

**Reply to the note by RBB Economics on
“The potential for ‘waterbed effects’ in the
UK grocery retail industry”**

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Association
of Convenience
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1 SUMMARY

- 1.1 In their note to the Competition Commission¹, RBB Economics (referred to here as “RBB”) comment on the submission by the Association of Convenience Stores (referred to here as “ACS”) regarding the working of a “waterbed effect”².
- 1.2 It should be recalled that the ACS’ submission falls into three parts. The first part covers a basic “static model” (Section 2). The second part extends this into a “dynamic model”, allowing for knock-on effects through adjustments in the upstream market (Section 3, para. 3.1 – 3.19). A final part points out the potential of additional competitive harm that could arise from the exercise of differential buyer power and that could then be exacerbated through a waterbed effect (Section 3, para. 3.20 – 3.29). Here, the ACS’ submission referred, in particular, to private labels.
- 1.3 While RBB’s note criticizes only the first two parts, we argue, however, that the formal analysis that RBB itself undertakes in the Annex to their note ends up providing strong support for the arguments that were made in the third part of the ACS’ submission.
- 1.4 RBB criticize the ACS’ submission on the following grounds³.
- It is asserted that the conclusions derived in the static model rely on a model that makes “unrealistic assumptions” and that the underlying approach is “somewhat contrived”. It is also alleged that the derived results are not robust to what seem to be realistic changes to the model.
 - It is asserted that the dynamic model relies on the concept of an upstream market that is characterized by the presence of a “cartel” or “market sharing agreements” and does, therefore, not allow for effective competition among suppliers.
 - It is asserted that the ACS’ submission fails to take into account dynamic (feedback) effects through investment incentives at the retail level, which would supposedly benefit consumers.
 - In addition, in a technical Annex RBB argue that once the timing of moves in the ACS model is reversed, which is claimed to better reflect reality, the working of a waterbed effect would, if at all, actually be to the benefit of consumers.

¹ RBB Economics, The Potential for ‘Waterbed Effects’ in the UK Grocery Retail Industry, March 2007.

² Association of Convenience Stores, The ‘Waterbed Effect’: How Non-Cost Related Discounts to Large Retailers can Harm Consumers, 15 November 2006.

³ In addition, RBB’s note starts out with a criticism of the (relatively mechanical) view that a waterbed effect could arise simply as suppliers may seek to compensate for revenues lost with stronger buyers. This criticism clearly can not apply to the ACS’ submission as its main objective was precisely to show that the waterbed effect needs not rely on such an “accounting exercise”.

1.5 In what follows, we provide a thorough rebuttal of all of these arguments. Our main points of reply are the following:

- The criticism advanced in points 1-2 is unfounded. It is based on a misunderstanding of both the (formal) model in the ACS' submission and of the business reality faced by ACS' members. RBB's arguments thus neither represent a valid criticism of the more conceptual contribution made by the ACS' submission nor do they adequately take into account the relevant circumstances.
- We argue that the dynamic effect working through investment incentives which the RBB note newly introduces is in fact more likely to give rise to additional competitive harm. Again, our difference to RBB's arguments is that we take into account the business reality of ACS' members. Consequently, we argue that an (informal as well as formal) argument that relies on retailers obtaining the same terms of supply irrespective of their size or other characteristics is unsuitable in the present circumstances.
- Finally, while we argue that the "technical modification" that the RBB note introduces in its formal Annex is much less convincing than the original specification in the ACS' submission, we also argue that the formal analysis actually ends up showing that through the exercise of differential buyer power there can be additional competitive harm. Precisely, we argue that RBB's own conclusions rest on a particular interpretation of their modified model and, what is more, on a particular selection of equilibrium. Once one chooses, instead, an equilibrium that is much more convincing given the circumstances faced by ACS' members, RBB's conclusions are reversed: Through a waterbed effect powerful retailers have then strong incentives to undertake strategies that are likely to lead to competitive harm.

1.6 Before turning to the more detailed response, it should be noted that even if RBB's analysis and criticism could be taken at face value, which we contest to be the case, then still at no point it would have been shown, as asserted, that "[t]he waterbed effect found by the ACS may be overturned [...]". As also the ACS' submission has itself made clear when a waterbed is more likely to be effective and when not, it is clearly misleading to argue that the waterbed effect has been "overturned" by pointing out circumstances when it should be ineffective (such as in the presence of undifferentiated suppliers without power to price discriminate in the first place).⁴

⁴ This should, however, not indicate that in different contexts other effects could not arise. As argued in Dobson and Inderst (2007), for instance, even the fact that sometimes retailers will try to (successfully) demand a discount when they become aware of a similar concession to rivals, in which case a waterbed effect would be truly "overturned", is not inconsistent with the simultaneous operation of a waterbed effect, albeit with respect to different retailers. As argued there, based on the formal models of bargaining that underlie the respective theories, a waterbed effect should once again be more likely to apply to weaker retailers, supporting the conclusions of the ACS' submission. See: Dobson, P W. and Inderst, R., 2007, Differential Buyer Power and the Waterbed Effect: Do Strong Buyers Benefit or Harm Consumers?, European Competition Law Review, July (No. 7), pp. 393-400.) (See also at: http://personal.lse.ac.uk/inderst/Dobson-Inderst%20-%20waterbed_eclr_final_version%207-4-07.pdf)

2 CRITICISM OF THE STATIC MODEL

2.1 We isolate separately the different arguments and respond to them in turn.

Retailers are assumed to deal with a price-setting monopolist upstream

2.2 RBB's note criticises the ACS model on the grounds that in order to be a fair reflection of reality, too much bargaining power is granted to the supplier in that the supplier essentially ends up making a take-it-or-leave-it offer to retailers. This criticism ignores that what matters for the working of the model is solely the role of buyers' outside options but not the particular "game form". We will elaborate on this next.

2.3 The static model considers competing retailers of different size negotiating with their joint supplier. Negotiations proceed in the shadow of retailers' outside options, for example to choose to stock a different good (cf. also the following remarks below). What is at stake in each bilateral negotiation is thus the difference between the joint profits that could be realized and the value of the respective outside options. This is the "net surplus" (or "incremental surplus") that can be bargained over, given that neither side would accept a deal that makes it worse off than under its next-best alternative.

2.4 What matters for the formal model in the ACS' submission is only that the value of retailers' outside options *does* affect the outcome of negotiations, but not the precise way that net surplus is ultimately shared.⁵ The formal model makes the simplifying assumption that the respective supplier extracts all of the net surplus. This is done merely for reasons of tractability and does not affect results (cf. ACS para. 2.23). What is more, as discussed in detail in footnote 7 of the submission, an outcome akin to "price-setting" by the supplier also has some strong formal (game theoretic) support: It is the unique equilibrium outcome under a fully-fledged bargaining model where, first, the so-called "outside-option principle" applies and, second, retailers' outside options are sufficiently attractive.⁶

Retailers are assumed to deal with a price-setting monopolist upstream

2.5 RBB's note criticizes the ACS modelling approach by asserting that it relies on the assumption of a monopolistic supplier. This is not the case.

2.6 That one and the same supplier is chosen by a number of different retailers and that no close substitutes are stocked at the same time cannot suggest that this supplier is a

⁵ Strictly speaking, this holds only as long as not every retailer can extract the full share of the net surplus, in which case retailers' outside options would trivially cease to play a role in negotiations.

⁶ For a brief illustration of the last point suppose that two parties, A and B, negotiate over how to split profits of 100 that they can jointly realize. If both sides have no viable alternative, then being agnostic on the other drivers of bargaining power one would presume an equal split (50 each). Suppose now that party B, instead, has an attractive alternative option under which it could ensure itself a payoff of 70. The "outside-option principle" would then assert that the profits of 100 are split such that party B only realizes the value of its attractive outside option, namely 70, while the total net surplus, which amounts now to $100 - 70 = 30$, is fully pocketed by party A. This would then be akin to a take-it-or-leave-it offer made by party A.

monopolist in the traditional sense of wielding substantial market power. What could matter more than competition “on the shelf” is competition “for the shelf” (i.e. for the patronage of any given retailer).

- 2.7 Importantly, however, this should not suggest that the waterbed effect is equally applicable regardless of the level of upstream competition. In fact, perfect competition clearly erodes any scope for price discrimination. The importance of a supplier’s market power for the working of a waterbed effect is clearly acknowledged in the ACS’ submission. What is more, such a variation was identified as a key guide as to whether and when one should expect a waterbed effect to be stronger and to ultimately lead to consumer harm (cf. ACS para. 2.53).
- 2.8 RBB’s criticism seems to equate a retailer’s outside option with the potential for backward integration and self-supply.⁷ However, the ACS’ submission did not identify buyer power solely with the attractiveness of backward integration.⁸ When introducing more informally the model, we noted in para. 2.9: *“Instead of continuing to purchase from some incumbent supplier, a retailer can also switch to another source of supply. This involves some costs, which may be either incurred at the level of the retailer or at that of the supplier and which allow for a broad range of interpretations. Larger retailers can essentially spread these costs over more units, which makes the option to switch suppliers both more profitable and more credible. As this increases the value of a large retailer’s outside option, the incumbent supplier is forced to offer the retailer a better deal.”*
- 2.9 And when introducing the formal model, we noted in para. 2.27: “There exists also an alternative source of supply. If a retailer rejects the incumbent supplier’s offer, it can access this alternative source of supply, though only at costs $F > 0$. While we, as well as the existing literature, specify for concreteness that these costs are incurred by the buyer, this need not necessarily be the case. Alternatively, F or a fraction of it, may have to be incurred by the new supplier.”

Switching cost and source of size-related discounts

- 2.10 RBB’s note criticizes the applicability of the formal model used to generate size-related discounts in the ACS’ submission. As already noted in 1.2, there is no need to presume that buyer power arises solely from the credibility and profitability of the threat of self-supply. (On this see also in much more detail the separate submission of the ACS that responds to the Competition Commission’s own working paper on the waterbed effect. There, it is argued, first, that the advanced theories of a waterbed effect are not tied to a

⁷ Clearly, if the only viable options are to source from a single given supplier and to self-supply, then by assumption the presence of other suppliers is irrelevant.

⁸ Admittedly, some of the academic papers that have also informed the submission have chosen to take this route. While this is a very convenient theoretical approach in that it allows to abstract from some “technical” complications, this interpretation is neither necessary nor often particularly realistic.

particular theory of the source of size-related discounts and that, second, also the presumption of non-negligible fixed costs of establishing a new supply relationship, which could arise equally at the supplier or the retailer, is not unfounded.)

- 2.11 RBB criticizes that the model lacks realism as in the model retailers never actually carry out their threat of investing into their “outside option”. Here, it should be recalled that RBB uses the specific interpretation that when not sourcing from the given supplier, a retailer’s next-best alternative is to integrate backwards and self-supply. RBB’s criticism is that retailers should be expected to actually carry out their threat, thereby sinking the associated (fixed) costs so as to further enhance their bargaining position with respect to suppliers.
- 2.12 Retailers arguably undertake a multitude of different strategies to enhance their bargaining position with respect to suppliers. This could involve both increasing competition “on the shelf” through listing more suppliers in a given category but also increasing competition “for the shelf”, which may involve the opposite strategy of prioritizing one or few suppliers. The use of private labels is another such strategy. As conceived by RBB, and formalized in their Annex, even as we narrow down the specification of the respective category, a retailer would then still want to position a private label as a close (or, in their formal model, even perfect) substitute of a listed branded good. This is often clearly not feasible and should realistically be rarely the case, unless the branded supplier’s good is fully delisted in favour of the (now almost equivalent) private label.
- 2.13 In addition, it should be kept in mind that the ACS model arguably intends to be applicable to the retailing circumstances faced by convenience stores, which are represented by ACS. In many product categories, for these retailers’ shelf-space constraints may play a larger role than for the large formats operated by the leading grocers.

3 CRITICISM OF THE DYNAMIC MODEL

- 3.1 RBB's criticism of the dynamic model relies on the assertion that the ACS model "contrives to eliminate the possibility of competing suppliers by assuming upstream territorial allocation akin to a cartel" or that it "effectively requires there to be a collusive agreement among suppliers".
- 3.2 In the ACS' dynamic model, once a supplier drops out or fewer suppliers enter, all retailers are potentially negatively affected through a worsening of their purchasing conditions. (For large and powerful retailers, this will be more than compensated for by the initial discount that triggered the consolidation of the upstream market in the first place.) In the bargaining framework, the consolidation of the upstream market leads to an erosion of the value of retailers' next-best alternatives. Consequently, in stark contrast to RBB's remarks the operation of competition in the upstream market (and how it changes dynamically) is, in fact, a key ingredient of the dynamic model of the waterbed effect and wholly consistent with the static model. (It seems that RBB's comments were again derived from their particular interpretation that buyer power equates to the threat of backward integration.)
- 3.3 As noted above (cf. Section 2.2), the fact that in the static model all outlets in the considered local markets procured from the same supplier can also not suggest that this supplier wields substantial market power (let alone monopoly power). What is more, the specification that, in equilibrium, all retailers in a given local market stock goods from the same supplier was only used for simplification but does not represent a necessary assumption, neither for the economic arguments nor even for the formal results to hold. To see this in an informal manner, note that the argument in the static analysis uses only the result that through passing on some of their additional discounts larger retailers take away volume and market share from their smaller rivals, which in the presence of size-related discounts should then lead to a worsening of the terms of supply for the latter. It is inconsequential for this argument whether the different retailers source from the same or from different suppliers. Consequently, all formally derived results from the ACS' submission are robust to a modification of the single-supplier assumption. (As we argue in detail in the separate submission of the ACS that responds to the Competition Commission's own working paper on the waterbed effect, the arguments not only extend, but are even made stronger if large retailers switch to own-label goods.)

Dynamic investment incentives

- 3.4 Section 3.2 in RBB's note illustrates verbally the incentive effects that are formally worked out in Inderst and Valletti (2006), which RBB's note references.⁹ According to this theory, size-related discounts can provide additional investment incentives for downstream firms, given that by becoming more efficient or by otherwise improving their offering to

consumers they not only gain directly a competitive advantage but, in addition, benefit from lower purchasing prices. Through the working of a waterbed effect these incentives can then further increase.

- 3.5 The ACS' submission did not consider these additional dynamics. We acknowledge that such an effect is conceivable and has a formal underpinning. We would, however, assert that the work of Inderst and Valletti (2006) and related work in Inderst (2007) would suggest that in an environment with *differential* buyer power, i.e., where presently buyers benefit to a different degree from size-related discounts, consumers may end up being harmed if such dynamic effects prove to be sufficiently strong.¹⁰
- 3.6 The contribution of Inderst and Valletti (2006) is largely a methodological one, criticizing existing work on the ban of price discrimination in intermediary goods markets.¹¹ Their analysis does not cover the case where prior to the investment stage of the model retailers already have different size and thus enjoy discounts to a different extent. Inderst (2007) completes this picture by explicitly considering such asymmetries. Arguably, in light of the reality faced by ACS' members, it is the asymmetric case that is of particular relevance. Importantly, the exercise of buyer power may then actually stifle the investment incentives of smaller retailers that are already at a substantial disadvantage.¹²
- 3.7 Through further amplifying differences in size and thus both buyer and seller power, the dynamics that RBB's note now brings into play are then likely to both amplify the harmful effects of a waterbed effect and, in addition, risk creating competitive harm in the long run through adjustments in the downstream market. Such adjustments through further consolidation, which are realistic but were not at the core of the ACS' submission, may then further amplify any resulting consumer detriment.
- 3.8 In their note, RBB argue that their argument "generalises to other means by which downstream firms can increase their sales volumes". Particularly when taking into account our preceding arguments that such means should be employed to a larger extent by larger and already powerful retailers, it must be noted that it is not guaranteed that these "means by which downstream firms can increase their sales volumes" are not themselves

⁹ See Inderst, R. and Valletti, T., 2006, Price Discrimination in Input Markets, mimeo. Available at: http://personal.lse.ac.uk/inderst/pd_0107.pdf

¹⁰ See Inderst, R., Leveraging Buyer Power, 2007 (rev. version at Royal Econ. Society annual conference: <http://zeus.econ.umd.edu/conference/res2007/program/res2007.html>.)

¹¹ Inderst and Valletti (2006) build on the same framework as used in the ACS' submission. In the light of the above discussion it may be interesting to note also their main criticism of existing work. They argue that most of the existing work takes a supplier as being essentially a monopolist, while in Inderst and Valletti (2006) as well as in the ACS' submission, the potential for substitution is explicitly taken into account through the outside-option approach.

¹² Quoting from the abstract of Inderst (2007): "We show how buyer power can trigger and then accelerate a growing concentration in the downstream market as it provides firms that are already large with higher incentives to grow even further, be it through acquisition or through investing in lower own costs or a more attractive offering to customers." To the extent that some retailers are large and powerful not due to higher efficiency or superior services that they offer customers but simply as they control more outlets and thereby shift a larger volume, the resulting harm is also more likely to be higher.

harmful to competition. In fact, if the growth of a retailer's size and market share not only creates additional discounts but also harms rivals through a worsening of their terms of supply, then stronger retailers may be tempted to engage in strategies that undermine smaller rivals' sustainability in the long run. This could include "micro-marketing" techniques such as local promotions and a judicious choice of the product mix so as to target the outlets of weaker rivals. Below-cost pricing on a selected range of known-value items may have similar effects.¹³

¹³ See also Dobson, P., 2006, Micro-marketing and Discriminatory Practices in UK Grocery Retailing.

4 RESPONSE TO THE ANALYSIS IN RBB'S ANNEX

- 4.1 The annex in RBB's note seeks to analyze a model where retailers' alternative options consist of integrating backwards. The model differs from the ACS' submission by allowing for an "initial stage" where retailers can already carry out their "threat" of integrating backwards, before even allowing a supplier to make a (competing) offer.¹⁴
- 4.2 If a retailer already integrates backwards at the initial stage of the RBB model, i.e., before a given supplier can even make an offer, then the RBB analysis assumes that the retailer still negotiates with the supplier subsequently. At this stage, the retailer's outside option seems then to be that of self-supply but without having to still incur the associated fixed costs. As the model presumes that the self-supplied good and that of the supplier are undifferentiated and produced at identical costs, it is unclear why the supplier's good would then still be listed.
- 4.3 RBB's note asserts next that in their model both of the two considered retailers would integrate backwards at the initial stage. (See, however, the criticism below.) While their analysis focuses on the case with two symmetric retailers, they argue as follows: "It would be straightforward to modify the model presented in this annex to consider a retail chain competing with an independent store. Once again, both firms would have the incentive to sink F at stage 1 with the effect that final consumers benefit." It should then be added that in this case both retailers, irrespective of their size, would obtain completely identical terms of supply (namely to purchase at the supplier's marginal costs). Clearly, if no size-dependent discounts are given in the first place, we can also not expect a waterbed effect to arise. Moreover, as one chain grows even substantially larger, still the same predictions hold: All retailers would command the same purchasing conditions irrespective of their size. This clearly confines the applicability of the whole analysis.
- 4.4 On a more conceptual level, as noted already above, the addition of an additional stage to the model, where retailers can pre-empt a supplier's offer by making investments, clearly does not represent a seemingly innocuous "change in timing". It must be asked why there should not be yet another, earlier stage at which a supplier could pre-empt retailers' investment by making a sufficiently attractive offer. After all, these investment costs represent pure deadweight loss and an offer could be made quicker than such investment is undertaken. It is entirely unclear where the frictions in negotiations should come from that would prevent a more efficient outcome to arise.
- 4.5 In the rest of this response, though, we take the approach taken in RBB's annex as given and comment only on the results. RBB's analysis selects a particular equilibrium of the

¹⁴ As noted also further below in more detail, it is thus misleading to refer to this fundamental model change as merely a "modification [...] to test the robustness of the ACS model to changes in the timing assumptions". Such a comment would have been warranted, for instance, if the ACS' model had allowed one retailer a first-mover advantage, either on the retail market or in his negotiations with the supplier, which it did not. In this case a robustness analysis by perturbing the ordering of moves would have been truly called for. Adding additional stages to a model, instead, is simply something different than a change in the "timing assumptions".

investment game, namely that where both retailers invest. Their analysis does not, however, comment upon the fact that also other equilibria exist. In what follows, we argue, instead, that the omitted equilibria are more plausible, both in light of the real circumstances of ACS' members and also on more theoretical grounds. What is more, we show that an analysis of these more plausible but previously omitted outcomes reverses the conclusions of RBB's analysis. In fact, we argue that a full analysis of RBB's model would then give rise to an additional theory of competitive harm that arises through a waterbed effect.

- 4.6 In the equilibrium selected in RBB's analysis both retailers integrate backwards through their investment decisions. Two other (pure-strategy) equilibria exist, though, in which only one retailer integrates backwards. As in these equilibria retailers will ultimately be asymmetric, both in size and with respect to their terms of supply, these are arguably more adequate both as a comparison with the ACS' submission and with the business reality faced by ACS' members in mind. (We also provide a more theoretical motivation for this selection below.)
- 4.7 The interesting fact to note is that when selecting the asymmetric equilibria in RBB's investment game, the waterbed effect is now further exacerbated: The already integrated retailer obtains still better purchasing conditions, while the purchasing price of the adversely affected smaller retailer is now even higher. In essence, this result thus provides a formalization of the argument put forward only verbally in the ACS' submission that waterbed effects could arise or could be strengthened if some retailers, though not all, own strong private labels. What is more, RBB's analysis points to the possibility that private labels could be used strategically, through a waterbed effect, to undermine the competitive position of smaller, weaker rivals.¹⁵
- 4.8 We conclude by arguing why also on a more formal level (next to realism) the choice of an asymmetric equilibrium is more convincing in the present context than the choice of the symmetric equilibrium. We make two observations. First, if it is taken as a given that one retailer integrates backwards, then the supplier and the other retailer are *jointly* strictly better if that retailer does not integrate backwards, thereby not incurring the deadweight loss from the investment. Second, the two asymmetric equilibria are also "Pareto dominant" with respect to the symmetric equilibrium. That is, compared to the symmetric equilibrium, in an asymmetric equilibrium none of the three firms is made worse off but at least one firm is made strictly better off.¹⁶

¹⁵ It should be noted that for these results to hold it is inconsequential whether the "backwards integrated" retailer still purchases from the supplier, as envisaged in RBB's analysis, or whether this is no longer the case.

¹⁶ In the present application, where instead of playing some "anonymous game" suppliers and retailers are in constant contact, the choice of these superior outcomes, instead of those where money is left on the table, should be more natural than appealing to a criterion of "weak dominance" in strategies, as the RBB analysis seems to suggest. When it comes to choosing between the two asymmetric equilibria, a retailer's current size and position may in turn prove decisive.

5 TECHNICAL ANNEX

5.1 In this technical annex to Section 4, we will make the following assertions more formal.

- Claim 1) There exist asymmetric investment equilibria in RBB's model.
- Claim 2) These equilibria are "Pareto dominant" and thus present a more natural selection in the present context.

5.2 Ad Claim 1

- We can refer here to the payoff matrix on page 9 of RBB's note. Given symmetry, it is sufficient to establish that a Nash equilibrium exists in which chain A invests and chain B does not invest. Considering first chain A, a deviation is not optimal if

$$\pi_A(0, w_B^+) - F \geq \pi_A(w_A, w_B).$$

- Next, for chain B a deviation is likewise not optimal if

$$\pi_B(w_B^+, 0) \geq \pi_B(0, 0) - F.$$

- We show that both conditions hold. To see this, note first that from the arguments in the ACS' submission for sufficiently low F the supplier's offer will be optimally chosen so as to ensure that a retailer just realizes the respective value of his outside option. Consequently, we have that

$$\pi_B(w_B^+, 0) = \pi_B(0, 0) - F,$$

ensuring that condition () holds with equality. By the same argument, we have that

$$\pi_A(w_A, w_B) = \pi_A(0, w_B) - F.$$

5.3 To see that this implies that deviation is also not optimal for A, note first that for the derived profit functions it holds that $\partial\pi_A/\partial w_A < 0$ and $\partial\pi_A/\partial w_B > 0$, where w_A and w_B now represent generic values of the respective wholesale prices. Hence, it remains to show that $w_B^+ \geq w_B$. This is precisely the waterbed effect such that, consequently, the result follows immediately from the ACS submission.

5.4 Ad Claim 2

- We argue first that, as asserted in the main text, provided that one retailer, say A, invests, B and the supplier are jointly better off in case B does not invest. To see this, note first that from Claim 1 we know that B is in fact indifferent. It thus remains to show that the supplier strictly prefers that B does not invest. To see this, note first that if B invests as well, then the supplier's profits are simply equal to zero. Instead, if B does not invest, the supplier's profits are equal to $m_B w_B^+ > 0$, where $m_B^+ > 0$ is the

market share of B if A invests but not B and where $w_B^+ > 0$ is the then prevailing strictly positive wholesale price.

- We argue next that an asymmetric equilibrium leads to a Pareto-dominant outcome. By the previous remarks, it remains to show that the investing retailer, say again A, prefers at least weakly the asymmetric outcome. This is the case if $\pi_A(0, w_B^+) \geq \pi_A(0, 0)$ which even holds strictly.