The Pursuit of Retailing Dominance: Market Dominance, Channel Dominance or Both?

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Abstract

The emergence of power retailers, such as Wal-mart, Best Buy, and Home Depot, has significantly changed the competitive landscape in the retailing industry over the past two decades. These power retailers frequently dominate other small retailers by charging lower prices (market dominance). Some also pursue the strategy of dominating the distribution channel by participating in setting the wholesale price (channel dominance). Indeed, in the case of Wal-mart, it exercises both market and channel dominance. Some upstream suppliers complain of being squeezed by the power retailers but at the same time are entering into close partnerships with them. Others, like Procter & Gamble, work in close cooperation with power retailers like Wal-mart, and acknowledge the benefits of the symbiotic relationship.

In this paper, we investigate the dominance strategy that a self-interested power retailer should pursue using a game-theoretic model. We also analyze how a strategy of dominance pursued by a power retailer, whether it is market dominance or channel dominance or dual dominance, affects other members of the channel. We show that market dominance tends to benefit the power and weak retailers alike at the expense of the supplier. Channel dominance benefits both the supplier and the power retailer without necessarily harming the weak retailer. Interestingly, dual dominance is not always the best strategy for a self-interested power retailer to pursue. We further show that even when the power retailer chooses to pursue the strategy of dual dominance, the weak retailer, as well as the supplier, can all become better off relative to the case where the channel is free of any dominance.

We also investigate consumer welfare and social welfare under the various types of dominance.

(Keywords: power retailers; channel management; retail competition; game theory)
1 Introduction

The last two decades have seen the emergence of power retailers – behemoths that own a large percentage of the retail market by offering low prices to customers. The most celebrated example of power retailers is Wal-mart – a company whose name is synonymous with low prices. Other retailers like Best Buy dominate the retailing scene in the electronic goods market. Several other examples include Home Depot, Target, Toys R’ Us and Staples.

The rise to power of these retailers has generated a lot of debate about their impact on the rest of the retailing industry, the benefits and costs to consumers, and the upstream impact on the suppliers. Because of their low prices, most people seem to agree that power retailers benefit consumers. Also because of their low prices, the weaker retailers (like mom and pop stores) tend to suffer, as they are typically unable to match the low prices charged by a power retailer. Indeed, Wal-mart’s slogan – “Always low prices. Always.” – suggests Wal-mart’s determination to dominate in price, as well as the futility for small retailers to compete on the same.

However, suppliers disagree on whether the rise of power retailers is a blessing for them. For some, a power retailer, by virtue of its clout in the retail market, can flex its muscles and dictate the terms of supplying contracts. Thus, the emergence of power retailers signals a new era for channel relationships where power retailers dominate. For others, they welcome the opportunity to collaborate with a power retailer who can help them to reduce their costs of doing business through better capacity planning and inventory decisions. For instance, Procter & Gamble and Wal-mart work in close cooperation and both acknowledge the benefits of the fruitful partnership. Troy (2004) documents the fact that Procter & Gamble and Wal-mart work in an almost vertically integrated manner and quotes Tom Muccio, long time head of Procter & Gamble’s 250 member strong Wal-mart team as follows, “...the new structure envisioned more personnel touch points between the two organizations so departments such as logistics, finance and marketing were also working together...so we set joint objectives and strategies...”

Such a collaborative relationship entered by Wal-mart is, of course, not limited to P&G. Over 400 manufacturers have opened their offices in Bentonville, Arkansas where Wal-mart has its head-

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1Scores of articles talk about how Wal-mart crushes local mom-and-pop stores by charging lower prices and how it pushes manufacturers to the wall. This is best summarized in an editorial column titled “The High Cost of Low Prices” in Business Week (BWEd (2003)). Fishman (2003) cites examples of manufacturers like Vlasic Foods who were virtually driven out of business.
quarters to establish closer relationships and streamline their collaboration with Wal-mart (Useem (2004); Buckley (2004); and Troy (2004)). Such a collaborative relationship is fostered not just by Wal-mart, either. For instance, Home Depot allows its stores to be used as a testing ground for key suppliers (Skrovan (1994)). Costco has also set up a centralized POS sales and inventory database that allows participating suppliers to manage inventory and sales data more effectively from a single, central location (Parks (2006)). By and large, power retailers enjoy a reputation for being helpful and fair, even if tough and dominating, to their suppliers (Fishman (2003); Kanell (2005)).

Thus, along with assertive power retailers come some new modes of channel relationships. A power retailer may choose to exert dominance in the market through lower prices, which we call market dominance. Alternatively, it may choose to exert dominance over the upstream partners by virtue of the ability to participate in wholesale price setting, which we call channel dominance. Of course, a power retailer may choose to exert both types of dominance together, which we call dual dominance. Wal-mart is an example of dual dominance. Historically, Wal-mart achieved market dominance first and then extended its dominance to the channel. Today, for most of its products, Wal-mart collaborates closely with its vendors upstream and simultaneously challenges smaller retailers on retail price.

This new reality of power retailers and channel relationships raise two intriguing questions. First, what motivates a power retailer like Wal-mart to pursue dual dominance in the channel, and what is the impact of dual dominance by a power retailer on the welfare of other channel members: retailers, suppliers, and consumers? From Wal-mart’s experience, one may intuitively come to the conclusion that one kind of dominance should always be better for a power retailer than no dominance at all and dual dominance should always trump any single dominance. Therefore, all power retailers should have incentives to pursue the strategy of dual dominance and Wal-mart will never move away from that strategy. We will investigate in this paper whether this intuition is well-founded.

In practice, not all power retailers pursue dual dominance. Costco, for instance, collaborates with its suppliers, but does not follow an explicit price undercutting policy. Sears used to follow an explicit policy of charging low prices, evident by its old slogan “Shop at Sears and Save”. However, over the years, as the “Wheel of Retailing” spins, it has switched its policy away from explicit price
undercutting and abandoned the above slogan in favor of a policy of collaborating with suppliers like Kenmore and Michelin. The decision of the type of dominance is therefore in the hands of the power retailer, and it can choose to exert either market or channel dominance independently, or both together. This realization naturally begs the second question: what is the right dominance strategy for a power retailer? We address that normative question by developing a channel model with a manufacturer supplying a low-cost power retailer and a weaker retailer. Through the simple model, we examine the economic tradeoffs in a power retailer’s decision on dominance strategies.

Past research on channels has devoted a good deal of attention to channel structure and channel coordination. McGuire and Staelin (1983), Coughlan (1985) and Coughlan and Wernerfelt (1989) examine the manufacturers’ choice of channel structure but do not address the issue of channel coordination directly. Jeuland and Shugan (1983 and 1988), Moorthy (1988), Desai and Padmanabhan (2004) study how a manufacturer may achieve coordination in a dyadic channel. The issue of channel coordination under competing retailers is studied in Ingene and Parry (1995a, 1995b and 2000) and Iyer (1998). More recently, Raju and Zhang (2005) show how a manufacturer can coordinate the channel in the presence of a dominant retailer. In a way, all these studies focus on how manufacturers can shape channel relationships with the objective of maximizing manufacturers’ profits. In contrast, our study focuses on how a power retailer can shape channel relationships with the objective of maximizing its own profit.

Another relevant stream of literature looks into how power is distributed between the manufacturer and the retailer in the channel. Messinger and Narasimhan (1995) and Farris and Ailawadi (1992) do not find evidence for the balance of power being tilted either way. Kadiyali, Chintagunta and Vilcassim (2000), however, find strong evidence that the retailer’s power is significantly larger compared to the manufacturer. Choi (1991) and Lee and Staelin (1997) use a Stackelberg model in which the retailer dictates its margin to the manufacturer. Certainly, popular media has recognized the unmistaken trend that the retailer is becoming more powerful and several reasons have been forwarded for the same: intense competition among manufacturers (Jones (1990)), introduction of store brands (Raju, Dhar and Sethuraman (1995)) and increased concentration at the retail level².

²According to the US Census Bureau, in 1997, retail chains with a hundred or more stores accounted for only 0.07% of the total number of firms in the retail sector, yet they controlled 21% of the establishments and accounted for 37% of sales and 46% of retail employment. Since the late 1960s, their share of the retail market more than doubled.
In our paper, we take the phenomenon of power retailers as given and proceed to investigate how a power retailer may deploy its power in a channel context.

Although popular media invariably attaches a negative connotation to the term “powerful retailer”, a recent stream of academic literature shows that this may not always be sensible. Bloom and Perry (2001) use Compustat data on publicly owned firms to conclude that suppliers who hold a large share of their respective markets and have Wal-mart as their primary customer fare better than similar suppliers who do not report Wal-mart as their primary customer. Zhu, Singh and Dukes (2005) offer the evidence that incumbent retailers may benefit from the market entry of a power retailer because of expanded market demand as well as higher prices that the incumbent can charge for the products that the power retailer does not carry. On the theoretical side, Dukes, Geylani, and Srinivasan (2006) show that it is indeed an optimal strategy for the weak retailers to seek differentiation through a wider product assortment. In addition, Iyer and Villas-Boas (2003) examine a bargaining framework in a bilateral monopoly and show that there are conditions in which the presence of a powerful retailer might benefit both players. Other papers that consider bargaining contracts in a channel setting are Dobson and Waterson (1997) and Inderst and Wey (2005) that investigate, respectively, how downstream concentration affects the ability of an upstream manufacturer to bargain, and how this ability to bargain incentivizes it to engage in production and cost improvements. Dukes, Gal-Or and Srinivasan (2006) set up an analytical model of competing manufacturers and competing multi-product retailers and show that manufacturers might actually see profits increase when one of the retailers gains an exogenous cost advantage over the rival retailer as a result of the efficiencies generated due to the lower cost. They use a bargaining framework to ensure the manufacturer realizes part of these efficiencies, which in turn incentivizes the manufacturer to shift demand to this channel.

Closer to the theme of our analysis, Geylani, Dukes and Srinivasan (2007) model a fixed-size market scenario where the manufacturer is dictated the wholesale price by the dominant retailer but sets the wholesale price for the weak retailer. Since the dominant retailer appropriates most of the profits in this setting, the manufacturer responds strategically by shifting demand to the weak retailer, where its per unit margin is higher. Our work is different from theirs in several ways.

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3Their interpretation of power for a retailer is based on the negotiating ability of the retailer relative to the manufacturer.
Most importantly, we differentiate between different types of dominance (market vs. channel vs. dual dominance) and do not impose a particular type of dominance exogenously. Our objective is to uncover the economic incentives that a power retailer faces in deploying its power, rather than how a manufacturer may respond to a certain kind of dominance.

The main result of our paper is that, based on the magnitude of the cost advantage the power retailer has over the weaker retailer and the cross price effect between the demand schedules of the two retailers, the power retailer may, under different conditions, pursue the strategy of market dominance, or channel dominance, or both. Broadly speaking, market dominance leads to a high level of double marginalization and tends to benefit the power and weak retailers alike at the expense of the manufacturer. Channel dominance leads to collaboration between the power retailer and the manufacturer. This collaboration leads to efficiencies in the channel that benefit both these parties without necessarily harming the weak retailer. Dual dominance leads to a mixture of the above effects – increased double marginalization due to market dominance and increased efficiencies due to channel dominance. Surprisingly, we find that dual dominance is not always the best strategy for a self-interested power retailer to pursue.

Along with the above, we also resolve the paradox of suppliers being squeezed by the power retailers on the one hand, and the proliferation of close supplier partnerships with power retailers on the other. The power retailer aims to dominate the channel so as to maximize its own profit, and can always use market dominance as leverage to coax the manufacturer to collaborate with the power retailer, as the manufacturer is far worse off under market dominance as compared to the case when there is no dominance in the channel. If the manufacturer’s bargaining power (for sharing the joint profits accrued) is small, the power retailer can offer it “just enough” to make it indifferent between collaboration and no collaboration with market dominance. This explains the existence of supplier-power retailer partnerships with the suppliers still being worse off. However, if the manufacturer has comparable bargaining power (e.g. when large manufacturers like Procter & Gamble bargain with Wal-mart) it can claim a larger share of the joint profit and can be better off than when it does not collaborate. The weak retailers like mom-and-pop stores, surprisingly, need not be worse off than the benchmark case of no dominance, either. The consumers get a better deal since they are offered a better price, except in the case of market dominance. Our model is thus able to explain several noted phenomena that characterize the market and the channel in the
presence of a power retailer.

The rest of our paper proceeds as follows. In Section 2 we develop the model. We start with the benchmark case and, one by one, introduce modifications in this basic game to analyze the effects of market dominance, channel dominance and dual dominance. In Section 3 we integrate and compare the results from the four games in Section 2 to determine the impact of the power retailer’s dominance decisions on the other channel members and on consumer surplus and social welfare. We conclude in Section 4.

2 Model Develeopment

The game has three players, the manufacturer (denoted by M), the dominant power retailer (denoted by D) and the weak retailer (denoted by W). The manufacturer sells differentiated products through the two channels, namely the power retailer and the weak retailer. The channel structure is shown in Figure 1. It is cheaper, easier and more efficient for the manufacturer to transact business with the power retailer as compared to the weak retailer and we model this by introducing a per unit cost \( c \) that the manufacturer incurs while selling to the weak retailer. This per unit cost is zero when the manufacturer sells to the power retailer. Since the manufacturer is selling differentiated products to the two retailers and the cost of doing business with the two parties is different, the manufacturer may, as entitled by law, charge them different wholesale prices to optimize its own profit, even though the two retailers compete with each other.

We start with linear inverse demand curves for two differentiated products as in Singh and Vives (1984):

\[
\begin{align*}
p_D &= 1 - q_D - \beta q_W, \\
p_W &= 1 - q_W - \beta q_D.
\end{align*}
\]

where \( \beta \in [0, 1] \) is the degree of substitutability between the products. \( \beta = 0 \) means that the products are fully differentiated, and \( \beta = 1 \) means that the products are fully substitutable\(^4\).\(^5\).

Since we analyze a Bertrand game, we characterize the demand curves corresponding to the above

\(^4\)Using a more general price schedule like \( p_D = A - \alpha q_D - \beta q_W \) and \( p_W = A - \alpha q_W - \beta q_D \) with \( A > 0, \alpha > \beta > 0 \) makes no qualitative difference to the results in the paper.

\(^5\)Our demand specification corresponds to a quadratic consumer utility function. There are two products in the market – \( P_D \) sold by the power retailer and \( P_W \) sold by the weak retailer. Denoting by \( q_D \) and \( q_W \) the quantities
Figure 1: Channel structure: The manufacturer (M) charges wholesale prices \( w_D \) and \( w_W \) to the power retailer (D) and the weak retailer (W) respectively. The retailers charge consumers retail prices \( p_D \) and \( p_W \). The dotted line indicates that the two retailers compete with each other on retail price.

as:

\[
q_D = \frac{1}{1 + \beta} - \frac{1}{1 - \beta^2} p_D + \frac{\beta}{1 - \beta^2} p_W,
\]

\[
q_W = \frac{1}{1 + \beta} - \frac{1}{1 - \beta^2} p_W + \frac{\beta}{1 - \beta^2} p_D.
\]

Note that unless \( \beta \) is zero, prices are strategic complements. At this point, it is also useful to note two salient features of the above demand curves:

1. As \( \beta \) (degree of substitutability) increases, the base market size \((\frac{1}{1+\beta} \text{ for each firm at zero prices})\) decreases. This is consistent with the intuition that more differentiated products reach a wider market.

consumed of \( P_D \) and \( P_W \) respectively, the utility from consuming \( q_D \) and \( q_W \) is given by:

\[
U(q_D, q_D) = q_D + q_W - \frac{1}{2} (q_D^2 + q_W^2 + 2\beta q_D q_W)
\]

The corresponding consumer surplus is

\[
CS(q_D, q_D) = q_D + q_W - \frac{1}{2} (q_D^2 + q_W^2 + 2\beta q_D q_W) - p_D q_D - p_W q_W
\]

where \( p_D \) is the price of \( P_D \) and \( p_W \) is the price of \( P_W \).
2. As $\beta$ increases, the price sensitivity \(\left(\frac{1}{1-\beta^2}\right)\) increases and hence the intensity of competition increases.

In our model, we call the more efficient retailer the power retailer, and the less efficient retailer (with whom the manufacturer incurs a unit wholesaling cost $c$) as the weak retailer. As a general sequence, the order of decisions in the games that follow is the following: first the wholesale prices that will be charged to both parties are determined and then, given these wholesale prices, the prices charged to the consumer are decided. However, within the general sequence, we will provide more institutional details for the various cases we discuss, which are designed to model and tease out the effects of two different types of dominance by the power retailer:

1. Market dominance, where the power retailer declares that it will always undercut the weak retailer, and

2. Channel dominance, where the power retailer exerts its influence on the channel by wresting from the manufacturer the power to dictate a wholesale price and in fact jointly deciding with the manufacturer the wholesale price it will be charged. (The manufacturer is still free to decide the wholesale price it will charge to the weak retailer.)

Our analysis proceeds as follows. We start by setting up a benchmark case where no retailing dominance is present. The insights derived from the benchmark case will help us “warm up” for the significantly more complicated analysis of the cases with dominance. We distinguish three cases of retail dominance from the benchmark case and compare all cases in turn against each other to isolate the specific effects of each variety of retail dominance. The three cases, which are set up by introducing progressive modifications to the benchmark game, are market dominance alone, channel dominance alone and dual dominance i.e. market and channel dominance together.

2.1 Benchmark Case – No Dominance

The benchmark case is where the power retailer does not exert any kind of dominance. Here, the two retailers (dominant and weak) are symmetric in all respects for the manufacturer except that dealing with the weak retailer costs additional $c$ per unit. In this game, the manufacturer first decides the wholesale prices $w_D^0$ and $w_W^0$ for the dominant and weak retailers respectively. In
the second stage, given the wholesale prices, both the dominant and weak retailers simultaneously
decide the retail prices they will charge to the customers, \( p_D^b \) and \( p_W^b \) respectively. We solve the
game backward to ensure subgame perfection.

In stage 2, \( p_D^b \) and \( p_W^b \) are decided simultaneously as a function of \( w_D^b \) and \( w_W^b \) by the dominant
and weak retailers respectively, to maximize their profits. Their profit functions are given by:

\[
\pi_D^b = (p_D^b - w_D^b)q_D^b, \quad \pi_W^b = (p_W^b - w_W^b)q_W^b,
\]

where \( q_D^b = \frac{1}{1+\beta} - \frac{1}{1-\beta^2}p_D^b + \frac{\beta}{1-\beta^2}w_D^b \) and \( q_W^b = \frac{1}{1+\beta} - \frac{1}{1-\beta^2}p_W^b + \frac{\beta}{1-\beta^2}p_D^b \). In equilibrium, we have:

\[
p_D^b = \frac{1 - \beta}{2 - \beta} + \frac{2}{4 - \beta^2}w_D^b + \frac{\beta}{4 - \beta^2}w_W^b, \quad p_W^b = \frac{1 - \beta}{2 - \beta} + \frac{2}{4 - \beta^2}w_W^b + \frac{\beta}{4 - \beta^2}w_D^b.
\]

As expected, the coefficients for wholesale prices in the equilibrium retail prices are positive, and
the coefficient for own wholesale price is larger than the coefficient for the other’s wholesale price.

In stage 1, the manufacturer anticipates how its wholesale prices would affect downstream price
competition and sets its wholesale prices \( (w_D^b, w_W^b) \) to maximize its own profitability, which is
given by \( \pi_M^b = w_D^b q_D^b + (w_W^b - c)q_W^b \). It is easy to see that the optimum will be the same if the
manufacturer chooses them simultaneously or sequentially (in any order). However, for ease of
comparison with the cases that follow, we choose to maximize first over \( w_W^b \) (in stage 1b) and then
over \( w_D^b \) (in stage 1a).

Stage 1b: The manufacturer solves \( \frac{\partial \pi_M^b}{\partial w_W^b} = 0 \) to obtain \( w_W^b = \frac{2 - \beta - \beta^2}{2(2 - \beta^2)} + \frac{1}{2}c + \frac{\beta}{2 - \beta^2}w_D^b \) which is
increasing in \( w_D^b \).

Stage 1a: The manufacturer now solves \( \frac{\partial \pi_M^b}{\partial w_D^b} = 0 \) to obtain \( w_D^b = \frac{1}{2} \). Substituting this everywhere we obtain the expressions\(^6\):

\[
w_D^b = \frac{1}{2}, \quad w_W^b = \frac{1}{2} + \frac{c}{2}, \quad p_D^b = \frac{3 - 2\beta}{4 - 2\beta} + \frac{\beta}{2(4 - \beta^2)}c, \quad p_W^b = \frac{3 - 2\beta}{4 - 2\beta} + \frac{\beta}{4 - \beta^2}c,
\]

\[
q_D^b = \frac{1}{2(2 + \beta - \beta^2)} + \frac{\beta}{2(4 - 5\beta^2 + \beta^4)}c, \quad q_W^b = \frac{1}{2(2 + \beta - \beta^2)} - \frac{2 - \beta^2}{2(4 - 5\beta^2 + \beta^4)}c
\]

\(^6\)It can be checked that all second order conditions hold for all the optimizations.
\[ \pi_D^b = \frac{(2 - \beta - \beta^2 + c\beta)^2}{4(4 - \beta^2)^2(1 - \beta^2)}, \quad \pi_W^b = \frac{(2 - \beta - \beta^2 - c(2 - \beta^2))^2}{4(4 - \beta^2)^2(1 - \beta^2)} \]
\[ \pi_M^b = \frac{1}{2(2 + \beta - \beta^2)} - \frac{1}{2(2 + \beta - \beta^2)}c + \frac{2 - \beta^2}{4(4 - 5\beta^2 + \beta^4)}c^2 \]

The expressions above reveal some salient characteristics of the equilibrium in the benchmark case. Firstly, the power retailer is charged a lower wholesale price because of the cost of doing business is lower. Second, the retail price charged by the power retailer is lower than the retail price of the weak retailer. Third, a natural conclusion from the second observation, the power retailer accounts for higher sales than the weak retailer. Fourth, the power retailer’s profit is always higher than the weak retailer’s profit for all allowable values of \( \beta \) and \( c \).

While the above facts are quite expected, from a closer analysis of the equilibrium in the benchmark case one can bring to light a number of other interesting phenomena. The first and most important of these is that in equilibrium, the manufacturer absorbs part of the high cost of dealing with the weak retailer. Specifically, even though the cost of business with the weak retailer is \( c \) per unit compared to zero with the power retailer, the wholesale price charged is higher only by \( c/2 \) and not \( c^7 \). The reason for this is clear from the fact that both retail prices depend directly on both wholesale prices. If the manufacturer charges the weak retailer a high wholesale price, the weak retailer sets a higher retail price. Retail prices being strategic complements, the power retailer in turn also increases its retail price. Because of higher retail prices in both channels, the manufacturer suffers a decrease in total sales and makes a lower profit. The manufacturer thus finds it more profitable to subsidize the weak retailer by absorbing some of the cost \( c \) and keeping the retail prices lower. The second insight from the benchmark case is that the higher \( c \) is, the more profit the power retailer makes while profits of the weak retailer and the manufacturer decrease.

### 2.2 Market Dominance

Making more profit due to a better retailing efficiency does not make a retailer dominant. A retailer becomes a dominant retailer when it starts to project its pricing or channel power over other channel

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7 A main feature of the equilibrium that comes out of the benchmark case is that the manufacturer is charging different wholesale prices to the two retailers. While there has been extensive discussion around the legality of this policy, in our case this practice is well within the law since the manufacturer is selling differentiated products to the two retailers and has different costs of dealing with them. In light of this fact, the decision of the manufacturer to charge a higher price to the weak retailer is justified. In fact, the manufacturer is actually subsidizing the weak retailer by absorbing some of the cost, as discussed above.
members. In the case of Wal-Mart, for instance, it started in 1962 as a discount store, and it has since maintained and enhanced its reputation of being a lower-priced store despite its phenomenal growth over the years. To Wal-Mart, low prices are not just a marketing tactic. It is a mission. They are relentless in doing everything possible to remain faithful to their sales slogan “Always low prices. Always.” In other words, it projects its pricing power over the competing retailer in the marketplace.

To model such market dominance, we modify our benchmark game to allow the power retailer to institute a policy of always undercutting the weak retailer in price. This market dominance game unfolds in three stages. In stage 1, the manufacturer decides the optimum wholesale prices it will charge to the two retailers. In stage 2, given these wholesale prices, the power retailer makes the first move and chooses $\delta^m$, the amount by which it will undercut the weak retailer. In the final stage, the weak retailer chooses its optimum retail price given the wholesale prices and the amount by which the retailer will undercut. As before, we solve the game using the concept of subgame perfect equilibrium.

In stage 3, the weak retailer sets its price $p^m_W$, given $w^m_D$, $w^m_W$ and $\delta^m$, to maximize its profits $\pi^m_W = (p^m_W - w^m_W)q^m_W$, where $q^m_W = \frac{1}{1+\beta} - \frac{1}{1-\beta}p^m_W + \frac{\beta}{1-\beta^2}p^m_D$ and $p^m_D = p^m_W - \delta^m$. We thus have:

$$p^m_W = \frac{1}{2} - \frac{\beta}{2(1-\beta)}\delta^m + \frac{w^m_W}{2}.$$  

In stage 2, the power retailer commits to set its retail price at $p^m_W - \delta^m$ and choose $\delta^m$ (in equilibrium, we would expect $\delta^m \geq 0$ but we do not impose this constraint in the optimization here) to maximize its profits $\pi^m_D = (p^m_D - w^m_D)q^m_D$, anticipating the weak retailer’s price above. We have:

$$p^m_D = p^m_W - \delta^m,$$  

where $\delta^m = \frac{\beta(1-\beta)}{4 - \beta^2} + 2 \frac{1-\beta}{4-\beta^2}w^m_W - \frac{1-\beta}{2-\beta}w^m_D$.

Note here that $\delta^m$ is increasing in $w^m_W$ and decreasing in $w^m_D$ i.e. if the weak retailer’s wholesale price increases, the power retailer further lowers its retail price, while if the power retailer’s own wholesale price increases, it undercuts by a lesser amount. Substituting for $\delta^m$ we get the retail prices and margins respectively as:

$$p^m_D = \frac{1}{2+\beta} + \frac{1}{2}w^m_D + \frac{\beta}{2(2+\beta)}w^m_W, \quad p^m_W = \frac{2-\beta^2}{4-\beta^2}w^m_D + \frac{\beta}{2(2-\beta)}w^m_W.$$  

$$w^m_D = \frac{4-2\beta-\beta^2}{2(1-\beta^2)}w^m_W.$$  

11
At this point, for the same wholesale prices in the benchmark and market dominance cases \((w^b_W = w^m_W = w_W \text{ and } w^b_D = w^m_D = w_D)\), the retail prices under market dominance are both greater than the corresponding retail prices in the benchmark case, i.e. \(p^b_D\) is always greater than \(p^m_D\), and \(p^m_W\) is always greater than \(p^b_W\). Also, both the dominant and weak retailers make higher margins. One can therefore conclude that market dominance moderates price competition and worsens the double marginalization problem. This is in line with the intuition that the weak retailer, knowing that the power retailer will always undercut its price by a given amount, has little incentive to lower its price and, in turn, the dominant retailer’s price rises with the weak retailer’s. As a consequence of the higher prices, the total quantity sold declines.

The manufacturer can possibly offset this sales decrease by charging higher wholesale prices than the benchmark level. This, however, results in even higher retail prices due to double marginalization and a further loss of total sales. On the other hand, the manufacturer can reduce his wholesale prices to increase sales. But again, due to the aggravated double marginalization problem the benefits are pocketed by the retailers through a higher markup rather than being transferred to the consumers fully.

In stage 1, the manufacturer at its end determines the optimum wholesale prices by maximizing \(\pi^m_M = w^m_D q^m_D + (w^m_W - c)q^m_W\), anticipating how these wholesale prices affect the downstream competition. Once again, it is easy to see that the optimum will be the same if it chooses them simultaneously or sequentially (in any order), since the manufacturer is the sole decision maker in this stage. For ease of comparison with the cases that follow, we choose to maximize first over \(w^m_W\) (in stage 1b) and then over \(w^m_D\) (in stage 1a). In stage 1b, the manufacturer solves \(\frac{\partial \pi^m_M}{\partial w^m_W} = 0\) to obtain \(w^m_W = \frac{2 - \beta^2}{4 + 2\beta - \beta^2} + \frac{c}{2} + \frac{\beta(2 + \beta)}{4 + 2\beta - \beta^2} w_D^m\) which is increasing in \(w_D^m\). In stage 1a, the manufacturer now solves \(\frac{\partial \pi^m_M}{\partial w^m_D} = 0\) to obtain \(w^m_D = \frac{1}{2}\). Substituting this everywhere we obtain the equilibrium expressions as:

\[
w^m_D = \frac{1}{2}, \quad w^m_W = \frac{1}{2} + \frac{c}{2},
\]

\[
p^m_D = \frac{3 + \beta}{2(2 + \beta)} + \frac{\beta}{4(2 + \beta)} c, \quad p^m_W = \frac{3 - \beta^2}{4 - \beta^2} + \frac{4 - 2\beta - \beta^2}{4(4 - \beta^2)} c,
\]

\[
q^m_D = \frac{1}{2(2 + \beta - \beta^2)} + \frac{\beta}{4(2 + \beta - \beta^2)} c, \quad q^m_W = \frac{2 - \beta^2}{2(4 - \beta^2)(1 + \beta)} + \frac{4 + 2\beta - \beta^2}{4(4 - \beta^2)(1 + \beta)} c < \frac{4 - 2\beta^2}{4 + 2\beta - \beta^2},
\]
Market dominance compared to benchmark

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<th>Power retailer</th>
<th>Weak retailer</th>
<th>Manufacturer</th>
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<td><strong>Profits:</strong></td>
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<td><strong>Retail prices:</strong></td>
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<td><strong>Quantity sold:</strong></td>
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<td><strong>Margins:</strong></td>
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Table 1: **Comparison of market dominance with benchmark:** “>” means the quantity is always higher under market dominance, “<” means the quantity is always lower, “=” means the quantity is always the same and “>, <” means the quantity can be higher or lower for different values of $\beta$ and $c$.

\[
\pi_D^m = \frac{(2 + c\beta)^2}{16(1 + \beta)(4 - \beta^2)}, \quad \pi_W^m = \frac{(4 - 2\beta^2 - c(4 + 2\beta - \beta^2))^2}{16(1 + \beta)(4 - \beta^2)^2}
\]

\[
\pi_M^m = \frac{4 + \beta - \beta^2}{4(1 + \beta)(4 - \beta^2)} - \frac{2 - \beta^2}{2(1 + \beta)(4 - \beta^2)} + \frac{(4 + 2\beta - \beta^2)}{8(1 + \beta)(4 - \beta^2)} c^2
\]

In this market dominance game, the power retailer, still favored by the manufacturer with a lower wholesale price as in the benchmark case, charges a lower retail price and makes more sales and profits than the weak retailer. However, relative to the benchmark case, the market dominance exercised by the more efficient retailer has some profound implications for other channel members as stated in the following proposition.

**Proposition 1** The profits of the power retailer when it exerts market dominance are always higher than its profits in the benchmark case of no dominance. The profits of the manufacturer are always lower than in the benchmark case, and those of the weak retailer can be higher or lower, depending on the level of substitutability and the power retailer’s cost advantage. The retail markups for both retailers are higher than their markups in the benchmark case.

Table 1 summarizes how each channel member’s key performance measures change under market dominance relative to the benchmark case of no dominance. Ironically, as suggested by Proposition...
market dominance by the efficient power retailer raises the retail prices, instead of decreasing them. This is because the weak retailer will raise its price, given that it can never undercut the power retailer in price.

### 2.3 Channel Dominance

Retail dominance does not have to take the form of market dominance. The more efficient retailer may choose to exert its power on the manufacturer by seeking collaboration with the manufacturer and influencing the manufacturer’s wholesale price charged to the retailer, rather than directly undercutting the weak retailer. The wielding of power is then in the channel, rather than in the market directly, and such a bilateral manufacturer and retailer collaboration could again give the collaborating retailer a pricing edge in the marketplace. Therefore, we call this case channel dominance. The wholesale price charged to the power retailer is, in this case, decided jointly by the power retailer and the manufacturer in order to maximize their joint profit, which is then divided between the two based on their bargaining abilities. We cited several articles from the popular press that give evidence of collaboration between upstream manufacturers and retailers e.g. Procter & Gamble and Wal-mart both acknowledge the benefits of their symbiotic collaboration. The fact that more than 400 suppliers for Wal-mart have opened their offices in Bentonville, Arkansas (where Wal-mart is head-quartered) is again strong evidence for collaboration. Woolley (2002) states that “Costco negotiates directly, and fiercely, with suppliers” but at the same time it provides “a centralized POS sales and inventory database that allows participating suppliers to manage inventory and sales data more effectively” (Parks (2006)).

The game of channel dominance proceeds in the following three steps: in the first step, the power retailer and the manufacturer together decide the wholesale price $w^c_D$ and the lump-sum transfer $t^c$ to the manufacturer in a Nash bargaining framework. In the second step, the manufacturer decides the wholesale price $w^c_W$ it will charge to the weak retailer. In the third stage, the two retailers, given the wholesale prices they are charged, compete simultaneously on retail prices to maximize

---

8There is evidence to show that manufacturers accrue lump-sum benefits upon collaboration with power retailers. For instance, Wal-mart allows its suppliers to seamlessly access its information repository through the Retail Link system for free, through which the suppliers can access information about how their product is performing. As another example, Wal-mart does not charge slotting fees to any of its manufacturers. Home Depot allows its stores to be used as a testing ground for products of key suppliers. In our model, we consider benefits of the above nature under $t^c$. 

---
their individual profits. In this bargaining framework, we need to specify the “default/loss point” for both the manufacturer and the power retailer, i.e. the payoffs for respective parties when bargaining is not successful and an agreement cannot be reached.

For our analysis, we have considerable lattitude in selecting the default point. However, we shall take the payoffs in market dominance as the respective default points for our main analysis. We have made this choice for two reasons. First, in order for a retailer to exert channel dominance, the retailer may need to establish its market dominance first, as is the case historically for Wal-mart and Sears. Second, it is always in the interest of a power retailer to pursue market dominance relative to the case of no domiance, as we have shown in Section 2.2, and the power retailer can always establish its market dominance unilaterally. Therefore, the manufacturer comes to the bargaining table to profit from increased channel efficiency, and market dominance is a credible threat by a power retailer when negotiating with a manufacturer. What this selection of default points means to our analysis is that a power retailer’s ability to exert market dominance is taken for granted so that we can focus our analysis on why a power retailer like Wal-mart may or may not want to move away from dual dominance and exert only channel dominance like Sears. In Appendix A, we will extend our analysis to the case where no dominance is the default point.

As before, the game is solved using the concept of subgame perfect equilibrium. In stage 3, the two retailers simultaneously decide their prices, \( p^c_D \) and \( p^c_W \), to maximize their profits, given the wholesale prices, \( w^c_D \) and \( w^c_W \) respectively. We obtain:

\[
p^c_D = \frac{1}{2(2 - \beta)} + \frac{2}{4 - \beta^2} w^c_D + \frac{\beta}{4 - \beta^2} w^c_W, \quad p^c_W = \frac{1}{2(2 - \beta)} + \frac{2}{4 - \beta^2} w^c_W + \frac{\beta}{4 - \beta^2} w^c_D.
\]

In stage 2, the manufacturer now decides the wholesale price that it will charge the weak retailer to maximize its own profitability \( \pi^c_M = w^c_D q^c_D + (w^c_W - c) q^c_W \), where \( q^c_D = \frac{1}{1+\beta} - \frac{1}{1-\beta} p^c_D + \frac{\beta}{1-\beta^2} p^c_W \) and \( q^c_W = \frac{1}{1+\beta} - \frac{1}{1-\beta^2} p^c_W + \frac{\beta}{1-\beta^2} p^c_D \). From the first order condition, we can easily solve for

\[
w^c_W = \frac{2 - \beta - \beta^2}{2(2 - \beta^2)} + \frac{1}{2} c + \frac{\beta}{2 - \beta^2} w^c_D.
\]

It should be noted that this is exactly the same expression as obtained in the benchmark case for \( w^b_W \) after stage 1b.
In stage 1, the manufacturer and the power retailer negotiate to optimally decide the wholesale price $w_D^c$ and the transfer $t^c$. We model this using a Nash bargaining framework with the market dominance profits as the default points for the players and asymmetric powers $\alpha_D$ and $\alpha_M$ for the dominant retailer and manufacturer:

$$\max_{\{w_D^c, t^c\}} \left( \pi_M^c(w_D^c) + t^c - \pi_M^m \right)^{\alpha_M} \left( \pi_D^c(w_D^c) - t^c - \pi_D^m \right)^{\alpha_D}$$

The Nash bargaining solution implies that the wholesale price $w_D^c$ is set to maximize joint profits $\pi_M^c + \pi_D^c$ and $t^c$ is set to make the product of the two terms as large as possible. At the optimal we then have:

$$w_D^{c*} = \frac{\beta(1 + \beta - \beta^2)}{2(2 - \beta)} - \frac{\beta(2 - \beta^2)}{2(4 - \beta^2)^c}$$

$$t^c = \frac{\alpha_D(\pi_M^c(w_D^{c*}) - \pi_M^m) - \alpha_M(\pi_D^c(w_D^{c*}) - \pi_D^m)}{\alpha_D + \alpha_M}$$

Denoting by $\pi_{D, nb}^c$ and $\pi_{M, nb}^c$ the profit after bargaining for the dominant retailer and the manufacturer respectively, we can write

$$\pi_{D, nb}^c = \pi_D^c - t^c$$

$$\pi_{M, nb}^c = \pi_M^c + t^c$$

Using the appropriate substitutions, we have the other expressions for this case below:

$$w_W^{c} = \frac{2 - 2\beta + \beta^2}{2(2 - \beta)} + \frac{2 - \beta^2}{4 - \beta^2}$$

$$\pi_W^{c} = \frac{(2 - \beta - \beta^2 - c(2 - \beta^2))^2}{4(4 - \beta^2)^2(1 - \beta^2)}$$

$$p_D^{c} = \frac{1}{2}, \quad p_W^{c} = \frac{3 - 3\beta + \beta^2}{2(2 - \beta) + \frac{2 - \beta^2}{2(4 - \beta^2)^c}}$$

$$q_D^{c} = \frac{2 - \beta^2}{2(2 + \beta - \beta^2)} + \frac{\beta(2 - \beta^2)}{2(4 - 5\beta^2 + \beta^4)^c}, \quad q_W^{c} = \frac{1}{2(2 + \beta - \beta^2)} - \frac{2 - \beta^2}{2(4 - 5\beta^2 + \beta^4)^c}.$$
induced by the double marginalization problem. Under channel dominance, the interests of the two parties are aligned (due to cooperative bargaining) which leads to higher efficiency in the distribution channel by lowering the wholesale price and mitigating the double marginalization problem\(^9\), ultimately leading to a higher joint profit. The dominant retailer has to provide the manufacturer a part of the profits it makes to induce it to cooperate, but because of the efficiency gain, it can still do better than in market dominance.

It must be noted, however, that the double marginalization problem is not rooted out completely because of the existence of the weak retailer and thus there is a limit to which the efficiency gain can be appropriated. Maximum efficiency in the manufacturer-power retailer channel would be gained if their wholesale price is brought down to zero. In the present case, however, this would hurt the manufacturer (and thus the joint profits) because of the externality that the weak retailer exerts on the manufacturer-power retailer channel. In other words, the wholesale price that the manufacturer charges to the weak retailer is positively related to the wholesale price charged to the power retailer, as can be seen from the expression for \(w^c_W\) in stage 2 above. Hence, as the \(w^c_D\) is reduced, \(w^c_W\) is also lowered. While the former effect is beneficial to the manufacturer-power retailer collaboration, the latter effect hurts the manufacturer. If \(w^c_D\) is lowered too much, the latter effect dominates the former\(^{10}\). In summary, as a consequence of the externalities exerted by the manufacturer-weak retailer channel, there is a limit to the gains that can be obtained by the manufacturer-dominant retailer collaboration. Interestingly, the weak retailer does no worse than in the benchmark case, indicating that channel dominance need not hurt the rival retailer, because of the efficiency gain. The consumer is also at an advantage, since both retail prices are lower because of the efficiency gain.

\(^9\)As an example, Costco, for which we earlier gave evidence of pressing upstream suppliers for a lower wholesale price, also has a stated aim of controlling the double marginalization problem and giving “the customer the lion’s share of a deal” (Woolley (2002)).

\(^{10}\)One can check that in equilibrium in stage 1, the marginal gain from increasing \(w^c_D\) in the M-D channel is exactly offset by the marginal loss in the M-W channel. The expression for joint profit is \(\pi^*_J = \pi^*_M + \pi^*_D = p^*_D q^*_D + (w^c_W - c) q^*_W\). Then \(\partial \pi^*_J/\partial w^c_D = p^*_D \partial q^*_D/\partial w^c_D + \partial p^*_D/\partial w^c_D q^*_D + (w^c_W - c) \partial q^*_W/\partial w^c_D + \partial w^c_W/\partial w^c_D q^*_W\). In stage 1 we have already solved for \(p^*_D, p^*_W\) and \(w^c_W\) in terms of \(w^c_D\), so that we can obtain expressions for each of the four parts in terms of \(w^c_D\). Our arguments above imply that at the optimal value of \(w^c_D\), the last two terms of this expression (the marginal change in profit from the M-W channel) should exactly offset the effect of first two terms (the marginal change in profit from the M-D channel). We can check that this is actually the case.
2.4 Dual Dominance – Simultaneous Channel and Market Dominance

The power retailer is not constrained to exert channel dominance exclusively. It also has the option to simultaneously declare to undercut the weak retailer in retail price and exert its power on the manufacturer to participate in wholesale price setting. The wielding of power is then both in the market and the channel. We call this dual dominance. In this section, we analyze the strategy of dual dominance from the point of view of the power retailer.

To gain some intuition at the outset, we recount that market dominance has the effect of aggravating the double marginalization problem to increase retailer margins but reducing the level of sales. This benefits both the downstream players at the expense of the manufacturer. Channel dominance has the effect of benefitting the power retailer and the manufacturer, without harming the weak retailer, since the benefits stem from an increase in channel efficiency. In the case of dual dominance, the power retailer’s profits are an outcome of the following effects kicking in together – collaboration leads to higher profits in the channel and price dominance leads to higher margins.

The game proceeds in the following four steps: in the first step the power retailer and the manufacturer together decide the wholesale price \( w_d^d \) and the lump-sum transfer \( t_d^d \) in a Nash bargaining framework, as in channel dominance. In the second step, the manufacturer decides the wholesale price \( w_d^d_W \) it will charge to the weak retailer. In the third stage of the game the power retailer decides the amount \( \delta_d^d \) by which it will undercut the weak retailer. In final stage the weak retailer, given the wholesale prices and the amount by which it will be undercut, decides the retail price it will charge to the consumer. The game is again solved using backward induction to ensure subgame perfection.

In stage 4, the weak retailer decides \( p_d^d_W \) as a function of \( w_d^d_D \), \( w_d^d_W \) and \( \delta_d^d \) to maximize its profits
\[
\pi_d^d_W = (p_d^d_W - w_d^d_W)q_d^d_W \quad \text{where} \quad q_d^d_W = \frac{1}{1+\beta} - \frac{1}{1-\beta}p_d^d_W + \frac{\beta}{1-\beta^2}p_d^d_D \quad \text{and} \quad p_d^d_D = p_d^d_W - \delta_d^d.
\]
We obtain:
\[
p_d^d_W = \frac{1}{2} - \frac{\beta}{2(1-\beta)} \delta_d^d + \frac{w_d^d_W}{2}.
\]

In stage 3, the power retailer optimally decides \( \delta_d^d \) as a function of \( w_d^d_D \) and \( w_d^d_W \) to maximize its profits \( \pi_d^d_D = (p_d^d_D - w_d^d_D)q_d^d_D \). We thus have:
\[
p_d^d_D = p_d^d_W - \delta_d^d, \quad \text{where} \quad \delta_d^d = \frac{\beta(1-\beta)}{4-\beta^2} + 2\frac{1-\beta}{4-\beta^2}w_d^d_W - \frac{1-\beta}{2-\beta}w_d^d_D.
\]
Note that here again $\delta^d$ is increasing in $w^d_W$ and decreasing in $w^d_D$ i.e. if the weak retailer’s wholesale price increases, the power retailer further lowers its retail price, while if its own wholesale price increases, it undercuts by a lesser amount.

In stage 2, the manufacturer optimally decides the wholesale price it will charge to the weak retailer by maximizing its profit $\pi^d_M = w^d_D q^d_D + (w^d_W - c)q^d_W$. From the first order condition, we obtain

$$w^d_W = \frac{2 - \beta^2}{4 - 2\beta + \beta^2} + \frac{\beta(2 + \beta)}{4 + 2\beta - \beta^2} w^d_D$$

which is increasing in $w^d_D$. Note that at this point, the calculations and expressions obtained are exactly the same as those at stage 1(a) in the market dominance case.

In stage 1 of the game, the manufacturer and the power retailer negotiate on the wholesale price $w^d_D$ and the transfer $t^d$. As in the channel dominance case, we model this using Nash bargaining with the market dominance profits as the default points. Assuming bargaining powers $\alpha_D$ and $\alpha_M$ for the dominant retailer and the manufacturer respectively, the wholesale price $w^d_D$ is set to maximize joint profits and the manufacturer is given a lump-sum payment

$$\max_{\{w^d_D, t^d\}} \left( \pi^d_M + t^d - \pi^m_M \right) \alpha_D \left( \pi^d_D - t^d - \pi^m_D \right) \alpha_D$$

At the optimum we then have:

$$w^d_D = \frac{\beta(1 + \beta)}{(2 + \beta)^2} - \frac{\beta(4 + 2\beta - \beta^2)}{4(2 + \beta)^2} c$$

$$t^d = \frac{\alpha_D \left( \pi^d_M \left( w^d_D \right) - \pi^m_M \right) - \alpha_M \left( \pi^d_D \left( w^d_D \right) - \pi^m_D \right)}{\alpha_D + \alpha_M}$$

Denoting by $\pi^d_{D,nb}$ and $\pi^d_{M,nb}$ the profit after bargaining for the dominant retailer and the manufacturer respectively, we can write

$$\pi^d_{D,nb} = \pi^d_D - t^d$$

$$\pi^d_{M,nb} = \pi^d_M + t^d$$
Substituting the above into the expression for the other quantities, we obtain:

\[
\begin{align*}
    w_W^d &= \frac{1}{2 + \beta} + \frac{4 + 2\beta - \beta^2}{4(2 + \beta)}c \\
    \pi_W^d &= \frac{(4 - 2\beta^2 - c(4 + 2\beta - \beta^2))^2}{4(2 + \beta)} \\
    p_D^d &= \frac{1}{2}, \quad p_W^d = \frac{6 - 2\beta - \beta^2}{2(4 - \beta^2)} + \frac{4 - 2\beta - 3\beta^2 + \beta^3}{4(4 - \beta^2)}c \\
    q_D^d &= \frac{4 + 2\beta - \beta^2}{2(4 - \beta^2)(1 + \beta)} + \frac{\beta(4 + 2\beta - \beta^2)}{4(4 - \beta^2)(1 + \beta)}c, \quad q_W^d = \frac{2 - \beta^2}{2(4 - \beta^2)(1 + \beta)} - \frac{4 + 2\beta - \beta^2}{4(4 - \beta^2)(1 + \beta)}c.
\end{align*}
\]

Under dual dominance, two effects come into play: channel dominance leads to efficiency but market dominance leads to aggravated double marginalization. The equilibrium is a balance between the two effects. From the power retailer’s perspective, under dual dominance, it can gain, relative to the case of channel dominance, from demand shifting to the manufacturer-dominant retailer channel as the weak retailer increases its markup and the manufacturer’s margin from the sales through the weak retailer is lower. However, it can also suffer, as the presence of aggravated double marginalization reduces efficiency gains from channel collaboration, which it shares with the manufacturer.

### 3 Optimal Dominance Strategies

The objective of the power retailer is to maximize its profits. This means that it will strive to establish some kind of dominance, as any kind of dominance always leads to higher profits than no dominance at all. Further, as argued in earlier sections, it can exert market dominance unilaterally, and, therefore, if the manufacturer refuses to cooperate and channel dominance or dual dominance cannot be sustained, the power retailer can always exert market dominance, so that we can treat it as the default option if bargaining with the manufacturer fails. Hence, the choice for the power retailer is basically between channel dominance and dual dominance. This choice will depend on the values of \( \beta \) and \( c \), as is stated in the following proposition.

**Proposition 2** Given that the power retailer is always capable of exerting market dominance, 

(a) if the substitutability between products is not high (low or medium \( \beta \)), the power retailer prefers
Figure 2: **Power retailer, weak manufacturer:** In each of the above figures, on the horizontal axis, $\beta$ varies from 0 to 1. On the vertical axis, $c$ varies from 0 to 1. “BM” means benchmark, “CD” means channel dominance and “DD” means dual dominance. Figure (a) shows the optimal dominance strategies for the power retailer. Figure (b) shows that a weak manufacturer has highest profits in the benchmark case (when there is no dominance). Figure (c) shows the strategy of the power retailer that gives the highest profits for the weak retailer. Figure (d) shows that there is no region where all players are better off compared to the benchmark case.

Channel dominance when its efficiency advantage is very small (low $c$) or very high (high $c$), and prefers dual dominance when its efficiency advantage is at a medium level (medium $c$).

(b) if the substitutability between products is high (large $\beta$), the power retailer prefers dual dominance.

Proposition 2 is illustrated in Figure 2(a). The power retailer makes the highest profits through channel dominance in the region marked “CD” and through dual dominance in the region marked “DD”. (Figures 2(b), 2(c) and 2(d) will be discussed subsequently.) To understand the power retailer’s choice, we note that for the power retailer, channel dominance is always desirable, as it increases channel efficiencies. The main question is then whether market dominance is also desirable for the power retailer. The answer depends, as stated in Proposition 2, on $\beta$ and $c$. Intuitively, when $\beta$ is high, the competition is intense and prices and profits are low. In that case, market dominance introduces the price moderation effect by aggravating the double marginalization problem: it helps to moderate competition and sustain higher prices, thus increasing profits. Hence, the optimal strategy is dual dominance. When $\beta$ is low or medium, the intensity of competition is low and prices are high because products are differentiated, so that the price moderation effect is not as pronounced. In that case, whether the power retailer can benefit from market dominance depends on the demand shift effect: the manufacturer has incentives to shift more demand to the power retailer when the weak retailer increases its retail margin in response to market dominance by the
power retailer. This effect is small when $c$ is low. That is why for a low or medium value of $\beta$, if $c$ is also low, the power retailer does not want to pursue dual dominance, since the demand shift effect is not enough to counter the inefficiencies brought about by aggravated double marginalization. As $c$ increases, switching to dual dominance has a considerable demand shift effect, enough to counter the inefficiencies brought about by aggravated double marginalization. However, as $c$ becomes very high, a very small amount is being sold through the weak retailer in the first place. Choosing dual dominance will not improve profits enough though the demand shift effect (because there is little demand to shift) but will increase double marginalization.

In short, when substitutability between products is high, dual dominance is optimal because market dominance helps to moderate price competition and channel dominance helps to increase efficiencies. When substitutability between products is low or medium, channel dominance increases profits by increasing efficiency and dual dominance is preferred only if the magnitude of the profit increase through the demand shift effect is big enough to overcome the reduction in profits due to aggravated double marginalization. Therefore, a power retailer’s dominance strategy can be and should be a deliberate choice and this choice depends on substitutability between products and the efficiency advantage that the power retailer holds.

Interestingly, examples from the retailing world offer some support to our thesis. For instance, Sears started out with the image of a low price retailer that dominated that market, as evident by its initial slogan – “Shop at Sears and save.” Over the years it has abandoned this strategy (and also the slogan) and moved to a strategy of channel dominance alone, choosing to collaborate closely with manufacturers like Whirlpool (under the brand Kenmore), Michelin and others. Wal-mart also started as a low price store, leveraging its efficiency advantage for market dominance. As it grew bigger and developed the clout to be able to influence upstream manufacturers, it has chosen dual dominance as its strategy – it has stuck to its slogan “Always low prices. Always.” and it collaborates closely with its suppliers. Our model predicts that as other retailers catch up with Wal-mart in efficiency, then it too will eventually choose a strategy of channel dominance alone.

Figure 2(b) shows that a weak manufacturer (with small bargaining power; this figure assumes $\alpha_M = 0$ and $\alpha_D = 1$) makes profits lower than the benchmark case under both channel and dual dominance, since it always makes profits equal to its profits under market dominance. Figure 2(c) shows the highest profits for the weak retailer – in the region marked “DD”, the profits for the
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<td>Power retailer</td>
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</tr>
<tr>
<td>Weak retailer</td>
<td>&gt;, &lt;</td>
</tr>
<tr>
<td>Total</td>
<td>&gt;, &lt;</td>
</tr>
<tr>
<td><strong>Margins:</strong></td>
<td></td>
</tr>
<tr>
<td>Power retailer</td>
<td>&gt;</td>
</tr>
<tr>
<td>Weak retailer</td>
<td>&gt;</td>
</tr>
</tbody>
</table>

Table 2: **Comparison of dual dominance with channel dominance**: “>” means the quantity is always higher under dual dominance, “<” means the quantity is always lower, “=” means the quantity is always the same and “>,<” means the quantity can be higher or lower for different values of β and c.

weak retailer from dual dominance exceed the profits from the benchmark and channel dominance cases, and vice versa in the region marked “BM≈CD”. Figure 2(d) shows that there is no region where all players are better off than the benchmark case (because the weak manufacturer is never better off). We will show, shortly, that this region is non-empty when the manufacturer has a large bargaining power.

Table 2 summarizes how each channel member’s key performance measures change under dual dominance relative to channel dominance. It is interesting to note that no matter what dominance strategy that the power retailer chooses to pursue (channel dominance, dual dominance and even market dominance), the power retailer emerges as the lower priced retailer in the market and captures a larger market share compared to the weaker retailer. It is thus free from any concerns that a certain dominance strategy will malign this reputation.

From Table 2 and Figure 2, we can also see that the choice of dominance by the power retailer also influences the profits of the other players. However, such influences need not always be menacing to other channel members as usually portrayed in popular media. Figure 3 shows the dominant retailer’s optimal strategies and implications for other channel members when the manufacturer’s and the power retailer’s bargaining powers are the same ($\alpha_M = \alpha_D$). Figure 3(a) shows the optimal choice from the power retailer’s perspective. Figure 3(b) shows the preference over the power
Figure 3: **Power retailer, strong manufacturer:** In each of the above figures, on the horizontal axis, $\beta$ varies from 0 to 1. On the vertical axis, $c$ varies from 0 to 1. The labeling of the figures is the same as in Figure 2. The most important difference between this set of figures and the ones in Figure 2 is that there exists a large region of the parameter space where the dominant retailer’s optimal strategy is also optimal for both the other players. This is shown in the region marked “All better off” in Figure (d).

retailer’s strategy from the manufacturer’s point view, and Figure 3(c) from the weak retailer’s perspective. Finally, Figure 3(d) illustrates the union set of the regions where the manufacturer and the weak retailer have the same preference as the power retailer over dominance strategies and the set is far from empty. One critical factor to this win-win outcome is the fact that the power retailer’s collaboration with the manufacturer leads to efficiency in the manufacturer-power retailer channel and it need not harm the weak retailer. Another critical factor is the manufacturer’s bargaining power. (In Figure 2(d), where the power retailer’s bargaining power is one, but the manufacturer’s approaches zero, the union set is empty.) Therefore, it is not surprising that P&G may be happy about its collaboration with Wal-mart, but other smaller manufacturers may not. Regardless, consumer welfare and social welfare increase because of improvement in channel efficiency. This is stated in the following proposition.

**Proposition 3** As a result of dominance exerted by the power retailer, the manufacturer and the weak retailer can all be better off compared to the case where there is no retail dominance. Consumers are always better off with retail dominance and so is the social welfare.

Finally, we consider an extension to the model where we use the benchmark case as the default point for Nash bargaining between the power retailer and the manufacturer. This is the case when the game starts from a “clean slate” i.e. the status quo is given by the benchmark game and the more efficient retailer has to choose between one of the three dominance strategies: market dominance, channel dominance and dual dominance. This modification, however, leads to no change in the
insights from the model and we relegate the details to Appendix A.

4 Discussion and Conclusions

The phenomenon of power retailers has attracted much attention from popular media in recent years, as power retailers like Wal-mart, Best Buy, and Home Depot have become a major force shaping the retailing landscape. They offer the lowest prices and control a large share of the market, at the expense of smaller retailers. Manufacturers rue the fact that they can no longer set wholesale prices unilaterally, but at the same time they collaborate with the power retailers. There has been much speculation by industry pundits about the faults and virtues of these power retailers. In this paper, we take a rigorous approach to examine the impact of power retailers on other channel members in their pursuit for dominance.

In our model, dominance is a consequence of conscious strategic decisions made by a power retailer and the power retailer can choose among three dominance strategies: market dominance, channel dominance, and dual dominance. Our analysis has generated a number of new insights. First, market dominance may only mean dominating the competing retailer and such dominance helps downstream retailers at the expense of the manufacturer. Second, because of the efficiency effect, the price moderation effect, and the demand shift effect, the power retailer has a clear preference in terms of what dominance strategy it wants to pursue. It is simply not true that a power retailer always wants to pursue dual dominance if it can manage to do so. For that reason, we expect and do observe variations in power retailers’ dominance strategies in the real world. Also for that reason, we expect and do observe that a power retailer’s dominance strategy changes as its cost advantage diminishes or the marketplace becomes more competitive. Third, regardless of what dominance strategy a power retailer pursues, it is not the case that all other channel members, including the weak retailer, the manufacturer, and consumers, will necessarily become worse off. Indeed, as our analysis shows that it is quite likely that other channel members may benefit from the rise of power retailers. This perhaps explains why power retailers seem to have longevity and can still power forward. Thus, what our analysis has shown is that power retailers are not a menacing force in the retailing industry, but a force of efficiency that can benefit all channel members.

As a first attempt at endogenizing a power retailer’s choice of dominance strategies, our model
has a number of limitations. First, in the basic model, we assume a symmetric demand structure for both retailers. One could argue that the power retailer has a larger base demand i.e. a larger intercept for the demand curve as compared to the weak retailer. However, we choose to not impose this exogenously and allow the quantity sold by the power retailer to be determined in equilibrium, depending on the choice of dominance strategy. We confirm that whatever the dominance strategy, the power retailer captures a larger share of the market and charges a lower price. Second, our model is a static model. Presumably, whatever dominance strategy a power retailer chooses to pursue, it would take time to establish that dominance. Thus, it is desirable to develop a dynamic model to examine the process of establishing dominance in the channel context. We leave this modeling to future research. Finally, we do not consider competition between manufacturers as well as between power retailers. In practice, such competition does exist, and future research can extend our analysis in that direction.

Notwithstanding these limitations, we hope that the paper can spark further interests in studying power retailers.

References


Appendix A  Using the benchmark case as the default point for Nash bargaining

In our basic model, we assumed that for the bargaining step in channel and dual dominance, the default points for the power retailer and the manufacturer (the profits they obtain if the bargaining fails) are given by their respective profits in the market dominance game. The reason behind this was that there is a strong belief among practitioners and scholars alike that for a retailer to be able to exert dominance over the channel, he must have been in a strong position in the market first. Furthermore, the power retailer can exert market dominance unilaterally. However, for our theoretical analysis, this assumption is not necessary. The game can start from a “clean slate”
i.e. the status quo is given by the benchmark game and the more efficient retailer has to choose between one of the three dominance strategies: market dominance, channel dominance and dual dominance. Incorporating this into the model does not change the market dominance game, but slightly changes the channel dominance and dual dominance games – the default points for the power retailer and the manufacturer in the Nash bargaining step will be given by their respective profits in the benchmark case. This modification, however, leads to no change in the insights from the model. As illustrated in Figures A1 and A2, corresponding to Figures 2 and 3 in Section 3, the only thing new is the fact that the power retailer may only want to exert market dominance now when $\beta$ is sufficiently large and $c$ is sufficiently small (see Figures A1(a) and A2(a)). This is because only in a sufficiently competitive market is the power retailer in need of market dominance to cushion competition, even at the expense of channel efficiency.

**Appendix B  Generic solution for the Nash bargaining game**

In this section we will provide a sketch for the argument that in the Nash bargaining game to decide the wholesale price and the transfer payment, the wholesale price maximizes the joint profit of the bargaining parties and the transfer payment reallocates this profit based on relative bargaining powers and outside options.

Consider players 1 and 2 with profit functions $\pi_1(w)$ and $\pi_2(w)$ that depend on the variable $w$. The bargaining consists of choosing the level of $w$ and determining a transfer payment $t$ from player 2 to player 1. The default option of player $i$ is $d_i$, independent of $w$ and $t$. The bargaining power of player $i$ is $\alpha_i > 0$. Give the above, the Nash bargaining problem can be written as

$$\max_{\{w,t\}} (\pi_1(w) + t - d_1)^{\alpha_1} (\pi_2(w) - t - d_2)^{\alpha_2}$$

For the above, we can write the first order conditions w.r.t. $w$ and $t$ as

$$\begin{align*}
(p_1(w^*) + t - d_1)^{\alpha_1-1}(p_2(w^*) - t - d_2)^{\alpha_2-1} & \left[ \frac{\alpha_1}{\pi_1(w^*)} \left. \frac{d\pi_1(w)}{dw} \right|_{w^*} + \frac{\alpha_2}{\pi_2(w^*)} \left. \frac{d\pi_2(w)}{dw} \right|_{w^*} \right] = 0
\end{align*}$$
(a) Power retailer  (b) Manufacturer  (c) Weak retailer  (d) Manufacturer

Figure A1: **Power retailer, weak manufacturer:** For the above figures, we assume that in the Nash bargaining stage for channel dominance and dual dominance, the default points for the dominant retailer and the manufacturer are their respective profits in the benchmark case (and the power retailer has a large bargaining power). The most important difference between this set of figures and the ones in Figure 2 is that for high values of the substitutability parameter $\beta$ the dominant retailer prefers market dominance instead of dual dominance. The labeling of the figures is the same as in Figure 2.

(a) Power retailer  (b) Manufacturer  (c) Weak retailer  (d) All players

Figure A2: **Power retailer, strong manufacturer:** For the above figures, we assume that in the Nash bargaining stage for channel dominance and dual dominance, the default points for the dominant retailer and the manufacturer are their respective profits in the benchmark case (and the manufacturer has bargaining power comparable to that of the power retailer).
and

\[(\pi_1(w^*) + t - d_1)^{\alpha_1-1}(\pi_2(w^*) - t - d_2)^{\alpha_2-1} [\alpha_1(\pi_2(w^*) - t - d_2) + \alpha_2(\pi_1(w^*) + t - d_1)] = 0\]

Together from the two conditions, we get

\[\left.\left(d\left(\pi_1(w) + \pi_2(w)\right)\right)\right|_{w^*} = 0\]

which determines \(w^*\) to maximize the joint profit of the two players, and

\[t^* = \left(\frac{\alpha_1}{\alpha_1 + \alpha_2}\right)(\pi_2(w^*) - d_2) - \left(\frac{\alpha_2}{\alpha_1 + \alpha_2}\right)(\pi_1(w^*) - d_1)\]

which implies that \(w^*\) is set to maximize the joint profit of the two players and \(t^*\) reallocates it between the players based on their relative bargaining powers and outside options.