the gross margin is a useful proxy for measuring value capture vis-à-vis buyers for two reasons. First, due to the widespread adoption of open costing practices in the apparel industry, supplier firms have been unable to hide efficiency gains or lower labor costs, so that the margin on apparel assembly costs tends to be the same across suppliers. Second, in many cases a small set of lead firms accounts for a large proportion of the overall production of a supplier. Therefore, we can assume that an above average gross margin must originate from activities outside apparel assembly that suppliers can offer to their main lead firms.

Figure 6 displays the gross profit volume data for our 12 transnational FTS. It shows that the majority of them achieved absolute value capture. By 2015 all firms except Nien Hsing and

Tainan had reached at least 100 million annual profit volume. At the same time, this figure underscores that ‘absolute value capture’ happens on a broad spectrum. There is considerable variation in the generation of profit volumes, as Crystal, Youngone, and Shenzhou outperformed the other firms substantially by capturing more than 300 million USD gross profit volume.

Figure 6. Annual gross profit volume (million USD) of major transnational apparel FTS (2005-2022) (in 2005 constant prices)



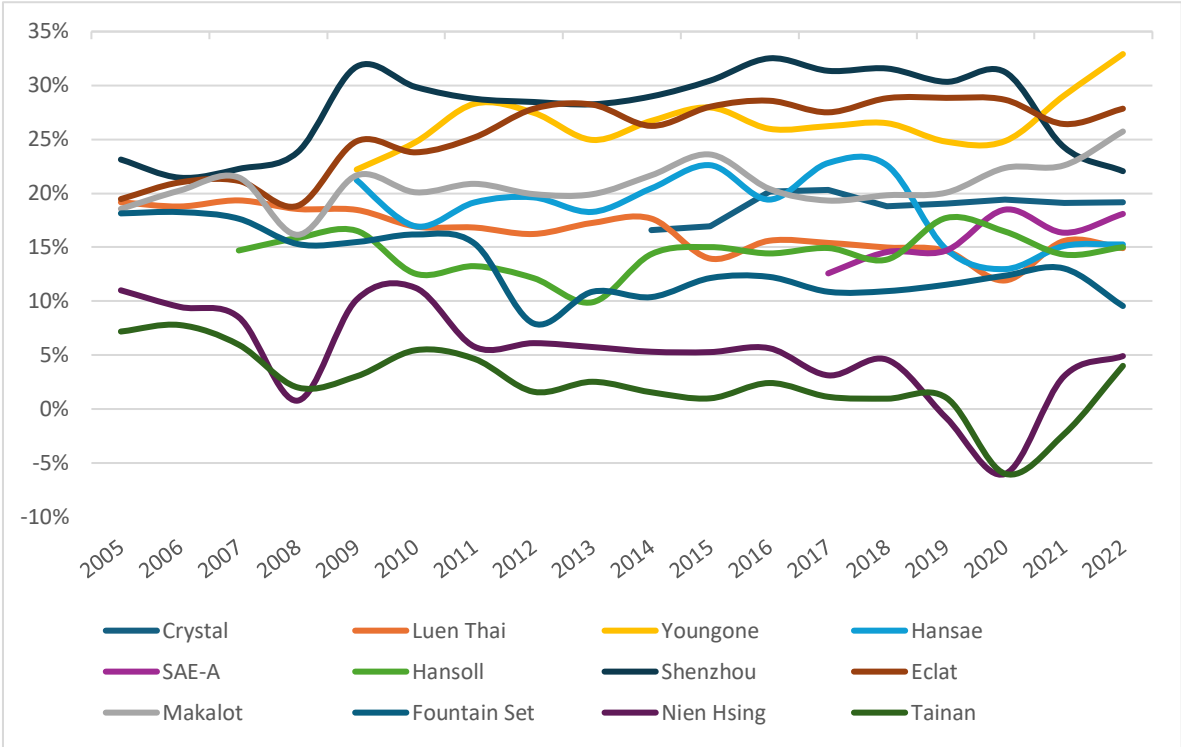
Source: Capital IQ database (2023).

Note: Values are inflation-adjusted, using the price level of the year 2005 as baseline. CPI for inflation was retrieved from US Bureau of Labor Statistics. <https://www.bls.gov/>

We defined a spectrum among average annual gross profit margins and their classification regarding value capture trajectories. Gross margins less than 10% were considered very low and thus classified as marginal value capture. Gross margins of 10-25% were considered an indicator for an absolute value capture trajectory because this value is less than half of the gross margin of the 10 largest apparel brands and retailers that we analyzed, which ranged between 30% and 70% and were on average around 50% in the period 2005 to 2022. Lastly, supplier gross margins higher than 25% were classified as achieving relative value capture, because it is more than 50% of the average of the lead firm margin and in some cases exceeded the margins of particular apparel brands and retailers.

Figure 7 displays the gross profit margin data. It shows that Shenzhou, Eclat and Youngone obtained gross margins higher than 25 percent since the early 2010s and thus relative value capture. Crystal, Luen Thai, Hansoll, SAE-A, Hansae, Makalot have gross margins that oscillate between 10 to 25 percent, but on average did not achieve more than 20 percent annually. Two firms, Nien Hsing and Tainan, neither achieved absolute nor relative value capture. Their average gross profit margins were at 5 and 2 percent respectively, and their dwindling revenues since the mid 2010s resulted in low average annual profit volume of USD 17 million and USD 25 million by 2022 respectively. Therefore, these two firms can be regarded as an example of a marginal value capture trajectory.

Figure 7. Annual gross profit margin (%) of major transnational apparel FTS (2005-2022)



Source: Capital IQ database (2023).

4.2 Complementary assets and value capture trajectories

This section demonstrates how Shenzhou, Eclat, and Youngone were able to capture higher relative value than Hansae, Hansoll, Sae-A, Leun Thai and Crystal by analyzing their buyers and the complementary assets that they provided for buyers. Table 1 provides the key data on these firms. The analysis of these firms’ complementary assets is based on corporate reports and newspaper articles in trade journals and local newspapers combined with interviews with mid and high-level corporate executives of these firms. These representatives occupy leading positions in sourcing, buyer relations, business development, and in some cases are the founders and/or CEOs of that company. The questions that we asked during these interviews

were centered around strategic decision making at the group level, the firm’s product, buyer technology strategies, the kind of complementary assets and entry barriers the firm seeks to create, and how the firm strategizes to capture profits, including the challenges to these initiatives. Where we could not directly interview supplier firms, we used interviews with the sourcing representatives of major apparel brands and retailers that worked with these supplier firms. Obtaining this kind of data required multi-sited fieldwork over two years, conducting interviews at supplier firm headquarters in Hong Kong and South Korea as well as subsidiary factories in Ethiopia and Kenya, and conducting a range of online interviews. We aimed at interviewing different high-level representatives of the same firm, and to include follow-up interviews where possible. Given the sensitive nature of buyer-supplier relationships, prices and profits, and trade secrets, it took time to build contacts, and for some firms we were not able to collect the necessary data and thus had to omit them from the study.

Table 1: Causal drivers of value capture trajectories of transnational FTS

Firm name	Value capture outcome (Average 2005-2022) Absolute VC (mil. USD, in 2005 prices) Relative VC (%)	Main production countries	Key buyers	Key product segments	Fabric capabilities (None-low-high)
Crystal	307 million 19%	Vietnam China Bangladesh	Uniqlo, Levi’s, GAP	Casual, denim, sportswear, intimates	Low More recent investment in 2 mills
Luen Thai	121 million 16%	China Bangladesh India	Ralph Lauren, Dillard’s, L Brands, Fast Retailing	Sweater, casual, sleepwear, sportswear	None Abandoned investment
Hansae	159 million 19%	Vietnam, Indonesia Central America (various countries)	Walmart, Target, Old Navy, Gap, Kohl’s	Knit and woven in tops, bottoms, activewear, sleepwear, suits, dresses. <i>Plan to move into synthetic athletic & activewear.</i>	Low Cotton knit mill in Vietnam acquired in 2013. <i>In 2024 acquired US synthetic mill, for fabric production in Guatemala.</i>
SAE-A	163 million 16%	Vietnam, Indonesia Central America (various countries)	Kohl’s, JC Penny, Tesco, GAP	Range of basic knit products	Low Two mills in Central America and Vietnam
Hansoll	95 million 14%	Vietnam, Indonesia, Guatemala	Abercrombie Fitch, Uniqlo, Ross, JCPenny	Range of basic knit products	Low One mill in Vietnam

Firm name	Value capture outcome (Average 2005-2022) Absolute VC (mil. USD, in 2005 prices) Relative VC (%)	Main production countries	Key buyers	Key product segments	Fabric capabilities (None-low-high)
Youngone	287 million 27%	Bangladesh Vietnam El Salvador	North Face, Engelbert Strauss, Lululemon, Patagonia	Outdoorwear	Medium Fiber and filler specialists, with trademarks. Also produce synthetic fabric for jackets and knit fabric in Bangladesh.
Eclat	139 million 26%	Taiwan, Vietnam, China	Nike, Adidas, Lululemon, Patagonia	Sportswear & athleisure	High Focus on circular knit for elastics
Shenzhou	403 million 28%	China, Vietnam, Cambodia	Nike, Adidas, Puma, Uniqlo, Lululemon	Sportswear & athleisure	High Buyer specific vertically integrated synthetic

Source: Created by the authors based on interviews and corporate reports. Additional data on Hansoll and Sae-A comes from Kwon et al. (2023).

Throughout the past twenty years, Crystal, Luen Thai, SAE-A, Hansae, and Hansoll sustained absolute value capture based on efficiency in their core production hubs, multi-country sourcing, and ancillary services. Their core manufacturing locations are predominantly Vietnam and Bangladesh, and they reach high levels of efficiency in those locations through large factories and investing in automated machinery. Securing large order volumes and allocating these orders first to their key production hubs ensures relatively high utilization rates for those factories. In addition, they have factories in several other countries that offer speed to market and duty-free options for the different end markets of their buyers. Investments in new sourcing locations are not driven by seeking to capture higher profits in these locations, but instead are based on the rationale to obtain more order volumes from existing buyers or attract new ones. Some firms expressed that in a couple of smaller sourcing locations such as Ethiopia, Kenya or Haiti, their subsidiary factories operated at a loss due to under-utilization and supply chain constraints but keep them because they met buyers' demands.

Lastly, these transnational FTS offer ancillary services for buyers that support receiving orders, but do not result in higher unit prices due to their low entry barriers. These include some form of logistics such as vendor managed inventory to reserve a certain fabric stock for particular buyers in their factories, or even holding safety stocks of finished apparel. Our interviewees suggested that this became more important in recent years, in light of higher inventory levels

of buyers. Another free service that transnational FTS offer is design support. Design suggestions became the norm in the early 2000s, when buyers demanded suppliers to provide them with style suggestions in order to compete in the emerging fast fashion segment, but it never resulted in additional fees obtained by suppliers given the low entry barriers for these kinds of services. Moreover, these suppliers have invested in different basic sustainability features to respond to some of the decarbonization plans by their core buyers, including renewable energy facilities, denim washing machines with lower water usage, and other energy efficiency mechanisms that enabled them to obtain sustainability certifications such as LEED.

As a result of building these complementary assets, SAE-A, Hansae, Hansoll, Luen Thai and Crystal were able to obtain large scale orders for basic apparel goods such as sleepwear, denim, t-shirts, casual wear. Their main buyers were large fast fashion brands from Europe (H&M, Inditex) or Japan (Uniqlo), and large retail chains in the US (Target, Walmart, Kohl's, JC Penny, GAP) complemented with mid-sized buyers both in US and EU. This concurs with the work by Kwon and colleagues (2023), which have demonstrated the rapid revenue growth of SAE-A and Hansoll throughout the 2010s by supplying large volumes to these buyers.

All of these transnational FTS except for Luen Thai have some fabric production in their core manufacturing locations, from which they supply to other regional production locations: SAE-A (Central America, Indonesia), Hansae (Vietnam), Hansoll (Vietnam), and Crystal (Vietnam, Bangladesh). With fabric mills, these suppliers are able to shorten their lead times and increase efficiency, but the fabric capabilities are basic and often in cotton; they are not geared towards producing synthetic fabric with specific tech-functions necessary for non-commoditized products.

Shenzhou, Eclat and Youngone also receive large-scale orders by operating high-efficiency facilities in core locations and offering multi-country production portfolio to buyers. But in addition, they have high fabric capabilities, and they produce for a specific set of high growth buyers in activewear, outdoorwear and athleisure such as Nike, Adidas, Puma, Lululemon, North Face and Patagonia. However, it is not about the buyers themselves, but instead a specific set of products that these buyers offer within the athleisure, activewear and outdoorwear segments. These buyers have commercialized products with technical functions through extensive marketing campaigns, but they depend on suppliers that can produce them based on their specialized fabric machinery and tacit knowledge. The key for supplier firms is to be the first supplier able to produce these products at scale, as part of a 'one stop shop' solution. As a result, the suppliers captured higher margins on these orders, according to our interviews and reports from equity analysts, especially Shenzhou and Eclat, which are vertically integrated fabric and apparel producers (Hong, 2016; Chou and Ling, 2016; Huang, 2021). The trajectory of Youngone is somewhat different, as explained below.

Shenzhou began to produce non-commoditized products for Nike in 2006 and Adidas in 2008, in specific factory complexes dedicated for each buyer (Altenburg et al. 2020). Major product launches for which Shenzhou formed the manufacturing backbone were Nike's lightweight, breathable and temperature-regulating 'Tech Fleece' for sports jackets introduced in 2007, and Uniqlo's Airism fabric launched in 2013, which combines sweat absorbing and breathable functions for shirts and underwear. The largest revenue stream of Shenzhou was generated with the launch of the Flyknit material, which is used for the upper part of Nike's running and football shoes (Chou and Ling, 2016, Huang, 2021).

Eclat pursued a similar strategy, directing its fabric capabilities towards athleisure beginning with its partnership with Lululemon in the early 2000s. Eclat produces a number of specialized fabrics combining features for sportswear (moisture, control, UV protection) and outdoorwear (thermal, waterproof, lightweight) (Eclat, 2022). It became Lululemon's sole supplier of the Luon fabric, a stretchable and breathable fabric that combines nylon with spandex, which generated high unit prices given that Lululemon's yoga pants had a list price of USD 100 per piece, without any mark downs. While it was Lululemon that owned the trademark on Luon fabric, Eclat was for a long time the sole supplier that could manufacture it, and therefore accounted for 30 percent of all Lululemon fabric sourcing by the mid 2010s (Yang, 2017).

Thus, synthetic fabric capabilities are central to these suppliers' relative value capture trajectory. Shenzhou began investing in synthetic fabric production in 2005, and managed to sustain relationships with top activewear buyers by expanding its knitted and woven synthetic fabric capacities at a double-digit rate throughout the 2010s (Hong, 2018). By the end of that decade, Shenzhou had become the largest supplier for Nike, Adidas, and Uniqlo, accounting for 10 percent, 10 percent and 8 percent, respectively, of the buyer's overall order volume (Chou and Ling, 2016). The second advantage of vertical integration is that suppliers can create higher margins vis-à-vis buyers by hiding cost points. While buyers have detailed breakdowns on the cost structure of their suppliers when fabric is sourced from a nominated fabric mill, in-house fabric production entails less transparency on these cost points and, according to our interviews, allows the supplier to add an additional margin of 2 to 3 percent.

Equally important as investing in fabric machinery is the tacit knowledge to use it, by managing the bonding process of adhering different fabrics for apparel with novel tech functions. The knowledge obtained from collaborating with buyers on these types of non-commoditized products is a valuable currency. Shenzhou benefitted from its initial relationship with Nike in the mid-2000s, which served as a magnet for orders from Adidas and Puma, as these buyers wanted to emulate Nike's successful products. According to our interviews, Shenzhou was able to generate so many orders in the activewear and athleisure segment because it was able to deliver consistent quality on scale by reserving capacity in customer specific clusters, that combined a wide range of yarn sourcing with product specific weaving/knitting and assembly facilities.

We find that intellectual property rights on specific garments or even fabric technologies are insignificant in explaining value capture outcomes. Shenzhou's and Eclat's shares of intangible assets only accounted for 0.3 percent and 0.05 percent, respectively, of their total asset portfolio. Instead, the bulk of their assets are plants and machinery, that accounted for 48 percent and 41 percent, respectively, of total assets in 2022 (Capital IQ database, 2023). Notably, the patents and trademarks of the technologies at the heart of Shenzhou's and Eclat's growth—Flynkit, Tech Fleece, Airism, Luon—are held by the brands. However, these technologies existed since the 1990s; what made them so successful during the 2010s was the marketing effort by brands to sell them as part of a new product launch. Therefore, what accounts for the supplier firm relative value capture from these technologies is their ability to provide vertical integration and expansion in manufacturing, linked to the specific market strategy of the buyer. Furthermore, intellectual property rights are not the key source of wealth creation, but rather the marketing efforts of apparel brands to 'sell' the innovations to customers.

Youngone does not have as high fabric capabilities, but rather is a fiber and filler specialist for outdoorwear. It has been producing for Engelbert Strauss, North Face and Patagonia for 30 years and then Lululemon since the late 2000s. Youngone has trademarks on fiber and filler inputs which it uses in producing down jackets and other outdoorwear. However, interviews with Youngone indicate that the firm cannot necessarily leverage its intellectual property into higher prices with buyers, but rather its capabilities to produce most of the supply chain for a complex product like down jackets results in more orders and higher efficiency by producing the parts themselves. To keep up large orders all year round and thus factory efficiency, it started combining mostly complex products of high value with low value products, especially knits to combat the seasonality of its outdoorwear orders. An additional boost to Youngone's profit margin comes from its domestic market business, where it has the sole right to market North Face products in South Korea, one of the bestselling brands there, for which it not only produces the goods but also received the retail markup. This domestic market business constitutes 25-30 percent of Youngone's total sales.

Notably, some of the firms in our study with an absolute value capture trajectory based on commoditized products have noticed the success of active and athleisure sales. The drop in demand of the industry during and after the COVID-19 pandemic made them reassess their product strategy, as the profit margins for their products declined and orders stagnated. They are trying to shift towards fast growing high unit price products in active and athleisure wear. Hansae is investing in a synthetic spinning and fabric mill in Guatemala that is supposed to cater for activewear buyers and accessing the necessary capabilities through the acquisition of a US fabric firm that produces synthetic fabric for activewear buyer that include New Balance and Patagonia. Crystal equally realized that its core basic products for buyers such as GAP and Uniqlo are stagnating and began entering the sportswear segment through purchasing Singaporean supplier Sin Lung in 2017, through which it gained access to key sportswear buyers including Puma, Under Armour, and North Face.

At the same time, catching up on the relative value capture trajectory is likely to be difficult. Achieving the levels of vertical integration of Shenzhou or Eclat requires huge investments into fabric capacity combined with securing orders by buyers that utilize their full capacity. Due to the limited number of buyers in these segments, it will be difficult for latecomers in these segments to obtain capacity, because firms such as Shenzhou and Eclat have already captured such high market shares.

5. Conclusion

The emergence of transnational FTS over the past twenty years raises the question of whether these large suppliers have been able to capture more value vis-à-vis their buyers. The GVC literature contains studies arguing both yes and no. We see the failure to resolve this debate as stemming from conceptual and methodological confusions, which this paper addresses through distinguishing between absolute and relative value capture and showing that value capture trajectories vary even among large transnational FTS. The paper explains why some transnational apparel FTS are able to capture relative value vis-à-vis buyers, but most do not, and rather increase their value capture on large orders with low profit margins, and thus compete vis-à-vis other suppliers to capture value. It does so by advancing Sako and Zylberberg's profiting from upgrading framework, which stressed the importance of a strong appropriability regime, operating with pre-paradigmatic technologies, or developing complementary assets to buyers as preconditions for supplier firm value capture. In the global apparel industry, where an appropriability regime and pre-paradigmatic technologies are virtually absent, complementary assets are the only option for supplier firms to capture value. Our Complementary Assets approach emphasizes that the competitive global industry dynamics shape lead firm strategies to sustain and create product markets. Central to our approach is that these competitive dynamics and lead firm strategies are the context in which supplier firms can capture more value by providing the complementary assets that lead firms need to implement their strategies. Thus, the types of complementary assets that are required and how those assets lead to different value capture trajectories for suppliers have to be specified for each industry and can change over time.

Despite the persistence of a 'supplier squeeze' in apparel global supply chains that entails increased requirements and cost pressures, a set of transnational apparel FTS manages to sustain profitability. These firms achieve this through continuous efficiency gains, capacity expansion, and a wide-ranging transnational production portfolio in apparel assembly, which allows them to serve as 'strategic suppliers' for lead firms. This strategy is based on succeeding in a fierce competition with other suppliers on orders for basic commoditized apparel products, so that not all apparel suppliers can obtain strategic supplier status given the underlying fallacy of composition. We find that only few transnational apparel FTS manage to truly escape the supplier squeeze and capture value through creating high barriers to entry vis-à-vis competing suppliers. Given the mature and widely available technology for apparel

assembly, entry barriers are relatively low. As a result, the competition shifts to other areas to build complementary assets that are linked to the marketing strategy of high growth buyers around commercializing new products. We find that the key complementary assets are a combination of integrated synthetic fabric-apparel production with tacit knowledge that facilitates the rapid scaling of new products. Transnational apparel FTS capture relative value when apparel brands are dependent on them because few or no other suppliers are able to form the 'manufacturing backbone' of their marketing strategy.

In sum, our Complementary Assets approach accounts for the structural conditions set by lead firms that shape the parameters in which supplier firms operate, without turning into a functionalism that neglects the agency of suppliers. Lead firm product strategies define the complementary assets that are required at a given point in time. The ability of supplier firms to respond to these end market strategies and to develop the necessary capabilities can put them in a position where they wield higher bargaining power, which forces lead firms to make concessions in terms of profit sharing. However, to capture more value on the profit margin, these 'specialized' complementary assets not only have to help lead firms create new product markets, where there is less competition among lead firms, but importantly for supplier firms, there has to be a limited number of other supplier firms with these assets. Thus, relative value capture can be eroded over time, if other supplier firms emulate. Finally, the Complementary Assets framework can be applied to investigate the causal drivers for different value capture trajectories across other globalized industries, but the starting point in terms of global industry competitive environment among lead firms will be a different one, so that the complementary assets that supplier firms seek to build will be different ones.

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