Low-wage Manufacturing and Global Commodity Chains:
A model in the unequal exchange tradition

22 February 2005

James Heintz *
Assistant Research Professor
Political Economy Research Institute
418 N. Pleasant Street, Suite A
Amherst, MA 01002
University of Massachusetts
jheintz@peri.umass.edu

* I would like to thank Samuel Bowles, Elissa Braunstein, Alper Duman, Gerald Epstein, Thomas Hertz, Robert Pollin, Mohan Rao, Stephanie Seguino, and two anonymous reviewers for insightful comments and suggestions on earlier versions of this paper. All errors are mine.
Low-wage Manufacturing and Global Commodity Chains:  
a model in the unequal exchange tradition

Abstract

The institutional setting of subcontracted manufacturing has a profound impact on how the benefits of trade are distributed. This paper develops a model that combines insights from unequal exchange theorists and global commodity chain analysis to clarify the distributive dynamics of production networks in which subcontracting and branding are defining features. In this framework, the ability of productivity growth to increase income from exports is constrained and depends on how the benefits of productivity improvements are captured – as lower consumer prices or higher rents for brand-name multinationals. Increasing consumption in affluent consumer markets raises export earnings. However, developing countries, acting alone, are constrained in their ability to impact the demand-side of global commodity chains. Instead, supply-side policies to support industrial up-grading represent a more viable option for raising incomes.

JEL Classification: F02, F23, O19

Keywords: trade, global commodity chains, subcontracting, branding.

1. Introduction

Does the increase in manufacturing exports from developing economies improve the economic well-being of workers producing these goods? Many contend that the benefits of low-wage, subcontracted manufacturing of branded consumer goods primarily accrue to consumers and multinational firms in the global North. Supporters of this position point to the existence of sweatshops, dangerous workplaces, and poverty-level
wages as evidence. In contrast, others argue that greater export demand translates into higher export earnings and new employment opportunities. In labor-surplus economies, additional jobs raise incomes, even when wages fail to increase. Therefore, subcontracting improves the incomes of the poor by providing additional sources of remunerative employment. This paper engages with these issues by developing a model that combines the insights of earlier “unequal exchange” theorists and new work on global commodity chains to clarify the linkages among retail prices, factor payments, and consumer demand in products where branding and subcontracting are important features.

The pattern of trade in manufactured goods has undergone a significant transformation in recent decades, with the broad composition of exports from less developed countries converging to that observed in advanced economies. Manufactured goods account for an increasing share of the exports of developing countries. In the 1970s, manufacturing accounted for less than 20 percent of all exports of developing countries. By 2000, this proportion had risen to over 70 percent.¹ Much of the change was driven by key economies in East Asia and Latin America (Lall 1998). Manufacturing remains underdeveloped in many of the poorest countries of the world. Nevertheless, the overall transformation is notable – developing countries are exporting more manufactured goods than ever before.

As manufactured exports of from the developing economies expand, the affluent consumer markets of North America, Western Europe, and Japan provide a vast source of purchasing power for these goods. For example, U.S. imports of goods from non-OPEC

developing economies increased from 23.0 percent of total imports of goods in 1978 to 44.6 percent by 2002. These imports include products that constitute an inexpensive supply of manufactured consumer goods.

Consider the example of U.S. clothing imports. Figure 1 illustrates trends in the relative price of clothing from 1958 to 2002, measured as the consumer price index for clothing divided by the CPI for other goods, excluding the volatile components of food and energy prices. Figure 1 also shows the constant-dollar (2002) value of clothing imports over the same period. Relative prices began to fall noticeably in the early 1970s at the same time that the growth of clothing imports accelerated. The relative price of clothing continued to decline as import penetration rose.

Declining prices for consumer goods help support the expansion of consumption in industrialized countries and, in turn, the growth of consumer-oriented industries such as retailing. In developing countries, the growth in such consumer markets expands export earnings and provides new employment opportunities, although often at low wages. Trade theory in the Heckscher-Ohlin/Stopler-Samuelson (HOSS) tradition offers an explanation of these observed trends. Developing countries, with an abundance of

---

2 Author’s calculations from U.S. international transactions data, Bureau of Economic Analysis, U.S. Department of Commerce. Developing countries include the countries of Latin America, Caribbean, Asia, and Africa, excluding Japan, Australia, New Zealand, and South Africa.

3 Using the CPI which included food and energy prices does not change the trend illustrated in Figure 2 in any meaningful way.
inexpensive labor and a relative scarcity of fixed capital, will specialize in low-wage, labor intensive production. Under conditions of unrestricted trade, the relative prices of goods adjust so that prices of labor-intensive products fall in high-income, capital-rich countries while employment in export sectors expands in developing economies. HOSS theories rely on well-functioning markets that seamlessly map the movement of relative factor and output prices and thereby abstract from the power dynamics of trade networks and the macroeconomic environment in which production takes place. However, the institutional character of modern networks of production, distribution, and consumption impact the distribution of the gains from trade and who benefits from price reductions or expanded production. For example, the existence of surplus labor, as opposed to the assertion of full-employment, changes the distributive predictions of the HOSS framework.

A different approach to international trade – the “unequal exchange” tradition – provides an alternative framework for examining the distributive consequences of the context in which global exchange occurs. The term “unequal exchange” was coined by Arghiri Emmanuel (1972) in his theoretical exposition of the trade relationship that existed between the “core” and the “periphery”. Although using distinct theoretical approaches, earlier works by Raúl Prebisch (1950), W. Arthur Lewis (1954), and Hans Singer (1950) formed the foundation of a broader unequal exchange tradition, in that they offered different structural explanations for observed inequalities in international trade when developing economies specialized in primary commodities and industrialized countries specialized in manufactured goods. Emmanuel’s evocative name for his
approach to the core-periphery trade relationship captures the spirit of this rich theoretical tradition.

Many of the characteristics of modern international production and trade networks reflect the conditions identified by the unequal exchange literature. Three aspects are particularly relevant:

1. flexibility in sourcing decisions mimics the effect of capital mobility in the sense that competitive pressures limit the scope for subcontractors to raise production costs without triggering a substantial loss of output;
2. oligopolistic, or monopolistic, structures in advanced economies are explicitly linked to competitive conditions in developing country manufacturing; and
3. a surplus of labor exists at the point of production such that an expansion in output does not bid up wages.

In many respects, these characteristics reflect aspects of the unequal exchange theories of Emmanuel, Prebisch, and Lewis, respectively. Not surprisingly, these factors exert a strong influence over the distributive outcomes under the new international division of labor in a way that is not adequately captured by the HOSS model and other frameworks that emphasize the movement of product prices and factor costs alone.

The work of both Raúl Prebisch and Hans Singer locates the determinants of the trade-based inequalities in the differences that exist in the product and factor markets of developing and industrialized countries. Two factors contribute to this dynamic. First, the institutions of the industrial North have sufficient market power to cause prices and wages to be stickier than is the case in the developing world where greater flexibility prevails. Second, the income elasticity of demand for manufactured goods is higher than
that of primary goods. Therefore, demand for manufactured goods responds vigorously to productivity improvements that raise incomes. However, the demand for primary goods responds weakly (or possibly even negatively) to technological innovations. Therefore, during periods of productivity-led growth, prices of manufactured goods rise relative to prices of primary products. Since primary commodities are price inelastic, the income terms of trade – that is, receipts from exports relative to imports – fall, leading to a widening gap between industrialized and developing countries.  

In contrast with the Prebisch-Singer approach, Lewis focused on differences in the structure of non-clearing labor markets – in particular, the existence of a substantial surplus of labor in the developing world. In his framework, the price of labor in a labor surplus economy corresponds to the subsistence wage and labor demand can increase substantially without bidding up wages. Capital accumulation raises productivity, but in a labor surplus situation wages do not increase. Therefore, unit labor costs fall when productivity improves, leading to lower prices or higher profits. The benefits accrue to industrial purchasers and, potentially, the consumers in industrialized countries.

Emmanuel uses a markedly different approach to the problem of unequal exchange. In essence, Emmanuel applies Marx’s transformation problem to international trade. Profit rates are equalized across national boundaries due to the mobility of capital. In contrast, labor is mobile nationally, but immobile internationally. National wage levels

---

4 The notion of “immiserating growth” proposed by Jagdish Bhagwati (1952) shares some features with the Prebisch-Singer analysis. In Bhagwati’s model, real economic growth can be associated with declining domestic consumption when productivity increases reduce the terms of trade such that total consumption of imported goods actually falls. This occurs when domestic production of imported goods is underdeveloped and demand for imports is price inelastic.
are taken as independent, exogenous variables, determined by a range of historical and institutional factors. Under conditions of complete specialization, the free circulation of capital produces a situation in which developing countries with low wages suffer a disadvantage in international trade since they export goods produced with a given quantity of labor in exchange for imports from industrialized countries produced with relatively less labor. This occurs because the price of the imports they purchase must accommodate both the high wage of the industrialized workers and the equalized profit rate.

The unequal exchange tradition shares some common features with more recent theoretical frameworks that focus on the institutional connections that shape patterns of international industrial production, distribution, and consumption. A prime example is global commodity chain analysis which has been put forward by Gary Gereffi and others as a means of understanding the organization and relative influence of different players in global production systems (Gereffi 1994, 1999; Kaplinsky 2000; Henderson et al. 2003). Global commodity chain analysis attempts to explain how the transnational organization of production operates and evolves. Instead of focusing only on the movement of relative prices of imports and exports, it also incorporates issues of structural differences, dependency, and the nature of retail and consumer markets.

For example, in a buyer-driven commodity chain, large retailers or brand-name corporations set up a decentralized system of production and distribution. Actual production is subcontracted out to small producers who face extremely competitive conditions. Various intermediaries coordinate the relationship between the retailer, or brand-name firm, and the subcontractors. Retailers and brand-name multinationals enjoy
some degree of market power which they can use to keep prices low for the goods they purchase or to earn rents through the development of monopolistic brand identities.

Buyer-driven commodity chains can be contrasted with producer-driven commodity chains in which large manufacturing enterprises establish a system of global production in which different vertically integrated segments of the production process are located in different countries (Gereffi 1994; Hummels, Ishii, and Yi 2001; Jones 2000; Arndt and Kierzkowski 2001). Industries such as motor vehicle production and electronics are examples of producer-driven commodity chains. In these types of production networks, developing countries tend to specialize in the labor-intensive assembly of high-technology component parts imported from more advanced economies (UNCTAD 2002). Differences in skills, technological know-how, and economies of scale in production influence the distribution of value-added across the commodity chain (Streeten 1993).

This paper specifically focuses on buyer-driven commodity chains. By combining the insights of global commodity chain analysis with the theoretical innovations of the unequal exchange traditions, a model of these relationships can be developed that explores the distributive consequences of the expansion of globalized manufacturing tied to affluent consumer markets. The following section of the paper develops such a model focusing on the relationships between retail prices, production costs, and the distribution of rents along a buyer-driven commodity chain in which branding and subcontracting are the defining features.
2. Commodity chains, branding, and distribution: a model

We develop a model of a global commodity chain that captures the characteristics of modern retailing and brand-name multinational production. To start, we disaggregate the retail price of a product, \( P \), into shares received by each of the primary players in the commodity chain: (1) the retailers or brand-name corporations, (2) the intermediaries which coordinate subcontracted production on behalf of the retailers and brands, and (3) the subcontractors who actually produce the goods. Due to the competitive conditions facing subcontractors and the existence of surplus labor, unit labor costs are assumed to be equalized across producers. We break down the price components as follows:

\[
(1) \quad P = \alpha(b) + rP + e(1 + z)\left(\frac{w}{t}\right)
\]

in which \( \alpha \) represents the gross per unit monopoly rents due to branding (assumed to be increasing a decreasing rate), \( b \) represents the extent of branding activities (advertising, endorsements, promotions, sponsorships, media strategies), \( r \) is the percentage of the retail price going to intermediaries, \( e \) is the exchange rate (with local currency units in the denominator), \( z \) is the exogenously given competitive profit margin for subcontracted producers, \( w \) is the average wage per worker,\(^5\) and \( t \) represents labor productivity (output per employee). This expression represents a version of variable mark-up pricing at the

\(^5\) For informal and home-based production, employment may not be structured as a wage relationship. Instead, workers are paid in terms of their unit labor cost. Their wage equivalent is then the piece-rate multiplied by labor productivity.
retail level in which a firm’s ability to bid up prices depends on its investment in branding activities.\textsuperscript{6}

Solving Equation 1 for $P$ gives us the following expression for the retail price:

$$P = \frac{1}{(1-r)[a(b) + e(1+z)\left(\frac{w}{t}\right)]}$$

Some immediate accounting relationships can be derived from this expression. For example, higher monopoly rents due to branding activities will bid up the retail prices. Likewise, if intermediaries ($r$), subcontractors ($z$), or production workers ($w$) are able to increase their claims on income within the commodity chain, \textit{ceteris paribus}, retail prices will increase. However, an increase in labor productivity ($t$) will lower retail prices.

Market power is concentrated at the level of the retailer or brand-name producer. These firms choose a level of branding, $b$, to maximize their profits from retail operations. Sales of goods depend on the demand for the branded commodity, $d(P,Y)$, as a function of price, $P$, and disposable income, $Y$. Note that the level of branding is not included in the consumer demand function here, although branding often directly influences the quantity demanded. This is done for simplicity of exposition. Including branding in the demand function does not change the fundamental logic of the model in any meaningful way. A demand function with branding included is discussed in the paper’s appendix.

\textsuperscript{6} In this respect, the model differs from monopolistic competition models in the Robinson-Hicks tradition in which price is determined by the firm’s optimization decisions given a particular market structure. Here, market power is endogenous. The firm invests in a level of branding that determines its per unit rents.
The operating costs of the retail firm, apart from the cost of goods sold, are comprised of two factors: (1) the direct cost of retailing, which increases with the amount of goods sold, and (2) the costs of branding. If $R_c$ represents retail operating costs, then:

$$R_c = R_c (\delta (P,Y), b)$$

For the sake of this model, we adopt a simple additive expression for operating costs in which $c$ represents the constant per unit cost of retailing and $\mu(b)$ is the cost of branding, assuming increasing marginal costs:

$$R_c = c\delta (P,Y) + \mu (b)$$

The profits of the retail firm, $p$, can be expressed as total sales revenue less the cost of goods sold less retail operating costs:

$$\pi = P\delta (P,Y) - \delta (P,Y)[ rP + e(1 + z) \frac{w}{t}] - c\delta (P,Y) - \mu (b)$$

From Equation 1, we can see that price less the unit cost of goods sold is simply the per unit monopoly rent, $a(b)$. Therefore, the objective function in Equation (5), when combined with Equation (1), can be simplified to:

$$\max_b \quad \alpha(b)\delta (P,Y) - c\delta (P,Y) - \mu (b)$$

In other words, firms choose a level of branding to optimize the total net rents received. Two factors contribute to the total rents the firm enjoys – the rents they receive for the branded commodity and the level of consumer expenditures.

The first-order condition for maximization is:

$$\alpha_b \delta (P,Y) + (\alpha - c)\delta_r (\frac{\alpha_b}{1 - r}) - \mu_b = 0$$
We can divide this expression into two parts that have more intuitive interpretations. The first represents the net marginal benefits of branding:

\[(8a) \quad B' = \alpha \delta(P,Y) - \mu_b\]

This expression indicates the value of the rents that would be enjoyed by increasing the extent of branding less the costs of doing so. For example, by investing more into name recognition, brand presence, endorsements, and image enhancement, firms will be able to raise the price of their products while maintaining a competitive position.

The second part of Equation 7 represents the indirect marginal costs of branding:

\[(8b) \quad C' = -\alpha + \delta(p)\frac{\alpha_b}{1 - r}\]

While branding raises rents, it also raises retail prices (from Equation 2) and reduces demand. A decline in consumer expenditures will reduce total rents, even though rents per unit sold could be increasing. This places constraints on the extent to which firms can raise prices and capture additional rents. At some point consumers will stop buying. The above expression for the indirect marginal costs of branding captures this effect, adjusted for changes in the actual costs of retailing. When net marginal benefits equal the indirect marginal costs, the firm is practicing its optimal branding strategy (as expressed in Equation 7).

We can illustrate these relationships graphically. Figure 2 shows the net marginal benefit curve (B') and the indirect marginal cost curve (C') as a function of the amount of branding a firm undertakes. For interested readers, the derivation of the slopes of these curves is included in the appendix. The intersection of the curves represents the optimal strategy for the firm (b* in the graph).
How would the company’s branding and pricing strategy respond to an exogenous shift in one of the prices or distributive parameters of the model? For example, what would happen if subcontractors in a country suddenly became more attractive due to the availability of lower cost labor raising from an exogenous change in trade policy, productivity improvements, the entry of a new low-wage producer, or an exchange rate depreciation? The four-quadrant diagram in Figure 3 illustrates the various effects. From Equation 2 we know that, at a give level of branding, retail prices will be reduced while per unit rents, as given by the function \( a(b) \), remain the same. Since prices are reduced at each level of branding, demand will increase, thereby causing the marginal benefit curve to shift to the right, from \( B' \) to \( B'' \), as illustrated in the upper-right frame of Figure 3. The equilibrium level of branding moves from \( b' \) to \( b'' \). Access to less expensive sources of productive labor leads to an increase in the overall extent of branding.

Why is this the case? Branding provides firms with monopoly rents and boosts their profitability. However, the extent of branding is constrained by the negative impact of higher prices on consumer demand. An exogenous change that makes cheaper sources of labor available will reduce retail prices for any given level of branding. After such a shift, the firm is no longer maximizing total rents at the original level of branding.
Therefore, the retailer or brand-name producer can raise rents by extending their efforts at product differentiation and identity-building further. Before the reduction in labor costs, these higher levels of branding would have lowered total rents, since consumers would have reacted negatively to the price increases by reducing their demand.

This connection between globalized production and branding strategies is reflected in the actual strategic choices of multinational firms. For example, in 1999, the president of Levi-Strauss, John Ermatinger, justified the company’s decision to switch to lower-cost subcontractors to produce the corporation’s jeans in the following terms:

“Our strategic plan in North America is to focus intensely on brand management, marketing, and product design as a means to meet the casual clothing wants and needs of consumers. Shifting a significant portion of our manufacturing from the U.S. and Canadian markets to contractors throughout the world will give the company greater flexibility to allocate resources and capital to its brands.” (Quoted in Klein 2002: 195)

The remaining parts of Figure 3 illustrate what happens to prices and demand when average labor costs decline. The lower right quadrant of Figure 3 shows the impact on prices. Since production costs are lower, the price curve shifts towards the horizontal axis. At a given level of branding, prices fall. However, this tendency for prices to fall is partially offset by the higher levels of branding. In Figure 3, the net effect is a reduction in prices which leads to an increase in demand, as seen in the lower left quadrant. Total rents increase due to a combination of higher per unit rents and increased demand.
Changes in any of the parameters governing the distribution of value across the commodity chain will affect branding decisions and competitive strategies. The relevant comparative static calculations are detailed in the appendix. In general, any exogenous change that reduces unit labor costs (e.g. higher productivity or lower wages) increases the degree of branding and total rents received.

The impact on retail prices is more complex. In general, lower production costs or a reduction in the share of intermediaries will lower retail prices and increase consumer demand. Whether reductions in unit labor costs are captured as higher rents or lower prices depends on the structure of the consumer market. As demand becomes more price elastic (due to more competitive market conditions or the availability of substitute goods), the greater the likelihood that labor cost reductions will result in lower prices and smaller increases in branding expenditures.

Under certain extraordinary circumstances – the existence of an inelastic demand curve and high marginal rents due to branding – lower production costs can theoretically lead to higher retail prices. This occurs when the increase in per unit rents associated with a higher level of branding more than off-set the effect of lower production costs. This is only likely to happen when there is practically no competition in the final consumer markets. More generally, we expect to see prices fall when unit labor costs decline, as was evident in the example of the U.S. clothing market (Figure 1).

3. Discussion and conclusion

How does this analysis fit into the earlier literature on unequal exchange and trade-based inequalities? If subcontractors and production workers face highly
competitive conditions, in the long-run they will be unable to capture the direct benefits of technological improvements or productivity enhancements and to raise their standards of living, either in terms of increased profits or higher wages. The distribution of productivity gains will depend on the optimal competitive behavior of the multinationals that possess a significantly higher degree of market power. Depending on the nature of the specific consumer market, the gains from low-cost production will be distributed between final consumers on the one hand and brand-name multinationals on the other.

Innovative producers might be able to capture some short-run gains by raising productivity, cutting prices, and thereby increasing demand for their output. However, competitive pressures among other subcontractors to reduce their unit labor costs will erode these gains over time. Long-run incentives might be inadequate for a subcontractor to invest in productivity improvements. If the short-term benefits are not sufficient to cover the costs of investing in productivity improvements prior to the adjustment to a new low-cost equilibrium, these improvements will not be made. Under such conditions, export production tied to a global commodity chain would be characterized by a low-wage/low-productivity trap.

Of course, when a new competitor with lower production costs enters the market, other producers have a clear incentive to improve productivity. The entry of lower-cost producers will place downward pressures on unit labor costs, lowering prices and increasing branding expenditures as outlined previously. However, the benefits of productivity improvements due to the entry of new competitors are realized in terms of retaining existing jobs and production, not in terms of higher average living standards per worker.
Recent empirical research suggests that developing countries have experienced deterioration in the net-barter, or commodity, terms of trade of their manufacturing export sectors vis-à-vis the manufacturing sectors of the advanced industrial economies (UNCTAD 2002, Maizels 2000, Sarkar and Singer 1991). Similarly, the terms of trade between manufacturing sectors in developing countries and traded services and complex manufacturing in advanced economies appear to have deteriorated since 1960 (Minford, Riley, and Nowell 1997). Others have found that the barter terms of trade of manufactured goods from developing countries relative to exported machinery, transport equipment, and services from developed economies has also been declining (Wood 1997). However, these findings are not universal. Some researchers have found little evidence of a negative trend in the net barter terms of trade for manufactured exports (Athukorala 2000, 1993).

Furthermore, the income that exports generate is as relevant as the export price. Measures of the commodity terms of trade do not take into account the fact that manufactured exports from developing countries have expanded rapidly in recent years. For example, empirical studies show that trendless net-barter terms of trade for manufactured exports can co-exist with rising income terms of trade which take into account changes in the volume of exports (Athukorala 1993).

Such findings are consistent with the theoretical argument that subcontracted manufacturers find it difficult to capture a larger share of value-added generated along global commodity chains. The primary benefits accrue from the expansion of the volume of exports, not increases in per-unit value-added. However, it is important to recognize the existence of other types of global production networks for manufactured goods when
interpreting these trends. Branding and subcontracted production are not the defining features of all types of commodity chains. As mentioned earlier, in the case of labor-intensive assembly of imported, high-technology component parts, differences in skills and technological knowledge exert a stronger influence over the distribution of value-added across the commodity chain. In such cases, the volume of manufactured exports from developing countries participating in these networks is not a good indicator of total value-added produced because of the high import content of the exports.

Based on the analysis presented here, increasing volumes of manufactured exports, rather than raising labor productivity, is likely to be more important for improving export earnings in buyer-driven commodity chains. When import demand is sufficiently income elastic, the growth of consumer income in affluent markets generates a proportionately larger increase in export earnings. Empirical estimates of the income elasticity of manufactured import demand in high-income countries have been reasonably high – generally lying between 1.0 and 3.0 (Heintz 2003, Deyak, Sawyer, and Sprinkle 1997, Senhadji 1997, Goldstein and Khan 1985). Elasticities of this magnitude suggest that the growth rate of earnings from manufactured exports will increase more rapidly than the growth rate of consumer incomes.

Nevertheless, developing countries, acting alone, are constrained in their ability to impact the demand-side of global commodity chains, e.g. by raising the incomes of consumers in high-income markets. Instead, efforts to redistribute rents across commodity chains represent a more realistic set of policy options. For example, supply-side policies to support industrial up-grading are a viable means of raising export earnings. Industrial up-grading refers to the movement up commodity chains to capture a
larger share of the total income generated throughout the production and distribution network (Gereffi 1999, Kaplinsky 1998). If producers in the lower echelons of commodity chains share in the rents captured elsewhere, their average incomes will rise (Kaplinsky 1998).

However, there are problems with assuming that industrial up-grading will be an automatic outcome of participation in global production. Competitive pressures can constrain the capacity for up-grading by limiting the resources and the flexibility needed to pursue long-run strategies of industrial development. Furthermore, as global competition intensifies, uncoordinated decisions by producers can lead to over-capacity and a fallacy of composition in international markets, producing downward pressure on the value of manufactured exports (Erturk 2002). These dynamics undermine the ability of countries to pursue coordinated industrial strategies, such as up-grading export production.

The creation of codes of conduct for brand-name producers represents a second strategy for redistributing rents across buyer-driven commodity chains, one requiring greater international coordination. Retailers and brand-name manufacturers are sensitive to reputation effects that might damage a carefully crafted corporate image. A bad image can be disastrous for profits and cripple a company’s ability to secure future branding rents. This vulnerability can be leveraged in order to redistribute resources across the commodity chain to subcontracted workers. Moreover, studies have found that

---

7 In the apparel industry, industrial up-grading often consists of moving from “cut, make, and trim” (CMT) operations, in which the cloth is supplied by the contracting firm, to “full-package” (FOB) exporting, in which the subcontractor is entirely responsible for manufacturing ready-to-wear clothing. With full-package exporting, the brand-name company effectively withdraws from the production process. When subcontractors provide these additional services, they can claim a larger share of the income generated throughout a commodity chain.
consumers are willing to pay a price premium for products produced under decent working conditions that exceeds the costs of making substantial improvements in working conditions (Pollin, Burns, and Heintz 2004). The most significant constraint for implementing such codes of conduct is designing an effective and credible system for monitoring and enforcement.

Finally, it is important to recognize the limitations of the analysis presented in this paper. The model and theoretical arguments outlined here are tools for exploring relationships across consumer-oriented commodity chains in which branding and subcontracting are central. However, like all models that aim to simplify, the usefulness of the conclusions are constrained by the appropriateness of the assumptions. In addition, the arguments presented here only address one type of international production network. Further work, both empirical and theoretical, is needed to better understand the broader distributive implications of the institutions that shape global networks of production, exchange, and consumption.

Bibliography


J. Heintz. Low-wage manufacturing and global commodity chains.


J. Heintz. Low-wage manufacturing and global commodity chains.


Appendix

A.1. First and second order conditions.

A firm chooses \( b \) to maximize total rents as given by the following objective function, presented as Equation 3 in the main text:

\[
\max_b \alpha(b)\delta(P, Y) - c\delta(P, Y) - \mu(b)
\]

The first order condition is:

\[
\alpha_b \delta(P, Y) + (\alpha - c)\delta_p \left(\frac{\alpha_b}{1 - r}\right) - \mu_b = 0
\]

The second order condition, which will be labeled \( S \), is:

\[
S = \alpha_{bb}\delta(P, Y) + \frac{\alpha - c}{1 - r} \delta_p \left(\frac{\alpha_b}{1 - r}\right) + 2\delta_p \frac{\alpha^2}{1 - r} + \delta_{pp} (\alpha - c) \left(\frac{\alpha_b}{1 - r}\right)^2 - \mu_{bb} < 0
\]


From the first order condition, we can derive an expression for the net marginal benefits of branding:

\[
B' = \alpha_b \delta(P, Y) - \mu_b
\]

and the indirect marginal costs:

\[
C' = - (\alpha - c)\delta_p \left(\frac{\alpha_b}{1 - r}\right)
\]

Clearly \( B' \) is a decreasing function of \( b \), assuming decreasing marginal returns and increasing, or constant, marginal costs to branding:

\[
\frac{dB'}{db} = \frac{\alpha^2 \delta_p}{1 - r} + \alpha_{bb}\delta(P, Y) - \mu_{bb} < 0
\]
The shape of the marginal cost curve is more complex. Assuming the second order conditions hold as described above, marginal costs will be a convex function of $b$ with a positive slope over the relevant range for maximization:

$$\frac{dC'}{db} = -\frac{\delta_p}{1-r}[\alpha_{bb}(\alpha - c) + \alpha_b^2] - (\alpha - c)\delta_{pp}\left(\frac{\alpha_b}{1-r}\right)^2 > 0$$

A.3. Comparative statics

The first-order condition can be solved for $b$ and the optimum, $b^*$, expressed as a function of the parameters in the price equation:

$$b^* = b^*(w, t, e, r)$$

How does $b^*$ respond to an exogenous change in these parameters? Take the example of changes in wages and labor productivity. Substituting $b^*$ into the first order condition and differentiating with respect to the relevant parameter yields:

$$\frac{\partial b^*}{\partial w} = \frac{-e(1+z)\alpha_b [\delta_p + (\alpha - c)\delta_{pp}]}{t(1-r)} \frac{1}{S} < 0$$

$$\frac{\partial b^*}{\partial t} = \frac{e(1+z)\alpha_b [\delta_p + (\alpha - c)\delta_{pp}]}{t^2(1-r)} \frac{1}{S} > 0$$

How do prices respond to an exogenous change in one of these parameters?

Taking the example of labor productivity:

$$\frac{\partial P}{\partial t} = \frac{\alpha_b}{1-r} \frac{eb(1+z)}{t^2(1-r)}$$
Using the comparative static results above, the first term is positive while the second term is negative. We would generally expect productivity improvements to reduce prices. However, a special case, in which prices increase with higher labor productivity, is possible. This would happen when demand is extremely price inelastic and the optimal level of branding is very responsive to reductions in production costs.

A.4. Consumer demand as a function of branding

Suppose we included branding as a determinant of consumer demand such that

$$
\delta = \delta(P, Y, b), \text{ with } \delta_b > 0 \text{ and } \delta_{Pb} \geq 0
$$

A positive cross partial derivative, \(d_{Pb}\), indicates that branding reduces the magnitude of the negative response of demand to higher prices – i.e. branding reduces price sensitivity.

With this augmented demand function, the first-order condition for maximization is:

$$
\alpha_b \delta(P, Y) + (\alpha - c)[\delta_P(\frac{\alpha_b}{1 - r}) + \delta_b] - \mu_b = 0
$$

The expression for the net marginal benefits of branding then becomes:

$$
B' = \alpha_b \delta(P, Y, b) + (\alpha - c)\delta_b - \mu_b
$$

The indirect marginal cost equation remains unchanged except for the new demand function. Note that the marginal benefits equation contains an additional term that captures the marginal increase in net rents due to the impact of branding on demand.

Including branding in the demand function changes the shape of the marginal cost and benefit curves illustrated in Figure 2 in the main text. The net marginal benefit curve becomes less steep. In addition, if additional branding reduces the price responsiveness of demand, the indirect marginal cost curve will also become flatter. Under these conditions,
a firm will respond to a decline in production costs by increasing branding to a larger extent than when demand is simply a function of income and price.
Figure 1

U.S. real apparel imports ($2002) and an index of the relative price of clothing (2002=100), 1958-2002

Source: For the core CPI (excluding food and energy) and the clothing price index: U.S. Bureau of Labor Statistics. For imports of apparel: U.S. Census Bureau, U.S. International Trade in Goods and Services, various years. Note: data includes both wearing apparel and footwear.
Figure 2. Optimal Choice of Branding

The graph illustrates the marginal costs/benefits of branding. The optimal choice, denoted by $b^*$, is where the marginal costs and benefits are equal, represented by the intersection of curves $C'$ and $B'$. This point indicates the balance between the additional benefits gained from increased branding and the additional costs incurred.
Figure 3. Impact of an exogenous reduction in unit labor costs on optimal branding, prices, and demand.