

Bachelor Thesis

Most-favoured nation clause agreements

Price effects during a switch from a wholesale market to an agency market

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1. Introduction:

This paper provides an understanding on the price effects of a switch from an agency model to a wholesale model under the implementation of most favoured nation clause (MFN clause) agreements. Whereas the wholesale model implies that distributors purchase products from suppliers and sell these to customers against prices they determine, the agency model implies that suppliers set customer prices, whereby distributors receive a predetermined share of the revenues. A most favoured nation clause is an agreement in which a party guarantees a counter party equal or better trading terms as it uses with any other party.

The subject received little attention until 2011 when the European Commission initiated a case against Apple and four publishers. The case was about the establishment of retail-price most favoured nation agreements and the subsequent transformation from a wholesale model to an agency model in the e-book retail market. According to the European Commission (2013), the parties created illegal, anti-competitive retail price agreements for e-books with the application of most-favoured nation clause agreements. Due to the findings of the commission, the four publishers were forced to terminate the initiated agency agreements with Apple and all other retailers in the European Economic Area.

Until 2011, economic literature on MFN clause agreements focussed on pro- and anti-competitive effects, however no attention was drawn to the effects of MFN clause agreements during a switch between the different selling models. This paper therefore studies the impact of MFN clause agreements during a switch between the agency and wholesale model. The structure of the paper is as follows. First it provides an introduction to the e-book case, most-favoured nation agreements and the wholesale and agency model. The paper then compares the impact of simple supply and demand parameters on prices under the agency and wholesale model. Thereafter the relation between differentiation among competitors and price levels is explained. This relation is compared in a market where MFN clauses are in force to a market MFN clauses are not in force. The findings are eventually put into perspective to the e-book case.

2.1 The e-book case

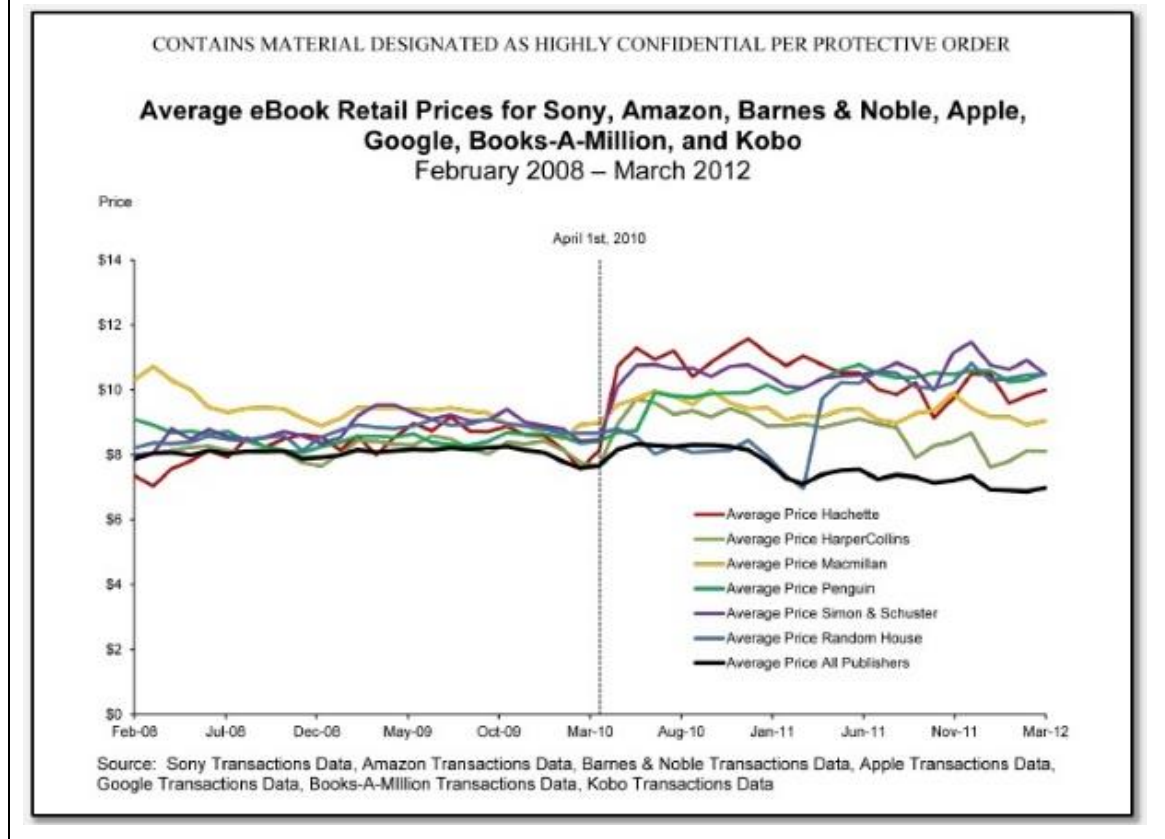
In December 2011, the European Commission started their investigations against Apple and four publishers of e-books, known as Hachette, Harper Collins, Holtzbrinck/Macmillan and Simon & Schuster. The concern of the commission was that Apple, together with the four publishers pursued anti-competitive agreements to raise the retail prices of e-books in the European Economic Area. According to the commission, the four publishers expressed each other's concern about the pricing strategy of the e-book retailer Amazon which possessed more than 90% market

share in 2009 (Maher, 2013). Amazon had set 9.99 USD as the standard price for new e-books. With this price, Amazon sold e-books with little, no or even negative mark-ups over the wholesale price. Publishers however often recommend retailers to sell e-books with a mark-up of a hundred percent. With Amazon's aggressive pricing strategy and market dominance, publishers were unable to enforce their desired price levels. To achieve control on enforcing higher price levels in the e-book market, the publishers intended to carry out a switch from the wholesale model in selling e-books to the agency model.

To achieve this aim, the four publishers have mutually agreed on key contract terms of selling e-books to Apple. These included a most favoured nation clause and the commission level paid to Apple. The MFN clause implied that publishers would have to match prices in Apple's iBookstore to the lowest prices in the market. This set-up would have resulted in significantly lower revenues for publishers if other retailers were to continue offering e-books at the prevalent price levels. As such, it provided publishers a better bargaining position to force retailers to switch from the wholesale model to the agency model. According to the commission's view, Apple's goal was to be able to enter the e-book market under prevalent price levels, while still achieving a favourable margin. Apple was aware that its interest and the interest of the publishers could be served with a joint switch from the agency model under the application of an MFN clause agreement. By initiating MFN clause agreements, Apple therefore took a coordinative function in creating a joint commitment device among publishers to force existing e-book retailers to switch to the agency model. Retailers which would not accept the desired conversion to the agency model were at risk to be denied to the e-book portfolio of the publishers. After closing agreements with Apple, the four publisher communicated the intention to switch to the agency model to other retailers. Amazon at first instance denied to switch to the agency model. As consequence, e-books of the four publishers were temporarily unavailable in Amazon's e-book store. Shortly after, Amazon accepted the new selling terms of the four publishers. Following the switch from the agency model to the wholesale model, e-book price levels of all four publishers increased (see figure 1).

As consequence of the commission's assessment that the agreement between Apple and the four publishers were illegal and anti-competitive, the publishers committed themselves to terminate the existing agency agreements with all retailers. For a cooling-off period of two years publishers also committed to refrain from any attempts to restrict, limit or impede any retailer's ability to set, alter or reduce prices of e-books. Furthermore they also committed themselves to refrain from contracting e-book retailers using any sort of most favoured nation clause for a period of five years.

Figure 1: A graph created by the US Department of Justice to show how e-book prices rose following the introduction of Apple's iBookstore. Source: Brodtkin (2013).



2.2 The most favoured nation clause

The term 'most favoured nation clause' originates from the context of trade policies between different nations. The OECD (2004) defines most-favoured nation clauses follows: 'To provide MFN treatment under investment agreements is generally understood to mean that an investor from a party to an agreement, or its investment, would be treated by the other party 'no less favourably' with respect to a given subject-matter than an investor from any third country, or its investment.'

In contract law as it applies in this paper, a most favoured nation clause (also known as most-favoured customer clause) is an agreement in which a party guarantees a counter party equal or better trading terms as it uses with any other party.

Past research describes both, pro-competitive and anti-competitive, effects of MFN clauses. Salop and Morton (2013) provide a review on the relevant academic literature, which is summarised in this section.

A pro-competitive effect is that MFN clauses can serve to reduce the hold-up problem and thereby encourage investment. The hold-up problem can exist when a party makes relationship-specific

investments to trade with a counterparty. After relationship-specific investments have been made, the counterparty could exploit the investing party by worsening its terms of trade. As consequence relationship-specific investments could be withheld, even if they were profitable given that there was no exploitation of the investing party. MFN clauses can provide an insurance to the investing party that the counterparty won't worsen its terms of trade compared to other parties and thereby stimulate investment. Customer prices may be lowered through additional investment, for instance due to lower production costs or a larger product choice. A second economic rationale for MFN clause agreements is the reduction of delayed transactions. Often prices are expected to decrease over the time a product is offered on the market. For some buyers it may be attractive to wait for discounted prices. With retroactive MFN clauses, customers could be reimbursed for any subsequent price decreases. Thereby incentives to delay transactions can be lowered. Especially with new products that have large economies of scale, a faster adoption of the product can be beneficial to the customer as sellers can decrease prices quicker through accelerated cost decreases. Another pro-competitive effect of MFN clause agreements is the reduction of transaction costs. A MFN clause enables a buyer to receive the best offers of the seller, without the need of costly (re)negotiations. Transaction costs are reduced and transactions, which had otherwise not happened due to costs of negotiations, can be made.

Economic literature also investigated various anti-competitive effects of MFN clauses. One is the facilitation of price coordination. Concluding a MFN clause agreement with a party makes it more costly for sellers to offer discounts to other parties. MFN clauses thereby commit suppliers to pursue less aggressive pricing strategies. An industry with competition that is of strategic complementary nature will experience dampening competition. Less aggressive suppliers which offer MFN clauses stimulate competitors to act less aggressive as well, leading to higher price levels for buying parties. Another anti-competitive effect is that MFN clause agreements can be used to prevent entrance into markets and to constraint existing competitors in expanding their market shares. Firms are limited in their ability of attracting customers from competitors through aggressive pricing strategies when competitors have offered their customers MFN clauses. A third anti-competitive effect can be increased sellers' bargain power, which is linked to the pro-competitive effect of reducing delays in transactions. While prices of products usually decrease during their life cycle, giving retroactive MFN clauses to buyers provides incentives to avoid price cuts as these decrease previous profits.

The above shows that economic literature does not offer a clear cut answer on the effects MFN clause agreements on customer prices and that its effects need to be examined in each market situation individually.

2.3 Introduction to the wholesale and agency model

The wholesale model implies that suppliers sell products to distributors or retailers against wholesale prices. The distributors are then free to determine an own pricing strategy towards the customer. The wholesale model enables distributors to pursue different pricing strategies to drive out competitors. A possible strategy is to initiate a price war, also known as ‘deep pocket argument’ (Telser, 1966). Another strategy is setting prices at sufficiently low levels to prevent new entrants to join the market, also known as ‘limit pricing’ (Milgrom and Roberts, 1982). To suppliers, the wholesale model can be beneficial and detrimental. On the one hand they can benefit for instance from price wars of retailers, which create positive externalities on their sales. On the other hand, they may suffer from retailers gaining market power and becoming too dominant. Also for customers, there are advantages and disadvantages related to the wholesale model. On the one hand it encourages differentiation among downstream firms by enabling for instance low cost or premium strategies. On the other hand the wholesale model may yield too high price levels from an overall welfare perspective as consequence of the double marginalization problem. Section 3 of this paper elaborates the double marginalization problem more in-depth.

Under the agency model, distributors or retailers act as selling agents of suppliers. Suppliers determine the price customers will pay, while distributors receive a predetermined share of the sales as commission. Distributors compete indirectly against each other through the level of commission agreed upon with the supplier. Section 3 of this paper shows the effect of the commission on the pricing decision of suppliers.

3. Effects of the wholesale and agency model on prices

The following section provides an equilibrium comparison between the wholesale and agency model under the application of simple demand and supply functions. To put the results into perspective they are compared to the outcome of a model with only one monopolist firm who is producing and selling a product. The results show what impact parameters of simple supply and demand have on customer prices during a switch from the wholesale model to the agency model. The findings of this section are used in section 5 when investigating the effects of MFN clause agreements during a switch between both models.

3.1 Introduction to the equilibrium model

For the agency and wholesale market, a model with one upstream firm (supplier) and one downstream firm (retailer) is applied. The supplier produces a good against constant marginal costs ‘ c ’, and customer demand is represented by the function ‘ $p = a - bx$ ’. For simplification matters it is assumed that the downstream firm incurs no additional costs from selling the product. Under the wholesale

model, the supplier sells its products to the retailer against wholesale price 'w'. The retailer sets price 'p_w', against which it sells the equilibrium quantity 'x_w' to customers. Under the agency model, the upstream firm sets price 'p_A' and sells an equilibrium quantity 'x_A' through the retailer. The supplier receives an exogenously agreed upon revenue share 'r', whereas the retailer receives a share equal to '1-r'. To put the outcomes into perspective, the equilibrium outcome in a monopoly selling model is derived. In such a market, there is one monopoly firm that produces and sells the good. In the monopoly market marginal production costs again equal 'c' and the customer demand is represented by the function 'p = a - bx'. In equilibrium the monopolist sells quantity 'x_M' against the price 'p_M'. The following quantity equilibria are derived (see 10.1 in the appendix):

$$x_W = \frac{a - c}{4b}$$

$$x_A = \frac{ar - c}{2br}$$

$$x_M = \frac{a - c}{2b}$$

From the aforementioned quantities, the following equilibrium prices can be calculated (see 10.1 in the appendix):

$$p_W = \frac{3a + c}{4}$$

$$p_A = \frac{ar + c}{2r}$$

$$p_M = \frac{a + c}{2}$$

3.2 Results

Observation 1: Prices charged in the agency and wholesale model are above the monopoly level, thus the following holds:

$$p_A > p_M ; p_W > p_M$$

Under the agency and the wholesale model, prices charged are above and quantities sold below the monopoly level. There are different causes for this outcome in both markets.

The wholesale model yields higher customer prices than the monopoly model due to the 'double marginalisation problem'. The double marginalization problem was, among the first, analysed by Sprengler (1950) and implies that a vertically integrated firm may ask lower retail prices as compared to a market with a separate up- and downstream firm. He argues that vertically disintegrated firms do

not take into account the (negative) externalities they impose on their counter trading partner when setting prices. As result, prices set by both firms are higher than the industry profit maximising level.

The reason that the agency model yields higher customer prices than the monopoly market lays in the fact that the revenue sharing mechanism imposes artificial costs on the supplier. The share of revenues which is attributed to the distributor forms part of the perceived selling costs. As consequence of higher perceived selling costs, the equilibrium quantity will be lower and the price higher as compared to the monopoly outcome. The higher the revenue share 'r', the lower are the perceived marginal costs of the supplier firm in the agency model. As perceived marginal cost strive towards the actual costs 'c', implying that 'r' strives towards 1, the equilibrium price tends towards the monopoly level. If in turn, the upstream and downstream firm would agree on a fixed transfer, rather than revenue sharing, the equilibrium price in an agency market would equal the monopoly price. This is due to the fact that the equilibrium quantity is derived from marginal and not fixed selling costs.

Observation 2: Increased demand leads to stronger price increases in the wholesale model as compared to the agency model, thus the following holds:

$$\frac{\delta p_W}{\delta a} > \frac{\delta p_A}{\delta a}$$

A characteristic difference between the equilibria of the agency and wholesale model is that under the wholesale model, price changes are more sensitive to shifts in the demand curve (represented by changes in 'a') than under the agency model. The reason behind this is that when demand increases in a wholesale market, both firms are able to increase their price. Prices will be increased by the supplier and retailer, regardless on the negative externalities caused to the other party. Under the agency model, assuming the revenue share is fixed and unaffected by changes in demands, only the supplier is able to adjust its price. Hence demand increases will result in less excessive price increases under the agency model as compared to the wholesale model.

Observation 3: Increased marginal production costs lead to stronger price increases in the agency model as compared to the wholesale model, thus the following holds:

$$\frac{\delta p_A}{\delta c} > \frac{\delta p_W}{\delta c}$$

Another remarkable difference is that in the agency model prices are more sensitive to the marginal costs 'c'. The reason is that under the applied demand formula, unless demand is fully inelastic or supply fully elastic, cost increases will never be fully passed on to the buying party. Under the wholesale model, the supplier therefore will not fully incorporate cost increases in its wholesale prices. Also the retailer will not pass on the entire wholesale price increases to customers. Cost increases are

thus dampened by the supplier and retailer in the wholesale market. Under the agency model only the upstream firm has the ability to adapt its prices with increased costs. As consequence, the price dampening effect of the retailers only partly passing on increased wholesale prices is not present in the agency market.

Finding: In markets with relatively low marginal costs compared to the reservation prices of customers, the agency model is more likely to yield lower customer prices compared the wholesale model.

The finding follows from observation two and three. To investigate under which conditions a switch from the wholesale model to the agency model yields lower customer prices, the breakeven point of the price equilibrium between both markets with regard to the revenue share ('r') received by the supplier is derived. Thereby it is assumed that the reservation price of customers ('a') and marginal production costs ('c') remain constant. Setting the equilibrium price under the wholesale model ('p_W') equal to the equilibrium price under the agency model ('p_A') and solving for 'r' yields the following result:

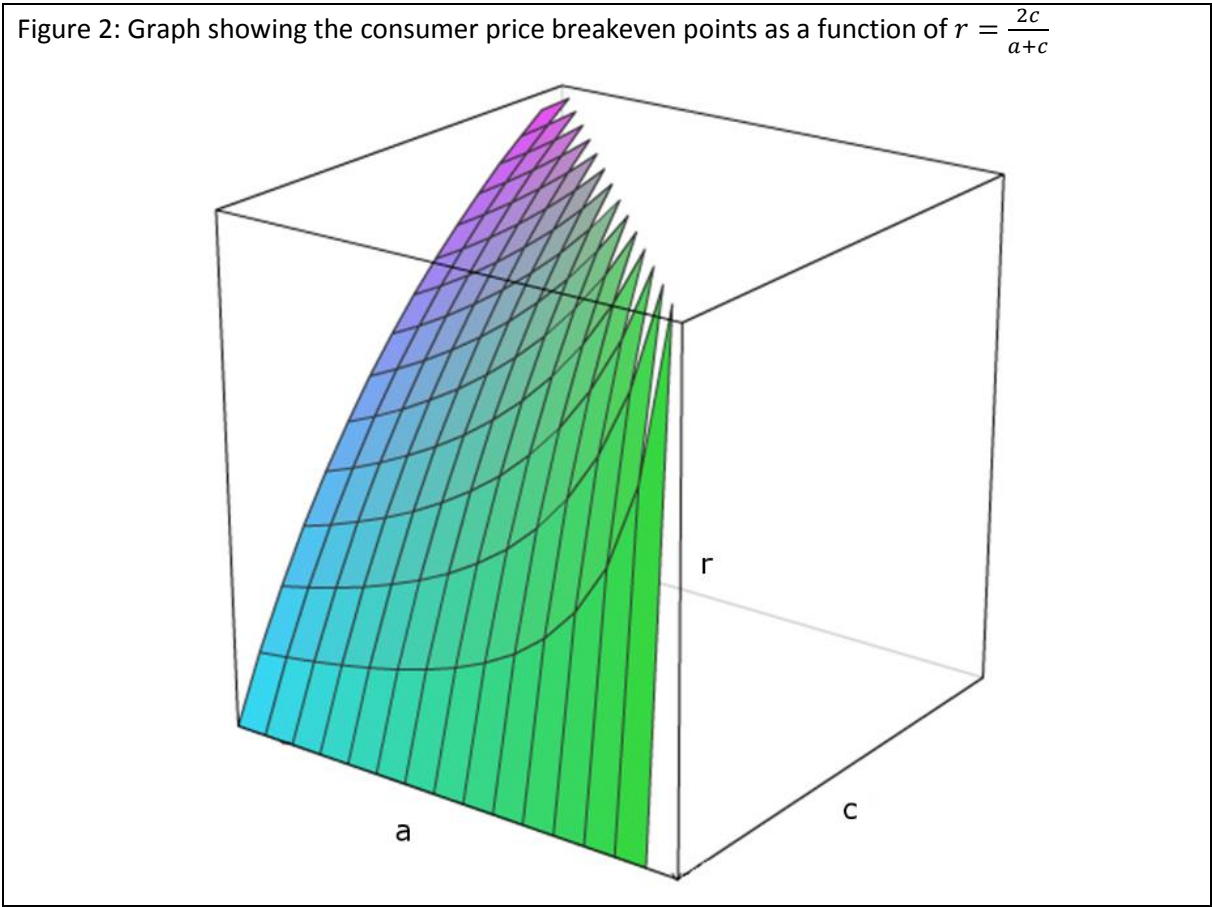
$$r = \frac{2c}{a + c}$$

A graphical representation of the function is shown in figure 2. Its surface represents the customer price breakeven points in the wholesale and agency model. The space above the function is the area in which the agency model results in lower customer prices as compared to the wholesale model. The space below the function is the area in which the wholesale model is favoured compared to the agency model from a customer price perspective. The graphical pattern of the function shows that the higher the marginal costs 'c' and lower the reservation price of customers 'a', the higher is the required revenue share of suppliers in order for the agency model to yield lower customer prices as compared to the wholesale model. Vice-versa, the lower the marginal costs and the higher the reservation price of customers, the lower is the required revenue share of suppliers in order for the agency model to yield lower customer prices.

One can apply the finding of the simplified model also to markets with more suppliers and retailers firms. The finding bases on observations two and three which result from the fact that under the agency model only suppliers are able to set prices whereas under the wholesale model both, suppliers and retailers are able to do so. This remains existent in markets with more up- and downstream firms.

The preceding section shows that whether a switch from a wholesale to an agency model results in lower customers prices depends on the reservation price of customers, marginal costs and the agreed-upon revenue share under the agency model. The following section shows the effects of differentiation

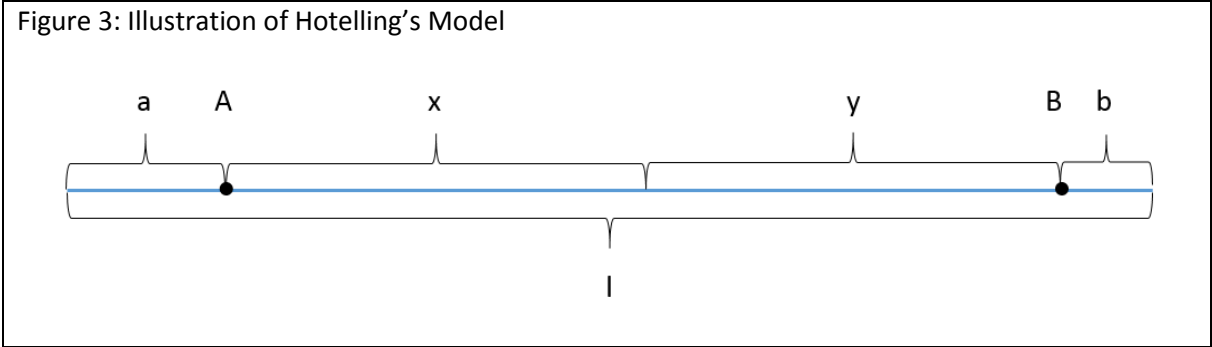
among upstream and downstream firms on the price levels, which will be applied to both selling models in the subsequent section.



4. The effect of differentiation on prices – application of Hotelling’s Model

Hotelling (1929) investigates the effects of differentiation among competitors on prices. Hotelling’s Model can be illustrated as follows. Buyers of a product are uniformly distributed among a line with length ‘l’. The line represents the values of a differentiating attribute. The buyers’ location represents their most preferred value of the attribute. There are two sellers located on the line. The sellers’ location represents their value of the attribute. The distance from a buyer’s location and the seller can be understood as in how far the seller’s attribute matches the buyers’ preferences. Each unit of distance causes transportation cost ‘d’ to the buyer, which is the disutility resulting from the fact that the seller’s attribute does not match the buyer’s preference. Buyers always purchase one unit of the standardised good at either of both sellers, demand is thus fully inelastic. When buyers purchase a standardised product at a seller, they choose based on the price of the product and their preferences regarding the seller. Assume that seller ‘A’ is located at ‘a’ and seller ‘B’ at ‘l-b’, whereby ‘l-a-b≥0’ (see figure 3). Given equal prices, buyers will maximise their utility by purchasing at the seller which’s differentiation will be the closest to the buyers’ preferred level. In this case all buyers on the left side

of 'A' will purchase at 'A' and all buyers on the right side of 'B' will purchase at 'B'. Buyers situated on the left half side between 'A' and 'B' will purchase at 'A' and the buyers on the right half side will purchase at 'B'.



Following the calculations of Hotelling's Model (see appendix), the following prices are charged by both sellers, whereas 'p₁' represents the price charged by seller 'A' and 'p₂' the price charged by seller 'B':

$$p_1 = d * \left(l + \frac{a - b}{3} \right); p_2 = d * \left(l - \frac{a - b}{3} \right)$$

One can observe that prices positively depend on the total extend of differentiation, 'l', and the measure of how strong buyers value differentiation, 'd'. Differentiation is perceived by buyers as a product of two factors. The first factor is the spatial distance between actual and preferred level of the differentiating attribute, which depends on the total extend of differentiation 'l' given that 'A' and 'B' are fixed. The second factor, 'd', transforms spatial distance between preferred and actual level of differentiation into utility of the buyer.

The reason for this observation is that differentiation allows sellers to lock-in buyers which are located close to them. Switching the seller creates high disutility for buyers which perceive the differentiation of their seller to be very close to their own preferred level, however very far from the other seller. When attracting buyers from competitors, sellers need to compensate buyers for the decreased utility caused by the switch. The more differentiated sellers are and the more disutility deviating differentiation causes, the higher the required price discount to attract the same number of buyers from the competitor. In high differentiated markets, where buyers can difficultly be attracted with price discounts, prices are likely to be relatively high. Vice versa, in less differentiated markets, buyers can easily be attracted with price decreases and price levels are likely to be low.

Note that it is also possible for a seller to undercut the competitor completely. For this to occur, the price difference would need to compensate for just more than the distance between the location of seller 'A' and 'B'. In such a case all buyers of the market would be attracted by one seller. A requirement

is that sellers are able and willing to sufficiently lower the price to compensate for the distance between A and B.

An assumption of the interpretation is that locations of sellers are fixed. If 'A' and 'B' were free to move in location, each would move as close to the other seller as possible in order to capture buyers located in the intermediate space between them. A limitation of the Hotelling's model is thus that high differentiation is unstable as parties will move towards each other. Eventually they will concentrate at the same point implying that there is no differentiation. This tendency is known as the Principle of Minimal Differentiation.

d'Aspremont, Gabszewicz & Thisse (1979) criticised Hotelling's Principle of Minimal Differentiation as, when sellers are sufficiently close to each other, no stable equilibrium can exist as either of the sellers would undercut the other seller's price to capture the entire market. d'Aspremont adjusted the Hotelling's Model and replaced linear transportation costs by quadratic transportation costs. With this assumption there is a stable equilibrium for all locations of sellers. Another observation is that sellers choose for maximum differentiation instead of minimal differentiation, implying that also an industry with high differentiation can be regarded as stable. Following d'Aspremont when evaluating the competitive nature of an industry it is not required to assume that the observed levels of differentiation and mark-ups will decrease by natural force.

Another assumption underlying Hotelling's Model is inelasticity of demand. When this assumption is relaxed, Hotelling (1929) suggests that most parts of his findings will remain qualitatively true. Smithies (1941) included a linear demand function in Hotelling's Model. He argues that the tendencies to move towards the centre is lessened under elastic demand. This is due to the fact that when moving towards the competitor, the loss of buyers at the edge of the market may at some point outweigh the benefit of gaining buyers in the intermediate space. Following this argumentation one can also argue that the tendency of moving towards the edge of the markets as proposed under quadratic transportation costs by d'Aspremont et al. (1979) is lessened. This is because buyers in the intermediate space of the market are lost when moving towards the edge. At a certain point the loss of buyers from the intermediate space of the market outweighs the gain of buyers on the edge of the market. Elasticity can thus weaken the incentives for sellers to move completely to concentrate at the same point as under Hotelling or completely move to the edges under d'Aspremont et al. Yet elastic demand does not imply that the models become qualitatively invalid. Besides having an impact on incentives to adjust positions in the market, one can also argue that elasticity has an impact on the mark-up due to differentiation. Given equal positions of sellers in a market which is elastic and in a market which is inelastic, one can expect lower mark-ups in the elastic market. Under the presence of elasticity, when increasing the mark-up,

seller must not only be aware of buyers switching to the competitor, but also of buyers leaving the market.

Having explained the relation between mark-ups and differentiation in a market, the following section investigates how this relation differs under the wholesale and agency model.

5. Mark-ups under the wholesale and agency model

Under the wholesale model suppliers and distributors are both able to set a mark-up on prices due to differentiation. For the supplier this mark-up is the difference between wholesale price and marginal costs. The mark-up of the retailer absent marginal costs from selling the product is the difference between the selling price and the wholesale price.

Under the agency model the situation is different. Johnson (2014) argues that in contrast to the wholesale model, the revenue sharing mechanism of the agency model does not allow the supplier to fully capture the revenues resulting from mark-ups due to differentiation. While distributors receive the full revenues due to their differentiation, suppliers firms have to attribute parts of their revenues due to differentiation to distributors. This is illustrated by the following model used by Johnson (2014). Let the mark-up over costs due to differentiation be defined by ' α '. The mark-up of the supplier, the upstream firm, is labelled ' α_U ', whereas the mark-up of the distributor, the downstream firm, is labelled ' α_D '. The revenue share attributed to the upstream firm is labelled ' r ' and marginal cost faced by the same firm is ' c '. The price which will be charged to the buyer is ' P '. The perceived marginal costs of the upstream firm consist of marginal costs ' c ' and the part of the revenues which has to be attributed to the downstream firm. The difference between marginal costs ' c ' and the perceived marginal costs represents the mark-up of the downstream firm due to differentiation. It is represented by following expression: ' $\alpha_D = \frac{c}{r} - c$ '. The mark-up of the upstream firm can be written as follows ' $\alpha_U = P - \alpha_D - c$ ', which simplifies to ' $\alpha_U = P - \frac{c}{r}$ '. The overall mark-up due to differentiation equals ' $P - c$ ' or ' $\alpha_D + \alpha_U$ '. Unlike under the wholesale model, the upstream firm does not receive the marginal costs and its mark-up due to differentiation, which would be ' $\alpha_U + c$ ' but it receives only a part of its mark-up due to differentiation with the marginal costs, which is ' $r * \alpha_U + c$ ' (see appendix 10.3 for the calculation). The downstream firm in turn does not only receive its mark-up due to differentiation, ' α_D ', as in the wholesale model, but also a share of the mark-up due to differentiation of the upstream firm, ' $\alpha_D + (1 - r) * \alpha_U$ '. Part of the revenues generated through upstream firms' differentiation are thus attributed to downstream firms. The agency model thus transfers part of upstream firms' surplus due to differentiation to downstream firms. The higher the differentiation among upstream firms the higher the revenue received by downstream firms for each unit sold. Unless the demand is perfectly elastic or supply is perfectly inelastic it is optimal for downstream firms to pass on some of the revenue

received through upstream firms' differentiation to buyers. Downstream firms are able to do so by increasing the revenue share the supplier receives in order to induce lower prices. As opposed to the wholesale model, buyers thus not have to pay for the full surplus of upstream firms' differentiation.

The previous section shows that the agency model transfers part of the surplus of upstream firms' differentiation to downstream firms and buyers. From a welfare perspective the findings imply that upstream differentiation yields to lower mark-ups under the agency model as compared to the wholesale model.

6. Mark-ups under the wholesale and agency model under the presence of MFN clause agreements

While buyers benefit from the transfer of part of the upstream firm's differentiation to the downstream firm and eventually to them under the agency model without the presence of MFN clause agreements, this effect is not present when a MFN clause agreement is in force.

In an agency market without MFN clauses, by adjusting the revenue share received by suppliers, distributors can indirectly influence the price buyers need to pay. By decreasing the revenue share of the supplier, the increase in perceived marginal costs induces suppliers to raise prices and vice-versa. If a distributor increases its revenue share for the supplier, it can attract additional demand from other distributors firms through lower prices it induced.

Assume a market in which distributors are little differentiated. Lock-in effects of customers that prevent them from switching the distributor are hardly present. As consequence, under the absence of MFN clause agreements, excessive price competition and low margins among distributors are likely. Under the wholesale model, this implies that distributors sell products with low mark-ups over the wholesale price. Under the agency model, this implies that distributors offering high revenue shares to suppliers in order to induce lower prices for buyers.

The MFN clause agreement under the agency model implies that retail prices set by suppliers are equal among all distributors. Incentives for distributors to compete in revenue shares are eliminated absent a relation between the revenue share and price. In such a situation, MFN clause agreements would restrict competition among distributors in an agency model and lead to lower revenue shares offered to suppliers. As consequence prices are likely to increase in markets with low margins of distributors when MFN clause agreements are initiated.

In contrast to the previous situation, MFN clause agreements can also result in lower prices for buyers. Assume a market in which distributors are highly differentiated and where customers face strong lock-in effects. Strong lock-in effects induce low price competition among distributors and hence high margins. Under the wholesale model this implies that distributors sell products with excessive mark-

ups over the wholesale price. Under the agency model it implies that distributors have an incentive to induce high price levels for buyers and hence offer low revenue shares to suppliers. Low revenue shares yield to higher perceived marginal costs and hence to higher prices for buyers. A MFN clause agreement under the agency model implies that suppliers are no longer able to increase prices with lower revenue shares. Agreeing on low revenue shares becomes even more harmful for suppliers and hence will an MFN clause agreement improve their bargaining position towards retailers. As consequence one can expect higher revenue shares of suppliers under the presence of MFN clause agreements. MFN clause agreements hence restrict the ability of distributors to charge high premiums from buyers and lead to higher revenue shares of suppliers. As consequence prices are likely to in markets with high margins of distributors when MFN clause agreements are initiated.

When MFN clause agreements are used during a switch from a wholesale to an agency model, it is thus important to analyse the competitive environment on the distributor level before the switch took place. In case price competition on the downstream level was very fierce, a MFN clause likely has an anti-competitive effect that leads to higher price levels following the switch. If price competition on the downstream level was low, a MFN clause can have a pro-competitive effect due to a better bargaining position of suppliers, which leads to higher revenue shares of suppliers and lower prices.

7. Application of findings to the e-book case

In this section the previous findings are applied to the e-book case introduced in section 2.1.

Section 3 shows that the agency model does per se result in higher prices for buyers. Given certain circumstances as relatively low marginal costs compared to the reservation prices of buyers and high revenue shares of suppliers, the agency model is expected to yield lower prices as compared the wholesale model. The results of section 3 appear particularly interesting in the e-books market as the reproduction of electronic content causes practically no marginal costs. When authors receive a share of the sales, perceived production costs of suppliers are increased. Nevertheless, one may expect that marginal production costs in the e-book market are relatively low compared to reservation prices of buyers. As result the agency model could result in lower prices as compared to the wholesale model.

Section 6 shows that a switch to the agency model with the use of MFN clause agreements may be problematic if it suppresses price competition on the distributor level. As mentioned earlier in this paper, before the switch to the agency model, the e-book market was characterised by excessive retail price competition initiated by Amazon, which sold e-books often with low or negative margins. With the switch to the agency model using a MFN clause agreement, such retail price competition was eliminated. This can be an explanation of the steep price increase of e-books offered by publishers following the switch to the agency model as to be seen in figure 1. One can also observe the

suppression of competition in the share of the retail price which retailers received. Whereas the margins beforehand were often zero or negative, they rose to 30% of the retail prices of e-books. One can conclude that application of MFN clause agreements had strong anti-competitive effects in the e-book market by eliminating price competition among retailers.

The commitment of the publishers to not only terminate all MFN clause agreements but also to terminate all agency agreements can be questioned. With the elimination of MFN clause agreement one may expect that prices are adjusted as retailers have incentives to induce suppliers to lower retail prices by offering higher revenue shares. If the e-book market would lead to lower price levels when the agency model is in place it appears reasonable to force publishers and retailers to terminate MFN clause agreements and to prohibit contractually fixed revenue shares, however not to force them to adopt the wholesale model. A reason why the commission has imposed the termination and prohibition of all agency agreements may lay in the fact that publishers did not have sufficient interest in lower retail prices. Even with fierce competition among retailers and resulting higher revenue shares, suppliers may not have been tempted to lower retail prices sufficiently. A reason for this could be that low e-book retail prices have a negative cross-price elasticity with paper books. Yet an option could have been to only dissolve present MFN clause agreements, to allow retailers to renegotiate revenue shares and observe the effect of this measure on retail prices. Should the aspired price decrease not be achieved through such a measure, the termination of agency agreements can be imposed as second step. If the e-book market was to lead to lower prices under the agency model the European Commission would have had opportunity to reveal such.

8. Concluding remarks

This paper provides the reader an introduction into the wholesale and agency model as well as the impacts of MFN clause agreements. It provides a starting point when analysing markets from a welfare perspective during a switch from the wholesale model to the agency model under the application of MFN clause agreements. It shows that a switch from the wholesale to the agency model is not per se harmful for buyers, even under the application of MFN clause agreements. Which selling model is better from a welfare perspective depends on demand and supply variables as marginal costs or the reservation price of buyers. Whether a MFN clause agreement is harmful depends on the competitive environment among retailers.

9. Sources

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10. Appendix:

10.1 Wholesale model with one upstream and one downstream firm

Demand, revenue, profit and cost functions of downstream firm:

$$P = a - bx$$

$$R = ax - bx^2$$

$$MR = a - 2bx$$

$$\pi_{DW} = x * (p - w)$$

$$MC = w$$

The downstream firm sets profit maximising p^* such that marginal revenues equals marginal costs, hence: $MR = MC$. Solving this equation yields the following profit maximising quantity x^* and the profit maximising price p^* :

$$x^* = \frac{a - w}{2b}$$

$$p^* = \frac{a + w}{2}$$

Profit function of upstream firm:

$$\pi_{UW} = x * (w - c)$$

$$\pi_{UW} = \frac{a - w}{2b} * (w - c)$$

$$\pi_{UW} = \frac{aw - w^2 - ac + wc}{2b}$$

First order condition, to maximise profit:

$$\frac{d\pi_{UW}}{dw} = \frac{a - 2w + c}{2b}$$

$$\frac{d\pi_{UW}}{dw} = 0$$

$$\frac{a - 2w + c}{2b} = 0$$

In equilibrium the profit maximising wholesale price equals:

$$w^* = \frac{a + c}{2}$$

Inserting w^* into x^* and p^* yields the following profit maximising quantity and price:

$$x_W = \frac{a - c}{4b}$$

$$p_W = \frac{3a + c}{4}$$

Inserting x_W and p_W and the wholesale price into the profit functions of the downstream and upstream firms yields the following results:

$$\pi_{UW} = \frac{a - c}{4b} * \left(\frac{a + c}{2} - c \right)$$

$$\pi_{UW} = \frac{(a - c)^2}{8b}$$

$$\pi_{DW} = \frac{a - c}{4b} * \left(\frac{3a + c}{4} - \frac{a + c}{2} \right)$$

$$\pi_{DW} = \frac{(a - c)^2}{16b}$$

Agency model with one upstream and one downstream firm

Demand, revenue and cost functions of upstream firm:

$$P = a - bx$$

$$R = ax - bx^2$$

$$MR = a - 2bx$$

$$TC = xc + xP * (1 - r)$$

$$MC = \frac{\delta TC}{\delta x}$$

$$MC = a - ar - 2bx + 2bxr + c$$

The upstream firm sets the profit maximising price such that marginal revenues equals marginal costs, hence: $MR = MC$. Solving this equation yields the following profit maximising quantity and the profit maximising price:

$$x_A = \frac{ar - c}{2rb}$$

$$p_A = \frac{ar + c}{2r}$$

With an increasing revenue share, the optimal quantity sold increases as the following term is strictly larger than 0, for r between 0 and 1:

$$\frac{\delta x_A}{\delta r} = \frac{c}{2br^2}$$

With an increasing revenue share, the optimal price charged decreases as the following term is strictly lower than 0, for r between 0 and 1:

$$\frac{\delta p_A}{\delta r} = -\frac{2c}{4r^2}$$

Derivation of the profit function of upstream firm:

$$\pi_{UA} = r * x * p - x * c$$

$$\pi_{UA} = r * \frac{ar - c}{2rb} * \frac{ar + c}{2r} - \frac{ar - c}{2rb} * c$$

$$\pi_{UA} = \frac{a^2r^2 - 2acr + c^2}{4rb}$$

Derivation of the profit function of downstream firm:

$$\pi_{DA} = (1 - r) * \frac{ar - c}{2rb} * \frac{ar + c}{2r}$$

$$\pi_{DA} = \frac{a^2r^2 - c^2 - a^2r^3 + c^2r}{2br^2}$$

Selling model with one monopolist

The following demand and cost functions hold for a situation in which there are only costs in producing the good (equal to c) and no distribution costs:

$$P = a - bx$$

$$R = ax - bx^2$$

$$MR = a - 2bx$$

$$MC = c$$

The monopoly firm sets the profit maximising price such that marginal revenues equals marginal costs, hence: $MR = MC$. Solving this equation yields the following profit maximising quantity and the profit maximising price:

$$x_M = \frac{a - c}{2b}$$

$$p_M = \frac{a + c}{2}$$

10.2 Hotelling's Model

For the introduction of the model and the variables please read section 4 of this paper. There is a point at which the buyer is indifferent between purchasing at A or B. This point is where the following holds:

$$p_1 + dx = p_2 + dy$$

Another equation that holds is:

$$a + x + y + b = l$$

Solving for 'x' and 'y' one finds:

$$x = 0,5 * \left(l - a - b + \frac{p_2 - p_1}{d} \right)$$

$$y = 0,5 * \left(l - a - b + \frac{p_1 - p_2}{d} \right)$$

Derivation of the profits of A and B:

$$\pi_1 = p_1 * q_1$$

$$\pi_1 = p_1 * (a + x)$$

$$\pi_1 = p_1 * \left(a + 0,5 * \left(l - a - b + \frac{p_2 - p_1}{d} \right) \right)$$

$$\pi_1 = 0,5 * (l + a - b) * p_1 - \frac{p_1^2}{2d} + \frac{p_1 * p_2}{2d}$$

$$\pi_2 = p_2 * q_2$$

$$\pi_2 = p_2 * (b + y)$$

$$\pi_2 = p_2 * \left(b + 0,5 * \left(l - a - b + \frac{p_1 - p_2}{d} \right) \right)$$

$$\pi_2 = 0,5 * (l - a + b) * p_2 - \frac{p_2^2}{2d} + \frac{p_1 * p_2}{2d}$$

Derivation of the profit maximising prices of A and B:

$$\frac{\delta\pi_1}{\delta p_1} = 0,5 * (l + a - b) - \frac{p_1}{d} + \frac{p_2}{2d} = 0$$

$$\frac{\delta\pi_2}{\delta p_2} = 0,5 * (l - a + b) + \frac{p_1}{2d} + \frac{p_2}{d} = 0$$

Results of the profit maximising prices of A and B:

$$p_1 = d * \left(l + \frac{a - b}{3} \right)$$

$$p_2 = d * \left(l - \frac{a - b}{3} \right)$$

Both solutions are subject to the constraint that 'd*(l-b-a)' is smaller than the difference between 'p₁' and 'p₂'. If this constraint is violated the firm with the lower price will receive the entire market share, which can result in a different optimal reaction of the competitor.

10.3 Differentiation mark-ups under the agency model

Downstream firm's mark-up 'α_D' is defined as $\alpha_D = \frac{c}{r} - c$. Upstream firm's mark-up 'α_U' is defined as 'α_U = P - α_D - c'.

Simplification of the term 'α_U = P - α_D - c':

$$\alpha_U = P - \alpha_D - c$$

$$\alpha_U = P - \left(\frac{c}{r} - c \right) - c$$

$$\alpha_U = P - \frac{c}{r}$$

Derivation of the revenue the upstream firm receives:

$$R_U = P * r$$

$$R_U = (\alpha_D + \alpha_U + c) * r$$

$$R_U = \alpha_D r + \alpha_U r + cr$$

$$R_U = \left(\frac{c}{r} - c \right) * r + \alpha_U r + cr$$

$$R_U = c - cr + \alpha_U r + cr$$

$$R_U = \alpha_U r + c$$

Derivation of the revenue the downstream firm receives:

$$R_D = P * (1 - r)$$

$$R_D = (\alpha_D + \alpha_U + c) * (1 - r)$$

$$R_D = (\alpha_D + \alpha_U + c) * (1 - r)$$

$$R_D = \left(\frac{c}{r} - c + \alpha_U + c \right) - \left(\left(\frac{c}{r} - c \right) * r + \alpha_U r + cr \right)$$

$$R_D = \frac{c}{r} - c + \alpha_U + c - (c - cr + \alpha_U r + cr)$$

$$R_D = \frac{c}{r} - c + \alpha_U + c - c - \alpha_U r$$

$$R_D = \frac{c}{r} - c + \alpha_U - \alpha_U r$$

$$R_D = \alpha_D + (1 - r) * \alpha_U$$