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RESALE PRICE MAINTENANCE POST LEEGIN: A MODEL OF RPM INCENTIVES

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Abstract

The prominent *Babies R Us* decision (*McDonough et al., v. Toys R US, Inc.,* 2009) was the first to explore the economic consequences of resale price maintenance after the Supreme Court's *Leegin* Decision. Previously, litigation concerned the presence or absence of an agreement; but that changed with the new jurisprudence which instead emphasized the restraint's direct anti-competitive effects. While the district court's decision in the Babies R Us case rested on the factual circumstances of the case, it did not have before it an economic model through which those facts could be integrated. This paper offers such a mode, the predicates of which are drawn from the case. The conclusions that are drawn from the model are fully consistent with the court's decision

I Introduction

The *Leegin* decision of 2007 changed the course of antitrust jurisprudence with respect to resale price maintenance (RPM) in an essential way. No longer would the critical issue be whether an agreement existed between supplier and distributor to set resale prices as it had been for decades. Ever since the *Dr. Miles* decision of 1911, these restraints have been evaluated under Section 1 of the Sherman Act, which required a combination or agreement among the parties for a violation to be found. In the presence of the *per se* rule established in the *Dr. Miles* decision, the only remaining issue was whether Section 1 could be applied, so that is where the battles were fought.

All this changed post-*Leegin* as attention was redirected at the actual consequences of the restraint. The parties were now directed towards specifying the gains and losses from the restraint so that economic analysis would assume a more consequential role. From the start, the Court acknowledged that RPM could have different competitive effects depending on the market circumstances in which it was applied (*Leegin*, 2007). This recognition was evident in Justice Kennedy's majority opinion. He reserved one section for circumstances where the benefits from the restraints would exceed their costs and the following one for the reverse.

In large measure, Justice Kennedy relied on various economic studies that detailed the ways in which the gains resulting from RPM exceeded their costs. Many of these studies provided economic models in which RPM could be used to create more efficient distribution systems. However, when he turned in the opposite direction, he had less to rely upon. Although there were numerous reports of RPM's leading to higher prices and exclusionary outcomes, there were fewer formal models that specifically detailed the anti-competitive consequences of vertical price restraints. Even the leading text on antitrust economics (Blair and Kaserman, 2nd ed., 2009, p. 373) merely noted the leading defect of RPM was its use to facilitate price-fixing arrangements. (Comanor, 2011)

In this paper, we seek to fill this void. Our purpose is to present a formal model of supplier–distributor interactions in which both the gainers and losers from RPM are identified. This model like all others must rest on structural predicates. Rather than simply adopting a pro forma underlying structure, as is generally done, we take our predicates from those present in a prominent post-*Leegin* RPM decision which involved

Babies R Us (BRU) (*McDonough et al. v. Toys R Us, Inc,,* 2009). The model itself has similar implications to that developed by Asker and Bar-Isaac (2014). However, in their model, an upstream firm uses RPM to exclude rivals, while in the one developed here, a dominant distributor employs RPM to exclude downstream rivals. In that regard, we follow an earlier model put forth by Comanor and Rey (2000).

That case is described in some detail in a recent paper (Comanor, 2013) so there little need to repeat that discussion. Instead it is sufficient for our purposes to describe the contours of the market structure within which RPM was practiced. Suppliers of strongly branded and highly priced baby products interacted with a dominant distributor that accounted for large proportions of their products' sales. Although these suppliers typically faced competition from generic rivals, there were reasons to conclude, and the judge so ruled, that those products were sold in separate and distinct markets.

At the same time, the dominant distributor faced competition from a group of rivals that employed a new technology, the Internet. These rivals had lower costs due to the new technology and were therefore able to charge lower prices for the same products. However, many consumers had strong preferences for using the established distributor, which offered certain services that the new rivals could not provide.

There was also evidence, which was noted in Judge Brody's decision, that the dominant distributor coerced its principal suppliers to impose RPM so that the rival distributors would not set prices below those that were charged by the dominant distributor. If such lower prices were set, product shipments would be discontinued, as in fact occurred. Although the suppliers may have preferred to have the alternate distributors actively selling their products, they were unwilling to jeopardize their distribution arrangements with the leading distributor. And in the end, they imposed RPM limitations on the new distributors.

In her decision, the Judge referred twice to a particular passage from the *Leegin* decision:

> A dominant retailer, for example, might request resale price maintenance to forestall innovation … that decreases cost. A manufacturer might consider it has little choice but to accommodate the retailer's demands for vertical price restraints if the manufacturer believes it needs access to the retailer's distribution network. (L*eegin*, p. 893)

While this passage suggests circumstances where enforcing RPM may have strong anti-competitive consequences, it hardly represents a detailed economic model.

In the section below, we offer just such a model. The essential actors are a monopolistic supplier, a dominant distributor, and a fringe of rival distributors. Not only does this fringe behave as perfect competitors but to be relevant in the market, its members must also have lower costs than their more dominant alternative. However, the fringe faces a structure of demand where some consumers strongly value the services that are offered by the dominant distributor and are willing to pay a premium to obtain their product from that source rather than the fringe.

Finally, we assume - again following the circumstances of the case - that arbitrage prospects make it infeasible to charge different prices to the fringe distributors than to the dominant outlet. In effect, the upstream supplier is unable to practice price discrimination.

In the following section, we develop an economic model in which these sets of actors interact. Of course, much rests on the structure of consumer preferences for the services that are offered by the two sets of distributors. However, all that is assumed is that consumers exhibit a wide range of preferences for the services that are offered.

II A Model of Suppliers and Distributors

At this point, we propose a simple model of supplier-distributor incentives that is designed to capture the critical features of the BRU decision that was discussed earlier. In this model, a single upstream supplier, U, produces a highly valued product. U can distribute its product to final consumers through a downstream dominant distributor, A, or through a large group of smaller distributors, B. We assume that the B firms together represent a competitive fringe and are all price-takers.

At the heart of the model are the presumed factors that distinguish the B firms from A. The former group of firms offer a different set of distribution services from A and in doing so bear lower costs: $\gamma_b < \gamma_a$; constant costs prevail for all distributors.

However, consumers differ in their evaluation of these services; some are willing to pay substantially more for the services offered by A but not all are. To some consumers, A offers superior distribution services, and they will not purchase the product without the services, but to others, A's services are indistinguishable from those that are offered by the B's. There is thus a distribution of consumer preferences on how much they are willing to pay for their ability to purchase U's product at A rather than through one of the B's.

Let the preferences for the value of the product absent the distribution services be denoted by t, and assume that the preferences are distributed between 0 and T according to the density function, f(t) and the cumulative distribution function F(t). While t is a variable that indicates individual customer types, let σ be a parameter that measures the premium associated with A's distribution services such that $t(\sigma - 1)$ is the additional value and $t\sigma$ is the total value of U's product that is purchased from A rather than from one of the B's. Thus, σ is a fixed value that indicates the average willingness of consumers to pay for enhanced distribution services (those provided by A), which in turn varies across consumers according to the distribution of t.

A critical feature of the model is that the price that is charged by U -- indicated by W and paid by both A and the B's -- is constrained to be the same. As mentioned, even though the demand elasticities may differ as between sales made to A and the B's, we assume that arbitrage prospects are too great to permit price discrimination to occur. Downstream prices are P_a and P_b, with $P_b = W + \gamma_b$ since the fringe firms are competitive and simply pass on the upstream price along with their costs to consumers. However, since P_b depends on W, which is endogenous, both final prices are also endogenous.

A consumer of type t will purchase the product from A even when $P_a > P_b$ so long as

$$(1) \qquad t\sigma - P_a \geq t - P_b = t - (W + \gamma_b).$$

The inequality in (1) is reversed for lower type consumers who then purchase the upstream product from a B distributor except for those with such low valuations that $t < P_b$. In that case, the consumer does not purchase the product at all.

Under these assumptions, the structure of demand that faces the A distributor is

(2) $D_a \;=\; Q\,[\,1 - F((P_a - W - \gamma_b\,)/\,(\sigma - 1)\,)]$ if $\sigma P_b < P_a \leq T\sigma$ and $(P_a - P_b)\,/(\sigma\text{-}1)$ $\leq T$

$Q\,[\,1 - F(P_a/\;\sigma)\,]$ if $P_a < \sigma\, P_b$ and $P_a < T\sigma$

0 otherwise.

In what follows, we let Q and T, which are both scaling parameters, be equal to one for simplicity. Note that the demand conditions that face A are influenced by P_b which in turn depends on W. At some point, lower values of W lead to reduced demand at A as customers switch away from him and purchase U's product instead from the B's. Therefore, lower values of W have divergent implications for A's profits; they reduce B's prices and shift customers away from A, but they also reduce A's marginal costs and lead to increased sales by lowering A's optimal price for given demand.

Note also that when $P_a \leq P_b + t(\sigma\text{-}1)$, all sales are made by A and none by the B's even if marginal consumers treat all distributors the same. Despite B's lower costs, consumer preferences are such that they lead to purchases being made entirely from A even when A sets a somewhat higher price to reflect its inherent advantages. The B's attract customers only when they have a price advantage from doing so.

Consider the demand schedules that are represented in Figure 1. The first of these schedules -- D_1D -- rests on the assumption that W and P_b already have been determined while P_a continues to vary. For values of P_a that are equal to or below the fixed value of P_b, adjusted for A's preferential status, the two demand schedules coincide which is consistent with B's sales being zero. However, where P_a exceeds that critical value, sales made by the B's increase and those made by the A distributor declines. A's operable demand schedule is then D_2D. In contrast, if the B's were excluded from the market, or alternatively if P_b is always set equal to or less than $[P_b + t(\sigma\text{-}1)]$, which here leads to the same result, the demand schedule facing A is represented by D_1D.

We model the decision process as sequential: First the upstream supplier (U) sets a price, W, to reflect the anticipated demand for U's product from both sets of distributors. The upstream supplier's choice of W determines P_b equal to $W + \gamma_b$; and then with P_b determined, A sets P_a. To be sure, the A distributor may not accept U's favored price and seek a different one. However, A's efforts here are compromised by the recognition of both parties that lower values of W lead to lower values of P_b and thus increased competition from the alternate distributors. Instead, we presume that A's bargaining power is directed towards achieving the imposition of RPM, as will be discussed below.

Note that as P_b varies in response to different values of W, the position of the kink in A's demand schedule shifts. The kink rises along the D_1 segment as P_b increases, and declines along the D segment as P_b declines. Although A's revenues expand along the D_1 segment, its costs also increase since higher values of W lead to increased marginal costs.

To derive A's optimal strategy for given W, consider its profit function:

(3) $$\Pi_a (W, P_a) = (P_a - \gamma_a - W) D_a = (P_a - \gamma_a - W) [1 - F((P_a - \gamma_b - W) / (\sigma - 1))]$$

so long as B's sales are positive. Otherwise,

(4) $$\Pi_a (W, P_a) = (P_a - \gamma_a - W) [1 - F(P_a / \sigma)]$$

Where both types of distributors are active, equation (3) above is the relevant expression for A's profits. The supplier price, W, has two effect: first, an increase in W reduces A's profit per unit, $(P_a - \gamma_a - W)$; but second, an increase in W can increase A's market share, $[1 - F((P_a - \gamma_b - W) / (\sigma - 1))]$, as $\partial D_a / \partial W = (1) / [\sigma - 1]F'((P_a - \gamma_b - W) / (\sigma - 1)) > 0$. Thus, $\partial \Pi_a / \partial W$ can be either positive or negative. However, A always benefits from lower values of W if the B's sales are otherwise foreclosed.

Consider now the position of the upstream supplier, U. Its profits depend of course on revenues and costs. By assuming that U's costs are entirely fixed, we direct attention to U's revenues, which depend on both his price, W, and its quantities sold. The latter are affected by its distribution arrangements and expanded when both sets of distributors are active. Although the absence of B's can be countered by a sufficiently low value of P_a, such that quantities are maintained, that is not so for the absence of A which attracts a loyal customer base.

Consider the supplier, U's, profit function:

$$(5) \qquad \Pi_u (W) = W [1 - F(W + \gamma_b)]$$

where $P_a > P_b + t(\sigma-1)$ so that both A and B distributors compete. Otherwise, the B distributors are absent from the market in which case

$$(6) \qquad \Pi_u (W) = W [1 - F(P_a/\sigma)].$$

Whether (5) or (6) applies can depend on the valuation factor, σ, which is available for the preferred distributor. When the B's are absent, U will seek the highest possible price of W that is consistent with A remaining in business. On the other hand, when both A and the B's are present, U sometimes prefers a lower value of W. U and A therefore can have either conforming or conflicting incentives in setting W when the B's are actually or potentially present.

Recall Figure 1. At the kink, the relevant marginal revenue schedule is discontinuous so there are strong prospects that A's optimal price is reached at point R. Whenever A's price exceeds that found at R, it is losing sales to its rivals; this is a problem that can be countered only by setting a lower price. For relatively modest marginal costs, it is optimal for A to set the entry-excluding price at the equilibrium point R.

At a higher value of its marginal cost, however, A's preferred price may be reached at a point such as S. Much depends on the value of W. An increased value of W will shift the kink higher on the D_1D demand curve but also increase A's marginal costs and thereby increase the likelihood that A's price is reached along the relevant D_2 demand segment. Both outcomes are possible. An important feature of the model is that U typically gains from making sales through both types of distributors, while A's profits are limited to his own sales.

As mentioned earlier, we have assumed that U sets W before A determines $P_{a.}$ In other words, we have let A set his price after U has already done so. In different circumstances, however, when these decisions are made both simultaneously and independently, then U will set W in order to extract as much profit as possible given A's choice of P_a. So long as the B's remain in the market, the Nash equilibrium value of W is the same in both the simultaneous and sequential move games. In both cases, W is set to maximize expression (5) above. Furthermore, if A's price is at the kink, small changes in W will not affect A's decision.

However, if at the sequential move equilibrium, A's price would allow him to earn positive profits, then U's optimal value of W in the simultaneous move model would be higher. This result in turn would lead to still higher final prices, although there would remain the classic successive monopoly problem leading to prices that are above those that an integrated monopolist would charge (Waterson, 1980; Salinger, 1988; Lemley and Shapiro, 2006).

III The Imposition of Resale Price Maintenance

To derive explicit results, we assume that f(t) is uniform in some interval [0,T]. In that case, F(t) = 1/T, which is here assumed equal to one. The applicable demand structure is then:

$$
(7) \qquad D_a = \begin{cases} \{1 - [(P_a - W - \gamma_b) / (\sigma - 1)]\} & \text{if } \sigma \geq P_a > \sigma P_b \text{ and } 1 \geq (P_a - P_b) / (\sigma - 1) \\ \{1 - (P_a / \sigma)\} & \text{if } P_a < \sigma P_b \text{ and } P_a < \sigma \\ & \text{otherwise.} \end{cases}
$$

In this case, the relevant demand curves are linear, as represented in Figure 2. The kink noted there is reached when the quantities indicated in the two expressions above are equal, which occurs when $P_a = \sigma (W + \gamma_b) = \sigma P_b$. The associated quantity demanded is $D_a = [1 - (W + \gamma_b) / 1]$. As noted earlier, the kink's position depends on the value of W as set by U so that the outcomes indicated in Figure 2 presume a pre-determined value of W.

Subject to this caveat, the outcomes noted in Figure 2 depend on marginal costs. At MC, where the relevant schedule passes through the discontinuity in the MR schedule, A's profit-maximizing position is reached at point R, where A accepts a lower premium to expand his sales volume by excluding the B's. However, with higher marginal costs, indicated here by MC', A accepts the presence of the B's in order to set a higher price: here indicated by point S.

Determining which cost schedule applies depends on the input price, W, along with distribution costs, γ_a. As described earlier, we model W as set by the upstream supplier to maximize net revenues. On the assumption of a uniform distribution of relevant preferences across consumers, we have:

(8) $\Pi_u (W) = W [1 - (W + \gamma_b) / 1]$.

With both A and B distributors present, net revenues are maximized at a fixed value of W that is equal to $[1 - \gamma_b] / 2$. In this case, both γ_a and γ_b impact A's price.

A's profits are affected by both demand and cost conditions. Depending on its costs, A can either accept B's presence by setting a higher price, or alternatively seek to exclude the B's by reducing its price. However a further option presents itself. If the B's can be excluded by other means, such as by having an external constraint imposed that P_b must equal or exceed P_a, then A can operate along the D_1D demand schedule rather than the D_2D demand schedule in Figure 2. In that case, A's optimal price is set at either points such as V or V' along the D_1 demand segment.

Imposing this additional constraint on the B distributors is tantamount to an RPM regime where rival distributors are required to set prices that are equal to or above those set by the dominant distributor. This would enable the distributor to set a higher price because it now does not need to fix a lower price to impede sales by the B distributors. A can then reach a point such as V rather than R, or a point such as V' rather than S.

When RPM is imposed and the B distributors are thereby foreclosed from the market, U's profit function is now:

$$(9) \qquad \Pi_u (W) = W \, [\, 1 - (\sigma + \gamma_a + W) / 2 \, \sigma \,]$$

with W now equal to $[\sigma - \gamma_a / 2]$. In the new circumstances, with A facing fewer competitive pressures, U can take some advantage of A's new posture. It can raise its price, W, to compensate partially for selling fewer units. The resulting impact of RPM on U's revenues depends on the relative values of γ_a , γ_b and σ.

As suggested in Figure 2, there are two cases to consider: In the first, Case I, the relevant marginal cost schedule passes through or below the discontinuity in the operative marginal revenue schedule, which leads to an equilibrium position at the demand schedule's kink, at point R. In this case, it is optimal for the dominant distributor to reduce his price sufficiently to exclude the B firms from the market. However, if RPM is imposed, which has the effect of excluding the B rivals, A can then set a higher price and increase its profits to an outcome such as at point V. Alternatively, if costs are higher as in Case II, A can avoid competition from the B's, and RPM permits him to shift from point S to point V'.

Points R, V and V' all lie along the D_1D inverse demand schedule:

(10) $P_a = \sigma (1 - Q_a)$,

where Q_a is the quantity that A chooses to sell.

At point R, $P_a = \sigma P_b = \sigma (W + \gamma_b)$; while at points V and V', $P_a = [\sigma + W + \gamma_a]/2$, although at different values of γ_a. In contrast, point S lies along the D_2D inverse demand schedule at

(11) $P_a = [(\sigma - 1) + \gamma_a + \gamma_b] / 2\} + W$.

Where RPM arises in circumstances that are broadly consistent with this model, it apparently results from pressures from large distributors. Indeed, in the model that is offered here, at least with plausible parameter values, the returns from RPM accrue to large distributors. With very high values of σ, however, the upstream supplier may prefer to sell only through the dominant distributor, and so the fringe firms become irrelevant, as does RPM. Of critical importance, therefore, are the conditions likely to make these pressures for RPM effective.

A common feature of the distribution sector is that large-scale distributors often sell very large number of products, all made by different suppliers. In contrast, suppliers often focus on a smaller number of items. In such circumstances, the failure to reach an agreement between them will have a greater proportional impact on the supplier's revenues than on the distributor's revenues; consequently, the distributor's bargaining power can be relatively strong. Of course, this may not be true on all cases; in particular where a supplier's product is essential to the distributor's market position. An important feature of the model that is outlined here is that RPM is more likely to arise when the distributor's buying power is sufficiently strong so as to permit him to impose its will on its suppliers.

In this regard, note the following result. For Case I above, maximizing joint profits simultaneously for both U and A implies:

(12) $P_a = \sigma\ (1/2 + \gamma_a/2)$.

Alternatively, with the sequential decision making process that was outlined originally, the classic successive monopoly problem arises with the resulting final price:

(13) $P_a = \sigma\ (3/4 + \gamma_a/4)$.

Consistent with the standard result, the presence of successive monopolies leads to higher final prices. This result suggests that if U and A were to negotiate parameter values between themselves, they might agree to a lower value of P_a than is suggested here. That type of agreement, however, would not be stable without direct transfers from A to U as joint profit maximizing requires that U set W equal to zero.

IV Policy Conclusions

This model illustrates how RPM can be used to eliminate competitive forces from the marketplace. In some circumstances, such as the one that is represented by Case I above, potential competition is reduced. In others, such as is indicated in Case II, actual competitors are eliminated. In either case, the remaining supplier and distributor react by setting higher consumer prices.

RPM can have the effect of imposing restraints such that lower cost distributors cannot exploit their positions by charging lower prices. Instead, they are required to set the same prices as their higher-cost rivals so their competitive advantage is removed. Consumers are harmed as a result. In effect, what this model demonstrates is that intra-brand competition in some circumstances cannot be divorced from inter-brand competition, but rather they jointly determine market results.

While decisions on whether or not to impose RPM turns on negotiations between suppliers and major distributors, the interests of consumers are not represented. Even if many consumers are willing to pay for the distribution services that are offered by major distributors, many are not willing to pay very much for those services; but with the imposition of RPM, the latter are forced to pay more for the enhanced distribution services or not have the product. In the model that was offered above, these consumers are mainly those who would prefer to obtain the product from one of the B outlets. Strikingly, without RPM, and so long as distribution costs at major distributors are modest, the resulting final prices will not reflect the major distributor's costs but rather the lower costs of their alternatives. It is only the presence of RPM that frustrates that result.

Although there are surely instances where RPM serves consumer interests, the model proposed here, which rests on realistic market conditions, suggests that these restraints can be employed for the benefit of large distributors and used to increase final prices and restrict outputs.

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Figure 1

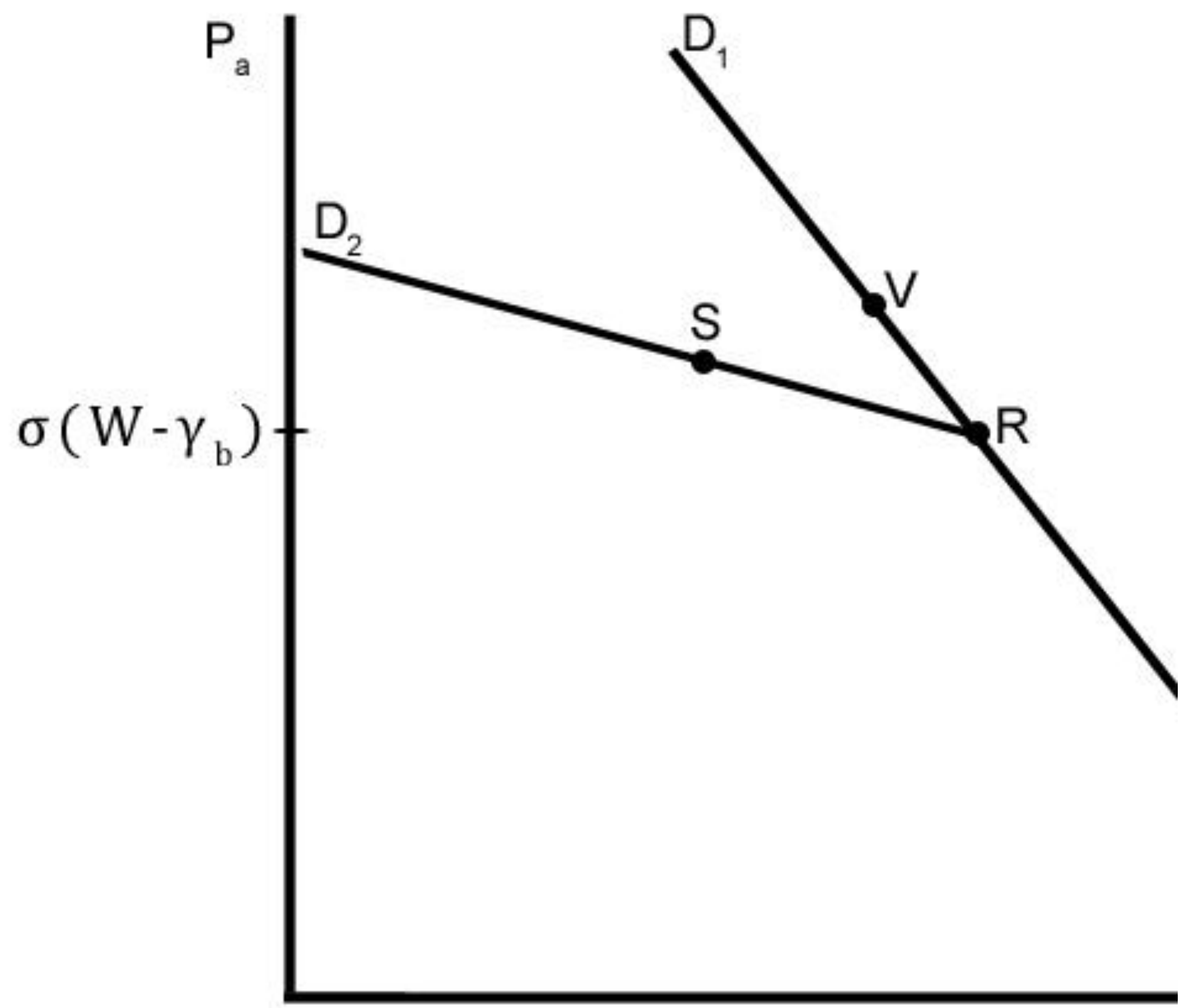

Figure 2