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# Investing in Power:
## Unequal Exchange in Global Value Chains

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# Investing in Power:
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# Investing in Power:
# Unequal Exchange in Global Value Chains

## 1. Introduction

As production has globalized, the question of how value is distributed within global value chains (GVCs) is one of the central questions in contemporary research on trade and development. The question has been analyzed mainly from the perspective of the governance structure of the chain, with the presumption that lead firms have power over suppliers and in turn, that supplier firms have power over their employees (e.g. Gereffi et al. 2005, Pietrobelli and Calias, 2008, Milberg and Winkler, 2013, Kumar, 2021, Nathan et al, 2023, Landes, 2025). The presumed consequence of this sequence of power asymmetry is a skewed distribution of value added in many GVCs, towards profits of the lead firms and first-tier suppliers (as described in Morris et al, 2018 and Kaplinsky, 2019, for example), and an associated fall in the labor share of income in both lead and supplier firm sectors located in their respective countries (see, for example, Milberg and Winker, 2013, and Onaran and Guschanski, 2022).

Power is central to the issue of value distribution in GVCs, but, as Dallas et al. (2017) note, "power tends to be both everywhere and nowhere in the GVC literature." The problem is not unique to understanding GVCs. Williamson (2000) writes about the theory of economic institutions more generally: "efficiency arguments have mainly prevailed over power interpretations because the latter are tautological, *but power issues refuse to go away*." (Williamson, 2000: 611, emphasis added). And for Acemoglu (2005), 'institutions are not typically chosen for the good of society, but imposed by groups with political power for their economic consequences.” (Acemoglu, 2005: 2).

This paper brings precision to the discussion of power in GVCs, and in particular to the treatment of economic power. Existing research tends to take the asymmetry of power in the GVC as given. In this paper, we extend the existing literature on power in global value chains by focusing on the issue of power in both product markets and supplier markets and thus seek to account for the simultaneous presence of oligopoly and oligopsony power that characterizes many GVCs. We present a formal model that reflects these power relations and distributive dynamics across a stylized value chain. Market power concentrated in this way allows the lead firm to capture a larger share of value-added, either through higher mark-ups – monopoly power – or lower unit costs goods purchased from suppliers – monopsony power. We recognize that value chains take multiple forms and the constellation of power within value chains vary across sectors. The focus in this paper is on the traditional GVC structure with the lead firm has the market power. The model could be adapted to other structures where market power lies elsewhere in the chain, e.g. such as with intermediaries.

We emphasize that maintaining or expanding market power involves costly investments, with the nature of that investment depending on the characteristics of the GVC. Moreover, building a power advantage is subject to barriers to entry. It can require investment in new product design, brand allegiance and the blocking of competitors on the one hand, and it can require spending on the expansion and control of supplier networks to maintain monopsony buying power over suppliers and their employees on the other. Entry deterrence is key in product markets and entry promotion is important for supplier markets. In both cases, firms must "invest in power" if they are to maintain their market control and continue to capture a disproportionate share of value added generated by GVC production and realized in sales.

The theoretical arguments presented in the paper's model can be summarized as follows. The type of market power a lead corporation invests in depends on structural characteristics of the final goods market. Those with an initial advantage with regard to product differentiation perpetuate market power through investment in innovation, product design or branding, acquiring upstart competitor firms, or locking in buyers through other restrictive commercial practices. These investments help to maintain customer allegiance, limit competition, and sustain inelastic demand on which markup pricing power depends. By contrast, corporations operating in highly competitive final goods or first-tier supplier markets, who can maintain only a small markup over costs and are profitable from their high sales volume, are likely to direct their investment towards securing monopsony power over their suppliers. In this case, firms invest in controlling supplier prices, quality, delivery times, transport costs and payment schedules in order to maintain or increase the small markups that they earn through management of their value chain.

Buyer firms may also invest in the monitoring of suppliers to guarantee product quality and compliance with corporate codes of conduct. At the same time, they invest in building a geographically diverse network of suppliers allowing them to switch supply contracts or to provide a credible threat of doing so, all to reduce the labor supply elasticity in any one location. The two strategies may co-exist: oligopolists may also seek to expand oligopsony power. The two strategies may also be interdependent. Maintaining brand loyalty in the product market, for example, may require the ability to show consumers that suppliers are following corporate codes of conduct designed by the lead firm or by multi-stakeholder institutions.

The investments that lead firms and first tier-supplier firms make to maintain power constitute an important and often-ignored feature of GVCs. When successful, these investment strategies help perpetuate power asymmetries across the chain, and the actors with the most power are able to claim a disproportionate share of the value added. Over time, Investments in market power represent valuable intangible assets of the firm which can be as important, or in some cases more important in generating profits for the lead corporations than their physical assets such as plant and machinery.[2]

The difference between the market value of a firm and the value of that firm's tangible assets represents one measure of the value of intangible assets. Among U.S. corporations, the stock of intangible assets has grown in recent decades and it is not uncommon for the value of intangible assets to exceed the total value of physical capital (Crouzet et al. 2022, Corrado et al., 2022). Categories of intangible assets are broad and include, among other items, branding, product innovation/differentiation, consumer innovation, value chains, and distribution networks (Corrado et al. 2022). The creation of intangible assets involves costly investments often characterized by economies of scale. Higher levels of investment in intangibles are associated with greater industry concentration and market power, and increases in firm mark-ups can be explained by the growth of the use of intangible assets (De Ridder, 2025; Crouzet

[2] Consistent with this, Durand and Milberg (2019) find that lead firms are able to further the unequal distribution of value added in GVCs through control of intellectual property.

and Eberly, 2019). Studies have linked the growth in the value of intangible assets to lower levels of investment in tangible, physical capital (Crouzet and Eberly, 2019). This is consistent with corporate restructuring in which production is globally outsourced to producers with traditional physical capital investments, while lead corporations increase their investments in intangibles. These investments are linked to higher profitability by securing market power, not by enhancing productivity, since productive activity occurs in different firms located elsewhere in the value chain.

With its focus on market power and distribution, our theoretical approach can be seen as part of the unequal exchange tradition. Early unequal exchange theorists, rooted in the Marxist tradition, argued that structural wage inequalities between countries in the global north and the global south produced terms of trade that were unfavorable to the developing countries of the periphery and allowed firms in developed economies to capture a greater share of the value produced, framed in terms of the labor theory of value (Emmanuel, 1972). In the Prebisch-Singer tradition of unequal exchange, differences in the characteristics of markets between the global north and global south (e.g. supply elasticities in the south and demand elasticities in the north) produce unequal outcomes transmitted through the terms of trade (Prebisch, 1950; Singer 1950; Floto, 1989). Others writing in this tradition stress power differentials between capitalist firms in the global north and those in the global south which allow for unequal profit rates that are reflected in the terms of trade (see, for example, Basu and Vasudevan, 2021).

Like Prebisch and Singer, our model incorporates differences in the structures of the final goods markets. Similar to Basu and Vasudevan, power differentials drive distributive dynamics across value chains. However, unlike Prebisch and Singer and others in the unequal exchange tradition, we model international trade as the outcome of a relationship between lead firms and a network of supplier firms in which the lead firm can have monopsony power over its suppliers. We build on Heintz (2006), which showed how pressure on low-cost suppliers could support investment in enhanced brand allegiance and thus higher cost markups, and we follow post-Keynesian approaches linking prices to markups which are determined by the lead firm investment plans tempered by market dynamics.

After a discussion of the nature of power in GVCs and the investments required to maintain it, we then present two models, one focused on monopolistic power and the other on monopsonistic power, showing how the investment in market power sustains an unequal distribution of value in GVCs, and why some first might pursue both strategies simultaneously. We conclude with some reflections on how to extend the model in light of the growing number of sources of countervailing power, beyond the traditional buyer-supplier (dyadic) power within GVCs. These include consumer power, NGO and state power, and the power of intermediaries in value chains that have developed capabilities that now drive GVCs or even build new brands that compete directly with the previously empowered lead firms in the chain.

## 2. Maintaining power in GVCs

### *Investing in oligopoly power*

The following section motivates the theoretical framework with actual examples of firm strategies to better ground the elements of the model. To start, we note that the growing importance of oligopoly power in the global economy is widely recognized. In the US, it is typically associated with rising industrial concentration (Philippon 2019), and is attributed with contributing to the rise in firm markups and the profit share of national income (De Loecker 2018, Autor et al., 2020), tempering domestic investment (Knauss, 2025) and the surge of consumer prices in the early 2020s (Matamoros, 2024). There is nothing inevitable about this broad-based increase in market concentration, and its rise has been the result of industrial transformation of the US economy and investment strategies of leading firms.

It is important to note briefly that even when the global value chain is not important to firm profitability, that it must invest in a variety of ways to maintain market power. In the US, the dominance of oil and gas, autos and chemical companies in the 1980s has given way to a leading role for tech firms in 2025 (see Figure 1). The prominence of tech firms on the 2025 list indicates that a primary source of market power is not the traditional form of industrial concentration associated with higher consumer prices. Their power is maintained through network externalities and strategic investments in the acquisition of potential competitors. Meta's purchase of Instagram and WhatsApp, for example, were described by the US Federal Trade Commission as a 'buy or bury' strategy. In 2023, Google subverted competition with acquisitions and auction manipulation, harming publishing customers, competition, and consumers of information on the internet. Another tech firm business model is to enter into restrictive, but costly, arrangements with business users as opposed to final consumers. Google, for example, paid Apple more than $10 billion per year to use Google search as the default search engine on Apple devices.[2]

**FIGURE 1**
**Largest US Companies by Market Capitalization, 2025 vs. 1980**
**($ Billions)**

**2025** **1980**

| Rank | Company | Market Cap | Industry | Company | Market Cap | Market Cap (2025 dollars) | Industry |
|---|---|---|---|---|---|---|---|
| 1 | Microsoft | $3,568 | Tech/software | IBM | $34.6 | $135.3 | Tech/hardware |
| 2 | NVIDIA | $3,506 | Tech/hardware | AT&T | $33.4 | $130.6 | Telecomm |
| 3 | Apple | $2,986 | Tech/hardware | Exxon | $32.9 | $128.7 | Oil & Gas |
| 4 | Amazon | $2,220 | Tech/Retail | Standard Oil | $20.5 | $80.2 | Oil & Gas |
| 5 | Alphabet (Google) | $2,003 | Tech/software | Shell | $19.7 | $77.0 | Oil & Gas |
| 6 | Meta Platforms (Facebook) | $1,736 | Tech/software | Mobil | $19.2 | $75.1 | Oil & Gas |
| 7 | Broadcom | $1,173 | Tech/media | General Motors | $18.9 | $73.9 | Automotive |
| 8 | Tesla | $1,144 | Automotive | Texaco | $18.8 | $73.5 | Oil & Gas |
| 9 | Berkshire Hathaway | $1,043 | Diversified (Finance) | Dupont | $16.1 | $63.0 | Chemicals |
| 10 | Walmart | $769 | Retail | Gulf Oil | $15.1 | $59.1 | Oil & Gas |

Sources: End of Year 1980 Sources: Minneapolis Fed Inflation Calculator, Small Business Connections. 2025 data from Companies Market Cap.

Another type of investment in oligopoly power – closely tied to GVC structure and a core element of the model presented in the next section -- is the more traditional one of building brand allegiance in an effort to differentiate the product and reduce the price elasticity of demand. Firms with large markups rooted in brand allegiance or product differentiation must invest heavily to sustain their market power. Such firms are increasingly common in the US which has seen, in addition to the industrial change noted above, a steady shift towards "factory-less firms" – goods-producing companies that outsource all "physical transformation activities" but continue to control sales revenue as well intellectual property income from patents and trademarks (Fort et al. 2018). Expenditure by such firms is focused on technology, design, and marketing. Fort et al. (2018) found that more than a quarter of wholesale firms in

**FIGURE 2a 2023-2024 Average Net Income, R&D Expenses, Marketing Expenses and Stock Buybacks (Billions USD)**

| Company | Net Income | R&D Spending | Marketing Spending | Repurchases of common stock |
|---|---|---|---|---|
| Amazon | $44.8 | $18.8* | $20.9 | $0 |
| Apple | $95.4 | $30.6 | - | $86.3 |
| LVMH | $15.3 | - | $34.1 | $1.4 |
| Nike | $5.4 | $0.7* | $4.2 | $4.9 |
| Qualcomm | $8.7 | $8.9 | $2.6 | $3.5 |
| The Gap | $0.7 | $0.04 | $0.8 | $0.04 |
| Walmart | $13.6 | - | - | $6.4 |

**FIGURE 2b 2023-2024 Average R&D, Marketing, and Stock Buybacks as Percentage of Net Income**

| Company | R&D Spending, % Net income | Marketing Spending, % Net Income | Repurchases of common stock, % Net Income |
|---|---|---|---|
| Amazon | 41.8% | 46.5% | 0.0% |
| Apple | 32.1% | - | 90.4% |
| LVMH | - | 222.8% | 8.9% |
| Nike | 13.2% | 77.5% | 90.3% |
| Qualcomm | 101.9% | 30.2% | 40.8% |
| The Gap | 6.4% | 123.5% | 5.6% |
| Walmart | - | - | 46.7% |

Note: All values are in Billions USD, except number of suppliers and percentages. LVMH values converted from Euro to USD using exchange rate on 12/29/2023 (1.105 USD = 1 EUR). R&D spending marked with an asterisk are values from capitalized R&D expenses capitalized in 2024, which is not necessarily indicative of actual R&D expenditures made in that year. Marketing Spending for Qualcomm is part of their “Selling, general and administrative costs” line item and may include non-marketing expenses. Fields are marked with a “-“where data are unavailable. All data are from company 10-K forms except for LVMH where data is from annual financial statements on the company website.

the US were factory-less in 2017, up from just 12 percent in 2007. Factory-less companies import from overseas five times as much as other firms, an indication of the growing importance of GVC dynamics for maintaining firm profitability. Many of these can be considered hybrids from the perspective of investment in power, since they spend enormous effort and investment on product design (e.g. Apple) and brand marketing (e.g. Nike, LVMH) at the same time that they outsource all of their manufacturing in well-developed supplier networks. Figure 2 shows R&D and marketing spending by a small group of companies for 2023-2024 to give a sense of the magnitudes. Qualcomm R&D spending exceeds its net income. For Apple, R&D spending was over $30 billion annually, or one-third of net income**.**

Currently, all Apple iPhones sold in the US are assembled in China under a contract with Foxconn, a Taiwanese-owned firm. According to a 2017 study, Apple controls 42 percent of the value added in the production of iPhone, while China earns 2 percent and Foxconn 8 percent (Dedrick and Kraemer, 2017). What is not included in these percentages is that Apple has invested heavily in its suppliers, Foxconn and some others. According to McGee (2025), Apple invested in machinery and equipment for supplier firms as an essential part of its business plan during the period of 2007-2013. Figure 3 shows Apple's investment in China in billions of dollars and as a percent of its investment in the US. Apple investment in China exceeded that in the US in 2013, 2014 and 2015 and then fell off.

**Figure 3**
**Apple Investment in U.S. and China, 2011 – 2024**
**(Billions, USD and %)**

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| U.S. | 4.4 | 6.0 | 7.4 | 9.1 | 12.0 | 16.4 | 20.6 | 24.0 | 24.7 | 25.9 | 28.2 | 31.1 | 33.3 | 35.7 |
| China | 2.6 | 7.3 | 7.4 | 9.5 | 8.7 | 7.8 | 10.2 | 13.3 | 9.1 | 7.3 | 7.5 | 7.3 | 5.8 | 4.8 |
| China (% of U.S.) | 60% | 122% | 100% | 104% | 73% | 48% | 49% | 55% | 37% | 28% | 27% | 23% | 17% | 13% |

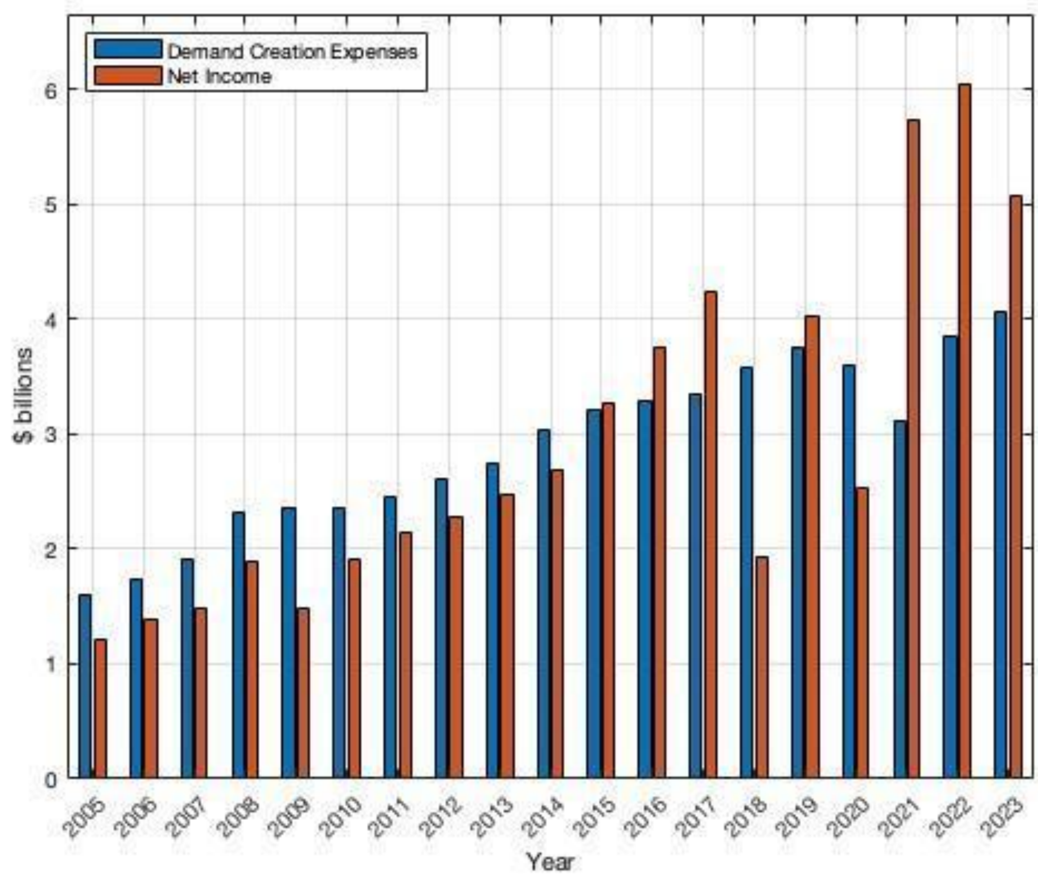
Notes: Investment is "long-lived assets" reported in the 10-K filing. For 2017-2024, China includes Hong Kong and Taiwan. For 2011-2016, China includes Hong Kong. For 2021 and 2022, definition notes "Long-lived assets located in China consist primarily of assets related to product manufacturing, retail stores and related infrastructure." For 2011-2020, definition notes "Long-lived assets located in China consist primarily of product tooling and manufacturing process equipment and assets related to retail stores and related infrastructure." Fiscal year data points are as of: 9/24/2011, 9/29/2012, 9/28/2013, 9/27/2014, 9/26/2015, 9/24/2016, 9/30/2017, 9/29/2018, 9/28/2019, 9/26/2020, 9/25/2021, 9/24/2022, 9/30/2023, 9/28/2024. Data found from 10-k forms available on SEC website.

Spending on brand allegiance is crucial for maintaining power, especially in factory-less firms. Marketing expenditure by French luxury products company LVMH was more than double its net income. Nike invested over $4 billion or 77 percent of its net income on marketing, with its international brand recognition rooted mainly in its Air Jordan brand and “swoosh” logo. The design elements and functional characteristics of the products are just part of the overall marketing process. According to Nike founder Phil Knight:

> For years, we thought of ourselves as a production-oriented company, meaning we put all our emphasis on designing and manufacturing the product. But now we understand that *the most important thing we do is market the product*…marketing knits the whole organization together.

The logos are visually simple, but their power results from the high levels of investment the firm makes to promoted them. The Nike aura, embodied in the swoosh logo, requiring constant engagement with consumers, endorsement of the most famous and up-and-coming athletes, and expensive contracts for visibility with many of the professional and collegiate athletic leagues. Michael Jordan reportedly earns $60 million per year from Nike for continued use of the Air Jordan brand. Nike succeeded Adidas as the sponsor of the NBA’s uniforms in 2020, under an agreement that provides all uniforms with a swoosh logo and costs Nike $1 billion over eight years. In Major League Baseball, Nike is also the uniform supplier after signing a 10-year deal with the league for $1 billion. Nike’s overall spending on marketing, what it calls “demand creation expenses” in its annual report, exceeded $4 billion in 2023, up from $1.5 billion in 2006. From 2005-2014, the branding expenses exceeded company profits (net income). Since then, profits have generally risen by a greater amount, indicating that the rate of return on brand marketing investment has increased over time (Figure 4).

**Figure 4**
**Nike Net Income and "Demand Creation Expenses", 2005-2023**
**(billions of USD)**




Source: Nike inc., 10-K filing, available on the Nike website.

The products Nike sells could be produced by hundreds of companies around the world. But the expense of branding makes entry extremely difficult – a multi-billion-dollar investment barrier. This branding investment hinges on having the power to generate such resources through the value chain, and the ability to markup prices over costs sufficient to generate such resources and the ability to charge a considerable markup over production costs. The strength of the brand allows for high markups over costs and an extensive product line that generates further profitability through price discrimination. Nike sells over 1000 varieties of shoes (Locke 2013). There are 39 varieties of Air Jordan sneakers and the uniqueness of each sneaker allows the company to respond to the tastes of almost every consumer. The Nike Kyrie 4 (retail price $140) is a customizable sneaker, where the customer can select the color of the different parts of the shoe and the swoosh. Customers may put a name or number on the shoe as well. The Jordan brand alone, which includes the Air Jordan line of sneakers, accounted for $6.59 billion in revenues (close to 13% of global revenue in 2023).

Before turning to examples of investment in oligopsony power, we should also mention investment that leading firms undertake to gain political influence. This practice has a long history in the US and elsewhere, across industries and across political parties. This form of investment in power through the political process is perfectly legal under current law, and has brought access and favors. A recent wave of such spending has been about firms seeking special exemptions from tariffs or from technology export restrictions and are thus relevant to the functioning of GVCs. Apple CEO Tim Cooke contributed $1 million to the Trump inauguration fund. Apple subsequently received an exemption to the US tariffs imposed on China (which were initially scheduled to be 145% and were then lowered to 30% and then to 25%). Elon Musk, who also gave $1 million to the Trump Inaugural Fund and $276 million to Trump superPACs, was able to secure the continuation of 100% tariffs on electric vehicle imports from China. Nvidia's exemption on the export of its H2O chip to China followed its donation of $1million to the Trump Inaugural Fund, followed by a series of private meetings with Trump at his Florida estate, and an agreement to pay 15% of the Chinese sales revenue to the US government as a tax.[3]

***Investing in oligopsony power in GVCs***

We turn now to the buyer side of the lead firm strategy. Buyer monopsony power can lead to depressed supplier prices due to highly inelastic supply. Pressure on suppliers to suppress export prices has consequences for the profit margins of these suppliers and the labor standards in those supplier firms. A larger or geographically more dispersed network of suppliers means that a demand for reduced input prices (or faster response time or slower invoice payment or compliance with company labor standards) cannot easily be refused since there is a risk of the buyer of inputs moving to another supplier. Supplier networks vary in size depending on firm and industry. Among the firms we focused on above, retailers naturally have the largest number of suppliers. In 2023-2024, Amazon listed the number of suppliers at 1.9 million and Walmart declared “more than 100,000”. Apparel and footwear manufacturers are the next highest, with LVMH (2062 suppliers), The Gap (423) and Nike (232). In electronics, Apple reports a network of 188 suppliers and Qualcomm 97. Nike’s elaborate network of suppliers has been the subject of close study. As of 2023, its global value chain had 502 contractors in 38 countries, mostly in Asia, but also in Eastern Europe, Latin America and Africa. These suppliers employ 1.15 million people. Materials that are needed by these suppliers come from an additional 100 companies in 15 countries.[4] This extensive network has given Nike the

[3] Meta contributed to Trump’s inaugural Fund presumably to have Justice Department support in an anti-trust case.

[4] Sources are as follows: **Amazon**: Third party report, https://capitaloneshopping.com/research/amazon-marketplace-statistics/. **Apple:** From Apple supplier list

power to end contracts with suppliers when compliance is insufficient and risks hurting the brand reputation. Nike famously exited from the Sialkot, Pakistan soccer ball sector over child labor allegations and re-entered only when new guarantees were in place.

Monopsony power is considered a common feature of US labor markets, but only recently has it become of interest in GVC research.[5] The monopsony case related to suppliers is similar to the labor market dynamic: Monopsony power requires an inelastic supply response to input price changes. GVC research has for decades implicitly recognized this feature as driving GVC formation. The emphasis on "buyer-led GVCs" – put the focus on branded firms in retail and apparel (Gereffi and Korcenewicz, 1994). It was understood that brand allegiance created a barrier to entry for suppliers. Lead firms in "producer-led GVCs" were said to have power because of their proprietary technology.

The global supply of labor has shot up over the past 30 years. With the breakup of the Soviet Union in the 1990s, the entry of China to the WTO in 2001, the liberalization of trade in India and Latin America, and the mass entry of women in developing countries into manufacturing employment, the pool of labor in global production has risen dramatically. This

https://www.apple.com/tw/supplier-responsibility/pdf/Apple-Supplier-List.pdf. **LVMH:** From LVMH supplier list (in 2023 social and environmental responsibility report) https://www.lvmh.com/en/suppliers. **Nike:** From Nike 10-K (sum of 169 tier 2 suppliers and 69 contract mfgs) https://www.sec.gov/ix?doc=/Archives/edgar/data/0000320187/000032018724000044/nke-20240531.htm. **Qualcomm:** From CsiMarket, I am not sure their source but most of their information appears to come from financial statements https://csimarket.com/stocks/suppliers_glance.php?code=QCOM. **The Gap:** Report their supplier info to OpenSupplyHub. https://opensupplyhub.org/facilities?contributors=6941&lists=7767&sort_by=contributors_desc. **Walmart:** Supplier info page on website https://corporate.walmart.com/suppliers

[5] For an overview of research on the US, see Soklova and Sorenson (2021). For an estimate of the negative effect of monopsony power in domestic supply chains on US wage and salary growth from 1979-2014, see Wilmers (2018).

led to a shift in the status of labor in world production and trade[6] and a focus by researchers on the asymmetry of power between buyers and suppliers. The term monopsony was not always used, but the implication was clear. Anner (2020) in a study of Bangladeshi apparel exports, identifies two ways that buyers impose their power over suppliers: price-squeeze and sourcing squeeze. Nathan et al. (2023) in a series of studies of Indian apparel, identify monopsony power as the source of suppressed wages in textbook monopsony fashion.[7] The authors identify this as a process of "reverse subsidies," whereby the suppression of the buyer price constitutes a transfer from the supplier firms and workers to the buyer firms.[8] Zavala (2021) analyzed Ecuadoran cash crop export markets (vegetables, fruits, coffee, oil seeds, etc.) and shows how the government export board used its monopsony power to dampen the board's buyer price. He refers to this pricing phenomenon as the "markdown" over costs, with the markdown an inverse function of the supply elasticity (that is, a smaller elasticity associated with a larger markdown). In *Monopsony Capital*, Kumar (2021) puts monopsony power at the center of his analysis of global capitalism.[9]

Turning from suppliers to the lead firms that must invest in their oligopsony power, we note that Apple, Nike and Amazon are important for management experts not just for their product design, branding and IT capabilities, but also for their outsourcing strategies and, we would argue, their investment in value chain monopsony or oligopsony power. Founded in

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[6] See Freeman (1996) for a calculation of the declining capital-labor ratio globally. Milberg (forthcoming) connects the growth of female labor force participation in traded goods sectors to the expansion of export processing zones in developing countries.
[7] Robinson (1933) had termed the degree of wage suppression the "rate of exploitation." It is also called the Lerner index, defined as the reciprocal of the elasticity of the supply of labor See Alderman and Blair (2024), p. 27
[8] See also Nathan (2020,2021, and 2023).
[9] Kumar studies labor conditions in the apparel sector in India and argues that the concentration of suppliers there will eventually give workers more power not less.

1965, Nike has produced overseas since its inception. They have never owned any manufacturing facilities other than during a brief period in the 1980s when they purchased factories in Maine and New Hampshire and sold them a few years later. This means that all of the thousands of products that it sells are produced by companies that supply them to Nike. Nike's business model has been emulated by many US companies, to the point where management expert Jerry Davis has termed the combination of brand marketing investment and outsourcing the "Nikefication" of American business (Davis, 2023).

Amazon's business model requires investment in control of its suppliers. The 2023 case against Amazon by the FTC and 17 states noted 'anti-discounting measures' such that, if an Amazon seller is seen to offer lower prices elsewhere, the seller's products will be buried in Amazon search results. Sellers are also allegedly coerced into using Amazon's fulfillment services in order to obtain desirable 'Prime' status. This would make it more expensive for sellers to offer their products on other platforms and limit competition of other marketplaces against Amazon. Sellers on the Amazon site are also potentially forced to pay fees near 50 percent of their revenues. Amazon is also alleged to preference their advertisers or their own products over those known to be better quality in search results, and this has led to an FTC case against Amazon.[9] The trial is scheduled for October 2026.[10]

In general, buyers able to develop a geographically diverse supply base which provides an ability to contract where labor markets are weakest or to exit labor markets when there is disruption or damage to brand reputation. Boudreau et al. (2023) argue that monopsony power

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[10] This summary compiled from various online sources, including ftc.gov, justice.gov, courthousenews.com and nytimes.com.

in global value chains may have positive consequences also for the supplier and that the supplier price squeeze is not the only variable that should be observed in assessing the buyer-supplier relation. In particular, they find that in the case of coffee and garments, that greater buyer monopsony power is associated with longer-term, “relational” (as opposed to spot) contracting between buyer and supplier. This not only benefits the supplier by providing more certainty into the trajectory of buyer orders, but it also is associated with higher product quality for the buyer.

**Other Cost-Cutting Dimensions of the Oligopsony Buyer-Supplier Contract**

Suppressed export prices do not reflect the full monopsonistic relation. Other dimensions of the relationship between buyers and sellers – length of contract, invoice payment schedule, shipping costs, financing for export, compliance with CSR standards, and even direct investment in the supplier firm – can impact product quality and reliability of supply and thus unit costs. When there is ample monopsony power, purchasing contracts can be implemented in order to benefit the buyer. According to a recent survey of apparel fashion brand suppliers in South Asia, buyers have the ability to demand discounts on an already agreed-upon price, to cancel or reduce orders after a contract is signed, to delay payment for supplies, and to force suppliers to absorb the burden of unplanned local cost increases:

> Some 44 percent of respondents, for instance, reported brands insisting on discounts after the contracts were agreed upon, while 53 percent said they’ve received cancellations in the middle of production. Another 52 percent said that buyers don’t adjust for increased prices of inputs like fabric, and 81 percent said any uptick in minimum wages was ignored. One-third (33 percent) of those polled said they had their payments held back by three months or more. Half of the suppliers reported brands quoting a large order size before reducing it—and keeping the cost per item unchanged. (Chua, 2025, also see Transform Trade, 2025)

The surge in tariff rates imposed by the Trump administration provided a policy experiment for the power of buyers over suppliers in value chains. The tariffs have put enormous pressure on big retail firms, and they, in turn, have put that pressure on suppliers: Walmart, which sources many of its goods from Asia and particularly China, operates with small a small profit margin and a small markup over costs. From its beginning, it has won customers and generated profits by keeping prices low and this requires intense bargaining with suppliers (source). Any ripple in that equation, and the business model doesn't work for the company. A 30 percent tariff isn't a ripple; it's a wave. According to press reports, Walmart demanded that its Chinese suppliers absorb 66 percent of the tariff increase and 66 percent of the shipping costs (which had also increased).[11] Nonetheless, Walmart has warned customers that it may raise prices, as has another big retailer, Target. (Saporito, 2025). Walmart's supply network, nurtured through activity at its Benton, Arkansas headquarters, is an intangible asset that is no doubt more valuable to the company than any brick-and-mortar stores or warehouses.

**3. Modeling Lead Firm Investment in GVC Power**

Based on the features of value changes discussed, we present a formal model that captures how market power affects distributive dynamics across value chains. In so doing we

[11] https://www.scmp.com/economy/china-economy/article/3312482/us-retail-giants-pushing-chinese-suppliers-shoulder-66-tariff-costs?tpcc=GME-O-enlz-uv&utm_source=cm&utm_medium=email&utm_content=20250610_China_Economy_FW_RU&utm_campaign=GME-O-enlz-uv&UUID=a4f56ba4-c1a4-453f-924a-82f93ef44743&CMCampaignID=5b7a39b463dd96bd8efce216297e656d On shipping costs, see: https://www.scmp.com/economy/china-economy/article/3313342/us-retailers-demand-chinese-firms-pay-shipping-costs-trade-pressure-grows?utm_source=cm&utm_medium=txn&utm_campaign=enlz-NOT-Follow&utm_content=20250608_daily5&d=a4f56ba4-c1a4-453f-924a-82f93ef44743

offer a new theoretical approach for examining value chains within an unequal exchange framework. We examine two types of market power in value chains: monopolistic and monopsonistic power. These are initially treated separately, but then we explore how they interact. In both cases, investment in market power is costly, and a lead corporation makes decisions to optimize the total value-added that it is able to capture. The corporation's choices are constrained by the structural features of markets, particularly the nature of demand in the final goods market. The model generates a number of predictions that reflect the nature of many modern value chains highlighted in the previous sections.

### *A. Value chains with monopolistic power in the final goods market.*

The first case is the model of a firm investing in monopolistic power in order to mark-up prices in the final goods market. A lead corporation invests in building a degree of market power, *b*, in the final goods market allowing for higher mark-ups. In the original Heintz (2006) paper, this represented investment in branding. Here we generalize so that b captures a degree of monopolistic power from a variety of sources – branding, other forms of product differentiation, certain types of patents, products with network externalities, and similar approaches detailed earlier. The distribution of value-added across the value chain is given as:

(1) $P = \alpha(b) + rP + U$

where *P* is the price in the final goods market, $\alpha$ is the mark-up of the lead corporation (based on the degree of market power, *b*), $r$ represents the fraction of the price captured by intermediaries along the value chain, and U is the per unit value-added at the point of production (i.e. unit labor costs marked up by z).[12] Per unit value added at the point of production is given by:

$$(2)\ U = e(1+z)(\frac{w}{t})$$

where e is the market exchange rate, z is the mark-up of the firm at the point of production, w is the wage rate, and t is labor productivity (output per unit of labor input). Expressing equation (1) in terms of price as a function of the other variables yields:

$$(3)\ P = \frac{1}{1-r}[\alpha(b) + U]$$

Demand in the final goods market is given by:

$$(4)\ \delta = \delta(P, b) \text{ with } \delta_P < 0 \text{ and } \delta_b > 0.$$

Investments in monopolistic power can reduce the price responsiveness of demand. Therefore, we assume that $\alpha_{Pb} \geq 0$ (i.e. $\delta_P$ can become less negative at higher levels of b).

Investing in monopolistic power (e.g. branding) is costly, with total costs equal to

$$(5)\ K = K_0 + k(b)$$

in which $K_0$ represents the fixed costs of developing monopolistic power (these can be sizeable, acting as a barrier to entry to these markets) and k(b) represents the variable costs, with $k_b > 0$.

Lead corporations choose a level of market power, b, to maximize the total share of value added they receive across the value chain.[13]

[12] The price would also include the costs of any non-labor inputs into production. We simplify the model by focusing only on value-added, without losing any of the core analytical relationships.

[13] In Heintz (2006), value-added is maximized net of the costs of retailing. Including an expression for retail costs does not change the analysis substantively and we do not include them here to keep the exposition as simple and clear as possible.

(6) $V = \alpha(b)\delta(P,b) - K_0 - k(b)$

The first-order conditions for optimization yield the following:

(7) $\alpha_b\delta(P,b) + \alpha(b)\delta_b = k_b - \frac{1}{1-r}\delta_P\alpha(b)\alpha_b$

The left-hand side of equation (7) represents the marginal benefits of an increase in b. There are two components: the effects of a higher mark-up and the increase in demand associated with a higher level of b. The right-hand side represents the marginal costs of increasing b. Here there are also two components: the direct marginal costs of investing in market power and negative price impacts on demand associated with a higher mark-up.

The positive relationship between the degree of monopolistic power and the market up suggests that, for the model to be internally consistent, there must be a relationship between b and the price elasticity of demand. Specifically, a higher b should make demand less price elastic, allowing for higher mark-ups.[14]

(8) $\varepsilon_P = \delta_P \frac{P}{\delta(P,b)} < 0$, such that $\frac{\partial \varepsilon_P}{\partial b} > 0$

Equation (8) simply states that an increase in b will cause demand to be less price elastic (i.e. less negative and closer to zero) allowing for a higher mark-up. Under what conditions would the price elasticity of demand become less elastic with an increase in b, our indicator of market power in the final goods market? Equation 9 shows this condition.

[14] This can be illustrated as follows. Suppose a firm maximizes profits with constant marginal costs, such that $\pi = P\delta(P) - c\delta(P)$, where $\delta$ is the quantity demanded for a given price. It can be shown from the first-order conditions that $(P - c)/P = -1/\varepsilon_P$, where $\varepsilon_P$ is the price elasticity of demand and $(P-c)/P$ represents the mark-up over costs as a share of the price. A more price elastic demand is associated with a higher mark-up.

(9) $\frac{\partial \varepsilon_P}{\partial b} = \delta_P \left[\frac{\frac{1}{1-r}\delta(P,b)\alpha_b - P\delta_b}{\delta(P,b)^2}\right] + \frac{P}{\delta(P,b)}\left[\frac{1}{1-r}\alpha_b\delta_{PP} + \delta_{Pb}\right] > 0$

To make the implications of equation (9) clearer, in addition to $\varepsilon_P$ defined as the price elasticity of demand, let us define $\varepsilon_b$ as the elasticity of demand with respect to b ($\varepsilon_b$>0) , $\varepsilon_{PP}$ as the elasticity of the price responsiveness of demand with respect to P, $\varepsilon_{Pb}$ as the elasticity of the price responsiveness of demand with respect to b, and $\rho_b$ as the elasticity of prices with respect to b (i.e. the percent change in prices associated with a given percent change in b, with $\rho_b > 0$). It can be shown (see appendix) that the condition in equation (9) holds when:

(10) $\rho_b - \varepsilon_b < -[\varepsilon_{PP}\rho_b + \varepsilon_{Pb}]$

To interpret equation (10), let us begin with a simplifying assumption that price responsiveness does not change with b or P (this would be the case, for example, with demand curve that is linear with respect to prices). In this case, the right-hand side of equation (10) would be zero and the condition holds when the elasticity of demand with respect to b is greater than the elasticity of prices with respect to b (i.e. a higher b has a proportionately larger impact on quantity demand than it does on prices).

This condition can be relaxed significantly if we allow price responsiveness to vary. We would expect that a higher b (e.g. greater investment in branding and product differentiation) would make demand less sensitive to price increases, i.e. $\delta_P$ would become less negative meaning that $\delta_{Pb}$ is positive. Likewise, for a given increase in prices (e.g. a $1 price increase) we would expect demand to be less sensitive if prices are set high (as would be the case with high-end brands) than if they were low. Under these conditions, the right-hand side of equation (10) would be negative, and higher levels of $\rho_b$ relative to $\varepsilon_b$ would be consistent with demand becoming more price inelastic as b rises. In summary, under reasonable assumptions – when investments in market power reduce the price responsiveness of demand and mark-ups do not increase prices excessively – demand will become less elastic as investments in monopolistic power increase.

### *B. Value chains with monopsony power over producers*

In this variation on the model, a lead corporation invests in building a degree of monopsony power, c, at the point of production that allows them to lower the share of value added received in the form of profits or wages. We assume the final goods market is characterized by a competitive environment and lead corporations maintain a fixed mark-up, in contrast to the model with monopolistic power.

The distribution of value-added across the value chain is given as:

(11) $P = mP + rP + X$

where P is the price in the final goods market, m represents the fraction of the price captured by the lead corporation, r represents the fraction of the price captured by intermediaries, and X is the per unit value-added at the point of production. In this case, per unit value added is given by:

(12) $X = \beta(c)U = e(1+z)(\frac{w}{t})$ such that $0 \leq \beta(c) \leq 1, \beta_c < 0$

In which e is the market exchange rate, z is the mark-up of the firm at the point of production, w is the wage rate, and t is labor productivity (output per unit of labor input). We use U to represent unit value added in the absence of monopsony power. $\beta(c)$ is a parameter that represents the unit cost reduction from monopsony power c. Increases in monopsony power, indicated by an increase in c, squeezes the value-added captured at the point of production, by reducing $\beta(c)$. From equation (11), we can derive an expression for prices in the final goods market:

(13) $P = \frac{1}{1-m-r}\beta(c)U$

Demand, $\delta$, in the final goods market depends only on the price

(14) $\delta = \delta(P)$ with $\delta_P < 0$

The price elasticity of demand is therefore

(15) $\varepsilon_P = \delta_P \frac{P}{\delta(P)}$

Investing in monopolistic power involves building an extensive network of suppliers, so that lead corporations can credibly threaten to source from another producer globally if a particular producer does not meet their demands with regard to the cost of sourcing the goods sold. As with monopolistic power, building this network is costly with costs represented by:

(16) $L = L_0 + l(c)$

in which $L_0$ represents the fixed costs of developing monopsony power and $l(c)$ represents the variable costs, with $l_c > 0$.

As with the monopolistic model, lead corporations choose a level of market power, c, to maximize the total share of value added they receive across the value chain.

(17) $V = mP\delta(P) - L_0 - l(c)$

The first order conditions are (differentiating (17) with respect to c):

$$(18) \qquad m\left[P\delta_P \frac{1}{1-m-r}\beta_c U + \delta(P)\frac{1}{1-m-r}\beta_c U\right] - l_c = 0$$

Equation (18) can be restated as

$$(19) \qquad \frac{m}{1-m-r}\beta_c U\delta(P)[1+\varepsilon_P] = l_c$$

Note that, if $l_c>0$, equation (19) can only hold if $\varepsilon_P < -1$. In other words, demand must be price elastic, with a price elasticity greater than 1 in absolute value terms (or less than -1 with regard to the value based on the elasticity definition).

This result, that investment in monopsony power should be more evident among lead corporations operating in final goods markets exhibiting elastic demand, stands in contrast with the model of monopolist power – where firms engage in costly investments to reduce price elasticity in order to strengthen their ability to mark-up prices. In this way, the structural characteristics of the final goods markets shape the strategies of lead corporations with regard to investing in power.

In this monopsony version of the model, lead firms have an incentive to invest in monopsony power when it allows them to lower retail prices leading to a proportionately larger increase in the demand for the goods sold. Despite a fixed, competitive mark-up, these firms increase the total value-added they capture by increasing the volume of sales while maintaining "everyday low prices."[15] They achieve this by exercising monopsony power at the point of production.

[15] Everyday low prices (EDLP) was a retail strategy first adopted by the U.S. corporation, Walmart, in the 1990s and replicated by other corporations.

If lead corporations exert monopsony power at the point of production, what are the distributive consequences for producers and workers? From equation (12) with a given level of value added at the point of production, $X_0$, we can derive the following relationship between wages and profits (represented by the mark-up, z):

$$(20) \qquad w = \frac{tX_0}{e(1+z)}$$

Assuming the other parameters – labor productivity (t) and the exchange rate (e) – to be fixed, for a given $X_0$ there is a direct trade-off between wages (w) and profits (z). If $X_0$ is squeezed through the exercise of monopsony power, wages, profits, or both must fall. In this model, the distributive outcomes at the point of production are determined by the relative bargaining power of labor and the firms at the point of production. The appendix illustrates how these dynamics could be captured in a modified Nash bargaining framework.

The exercise of monopsony power squeezes the per unit value-added at the point of production, but it also increases the volume sold in the final goods market. This implies that demand for output, and demand for labor, would increase among producers. Therefore, any benefits of the exercise of monopsony power among producers and workers would come in the form of higher levels of production and employment. Note that this increased demand would be distributed among many firms participating in the value chain, all of which are in effect competing with each other.

## C. Graphical illustration of monopolistic and monopsony models

Figure 1 presents key relationships of the model with monopolistic power. Quadrant #1 shows the relationship between market power, b, and prices; quadrant #2 contains the demand curve; quadrant #3 illustrates the relationship between the mark-up and b; and quadrant #4 presents the total value-added captured by the lead corporation. At an initial level of market power, $b_0$, the figure traces outcomes with respect to price, quantity demanded, and value-added per unit. The total value-added at $b_0$ is represented by the rectangle A in quadrant #4. If market power were to increase to $b_1$, the demand curve (in P, $\delta$ space) shifts out and becomes more inelastic. The changes in the key variables are captured in quadrants #1 to #3, and total value-added, indicated by rectangle B in quadrant #4, is larger at the higher level of market power. Note that, despite higher prices, in this diagram, the quantity demanded remains robust because of the impact of b on the shape and level of the demand curve.

Figure 2 illustrates the monopsony power model using a similar approach. Quadrant #1 shows the relationship between monopsony power, c, and prices; quadrant #2 contains the demand curve; quadrant #3 shows the relationship between c and the per unit value added captured by the lead corporation (rP), and quadrant #4 indicates the total value-added. At an initial level of investment in monopsony power, $c_0$, Figure 2 tracks outcomes with respect to prices, quantity demanded, and value-added, with total value added represented by rectangles D+E in quadrant #4. If monopsony power were to increase to $c_1$, prices would fall (because of lower value-added in the form of wages and profits at the point of production) and demand would increase. In this case, total value added is represented by the rectangle D+F. In this case, D+F > D+E and total value-added increases because demand is sufficiently price elastic.

**Figure 1. Monopolistic model with an increase in b.**

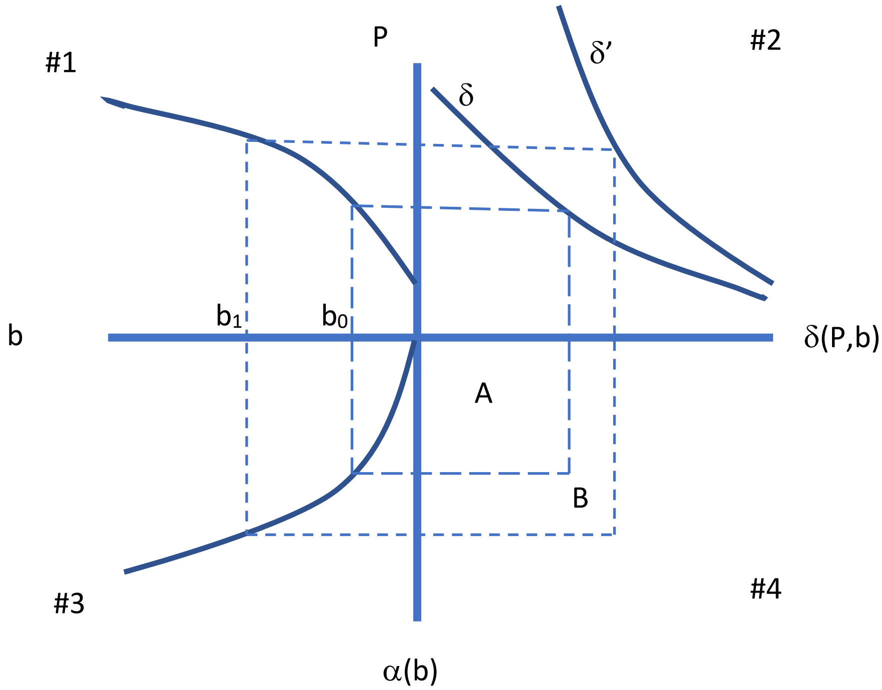
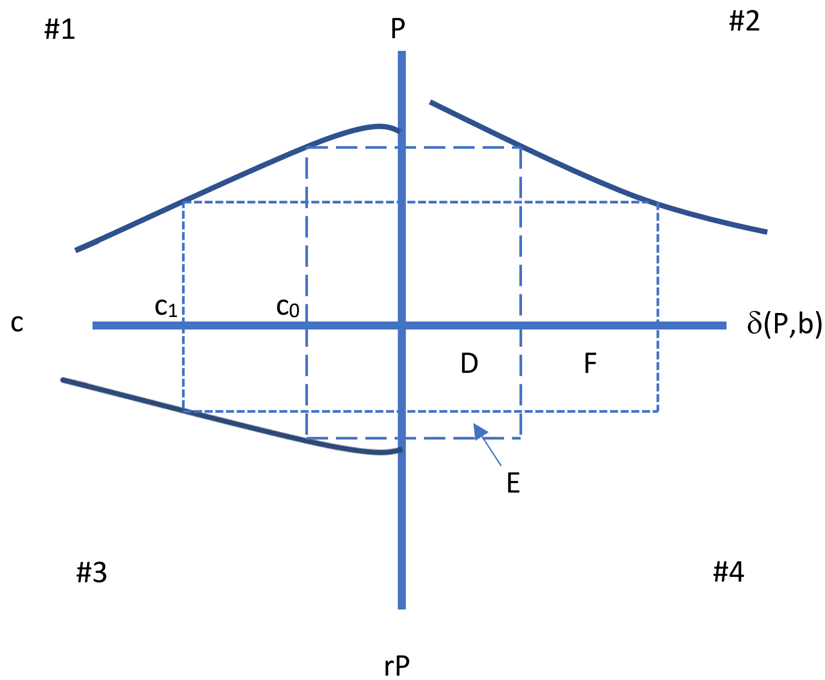



**Figure 2. Monopsony model with increase in c**



### *D. A hybrid case: monopolistic firms exercising monopsony power*

What would a model which combined monopolistic and monopsony power look like? Under what conditions would a firm with monopolistic power find it beneficial to invest in developing its monopsony power? To illustrate, we can replace the unit labor cost term of the monopolistic model from equation (2) with equation (12), keeping the rest of the model the same. As equation (12) indicates, the exercise of monopsony power pushes down the per unit value-added captured at the point of production. Therefore, one way of exploring the impact of monopsony power within the monopolistic model is to look at how a change in unit-value added affects investments in monopolistic power, b.

If we assume that the first-order conditions of the monopolistic model hold then the optimal level of monopolistic power, $b^*$, can be expressed as a function of the per unit value-added captured at the point of production, i.e. $b^* = b^*(U)$. Here we use U to represent value-added at the point of production to keep it consistent with equation (7) (we could just as easily have used X from the monopsony model). Taking the derivative of equation (7) with respect to U and noting that $b^* = b^*(U)$, we can solve to find an expression for $\partial b^*/U$:

$$(21) \qquad \frac{\partial b^*}{\partial U} = -\frac{\alpha_b \delta_P + \alpha(b)\delta_{Pb} + \alpha(b)\alpha_b \frac{\delta_{PP}}{1-r}}{(1-r)S}$$

in which S represents the second-order condition for maximization and the other variables are defined as before (see appendix for derivation). How do we interpret this result? If b has no impact on price responsiveness ($\delta_{PP} = \delta_{Pb} = 0$), as would be the case with a linear demand curve, then the two final terms in the numerator of equation (21) would disappear and the expression would be unambiguously negative. The exercise of monopsony power would place downward pressure on value-added at the point of production and this would result in a higher optimal level of investment in monopolistic power. Monopsony and monopolistic power would be complementary, resulting in a greater share of value-add produced along the value chain being captured by the lead corporation.

We can relax the restriction and allow price responsiveness to change with b. The expression in equation (21) remains negative as long as the effect on responsiveness is not so strong as to make demand largely insensitive to changes in prices. One way of thinking about these results is to recognize that one of the costs of larger mark-ups is higher prices that reduce demand. Using monopsony power to squeeze producers at the point of production helps to reduce the pressure on prices, allowing for greater use of monopolistic mark-ups. Effectively, the share of output captured by the lead corporation rises, while that captured at the point of production falls. These effects offset each other, moderating the negative effect on demand of higher prices. Only if investments in monopoly power reduce price responsiveness to such an extent to make changes in supplier prices effectively inconsequential would there be no incentive to invest in monopsony power. In this case, lowering unit value-added at the point of production would lead to a negligible effect on b.[16] This situation is likely to apply only to very high-end luxury goods, where price is unimportant relative to the status attached to acquiring the product.

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[16] In addition, it is reasonable to assume a diminishing marginal return to monopolistic power, so that $\alpha_b > 0$ and $\alpha_{bb} < 0$. If this assumption holds – i.e. there is a smaller and smaller increase in mark-ups as b rises – then we would expect the marginal effect on price responsiveness to also decline with b. This supports a negative value for the expression in equation (21).

Clearly, whether monopolistic firms would also invest in monopsony power would depend on the costs of doing so, as reflected in equation (17), relative to the benefits of being able to maintain larger mark-ups while moderating the negative effects on demand. We do not pursue these details here, but note that, under a range of reasonable market conditions, a lead corporation would find it profitable to purse both monopolistic and monopsony power simultaneously.

**Labor Standards, Compliance and the Costs of CSR**

The example given above, concerning the joint investment in monopolistic and monopsonistic power, provides one set of circumstances where such a duo strategy makes sense. However, it focuses only on prices (i.e. lower unit labor costs and higher mark-ups). There are other situations where monopsony power can support monopolistic mark-ups. This occurs when a firm's reputation, and ability to maintain high mark-ups in the final goods market, is linked to conditions at the point of production. The case of corporate social responsibility (CSR), an important feature of lead firm management in sectors with developed GVCs, is an example of these dynamics. Within the logic of our model, a lead firm's commitment to and investment in a CSR program can be understood as in investment in branding (b) and product differentiation. But CSR is admittedly more complicated than this. Lead corporations might make costly investment in control over their suppliers, not to push down wages, but rather to preserve their reputation in final goods markets and their ability to exercise monopolistic pricing.

Even in a globally competitive environment, firms do not always benefit from low wages among supplier firms. One direct reason for this is that low standards may be associated with low productivity and low quality of production. When productivity falls with wages, unit labor costs could actually rise, or remain unchanged. For example, Distelhorst et al. (2017) find that Nike's efforts to encourage suppliers to implement "lean" manufacturing techniques – involving inventory control, quality control, and collecting performance indicators – helped both the quality of output and – the focus of their study – the rate of compliance with company labor standard code of conduct. Efforts to improve management practices among suppliers, with the possibility that this also raises labor and environmental standards constitute what Distelhorst et al. (2017) call "shared value." These authors studied 380 Nike suppliers in 11 countries and find that the supplier implementation of "lean" management practices was associated with a significant drop in non-compliance. It should be noted that even this strategy requires costly investment by the buyer firm. Nike established training center in Sri Lanka for supplier firms from around the region, although we should add that the company adopted a cost sharing model in which supplier firms had to absorb considerable amounts of the costs of attending the trainings.

A second, and, given the focus of this paper more important, reason for lead firms to seek supplier firm compliance with corporate codes of conduct is reputational. Poor labor and environmental conditions may become public and bring reputational damage to the buyers. Brand reputation, we have argued, is a crucial part of lead firm oligopoly power and thus must be protected, even if it is costly to do so. Non-compliance can be associated with unethical practices, including child labor, forced labor, non-payment of wages or overtime pay. It can lead to human tragedy, as happened in the Rana Plaza building collapse in 2013 that killed 1100 people producing garments for major brands, including H&M, Disney, Walmart, Benetton, Mango and The Children's Place among others. Non-compliance can also cause reputational damage for the lead firms. Nike, for example, suffered considerable damage to its brand in the late 1990s when investigative journalists revealed that child labor use was rampant in the soccer ball sewing operations in Pakistan. It took a number of years for Nike to recover its reputation.[17]

In the 1990s and 2000s, many firms faced pressure from NGOs, activist groups, shareholders, colleges and universities and governments to adopt corporate codes of conduct on labor and environmental standards. The firms sought to monitor suppliers to assess and raise levels of compliance with the codes. Monitoring is expensive, although it is hard to get precise firm-level data. The cost globally to industry for implementing CSR standards has been estimated between $15 and $80 billion.[18]

Buyers often use a threat of sanctions to improve supplier firm compliance, but a sanctions-based system requires that the buyer not only incur monitoring costs for compliance but also create a supplier network such that their threat to end a contract with a given supplier for non-compliance is a credible threat. Maintaining power over suppliers in this context is a form of monopsonistic power, but it would be used to protect the firm's market power in the final goods market, rather than pushing down unit labor costs at the point of production. With

[17] See Milberg (forthcoming) for an overview.

[18] Terwindt et al. (2018) provide the estimate of the range $15-$80 billion, covering the broader social compliance industry, citing various reports. Harvard Business Review (2018) estimates the cost at $20 billion for CSR broadly. And Ethical Trading Initiative (2016) cites a figure of $50 billion for audits and CSR teams (cited by le Baron (2017)).

regard to the model, this could be considered another aspect of investing in 'b', the variable capturing monopolistic power (since it ultimately is about protecting the brand).

There is considerable research on the effectiveness of various lead firms to bring supplier firms into compliance with its labor and environmental codes. A study of The Gap, inc. found that compliance with company labor standards improved more when the lead firm threatened to move to other suppliers. The threat was more credible in the case where the lead firm had a less concentrated pool of suppliers, that is more options for shifting contracts (Amengual and Distelhorst, 2025). The authors write:

> [T]he introduction of threatened penalties… reduced the probability of failing their next audit by 22 percentage points. Before the introduction of threatened penalties, we find near-zero effects of failing a compliance audit on future compliance... Threatened suppliers facing greater competition within the supply chain improved their compliance more than those facing lower levels of competition.[19] (Amengual and Distelhorst, 2025)

Corporate Social Responsibility (CSR) activity has been met with skepticism. LeBaron et al. (2022), for example, describe CSR as a "mask" for "exploitative business models," pointing to "the benefits that companies derive from CSR commitments that deflect attention from their core business models and the uneven value distribution within global supply chains." (Lebaron et al. 2022, pp. 106, 99). At the same time, CSR managers may be in conflict within the company with purchasing managers, who presumably see the costs involved in CSR standards (Distelhorst et al., 2017). Despites these criticisms and challenges, CSR constitutes a form of lead firm investment in GVC power, with the intentions or retaining its lead position in the

[19] Amengual and Distelhorst (2025), p. 3. Note that Amengual et al. (2020) find that cases of improved compliance were not met with more orders from the buyers due to the inflexibility of their relationships. They conclude that "inflexible commercial relationships constrain buyers' ability to provide incentives to promote labor compliance." Amengual et al. (2020), p. 818)

chain. Firms invest in developing codes of conduct and in auditing and monitoring suppliers. They invest in broad supplier networks that allow for a more credible threat to terminate supplier contracts for non-compliance. Still, many costs of compliance remain with the supplier or the supplier employees. Rossi (2013) studied Moroccan fast fashion garment suppliers and found that even as these companies upgraded to doing full package production (from design to production to logistics and transport) they relied heavily on irregular workers to meet buyer demands. These workers serve as a buffer that reduces costs and speeds delivery. Rossi writes:

> [I]rregular, lower skilled workers … are employed on a less formalized basis, with few or no benefits attached, lower wages, and subjected to most of the pressures deriving from the fast fashion production, without opportunities to upgrade their skills and conditions of work. The rationale for the supplier firm to hire both regular and irregular workers is to be able to respond simultaneously to contradictory buyers' pressures, that are heightened in the fast fashion model: high quality—ensured by regular workers—alongside responsiveness to quick changes in demand, reactivity to changes in scale and time of orders, and the ability to provide the full range of activities that characterize the higher value added full package supply at a low cost—all of this ensured by irregular workers at the end of the production chain. This segmentation in the labor force is therefore reinforced by fast fashion.

Not only is there a buffer labor force within the firm, but there are a variety of buyer-supplier relationships. Boudreau et al. (2023) identify a spectrum:

> At one extreme, "spot" buyers spread purchases among multiple arm's-length suppliers, allocating short-term orders to the lowest bidders and bearing the costs of suppliers' nonperformance. At the other extreme, "relational" buyers allocate orders to a few suppliers with whom they develop long-term relationships." (p. 70).

This distinction is consequential. Studies find that more relational and long-term buyer-supplier relations are associated with higher rates of compliance by supplier firms. Such supplier firms have also been found to enjoy higher markups over costs. Cajal et al. (2023), find that "exporters earn higher markups on otherwise identical orders produced for relational, as opposed to spot, buyers." Other studies find similarly that the duration of the supplier-buyer relation seems to be positively correlated with the supplier's export price (Amengual and Distelhorst, 2025, Distelhorst et al., 2017), meaning that suppliers attain better prices the longer that they are in a particular buyer-supplier relation.

The application our model to the issue of CSR provides some additional insights. While the goal of many CSR activists is to improve labor standards for production workers, the interventions might not have a significant impact of the distribution of shares of value-added across the value chain, even when codes are conduct are effective and binding. Our framework argues that the ultimate goal of protecting a corporation's reputation is to preserve or enhance its monopolistic pricing power.  Therefore, even if CSR is associated with higher unit labor costs, it could also strengthen a firm's brand. The impact on the shares of total value added is therefore ambiguous. The model can also provide insights into which lead corporations are more likely to adopt CSR practices along value chains. Given our analysis, we expect CSR to be more critical for those with some established monopolistic power and inelastic demand in their final goods markets. Based on the model, we would be less likely to see meaningful CSR practices adopted by corporations operating in competitive final goods markers. These are the firms that are more likely to invest in monopsonistic power to keep unit labor costs low in order to increase sales volume.

## 4. Conclusion: Beyond Dyadic Power in GVCs

In this paper we extended the treatment of power in GVCs in two ways. First, we have distinguished firm power as sellers and as buyers, that is between oligopoly power and oligopsony power. Firms with oligopoly power in product markets aim to sustain and raise their cost markup. Firms who operate in more competitive product markets must sustain their small markups by imposing their oligopsony power over supplier firms. Our second contribution is to identify these power dynamics as costly. Firms must invest in power if they are to sustain their market positions. On the product market side this requires investment in product design, brand allegiance and other forms of deterring competition. As buyers in GVCs, firms must invest in building a competitive supplier network such that higher input and transportation costs, increased wages, costs associated with CSR compliance or with negative demand shocks – can be passed through to suppliers. The model of pricing and trade showed how GVC activity can fund the investment in power. The hybrid version, which may be the most empirically relevant, shows that monopsony buyer power can be used to support the investment needed to maintain product market power. By understanding the dual-pronged nature of lead firm investment in power, we gain a deeper understanding of the corporate logic of the GVC.

Although formal models often are able generate important insights and predictions by focusing on key relationships, they are of course abstractions from reality and our discussion above of CSR shows that the real world is more complicated than the model can fully capture. Another limitation of our approach is the focus on “dyadic power,” whether it is oligopoly or oligopsony power. In the past ten years, many GVC scholars have argued that the nature of power in GVCs has become more diffused. While lead firms may continue to enjoy power, other actors and power dynamics have emerged. Power asymmetries can be strategically maintained by intermediaries in the GVC. Lead firms are today much more likely to be based in developing countries than even 10 years ago. As Sako and Zylberberg (2019, p. 688) write, “Gone are the days when lead firms hailed only from developed economies, and suppliers hailed only from developing countries." And supplier firms themselves may exert considerable power. Azaria et al. (2025) model this as a bargain between an exporter and an importer and allow for the co-existence of monopoly and monopsony power, that is with potential bargaining power with firms on either side of the exchange. In a similar vein, Dallas et al. (2017) note:

> Over time, the conception of power in GVCs has thus broadened from a focus on buyer power to include how key suppliers in some industries have been able to establish more powerful positions by following paths and strategies that not only create value but also retain it. (Dallas et al. 2017, p. 670)

The authors provide three examples of how power in GVCs goes beyond the simple dyadic and asymmetric power relation between buyer and supplier. In the wine industry, buyer preferences for certain varieties and wine quality have shifted power from producers to large buyer firms. In the garment sector, new ethically-driven stakeholders have imposed themselves on GVC dynamics. They focus on the FLA and the WRC. And in the consumer electronics sector, heightened capabilities by east Asian suppliers have created a more level playing field across suppliers and buyers. This more nuanced approach to power is echoed in the recent economic history by Acemoglu and Robinson, Power and Progress. The authors (p. 68) write that, "You may think power is ultimately all about coercion. That is not exactly right...[M]odern society turns on persuasion power."

Sturgeon (2009) has been most outspoken about the power of suppliers and of supplier networks: "This is because power exerted between the dyadic pair is partly shaped by relative bargaining positions rooted in the buyer (purchasing) power of lead firms and the competence power of suppliers ."[20] Sako and Zylberberg (2019) explore this supplier power from a

[20] Sturgeon (2009), quoted in Dallas et al. (2017, emphasis added).

transactions cost perspective, noting that gains accrue for suppliers who raise their competence level in environments where gains are appropriable and not immediately eroded by large competitive supplier networks. They focus on electronics and financial services and find upgrading by supplier firms can alter GVC governance in a number of ways, including becoming, at the extreme, their own branded firms. A growing number of Chinese firms have succeeded in this path, and the impact has been not just gaining value added with higher productivity, but in fact expanding market share and profits across developed country markets, putting at risk many of the oligopoly firms that were the focus of our analysis.[21]

Our model could be extended to account for a broader conception of power and value distribution in GVCs. What we have presented here is a framework for theorizing these relationships, with applications to lead firms investing in monopolistic or monopsonistic power. However, the general approach is malleable. The framework presented in this paper could be modified to account for value chains in which power lies in the hands of intermediaries, rather than lead corporations. It could also be extended to the analysis of a multi-nodal power structure, in which costly investments in intangibles affect bargaining power and the distribution of value-added between two firms, with different types of power, at distinct points along a value chain. We have tried to offer new tools to conceptualize the development of power along value chains through investments in intangible capital, and to analyze distributive dynamics across these relationships. Our hope is that we have presented an innovative way of

[21] Milberg and Johnston (forthcoming) show that Chinese imports which had been positively correlated with changes in the profit share of value added among US firms in the period 1997-2010, in fact competed against those profits in the period after 2010.

theorizing international trade, inspired by the unequal exchange tradition, that can be extended in future research.

**References**

Acemoglu, D. and S. Johnson (2023) Power and Progress: Our 1000-Year Struggle Over Technology and Prosperity, New York: Public Affairs, Hachette.

Alderman, B. and R. Blair (2024) *Monopsony in Labor Markets: Theory, Evidence and Public Policy*, Cambridge University Press.

Amengual, M. and G. Distelhorst (2025) *Cooperation and punishment in managing social performance: Labor standards in the Gap Inc. supply chain*, Strategic Management Journal.

Amengual, M., Distelhorst, G., & Tobin, D. (2020). Global purchasing as labor regulation: The missing middle. *Industrial and Labor Relations Review*, 73(4), 817–840. https://doi.org/10.1177/0019793919894240

Anner, M. (2020). Squeezing workers' rights in global supply chains: purchasing practices in the Bangladesh garment export sector in comparative perspective. *Review of international political economy*, 27 (2), 320–347.

Autor, D., Dorn, D., Katz, L., Patterson, C., & Van Reenen, J. (2020). The Fall of the Labor Share and Rise of Superstar Firms. *The Quarterly Journal of Economics*, 135(2), 645-709. https://doi.org/10.1093/qje/qjaa004

Bair, J., Anner, M., & Blasi, J. (2020). The political economy of private and public regulation in post-Rana Plaza Bangladesh. *ILR Review*, 73(4), 969–994. https://doi.org/10.1177/0019793920925424

Boudreau, L. (2024). Multinational enforcement of labor law: Experimental evidence on strengthening occupational safety and health committees. *Econometrica*, 92(4), 1269–1308. https://doi.org/10.3982/ECTA19408

Boudreau, L., Cajal-Grossi, J., & Macchiavello, R. (2023). Global Value Chains in Developing Countries: A Relational Perspective from Coffee and Garments. *Journal of Economic Perspectives*, 37(3), 59-86.
https://www.jstor.org/stable/27231714

Cajal-Grossi, J., Macchiavello, R., & Noguera, G. (2023). Buyer's Sourcing Strategies and Suppliers' Markups in Bangladeshi Garments. *The Quarterly Journal of Economics*, 138(4), 2391-2450.
https://doi.org/10.1093/qje/qjad026

Chandler, A. (1990) *Scale and Scope: The Dynamics of Industrial Capitalism*. Cambridge: Harvard University Press.

Chua, J. (2025, May 30). *'The Buyer is God': How Unfair Purchasing Practices Occur 'With Impunity' in India's Garment Industry.* Sourcing Journal. https://sourcingjournal.com/topics/labor/bangladesh-garment-factory-remediation-coordination-cell-accord-fire-safety-316170/

Corrado, Carol, Jonathan Haskel, Cecilia Jona-Lasinio and Massimiliano Iommi (2022) Intangible assets and modern economies. *The Journal of Economic Perspectives*, 36(3): 3-28

Crouzet, Nicolas, Janice C. Eberly, Andrea L. Eisfeldt and Dimitris Papanikolaou (2022) The economics of intangible capital. *The Journal of Economic Perspectives*, 36(3): 29-52

Crouzet, Nicolas and Janice C. Eberly (2019) Understanding weak capital investment: the role of market concentration and intangibles. NBER Working Paper. No. 25869.

Dallas, M. P., Ponte, S., & Sturgeon, T. J. (2019). Power in global value chains. *Review of International Political Economy*, *26*(4), 666–694. https://doi.org/10.1080/09692290.2019.1608284

Davis, D., Kaplinsky, R., & Morris, M. (2018). Rents, Power and Governance in Global Value Chains. *Journal of World-Systems Research,* 24(1), 43-71. https://doi.org/10.5195/jwsr.2018.662

Dedrick, J. & Kraemer, K. (2017). Intangible Assets and Value Capture in Global Value Chains: The Smartphone Industry. *World Intellectual Property Organization (WIPO) Economic Research Working Paper Series No.41*, 43-71. https://dx.doi.org/10.2139/ssrn.4430090

De Loecker, J. & Eeckhout J. (2018). *Global Market Power.* NBER Working Papers 24768, National Bureau of Economic Research, Inc. http://www.nber.org/papers/w24768

De Ridder, Maarten. 2025. Market power and innovation in the intangible economy. *American Economic Review*. 114(1): 199-251.

Distelhorst, G., Hainmueller, J., & Locke, R. M. (2017). Does lean improve labor standards? Management and social performance in the Nike supply chain. *Management Science*, 63(3), 707-728. https://doi.org/10.1287/mnsc.2015.2369

Durand, C. & Milberg W. (2019). Intellectual Monopoly in Global Value Chains. *Review of International Political Economy*, 27(2), 404–429. https://doi.org/10.1080/09692290.2019.1660703

Floto, Edgardo. 1989. El sistema centro-periferia y el intercambio desigual. Revista de CEPAL, 39: 147-167.

Fort, T., Pierce, J., & Schott, P. (2018). New Perspectives on the Decline of US Manufacturing Employment. *Journal of Economic Perspectives*, 32(2), 47-72. https://doi.org/10.1257/jep.32.2.47

Gereffi, G., Humphrey, J., & Sturgeon, T. (2005) The governance of global value chains. *Review of international political economy*, *12*(1), 78-104. https://doi.org/10.1080/09692290500049805

Gereffi, G. (1994). The Organization of Buyer-Driven Global Commodity Chains: How U.S. Retailers Shape Overseas Production Networks. In G. Gereffi & M. Korzeniewicz (Eds.), *Commodity Chains and Global Capitalism* (pp. 95-122). Praeger. https://hdl.handle.net/10161/11457

Guschanski, A. & Onaran, Ö. (2022). The decline in the wages share: falling bargaining power of labour or technological progress? Industry-level evidence from the OECD. *Socio-Economic Review*, 20(3), 1091-1124. https://doi.org/10.1093/ser/mwaa031

Heintz, J. (2006). Low-wage manufacturing and global commodity chains: a model in the unequal exchange tradition. *Cambridge Journal of Economics*, 30(4), 507-20. https://doi.org/10.1093/cje/bei095

Kaplinsky, R. (2019). Rents and inequality in global value chains. In S. Ponte, G. Gereffi, & G. Raj-Reichert (Eds.), *Handbook on Global Value Chains*. (pp. 153-168). Edward Elgar Publishing. https://doi.org/10.4337/9781788113779.00015

Knauss Z. (2024). *Exploring the Profit-Investment Puzzle: A Post-Keynesian Analysis of Market Concentration and Stagnation.* Working Papers 2409, New School for Social Research, Department of Economics. https://www.economicpolicyresearch.org/econ/2024/NSSR_WP_092024.pdf

Kumar, A. (2020). *Monopsony Capitalism: Power and Production in the Twilight of the Sweatshop Age*. Cambridge University Press. https://doi.org/10.1017/9781108764810

Landes, D. (2025). Trade, Global Value Chains and Power: The Role of Oligopsony, 1995-2020 (Order No. 31763333). [Ph.D. dissertation, The New School for Social Research]. ProQuest Dissertations and Theses Global. https://www.proquest.com/dissertations-theses/trade-global-value-chains-power-role-oligopsony/docview/3163307430/se-2

LeBaron, G., Edwards, R., Hunt, T., Sempéré, C., & Kyritsis, P. (2022). The ineffectiveness of CSR: Understanding garment company commitments to living wages in global supply chains. *New Political Economy*, 27(1), 99–115. https://doi.org/10.1080/13563467.2021.1926954

Locke, R. M. (2013). *The Promise and Limits of Private Power: Promoting Labor Standards in a Global Economy.* Cambridge University Press. https://doi.org/10.1017/CBO9781139381840

Matamoros, G. (2024). Are Firm Markups Boosting Inflation? A Post- Keynesian Institutionalist Approach to Markup Inflation in Select Industrialized Countries. *Review of Political Economy*, 36(3), 1042-1063. https://doi.org/10.1080/09538259.2023.2244440

McGee, A (2025) *Apple in China: The Capture of the World's Greatest Company*: New York: Scribner.

Milberg, W. (forthcoming) *Bounce: The Story of Globalization*, New York: The New Press.

Milberg, W. and L. Johnston (forthcoming) "The China Shock Then and Now: Imports, Markups and Profits, edited festschrift for Robert Blecker.

Milberg, W. & Winkler D. (2013). *Outsourcing Economics: Global Value Chains in Capitalist Production.* Cambridge University Press. https://doi.org/10.1017/CBO9781139208772

Nathan, D. (2020). Knowledge, Oligopoly and Labour in Global Value Chains. *Global Labour Journal*, 11(2), 134-151. https://doi.org/10.15173/glj.v11i2.3815

Nathan, D. (2021). From Monopoly to Monopsony Capitalism. *Indian journal of Labour Economics*, 64, 843-866. https://doi.org/10.1007/s41027-021-00350-w

Nathan, D. (2023). Knowledge and Global Inequality: Monopoly-cum-Monopsony Capitalism. *Economic and Political Weekly*, 58(7). https://www.epw.in/journal/2023/7/special-articles/knowledge-and-global-inequality.html

Nathan, D. & Rahul, S. (2025, May). *Wearing Thin: Retailer Impact on Indian Garment Manufacturers*. Transform Trade. https://static1.squarespace.com/static/62a067e5deea9a028a3eae4b/t/682c5f312eaa0f645a4d593e/1747738422527/Transform+Trade_Wearing+Thin_Retailer+Impact+on+Indian+Garment+Manufacturers.pdf

Nathan, D., Silliman Bhattacharjee, S., Rahul, S., Kumar, P., Dahagani, I., Singh, S., & Swaminathan, P. (2022). *Reverse Subsidies in Global Monopsony Capitalism: Gender, Labour, and Environmental Injustice in Garment Value Chains*. Cambridge University Press. https://doi.org/10.1017/9781009058179

Oka, C. (2010). Channels of buyer influence and labor standard compliance: The case of Cambodia's garment sector. In D. Lewin, B. Kaufman, & P. Gollan (Eds.), *Advances in Industrial and Labor Relations* (Vol. 17). (pp. 153-183). Emerald Group Publishing Limited. https://doi.org/10.1108/S0742-6186(2010)0000017008

Pietrobelli, C. & Saliola, F. (2008). Power relationships along the value chain: multinational firms, global buyers and performance of local suppliers. *Cambridge Journal of Economics*, 32(6), 947–962.
https://doi.org/10.1093/cje/ben016

Philippon, T. (2019). *The Great Reversal: How America Gave Up on Free Markets*, Belknap Harvard University Press.
https://doi.org/10.2307/j.ctv24w62m5

Ponte, S., Gereffi, G., & Raj-Reichert, G. (2019). *Handbook on Global Value Chains.* Edward Elgar Publishing.
https://doi.org/10.4337/9781788113779

Robinson, J. (1933). *The Economics of Imperfect Competition.* Palgrave Macmillan London.
https://doi.org/10.1057/9780230582149

Sako, M. and E. Zylberberg (2019) Supplier strategy in global value chains: shaping governance and profiting from upgrading, *Socio-Economic Review*, Vol. 17, No. 3, 687–707 doi: 10.1093/ser/mwx049

Saporito, B. (2025, May 26). Trump Is Asking Retailers to Deny Reality, *The New York Times.*
https://www.nytimes.com/2025/05/26/opinion/trump-walmart-tariffs.html

Siegmann, K., Merck, J., & P. Knorringa (2014). Voluntary initiatives in global value chains: Towards labour-led social upgrading?. *International Institute for Social Studies (ISS) Working Paper Series / General series,* (586), 11
hdl.handle.net/1765/51297

Sokolova, A. & T. Sorenson (2021). Monopsony in Labor Markets: A Meta-Analysis. *International Labour Review*, 74(1), 27-55.
https://doi.org/10.1177/0019793920965562

Transform Trade (2025) Wearing Thin: Retailer Impact on India Garment Manufacturers. May. Found at www.transform-trade.org

Villena, V. H., Wilhelm, M., & Xiao, C.-Y. (2020). Untangling drivers for supplier environmental and social responsibility: An investigation in Philips Lighting's Chinese supply chain. Journal of Operations Management, 67(4), 476–510.
https://doi.org/10.1002/joom.1131

Wilmers N. (2018). Wage Stagnation and Buyer Power: How Buyer-Supplier Relations Affect U.S. Workers' Wages, 1978 to 2014. *American Sociological Review*, 83(2), 213-242.
https://doi.org/10.1177/0003122418762441

Zavala, L. (2021). Competition in Global Value Chains. *Yale Graduate School of Arts and Sciences Dissertations.* 141.
https://elischolar.library.yale.edu/gsas_dissertations/141

**Appendix 1: Relationship between price elasticity and investments in monopolistic power (b).**

Beginning with equation (9) in the main text

(A1) $$\frac{\partial \varepsilon_P}{\partial b} = \delta_P \left[\frac{\frac{1}{1-r}\delta(P,b)\alpha_b - P\delta_b}{\delta(P,b)^2}\right] + \frac{P}{\delta(P,b)}\left[\frac{1}{1-r}\alpha_b\delta_{PP} + \delta_{Pb}\right] > 0$$

we multiply both sides of the equation by $\delta(P,b)^2$ to give us:

(A2) $$\delta_P\left[\frac{1}{1-r}\delta(P,b)\alpha_b - P\delta_b\right] + P\delta(P,b)[\frac{1}{1-r}\alpha_b\delta_{PP} + \delta_{Pb}] > 0$$

When we multiply equation (A2) by $\frac{b}{P\delta(P,b)\delta_P}$, recognizing that this express is negative, it yields:

(A3) $$\frac{1}{1-r}\alpha_b\frac{b}{P} - \frac{b}{\delta(P,b)}\delta_b + \frac{P}{\delta_P}\delta_{PP}\frac{1}{1-r}\alpha_b\frac{b}{P} + \frac{b}{\delta_P}\delta_{Pb} < 0$$

Equation (A3) can be expressed as:

(A4) $$\frac{1}{1-r}\alpha_b\frac{b}{P} - \frac{b}{\delta(P,b)}\delta_b < -[\frac{P}{\delta_P}\delta_{PP}\frac{1}{1-r}\alpha_b\frac{b}{P} + \frac{b}{\delta_P}\delta_{Pb}]$$

If $\varepsilon_P$ is defined as the price elasticity of demand, $\varepsilon_b$ as the elasticity of demand with respect to b ($\varepsilon_b$>0) , $\varepsilon_{PP}$ as the elasticity of the price responsiveness of demand with respect to P, $\varepsilon_{Pb}$ as the elasticity of the price responsiveness of demand with respect to b, and $\rho_b$ as the elasticity of prices with respect to b, then equation (A4) becomes

(A5) $$\rho_b - \varepsilon_b < -[\varepsilon_{PP}\rho_b + \varepsilon_{Pb}]$$

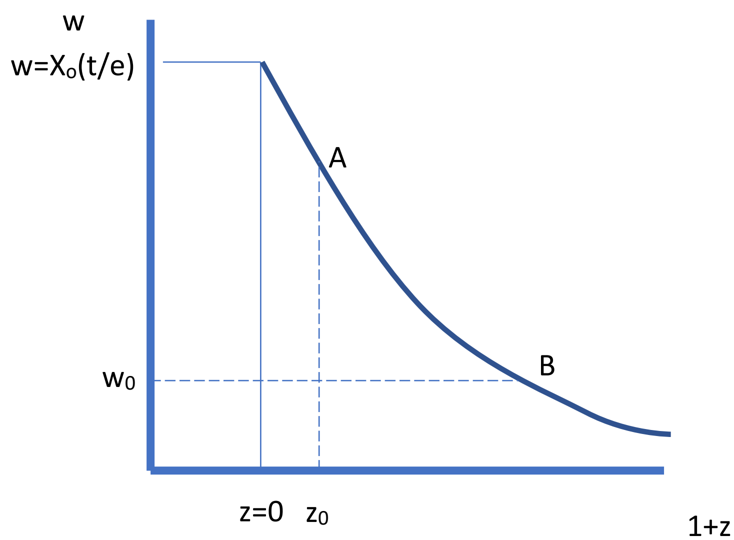
**Appendix 2: Bargaining over wages and profits at the point of production**

Equation (12) in the main text shows that a given level of value-added at the point of production, $X_0$, can be divided between wages, w, and a profit/mark-up, 1+z, through the following relationship:

(A6) $w = \frac{t}{e(1+z)} X_0$

The exact distribution based on w and z could be modeled using a simple bargaining framework, where workers have a fallback position or outside option equal to $w_0 < w$ and firms have an alternative profit opportunity based on $z_0 < z$. Figure 1 illustrates the possible bargaining outcomes based on equation (A6).

Figure A1. Illustration of bargaining dynamics.




The curve in Figure (A1) shows the possible combinations of w and z for a given $X_0$. The bargained outcomes would lie between points A and B on the curve, since neither the workers or the firm would accept an outcome worse than their fallback position. The higher the bargaining power of workers relative to the employer, the closer the outcome would be to point A.

The slope of equation (A6), illustrated in Figure (1), is:

(A7) $\frac{\partial w}{\partial z} = -\frac{t}{e(1+z)^2} X_0 < 0$

We can model the bargaining dynamics using a modified Nash bargaining framework, where workers and the firm maximize the geometric mean of the wage (net of the fallback) and the mark-up (net of the fallback), subject to the constraint from equation (A6):

(A8) $T = (w - w_0)^{\lambda}(z - z_0)^{1-\lambda}$

In equation (A8) the bargaining power of workers is represented by λ and the bargaining power of the firm by 1-λ.

Taking the natural log of both sides and equation (A8) and totally differentiating, the slope for a fixed level of T would be:

(A9) $\frac{\partial w}{\partial z} = \frac{w-w_0}{z-z_0}\frac{\lambda-1}{\lambda} < 0$

The bargained outcome would correspond when the slopes in equations (A7) and (A9) are equal. Setting them equal to each other and re-arranging gives us:

(A10) $w - w_0 = \frac{(z-z_0)t}{e(1+z)^2}\frac{\lambda}{1-\lambda}X_0$

The right-hand side of equation (A10) increases as λ increases. Therefore, for a given amount of value-added at the point of production, wages would rise when the relative bargaining of workers is stronger relative to the firm.

**A3. Second-order conditions and comparative statics**

The first order condition based on the objective function in equation (6), and expressed in equation (7), is:

(A11) $\frac{\partial V}{\partial b} = \frac{1}{1-r}\alpha(b)\delta_P\alpha_b + \alpha(b)\delta_b + \alpha_b\delta(P,b) - k_b = 0$

Therefore, the second-order condition is:

(A12) $\frac{\partial^2 V}{\partial b^2} = \frac{1}{1-r}\left[\alpha(b)\delta_P\alpha_{bb} + \frac{1}{1-r}\alpha_b^2\alpha(b)\delta_{PP} + \alpha_b\alpha(b)\delta_{Pb} + \alpha_b^2\delta_P\right] +$
$\frac{1}{1-r}\alpha_b\alpha(b)\delta_{Pb} + \alpha(b)\delta_{bb} + \alpha_b\delta_b + \frac{1}{1-r}\alpha_b^2\delta_P + \alpha_b\delta_b + \delta(P,b)\alpha_{bb} - k_{bb} < 0$

Rearranging:

(A13) $\frac{\partial^2 V}{\partial b^2} = \frac{1}{1-r}\alpha_{bb}\alpha(b)\delta_P + \frac{1}{(1-r)^2}\alpha_b^2\alpha(b)\delta_{PP} + \frac{2}{1-r}\alpha_b\alpha(b)\delta_{Pb} + \frac{2}{1-r}\alpha_b^2\delta_P +$
$\alpha(b)\delta_{bb} + 2\alpha_b\delta_b + \delta(P,b)\alpha_{bb} - k_{bb} < 0$

In order for a maximum to exist, the second order condition must be negative. If this does not hold, the total value-added, net of costs, would continue to increase with investments in market power.

If the first- and second- order conditions are satisfied and there is an optimal level of monopolistic power, $b^*$, we can express this optimal level of b as a function of the parameters of the model. Specifically, $b^*$ is a function of U, the value-added in terms of wages and profits at the point of production, $b^*$. Differentiating the first-order condition, equation (A11), with respect to U and recognizing $b^*(U)$ yields:

(A14) $\frac{1}{1-r}\left[\alpha(b)\alpha_{bb}\delta_P\frac{\partial b^*}{\partial U} + \alpha(b)\alpha_b\left(\frac{1}{1-r}\alpha_b\delta_{PP} + \delta_{Pb}\right)\frac{\partial b^*}{\partial U} + \frac{\alpha(b)\alpha_b\delta_{PP}}{1-r}\right] +$
$\frac{1}{1-r}\alpha_b^2\delta_P\frac{\partial b^*}{\partial U} + \alpha(b)\left(\frac{1}{1-r}\alpha_b\delta_{Pb} + \delta_{bb}\right)\frac{\partial b^*}{\partial U} + \frac{\alpha(b)\delta_{Pb}}{1-r} + \delta_b\alpha_b\frac{\partial b^*}{\partial U} + \alpha_b\left(\frac{1}{1-r}\alpha_b\delta_P +\right.$
$\left.\delta_b\right)\frac{\partial b^*}{\partial U} + \frac{\propto_b\delta_P}{1-r} + \delta(P,b)\alpha_{bb}\frac{\partial b^*}{\partial U} - k_{bb}\frac{\partial b^*}{\partial U} = 0$

Solving equation (A14) for $\partial b^*/\partial U$ and setting the second-order condition in equation (A8) equal to S gives us:

(A12) $\frac{\partial b^*}{\partial U} = -\frac{\alpha_b\delta_P + \alpha(b)\delta_{Pb} + \alpha(b)\alpha_b\frac{\delta_{PP}}{1-r}}{(1-r)S}$