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Bundling in the Television Market

Who will benefit the most from á-la-carte channel choice in the Norwegian television market?

By

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Abstract

I present the basic bundling models and relate the framework to the multichannel television market. These models all suggest that the á-la-carte policy would transfer surplus from firms to consumers, but I argue that these models cannot be directly applied on the television market for several reasons. Therefore I also present two more recent market specific models in order to measure the welfare outcomes of á-la-carte for the distributors, channels and consumers more accurately. I present respectively the Cullen & Crawford (2007) and the Crawford & Yurukoglu (2011) industry models. The second of these models is the most realistic and I therefore base my conclusions on this model.

The two market specific models were both tailored for the US market, and it is therefore necessary to compare the US and Norwegian markets to identify differences. I find that the markets differ to some degree both on the demand and the supply side, but I conclude that these differences are not significant. I am therefore confident that the outcome of á-la-carte in Norway would be similar to the simulation results from the US industry model.

Interestingly, I find that the consumer favored á-la-carte policy will not reduce the average household expenditure on television channels. Furthermore, the distributors and channels will be slightly better off under á-la-carte. The most important reason for these findings is the incorporation of bargaining theory in the model. Because the distributors and channels will renegotiate input costs under á-la-carte the model becomes much more dynamic.

Finally I discuss how robust these findings are on the long term, taking recent trends in the Norwegian television market into account.

Preface

This thesis is written as the final part of the Master of Science in Economics and Business Administration program at the Norwegian School of Economics (NHH), with a major in Business Analysis and Performance Management (BUS).

I have always found the television market interesting because of the ever changing market environment and its constant public attention. The bundling of channels has been heavily criticized by consumers, but is still practiced in most television markets. I wanted to investigate the consequences of unbundling the Norwegian market, especially from the distributors and channels point of view.

It has been a very interesting process, especially because the classic bundling theory does not apply particularly well to this market. Therefore, I had to look at industry specific models which have helped me to better understanding of the television market in USA and Norway. I would say that the most useful stage in the process has been the discussion of model assumptions which have given me much new insight on the market. Looking back, it has been very motivating to study a much discussed market, and I have found many answers I did not expect when I started.

A special thanks to my supervisor Øystein Foros for useful input and suggestions during all stages of the working process.

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1. Introduction

1.1 Background and Motivation

In this paper, the bundling of goods and its economical effects on both consumers and producers are investigated further. Specifically, the market under interest is the multichannel television market, or just the television market, where the bundling of channels has been the sole practice for a long time. I want to look at welfare effects of different pricing strategies in this market. Since this is a thesis within the Business Analysis and Performance Management profile I will be mostly concerned with the effects bundling has on the firm's profitability.

Many studies have been conducted on the welfare effects of bundling in general (notably Adams & Yellen, 1976 and Bakos & Brynjolfsson, 1999), and on bundling in the television market (Crawford & Cullen, 2007 and Crawford & Yurukoglu, 2011). This paper sets out to assess the consequences of new market regulations that will let consumers choose individual channels from a full menu of channels, also called a full á-la-carte policy. The most extensive studies on these welfare consequences have been conducted in the USA, but the results might also be applicable to the Norwegian market. I want to assess the welfare consequences bundling compared to á-la-carte in Norway, and therefore it will later be necessary to discuss in which ways the two markets differ.

Bundling in the television market is a much debated topic. Consumers are seemingly frustrated of being forced to subscribe to channels they never watch. Being able to choose channels á-la-carte seems to be the consumer-favored policy both in the USA (Consumers Union USA, 2004) and in Norway (Forbrukerombudet, 2011), but bundling is still the dominating strategy for distributors in the market. *Forbrukerinspektørene*, a Norwegian consumer rights television program, compared today's distribution of TV channels to a world where consumers would have to buy all newspapers at a newsstand instead of just the one they wanted (NRK, 2009). There seems to be dissatisfaction with how the market works today, but as I will come back to later, consumers might not fully understand the consequences of a the á-la-carte policy.

There are also legal issues surrounding bundling strategies. In February 2013, Cabelvision, a US cable television distributor, filed an antitrust lawsuit against Viacom (PRNewswire, 2013), a major US media conglomerate carrying popular channels like MTV and Comedy

Central. Cablevision claimed they were being forced by Viacom to carry 14 additional small channels on top of the two or three channels they actually were interested in.

Here, the distributor has taken the consumer perspective trying to stand up to this classic example of channel bundling. In a press release Viacom described the lawsuit as *"a hypocritical attempt to void the transaction"* (Reuters, 2013) drawing on the fact that Cablevision sells bundles to their own customers as well.

1.2 Problem formulation

I want to investigate the consequences of bundling and á-la-carte in the multichannel television market and find out if any party, consumers or firms, can benefit from unbundling the market. It is natural to focus my analysis on the Norwegian market. Specifically I want to find out if the consumers benefit and the distributors suffer from an á-la-carte policy, and by how much. My problem formulation will therefore be:

What would be the consequences of a full á-la-carte policy in the Norwegian television market, and who stands to benefit and lose the most by unbundling?

1.3 Structure

The television market is dominated by bundling, and therefore bundling theory will be central in this thesis. In the first section I will present important models in the field of bundling. These models are general, and not tailored for the television market, but are still important to get an understanding of the basic concepts behind bundling. I want to present the sources of bundling profitability, and explain why the television market is well suited for a bundling strategy. Furthermore, the welfare consequences of different forms of bundling are presented.

After the basic concepts I will present in detail the framework used by Crawford, Cullen and Yurukoglu in their two studies from 2007 and 2011. This framework is very useful to understand the television market, and will be the most important basis for my discussion of the Norwegian market which will follow at the end of the thesis. I will sometimes refer to these models as the first (2007) and second (2011) industry models, respectively.

I discuss the differences between the US and the Norwegian market and give a brief presentation of each market where I focus on consumers, distributors and channels. Finally, with potential market differences in mind, I will comment on the effect bundling has in Norway and give a prediction of future trends in the market with the emergence of on demand streaming services as an important factor.

1.4 Limitations

I base my conclusions on simulations from the US market, and even though the datasets in these studies are very extensive, the results do not necessarily apply to the Norwegian market. These issues I address by comparing the markets, specifically looking at how the assumptions taken in the US simulations are comparable to the characteristics of the Norwegian market. Most of the assumptions concern the estimation of parameters in the market simulations. I have not assessed the consequences of using different statistical distributions in these estimations, although I have justified the distributions already used in the studies.

I only look at the two extremes, namely pure bundling and full á-la-carte, which may lead to exaggerated results that are not fair in practice. This can be the case if a golden mean between the two policies exists, for instance a mixed bundling alternative. Policymakers love golden means. I expect that pure bundling and full á-la-carte will yield very different results.

The models I present does not explicitly address the emergence of on-demand streaming services like Netflix, HBO and Viaplay, accessible from consumers' computers, phones or tablet devices. At the end of my discussion, I will consider the effects of such services and how they will relate to the bundling models.

2. The Economics of Bundling

In this section I will present the concepts behind bundling from scratch using the basic literature within the field as a starting point. I also want to describe which factors that should be present in order for bundling to work as a tool for price discrimination. Furthermore, there will be a short discussion on how firms can decide whether to pursue a bundling strategy or not. Also, I will discuss how this general framework relates to the multichannel television market, and which modifications that will have to be made.

2.1 Bundling

A bag of Twist, an ever popular Norwegian chocolate assortment, consists of many different chocolate varieties. Most people can say that they like some, but maybe not all of the pieces in the bag. When a bag of Twist is served at special occasions all pieces usually disappear in a short period of time. There seems to be a natural law making sure that nothing is left. The guests have different tastes for the chocolate pieces and some guests might prefer pieces that other guests avoid. Economists at the party, of course not speaking out loud, would here

define the guests as consumers, and their chocolate tastes as the consumers' preferences. The economists would also note that the bag of Twist is a bundle of goods.

There are many reasons why selling the chocolate pieces in one package instead of singles can be beneficial for both producers and consumers. At the same time, consumers can in many cases be worse off if goods are sold in packages. The profitability and welfare consequences of bundling are the main subjects I want to address in this thesis. Both these subjects can be presented through intuitive models from economics.

Bundling can be defined as the *practice of selling two or more products in a package* (Pindyck & Rubinfeld, 2009). Bundles can contain both differentiated products (television channels) and undifferentiated products (a container of eggs). The main focus here will be on bundles consisting of different products and from now on, the term *bundle* describes a bundle consisting of differentiated products.

There are different forms of bundling (Adams & Yellen, 1976). *Pure bundling* describes the practice of only selling the goods in a package form, like when cable television distributors only sell their channels in bundles. Firms that offer their products both in a package form, and separately, follow what is called a *mixed bundling strategy.* An example of this could be fast food restaurant where customers can either buy the full meal or the food and beverages separately.

2.2 Bundling as a field in economics

As a result of a lawsuit in the US (USA vs Loew's Inc 1962, Supreme Court) the so-called *"block-booking"* of movies was ruled to violate the Sherman Antitrust Act[1]. The concept of block-booking is one early example of bundling. Loew's Inc, owner of the rights to the particular movies, forced the television channels to purchase a bundle of movies.

In this specific case some of the movies bundled together were the international blockbuster Gone With the Wind (GWTW) and the flop Getting Gertie's Garter (GGG). In the television market this could translate to pairing the popular sports channel ESPN with a niche network like Shopping TV.

Loew's Inc refused to sell the movies separately to television channels, hence pursuing a pure bundling strategy, but the court ruled this practice to be illegal in this particular case. This

[1] US equivalent of Konkurranseloven

does not necessary imply that pure bundling is forbidden in the USA, which is not the case, but illustrates the antitrust issues surrounding a pure bundling strategy.

The court's decision led to an in-depth discussion of bundling and its role in the somewhat controversial field of price discrimination (Stigler, 1963). Stigler's thorough comment to the ruling has later been regarded as the first time product bundling entered economic theory in the field of price discrimination (Liebowitz & Margolis, 2008). Stigler argued that two movies bundled together could extract more consumer surplus than selling movies individually – even if demand for each movie varied. Producers would benefit from this extraction, while the total welfare effects were unclear. The reasoning behind this argument will be presented in the following sections and is in many ways the foundation of bundle pricing.

2.3 Sources of Bundling Profitability

The ultimate goal with bundling is to increase the firm's profit by adding to the firm's revenue and/or reduce the firm's costs. Whether bundling is suitable in a particular industry or not must be assessed in each case, but it will be useful to consider bundling within a theoretical framework. This paper sets out to investigate the overall welfare consequences of bundling in the television market for the consumers, the distributors and the channels. It is therefore necessary to address factors that will affect bundling profitability in this particular industry.

2.3.1 Consumer preferences

A key factor determining the profitability of bundling is the correlation between consumers' reservation prices for the products in the bundle. In the case described above, the reservation price correlation turned out to be *negative* so that one buyer valued GWTW higher than the other buyer, whereas the roles were reversed for GGG (even though both channels valued GWTW significantly higher than GGG).

Pindyck & Rubinfeld have created a simple example (Table 1) showing how the relative valuations could be utilized by the movie company to extract consumer surplus.

	Gone With The Wind	Getting Gertie's Garter
Channel A	$ 12 000.00	$ 3 000.00
Channel B	$ 10 000.00	$ 4 000.00

Table 1: Negatively correlated reservation prices, modified Supreme Court Case (Pindyck & Rubinfeld, 2009, p.414)

When selling the movies separately Loew's Inc would charge $10 000 for GWTW and $3 000 for GGG thereby getting a total revenue of $13 000 from each channel. Another alternative would be to bundle the movies. Assuming additive reservation prices, the maximum price Loew's could charge for the bundle would be $14 000, a price both channels would agree to. In total, bundling would extract more consumer surplus by increasing the total revenue from $26 000 to $28 000. This is why bundling is especially suitable when correlation in demand for the individual components are negative.

Economists later supported Stigler's idea (Adams & Yellen, 1976) and the ability of sorting customers into groups is widely thought of as the main economic reasoning behind bundle pricing. Since firms through bundling are able to take advantage of the customer heterogeneity, bundling can serve the same purpose as third degree price discrimination.

Third degree price discrimination can be defined as *"the practice of dividing consumers into two or more groups with separate demand curves and charging different prices to each group"* (Pindyck & Rubinfeld, 2009). By reducing the variation in customers' reservation prices, firms are able to extract more consumer surplus. Consumer preferences as a reason for bundling will be discussed more thoroughly in the presentation of the Adams & Yellen framework later in this section.

2.3.2 Costs

Bundling does not necessarily only affect the firm's revenue. Administration and marketing costs could be lower if the products were sold in a bundle rather than individually. The literature presented above talks little about the demand-cost interaction and focus mostly on the demand side (Adams & Yellen, 1976). It has been argued that this one-sided focus can result in wrong conclusions when the cost functions differ (Salinger, 1995). In fact, Salinger shows that when a bundling strategy lowers the firm's costs, it tends to be more profitable when demand for the individual goods is *positively* correlated and component costs are high.

Although interesting, the cost implications in bundle pricing are not the main focus in this paper. In the more sophisticated and market specific models later in the paper, assumptions about costs will necessarily have to be taken. These cost assumptions will only be discussed on a practical level related to the cable television market.

2.3.3 Bundling as an entry barrier

Another reason to bundle is the entry-deterrent effect which, in fact, has been suggested to have even more effect on profitability than the price discrimination effect (Nalebuff, 2004). A firm with market power in two products can by bundling them together, stop entrants that only supply one of the two products. This effect goes beyond the scope of this paper, and is not particularly suited for this market. To compete in the television market the distributors offer bundles composed of roughly the same channels. There are entry barriers in this industry, but these are related to distribution technology and bargaining power, rather than the bundle strategies, in my opinion.

2.4 Bundling two goods

Adams and Yellen suggested a simple model that in various forms has been incorporated in most introductory microeconomic textbooks. Although it may be a very basic model where a monopolist sets the prices on two goods, it is helpful in understanding the main drivers behind product bundling, and some of the welfare effects of bundling. The more complex framework that will be discussed in later sections is also partly based on this model. Furthermore, the model provides insight on key factors that have to be present for bundling to be profitable. It is therefore useful to give the model some space in this paper to explain the fundamentals of bundling.

2.4.1 The two goods model (Adams & Yellen, 1976)

Pure price discrimination is in many cases legally problematic, but a monopolist selling two goods can instead resort to bundling to capture consumer surplus. The monopolist has three alternatives when setting the pricing strategy; pure components (separate sales), pure bundling and mixed bundling. In this model, consumers compare their reservation prices for each product ($r_1$and r_2) with observed market prices ($P_1$and P_2) and base their decisions on these comparisons.

When it comes to costs, it is assumed that the marginal cost of supplying each good separately ($c_1$and c_2) does not change with output. Also, the bundle cost is seen as the sum of the separate cost ($c_B = c_1 + c_2$). The model does not consider fixed costs.

In addition, consumers do not gain any utility for a second unit of either of the goods so they will either buy zero or one unit of each good.

2.4.2 Pure components strategy

Selling the two goods separately will divide consumers into four groups where some will buy both products, some buy either product 1 or product 2, and some will not buy any product. This is called the pure components strategy, unbundled sales or á-la-carte and will result in ordinary monopoly pricing in this model.

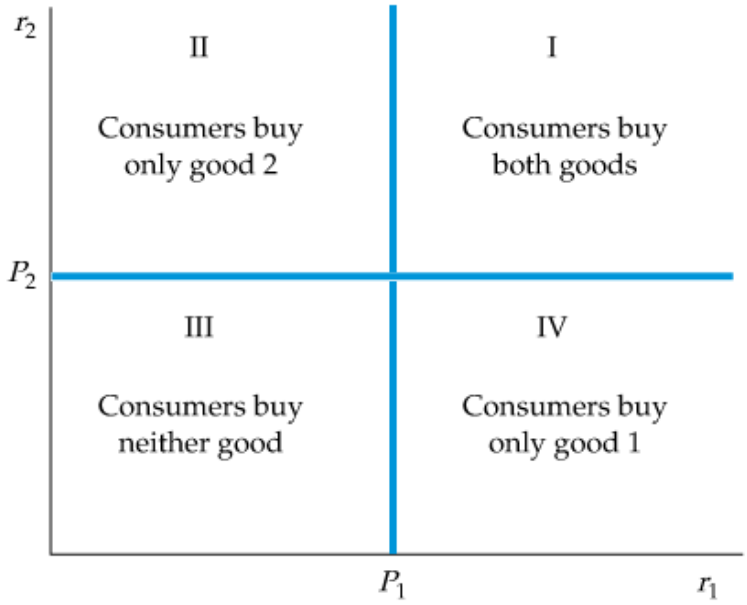

Fig. 1: Pure Components Strategy - Modified Adams & Yellen (Pindyck & Rubinfeld, 2009, p.415)

2.4.3 Pure bundling

When the products only are offered in a bundle the firm sorts consumers into just two groups. One group with a reservation price for the bundle r_B that is lower than the actual price P_B and one with a higher reservation price for the package of goods. It is assumed that the bundle reservation price is equal to the sum of the separate reservation prices (1), a strong assumption also called strict additivity (Guiltinan, 1987). At last, resale of components is impossible. This will create a straight line where both intercepts are equal to the bundle price P_B with a slope of minus one.

(1) $$r_B = (r_1 + r_2)$$

The first group consumes the bundle (area I), while the second group consumes no goods (area II). In this scenario it is not possible to purchase the products separately.

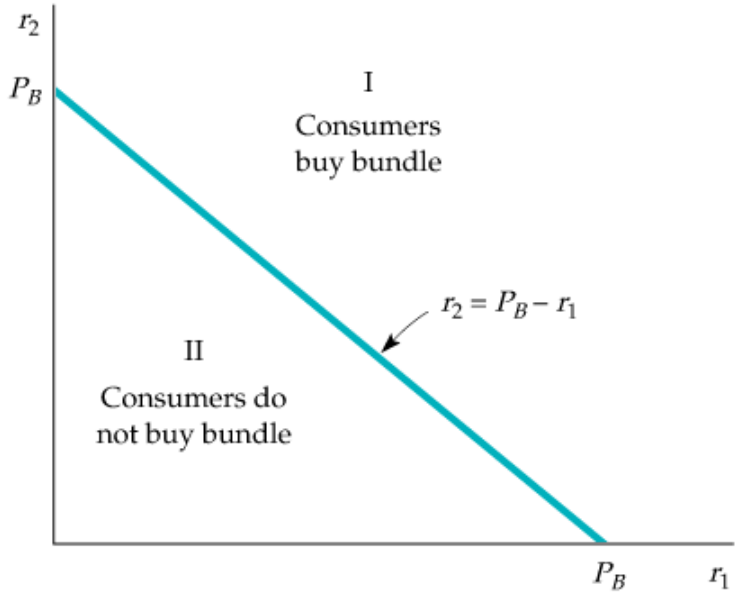

Fig. 2: Pure Bundling Strategy - Modified Adams & Yellen (Pindyck & Rubinfeld, 2009, p.416)

2.4.4 Mixed bundling

In the case of a mixed bundling strategy consumers will have more choices. Consumers will now be sorted into four groups because they have the choice of purchasing each individual product as well as the bundle or nothing.

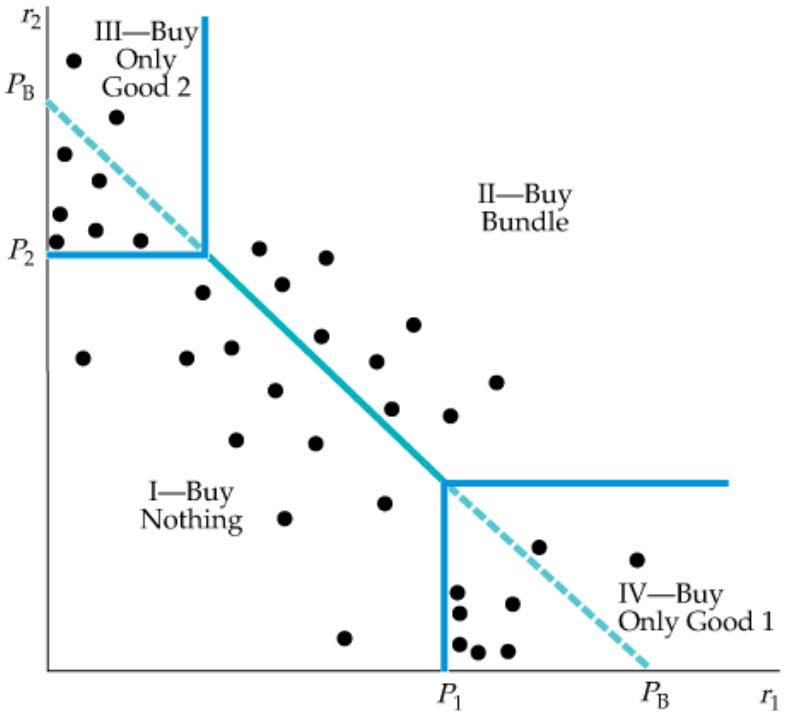

Fig. 3: Mixed Bundling Strategy - Modified Adams & Yellen (Pindyck & Rubinfeld, 2009, p.421)

Consumers (represented by dots) will again base their decisions on reservation prices. When $r_1 \leq P_1$, $r_2 \leq P_2$ and $r_B \leq P_B$ the consumer will not buy any products (I). If $r_B \geq P_B$, the consumer will decide to buy the bundle (II). In III and IV consumers will only purchase the single product where the price is lower than the matching reservation price.

2.4.5 Evaluation of the strategies

The profitability of these strategies will depend on the distribution of consumer reservation prices. The mentioned literature within the field shares the same view on the role correlations in demand have for profitability. In general, it is when firms observe *negative* correlation in reservation prices that they have the most to gain by pursuing a bundle strategy as seen in Table 1, but bundling can also be profitable even if the valuations are independent or slightly positively correlated (Schmalensee, 1984). It has also been argued that bundling can be profitable if consumer valuations for the goods are high relative to marginal costs (McAfee, McMillan & Whinston, 1989).

Each of the strategies above can be suitable for a monopolist depending on several factors. Adams and Yellen evaluate the strategies by comparing them to the case of first degree price discrimination where every consumer pays their reservation price hence extracting all CS (Pindyck & Rubinfeld, 2009). Every profit maximizing firm would prefer this pricing scheme if achievable, and the complete extraction scenario can be used as a benchmark to evaluate the three strategies above.

In the case of pure price discrimination no individual will realize any CS (Complete Extraction). At the same time no individual will consume a good if the cost of that good exceeds the reservation price (Exclusion). Finally, any individual whose reservation price for a good exceeds its cost will consume the particular good (Inclusion). If bundling can serve the purpose of price discrimination it will be natural to compare pure bundling and mixed bundling with the three conditions above.

If the firm decide to follow a pure bundling strategy it will be difficult to comply with the exclusion condition. Some consumers may for instance not satisfy $r_1 \geq c_1$ and still purchase the bundle thus violating the exclusion condition for one of the bundle components (product 1). Pure bundling will therefore only dominate the pure components strategy (where exclusion never will be violated) if the greater profits attained from more complete extraction of CS are not outweighed by less complete exclusion of consumers that are not viable.

In the article, Adams & Yellen give proof that *"whenever the exclusion requirement is violated in a pure bundling equilibrium, mixed bundling is necessarily preferred to pure bundling*". Creating two additional consumer categories will help the firm extract more consumer surplus from the consumers that value just one of the goods highly. In the pure bundling scenario these consumers could have been excluded from the market because the total bundle price was too high.

The exclusion requirement will often not be violated when marginal costs are low and the model says little about the optimal strategy in this scenario. As I will discuss later, pure bundling will often be the optimal strategy when marginal costs are low, and when there are more than two components.

2.5 Bundling more than two goods

The Adams and Yellen article concludes that mixed bundling yields higher profits than pure bundling in most markets. This was probably right at the time (1976), when marginal costs were an important factor in almost any market and it was more profitable to divide consumers into four groups than in two. The question is why mixed bundling is not observed to a larger extent in the multichannel television market? Pure bundling seems to be the dominating strategy both in the USA and in Norway.

There are many reasons why the model is not especially suited for the market under interest in this thesis. The model includes only two goods, which makes it good for discussion purposes, but it will fail to grasp the reality of many markets in the real world. One of these markets is the television market, where the typical bundle in most cases consists of much more than two channels. Furthermore, the model deals with the three different strategies in an intuitive way, but fails to address which of the strategies is the optimal under different cost assumptions.

With the emergence of the internet in the 1990s digital products with nearly zero marginal costs attracted more and more interest. Examples are digital subscriptions of magazines, streaming of music and software products. Having in mind that bundling can be profitable when marginal costs are low; bundle pricing seemed perfectly suited for the digital market. For instance, the marginal cost of a printed newspaper is much higher than the marginal cost of the digital version.

There was not much research on so-called N-good models in the bundling literature before the IT emergence, simply because large bundles of goods typically had been unprofitable and also

very complex to model (Hanson & Martin, 1990). When marginal costs decreased towards zero, bundling a large number of goods suddenly became more interesting.

2.5.1 The N-goods Model (Bakos & Brynjolfsson, 1999)

When marginal costs are zero, Bakos and Brynjolfsson show that the profitability of bundling increases with the number of goods in the bundle (Bakos & Brynjolfsson, 1999). In other words, the firm can to a larger degree benefit from the reduction in consumer heterogeneity when they increase the number of goods in the bundle. They approach the problem of model complexity by drawing upon general theorems from statistics. Because of this, even bundles with large number of goods can be analyzed, and the different bundling strategies can be evaluated also in the market for information goods. They find that when bundle size increases without bound the bundle profit is maximized and total welfare surplus will equal the firm's profit, thereby extracting all consumer surplus. This is the main contribution of their article, but cannot be applied to physical goods because of the assumptions of zero marginal costs.

One major advantage with their model is that, unlike earlier work (Hanson & Martin, 1990), it does not get more complex as the number of goods in the bundle increases. The reason is the assumption that consumer valuations of goods are independent and identically distributed (i.i.d). In total, three assumptions have been taken.

1. The marginal costs of all information goods i are zero.
2. For all bundle sizes,n, consumer valuations v_{ni} are independent and uniformly bounded, with continuous density functions, non-negative support, mean $\mu_{ni}$and variance σ_{ni}^2.
3. Consumers have free disposal

The second assumption means that every consumer's valuation (for the whole bundle) is characterized by only a single variable. In other words, the model can only capture consumer valuations for the aggregated bundle, which in this case is adequate when we are interested in pure bundling, as observed in the multichannel television market. If, on the other hand, we want to look at the mixed bundling scenario, more assumptions will have to be taken in order to account for correlations across the bundle components.

Bakos and Brynjolfsson find that, given the assumptions above, bundling n information goods can be remarkably superior to selling the n goods separately, seen from the firm's perspective. Bundling will substantially reduce the average deadweight loss, maximize the

firm's profit and reduce consumer surplus. In fact, as n increases, the deadweight loss per good and the consumer surplus per good converges to zero.

To explain the intuition behind this result it can be useful to draw parallels to the diversification of stocks (Kobayashi, 2005). Bundling reduces the variation in consumer valuations in the same way diversification reduces unsystematic risk in a portfolio of stocks. When the distribution of consumer valuations for each component is uniform [0.1], there will be an increasing fraction of consumers with moderate valuations near the mean of the distribution as the number of goods in the bundle increase as seen in Figure 4. In other words the demand curve for a large bundle will be more elastic near the mean valuation of the population and more inelastic away from the mean.

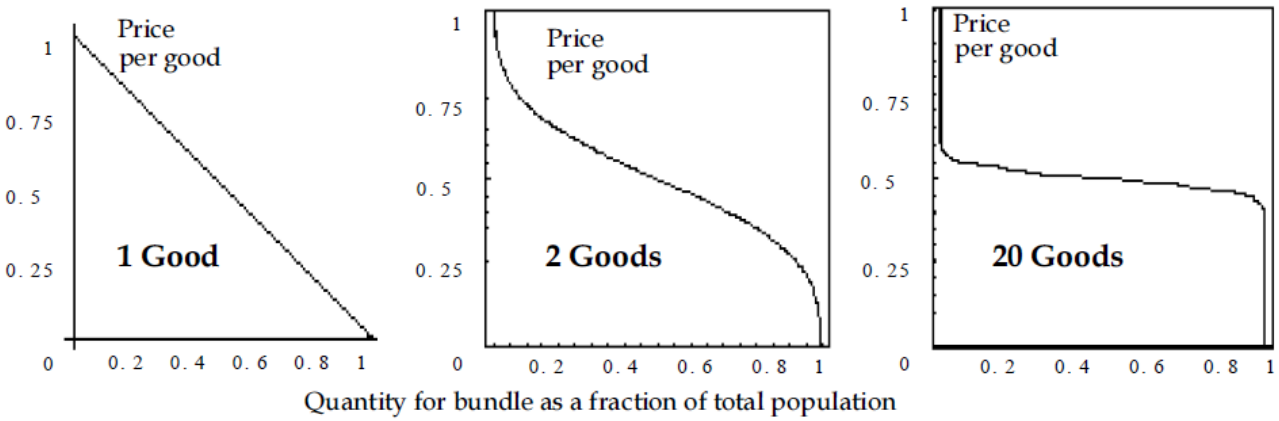

Fig.4: Increasing Bundle Size - Demand for bundles of 1, 2 and 20 information goods with i.i.d. valuations uniformly distributed in [0,1] (linear demand case) (Bakos & Brynjolfsson, 1999, p.5)

The findings suggest that pure bundling can be very profitable in some industries where marginal costs are low and valuations for the bundle components are independent. Television distributors can take advantage of this finding by offering large bundles and increase their profit substantially compared to pursuing a pure components strategy. At the same time, consumers will be worse off under bundling in this case.

Figure 5 below illustrates how the firm's profit monotonically increases with higher bundle size even with different distributions of consumer valuations. Eventually the firm will capture total surplus, but seen from the figure, this will require a very large bundle. In the television market, there are 100-150 channels in most markets which leads one to expect that based on

this model, the firm's cannot hope to extract all consumer surplus through bundling. Nonetheless, the figure shows how powerful bundling can be and why bundling is observed in the television market as well as in music streaming and online magazine subscriptions.

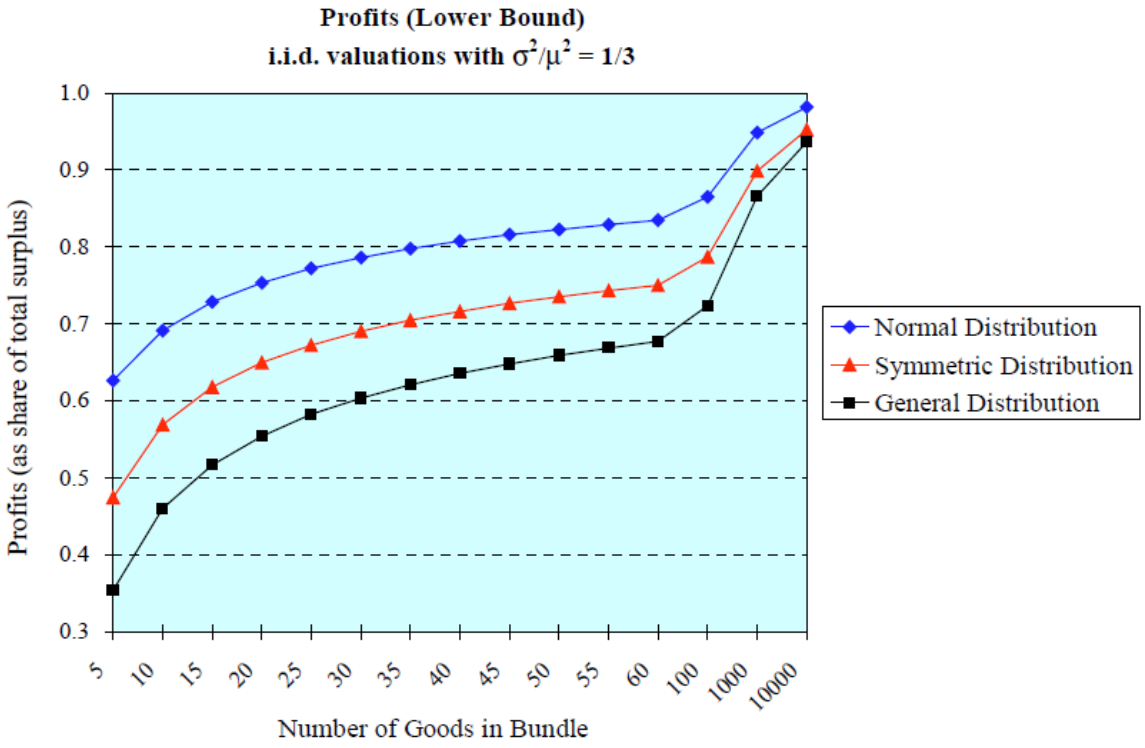

Fig.5: Bundle Profit for Different Demand Distributions - The lower bound on the profits per good from a bundle of i.i.d information goods increases monotonically with n (Bakos & Brynjolfsson, 1999, p.11)

On the contrary, bundling may not be so attractive when marginal costs are positive, which they in most cases are. Marginal costs can make bundling unprofitable, particularly if they are high compared to the mean valuation. If this is the case, the firm will get a reduction in profits when bundling the goods. The reason is that the strategy will reduce the fraction of buyers with valuations that are above the total marginal cost of the bundle. A pure components strategy would then be the best alternative because it would limit the consumption of the separate goods to the consumers that actually value these goods above the marginal costs.

2.5.2 Substitutes and complements

When a firm decides to bundle several goods, some of these goods will most likely be either substitutes or complements. For instance, ESPN and Fox Sports (with complementary broadcasting rights for sporting events) are definite complements for many consumers, while on the other hand the financial news channels Bloomberg and CNBC probably will be seen as substitutes. If a complementary channel is added to the bundle the consumer will experience

increased utility, while the opposite will be the case when adding a substitute. Bundling substitutable products can be frustrating for consumers, and can affect the firm's profit as well as the consumer surplus. Since the previous models (Adams & Yellen and Bakos & Brynjolfsson) have assumed that the reservation price for the bundle is the sum of the components' individual reservation prices it does not address substitutes and complements. If, in fact, goods in a bundle are substitutes or complements the reservation price for the bundle as a whole will not equal the sum of reservation prices.

The consequences of bundling these goods have been formalized in an analytical model of contingent valuations (Venkatesh & Kamakura, 2003). The model provides optimal strategies when substitutes and complements are present, and the study suggests that strong or moderate substitutes should be offered separately in a pure components strategy. Complements, on the other hand, should be purely bundled if the marginal costs are low. The television market consists of both complements and substitutes, but still the trend is to bundle all types of channels.

In study that follows this section (Crawford & Cullen, 2007) several bundles of channels with similar themes (*Theme tiers)* are suggested as a golden mean between pure bundling and á-la-carte. Based on the theory above, this could in my opinion be feasible for some bundles with complementary channels, but not for bundles with substitutes. With the themes suggested in the following model, distributors could risk to have bundles of mainly complements (Sports), or bundles consisting of mainly substitutes (Financial News). While the first bundle goes in hand with the theory above, the latter alternative does not because bundles of substitutes are not preferred. Because of this I will not discuss theme tiers in much detail and my focus in the further sections will instead be on the two extremes, namely pure bundling and á-la-carte.

2.5.3 The Monopoly Assumption

Most models in the field of bundling have either assumed simple monopoly or dominant firm (Liebowitz & Margolis, 2008). In a follow up study to the n-goods model (Bakos & Brynjolfsson, 2000) the monopoly assumption is questioned, and bundling is investigated in more competitive information goods markets. Both upstream competition between content producers and downstream competition between providers are investigated further. Since I have taken the perspective of television distributors I will briefly discuss the impact of downstream competition and how the monopoly assumption might be unrealistic.

All the models above assume that the firm has monopoly power in the market. This is not the case in the television market, neither in the USA nor in Norway. In both markets, there is downstream competition between cable distributors and satellite distributors. I will give an overview of the markets in Section 4, but for now it is enough to know that there are normally one cable and two satellite distributors competing in each local market. Usually consumers will have just one cable alternative in their street or geographical area. Because of this, an oligopoly setting with three distributors is more realistic than simple monopoly.

Later I will discuss welfare effects of bundling compared to á-la-carte in the television market. Competition will have an impact on these measures. For instance, Crawford and Cullen argue that competition will be higher under á-la-carte because there is no way to differentiate a channel offered on cable versus satellite (Crawford & Cullen, 2007). Since the second industry model in Section 3.3 takes competition into account, I expect the model to be more suitable than the general framework above for the specific market. Specifically, the industry model accounts for the bargaining process where the distributor input costs are decided. Instead of assuming monopoly, the estimated cost parameters are a result of a bilateral oligopoly bargaining model. These costs might be different for each distributor depending on a number of characteristics, in particular the bargaining power.

Finally, I want to note that the monopoly assumption not necessarily will give wrong results. The assumption simplifies bundling models which makes the models easier to interpret, and competition does not necessarily change the market outcomes to a large degree. Nonetheless, I find the oligopolistic setting more realistic and will therefore expect the model that incorporate competition to be of more predictive value when talking about the profitability and welfare effects of bundling in the television market.

2.6 Television market expectations

Before I move on I will outline some other expectations of how bundling works in multichannel television markets. Bundling was first thought of as a tool for price discrimination after the package selling of movies was taken to court in the US. Although one cannot say that the bundling phenomenon emerged from this particular market, the sale of movies was especially suited for a pure bundling strategy. I expect that bundling in the television market have the same positive effect for firms, because the market is in many ways very similar to the market for movies in the 1960s.

My first argument for this is the nature of consumer preferences in both cases. I find no reasons to believe that consumers are more homogenous (or heterogeneous) in tastes whether you look at a bundle of movies or a bundle of channels. The correlations in tastes, as described previously, will often be negative for pairs of channels something that makes bundling very attractive. I therefore expect the distributors to be significantly better off under bundling than under á-la-carte based on the basic framework.

On the other hand, the Adams & Yellen framework has its limitations, especially because it only considers the bundling of two goods and assumes monopoly. Also, as I mentioned in the model presentation, the framework was introduced at a time where high marginal costs had a large impact on pricing strategies. This is why it concludes that mixed bundling is the preferred alternative, because the consumers with reservation prices below costs could be excluded from purchasing the bundle. Undoubtedly, the majority of consumers do not satisfy the exclusion condition for one or more channels in the television market today. In fact, some consumers can in practice value a channel in their bundle at zero. At the same time I think firms can gain more by the overall extraction of consumer surplus through pure bundling, than they lose by excluding consumers through mixed bundling or á-la-carte. The main reasons will be the nature of marginal costs, and the fact that there are much more than two goods in a typical channel bundle. Since mixed bundling is not observed in the market under interest, I think it is fair to assume that pure bundling is more profitable.

A typical basic bundle in Norway consist of around 50 channels (Providers websites, 2013), but Bakos & Brynjolfsson argued that the bigger the bundle, the more profit could the firm extract from consumers given that marginal costs were close to zero. I would therefore expect large bundles that pools consumer preferences to the full. However, as they also explain, their model explicitly addresses digital information goods with zero marginal costs. One explanation for why not all television channels are part of a single bundle is these input costs. I expect that the affiliate fees paid per subscriber are higher for premium channels, which explains why these channels often are offered on top of the basic bundles. These channels often target a very specific group of consumers.

Finally, I think it must be questioned how the previous models deal with correlations in demand between the goods. In the television market there will certainly be channels that are related either as substitutes or complements. This must be reflected in the consumer reservation prices for a model to have good predictive value. Because of this, the strict

additivity condition in reservation prices is unrealistic for this market. One cannot simply find the bundle reservation price as the sum of individual channel reservation prices. This is therefore a potential problem in all the previous models.

In the next section, I will present market specific models that take more variables into account in order to give more accurate predictions of welfare measures in the television market. The main challenges will be to model the consumer preferences in a more realistic way, to account for downstream competition and to measure accurate welfare effects and profitability of bundling.

3. Industry models for the television market

In the first part of this paper the main drivers of product bundling have been presented, and the multichannel television market is shown to be especially suited for firms to extract the potential benefits from bundling. This section will in more detail look at the benefits from bundling in the television market as seen from the profit maximizing distributor's perspective. At the same time there will be a discussion on the impact of offering channels à-la-carte compared to the bundled world we observe today. Such a comparison is very useful in order to assess each strategy because it is easier to measure the exact profitability of bundling when there is an alternative scenario. Since bundling is the dominating strategy it can be seen as the baseline case in the welfare discussions. From now on the pure components strategy will be noted *á-la-carte*, as in a restaurant menu with free choice.

3.1 Background

The independent Federal Communications Commision (FCC) in the USA has analyzed the effect of à-la-carte pricing (FCC, 2004) through a six-month study and concluded that consumers would end up worse, paying more for television, if channels were offered à-la-carte so that consumers could choose individual channels.

Interestingly the FCC issued a modified report only two years later (FCC, 2006) contradicting the first report. The further report conclude that à-la-carte is economically feasible and beneficial for consumers, and the FCC admitted that the 2004 report was based on unrealistic assumptions and had a number of errors. In fact, the latter report suggests that households could save up to 13 percent on their bill if à-la-carte was introduced.

3.2 The 2007 Industry Model (Crawford & Cullen, 2007)

Partly motivated by the FCCs reports and the contradicting conclusions provided, economists have tried to answer the same questions about welfare consequences through more sophisticated numerical analysis. By taking into account more variables when looking for the welfare effects of à-la-carte opposed to bundling the hope has been to predict the consequences more accurately. When talking about the welfare effects most recent studies focus in particular on the impact on consumer welfare. Nonetheless, two interesting studies (Crawford & Cullen 2007 and Crawford & Yurukoglu 2011) offer insight on the consequences for the firms as well, in an overall welfare analysis.

The first of these studies, which now will be discussed thoroughly, addresses the questions already discussed on a practical level about the impact on prices, number of products offered and effects on welfare. Calibrating a basic welfare model, the paper discusses the effect of introducing two different à-la-carte alternatives in a world where consumers first must have purchased a "limited basic" bundle of channels. The study looks at both the extreme alternative where every channel is offered á-la-carte, denoted *full á-la-carte*, and a case where so-called *theme tiers* are offered consisting of channels covering specific themes like sports or science.

Crawford and Cullen also build their welfare model on the work presented in earlier sections of this paper, but is naturally based on the n-goods model to be able to describe this particular market. An important addition to the model is the effect bundling and á-la-carte can have on the number of products supplied. In the television market it is highly likely that a policy change will affect, in this case, the number of channels offered. At least, this is what the industry claims (Booz Allen Hamilton, 2004).

For the rest of this section the focus will primarily be on the full á-la-carte alternative, but results from both cases are included to illustrate how also theme tiers could serve as a golden mean between pure bundling and full á-la-carte.

Before the results can be presented the article model will be explained briefly to underline which assumptions that have been taken in the simulations to follow. I have modified some of the notations so that the equations will be easier to interpret.

3.2.1 The model

A monopolist offers a single product, but is considering offering an additional product, either including the new product in a bundle with the existing product or offering it as a stand-alone product.

With the á-la-carte option let $p_1$and p_2 be the prices charged for each product, and let p_{1+2} be the total price charged if the products were to be offered in a bundle.

For a given market size N define

(1) $$w_1(p_1) = D_1(p_1) \,/\, N$$

(2) $$w_2(p_2) = D_2(p_2) \,/\, N$$

(3) $$w_{1+2}(p_{1+2}) = D_{1+2}(p_{1+2}) \,/\, N$$

as the per-capita (per household) demand curves in each scenario and let

(4) $$C_i(w_i) = c_i w_i \text{ for } \iota = \{1,2,1+2\}$$

be the associated per-capita variable cost functions where $\boldsymbol{c_i}$ is the marginal cost for product $\boldsymbol{i}$. Some of the later simulations also incorporate fixed costs for each product and is denoted $\boldsymbol{F_i}$, but is ignored in the baseline model. Since the model assumes positive marginal costs it looks different from the Bakos and Brynjolfsson model, but remember that the conclusions will most likely not differ if these marginal costs are sufficiently low.

Now it is possible to derive the per-capita consumer surplus (5), gross profit (6) and gross total surplus (7) for each product $\iota = \{1,2,1+2\}$.

Consumer Surplus:

(5) $$\mathrm{CS_i(p_i)} = \int_{\mathrm{p}}^{\infty} \mathrm{w_i\,(v)dv}$$

This can be interpreted as the sum of the welfare surplus area including all households that have a willingness to pay (WTP) above the price set for each product.

Producer Surplus (total revenue – total costs)

$$PS_i(p_i) = p_i w_i(p_i) - C_i\big(w_i(p_i)\big) = (p_i - c_i)w_i(p_i) \quad (6)$$

Gross total surplus for each product (simply CS + PS)

$$TS_\iota(p_i) = CS_i(p_i) + PS_i(p_i) \quad (7)$$

The distributor will only be interested in the *profit* maximizing price for each product, here denoted:

$$p_i^M = argmax_{p_i} PS_i(p_i) \quad (8)$$

while on the other hand from a social perspective, the total *welfare* maximizing price will be denoted:

$$p_i^* = argmax_{p_i} TS_i(p_i) \quad (9)$$

Assuming that the goods are neither substitutes nor complements it is possible to describe the welfare effects of the introduction of a new product either as a stand-alone product or bundled with the existing product. This independent valuations assumption deals with several potential effects. For instance, adding an extra financial news channel (substitute) will have a different impact on the willingness to pay than adding an extra sports channel (complement because of different content). It can be questioned if this assumption is an oversimplification that will result in wrong conclusions. In Section 2, I explained how correlations in the demand for goods are determinants of bundling profitability and even though difficult to model for large bundles, correlations should be addressed. Nonetheless, this does not necessary mean that the model is of no predictive value.

From now it is assumed that the household demand curve for the new channel is based on an exponentially distributed WTP with mean and variance equal to \$1. The marginal cost is set to \$0.30. In Appendix A the observed distribution of viewing hours for CNN is reported, and it turns out that this distribution is very similar to the exponential distribution. Other channels also have similar distributions.

3.2.2 The á-la-carte scenario

In the case where the monopolist simply offers the products á-la-carte the profit from the newly introduced product will be PS_2^M. Because of the no correlation assumption, the profit

for the existing product will not be affected. Profit-maximizing price will be $1.31 returning a PS equal to the area B and a CS equal to the area A in Figure 6. There will be a dead-weight-loss equal to area C since some consumers with WTP above cost are excluded from the market as a consequence of the monopoly power.

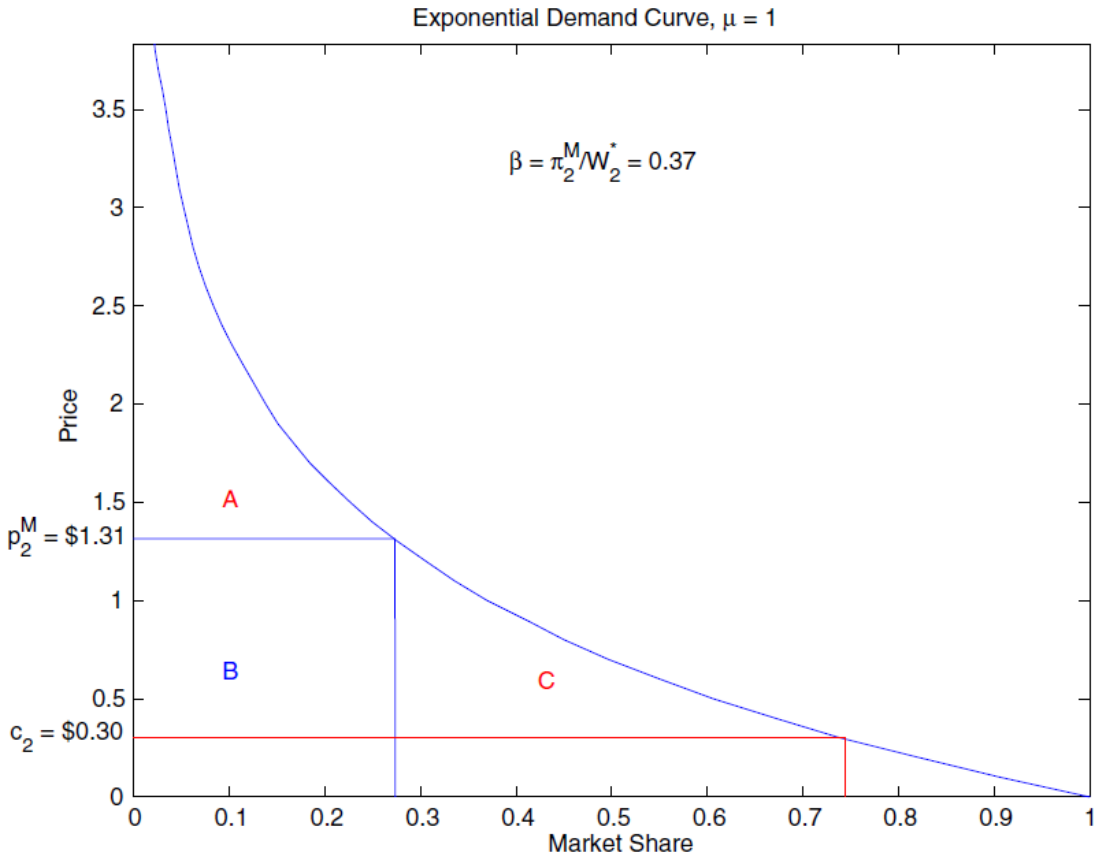

Fig.6: The incentives to offer stand-alone products (Crawford & Cullen, 2007, p.386)

In the á-la-carte scenario there will never be introduced products that reduce total welfare because the monopolist will only introduce products that by themselves add profit. Therefore, additional products introduced in an á-la-carte world will never reduce total welfare within this framework.

3.2.3 The bundling scenario

Suppose the new product enters a bundle that is offered on the market instead. With the same assumptions as in the scenario above more insight can be given of the firm's incentives to offer products in a bundle.

The monopolist will now instead of only looking at PS_2^M instead look at the *incremental* profit of adding the product to the existing bundle.

(10) $$\Delta PS^M = PS^M_{1+2} - PS^M_1 = B_{1+2} - B_1$$

If this change in profit through bundling is more than the incremental surplus from offering the new product as a stand-alone product instead, bundling will be the preferred alternative.

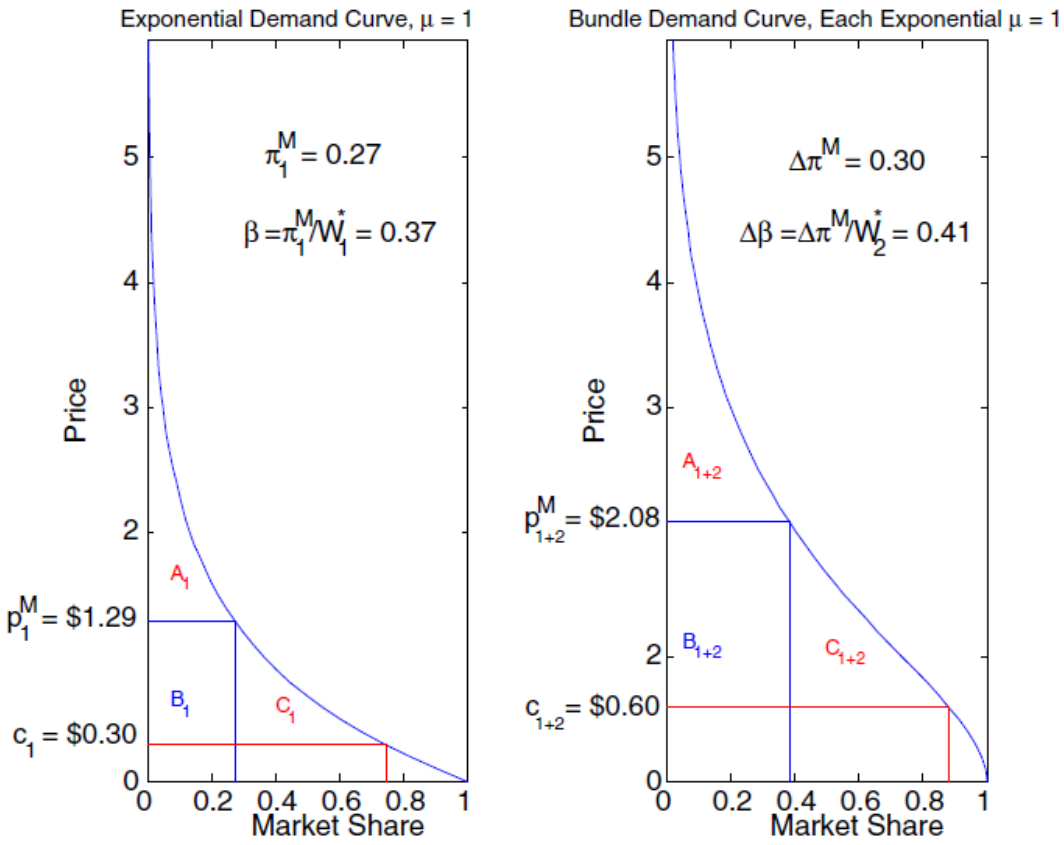

Fig.7: The incentives to offer products in a bundle (Crawford & Cullen, 2007, p.387)

The left panel in Figure 7 describes the demand for the already existing product, while the right panel shows the demand curve when adding the new product to a bundle.

The β as seen in Figures 6 and 7 was introduced as a way to measure the difference between private (producer) and social (total welfare) incentives to offer new products (Spence 1975). When β is increasing, the more surplus can the monopolist extract from the total surplus created as a result of introducing the new product. In other words, when the producer surplus increases relatively to the consumer surplus, the β will increase. The fraction can here be used to compare the á-la-carte and the bundling scenarios seen from the firm's perspective. Deriving the change in beta, $\Delta\beta$, that occurs when bundling (here a positive 0.41) it can be concluded that the monopolist in this case can extract a larger share of total surplus created. He should therefore offer the new product in the existing bundle rather than á-la-carte given the assumptions taken.

Even though the firm is better off when bundling, this does not necessarily mean that total welfare increases like in the á-la-carte scenario. The fundamental bundling models presented in previous sections also confirm this. Through bundling the firm takes advantage of customers' different taste preferences across the goods which may well result in the introduction of additional products that *decrease* social welfare. It can be in the firm's interest to introduce such products to increase surplus extraction on the other products in the bundle even if the new product decreases total welfare (Crawford & Cullen, 2007).

Crawford and Cullen put this model in use by obtaining a dataset from a local US cable television market. By running simulations they are able to predict more accurately the welfare effects of bundling compared to á-la-carte in the television market.

3.2.4 The market simulations

The complexity of the multichannel television market makes the analysis difficult without several assumptions. In the model it is assumed that the marginal costs to cable systems are positive, reflecting the so-called affiliate fees that channel conglomerates charge the distributors per subscription for the right to carry their channels.

The simulations introduce a hypothetical à-la-carte world where the affiliate fees are likely to differ from what we observe today. If the market is unbundled, the channels will charge higher affiliate fees to offset the loss of subscribers. In the á-la-carte scenario the model assumes that the cable system and the channel conglomerate share equally the revenues. It is also assumed that there are no fixed costs for the cable distributors associated with offering an additional channel and that the system maximizes short-run economic profit. Even though the cable system is likely to face competition from satellite television providers, this model assumes that the cable provider operates as a monopolist. Finally, the potential change in channel advertising revenues that might happen if à-la-carte was to be introduced is not addressed in this model. With all these simplifying assumptions one must be careful when interpreting the results. A discussion of model weaknesses will follow after I have presented the results.

3.2.5 The data

The simulations were done in two stages using price and market data from Monterey, California. California Cable of Monterey, owned by the largest cable distributor in the US, Comcast, was used as the sample system. The data that was not observable in the market, in particular each household's channel reservation prices, were obtained through surveys.

In the first stage of the simulations the observed market outcomes like reservation prices for bundles and marginal costs were used as input to calculate the observed welfare measures (consumer surplus, producer surplus and total surplus) by using the baseline welfare model. Secondly, the policy proposals, full á-la-carte and theme tiers, were analyzed numerically using simulations taking a number of assumptions.

In the following, full á-la-carte and theme tiers are compared to the baseline bundle that existed in the Monterey market. The results are summarized in Table 2 below.

Market outcomes and welfare: Baseline Bundle and two À La Carte scenarios

	Baseline: Bundle	Scenario 1: Full À La Carte	Scenario 2: Theme Tiers
Market outcomes			
Total price	$43.06	$78.54	$50.22
Average cable network price	$0.86	$1.47	$0.90
Average market share (%)	75.6	34.1	44.1
Welfare (all networks viable) per-household			
Consumer	$10.37	$17.17	$11.84
Producer	$20.52	$11.44	$17.29
Total	$30.89	$28.61	$29.13
Welfare (considering network exit)			
Difference in profit adding network to the bundle versus scenario	–	$12.31	$6.48
Network exit required to equate consumer surplus between bundle and scenario	–	41	24

Table 2: Market outcomes and welfare, baseline bundle compared to two policy proposals (Crawford & Cullen, 2007, p.394)

3.2.6 The baseline case

Since it is assumed that all consumers already subscribe to the "limited basic" service the more interesting bundle is the popular "expanded basic" service that at the time 72% of the households subscribed to with a price of $44.05. In order to find the welfare measures of the existing bundle the WTP for the bundle must be estimated. WTP for the bundle is assumed to be normally distributed with mean μ_B and variance σ^2. This is a fair assumption thanks to the central limit theorem which states that a sum of random variables tends to be normally distributed on the whole, even though the individual variables, in this case the WTP for individual channels, may have completely different distributions. Based on industry data the marginal costs in Monterey are assumed to be 28% of the price.

With these assumptions the predicted WTP for the expanded basic package is normally distributed with mean $47.00 and variance $151.29. Consumer surplus predicted per

household is $13.72, while producer surplus is estimated to $27.14 giving a total surplus of $40.86. These values will be compared in the next stage with the two alternative á-la-carte policies to find the welfare effects of a policy change, and will be referred to as the baseline case.

3.2.7 Welfare effects of full á-la-carte

When offering channels á-la-carte it is not the WTP distribution for the bundle that has to be estimated, but the WTP distribution for each individual channel since consumers now are free to choose their preferred channels. Because of this the article authors have taken numerous new assumptions that must be explained.

The model opens for the fact that a proportion of consumers can have a WTP at zero for some channels offered. Some households never watches sport networks like ESPN and would not pay anything for that channel, while others might have no interest in subscribing to the Disney Channel. For network j only a portion of households, γ_j, will have a positive WTP while the remaining proportion of the population, $1-\gamma_j$, value the network at zero. Among the consumers with a positive WTP it is assumed that the taste for each network j is distributed independently and follows a lognormal distribution[2] with location parameter μ_j and a shape parameter σ^2.

On the cost side there are strong reasons to believe that there would be a fundamental change in affiliate fees from the baseline case if the market instead was unbundled. In a Kagan Media Research report it is estimated that *"TV channel operators would need to raise per-capita channel carriage fees by a multiple of four to offset a 50% loss of subscribers from big basic bundles"* (Kagan Media Research, 2005). Furthermore, it has been estimated that the cable distributor in Monterey gets a 9% discount on affiliate fees when assuming that the marginal costs are 28% of the bundle price. The reason for this discount is the bargaining power Comcast has, being the country's largest distributor. Because of this, the obtained market data on affiliate fees has been multiplied by a factor of 0.91 to make the simulations more accurate in the Monterey market.

[2] In other words, the logarithm of the WTP's are normally distributed. It has been shown that the household income distribution in many countries is consistent with a two-parameter lognormal function for the low-mid income group (Clementi & Gallegati, 2005). Therefore it makes sense to do the same with the reservation prices which are closely connected to income.

To find the WTP for the individual channel the article authors assume the mean WTP to be a multiple of the estimated affiliate fee (cost) charged by each network i.e. $\mu_j = \lambda C_j$.

In the case of full á-la-carte the total price a consumer have to pay for all the channels is much higher ($78.54) than the previous bundle price for the same channels ($44.05). However, the number of consumers purchasing every single channel under á-la-carte will be very low. Therefore it is expected that many channels, by definition all of them, will lose subscribers as a result of the new policy.

3.2.8 Channel Exit

In the article the welfare effect is measured under two different assumptions, the first assuming that all channels are still being offered and the second that opens for channel exit.

It does not come as a surprise that consumers are much better off under á-la-carte, assuming no channel exit, with an *increase* in the per-household consumer surplus by 65.6%. At the same time it is easy to understand the firms' unwillingness to introduce this policy with a predicted 44.2% *decrease* in gross profit. Overall this drastically different allocation of surplus results in a total welfare loss of 7.4% compared to the baseline bundling scenario.

On the long term though, the pricing strategy can potentially affect which products that are supplied in the market. Especially interesting is the result of a pricing policy change in the television market. The industry claims that unbundling the market will drastically reduce the number of channels available in the market and at the same time increase consumer costs (Booz Allen Hamilton, 2004). What will happen with the number of channels when there is a shift from the bundled world that is observed today, to a market where every channel can be picked individually? Crawford and Cullen also investigate this in their 2007 study.

One effect of á-la-carte could be that some channels, though still adding to the aggregate consumer surplus, could exit the market affecting consumer welfare on the long term. This effect of á-la-carte has been addressed in the study by calculating the profit for each channel under á-la-carte and then looking at how many channels that could exit before bundling would give higher consumer surplus than á-la-carte. In fact 41 out of 50 channels in the market would have to exit for this to occur something that seems very unlikely to happen. Therefore the á-la-carte scenario, even when considering the impact of network exit, seems to improve consumer welfare and reduce firms' profit to a high degree, based on this study. Though, as I

will discuss further, there are a number of reasons why the study might be of low predictive value.

3.2.9 Robustness

The model is very simplified and relies on a few strong assumptions for the results to be valid, especially about the nature of fixed and marginal costs. Furthermore, the model does not take into consideration competition between cable and satellite television which surely is an important factor in this market. In fact, it does not take competition into account at all because of the monopoly assumption which I have questioned earlier.

The potential effects the á-la-carte policy would have on advertising revenues were not taken into consideration either. I expect the advertising revenues to be approximately a linear function of the time households spend watching the channel. If 50% of households drop the channel, the advertisers would surely want to renegotiate the terms with the channels.

Although insightful, I would argue that the 2007 model gives more insight on a few theoretical aspects of introducing á-la-carte rather than providing a practical result applicable to all television markets. The model also incorporates a few reasonable assumptions, and can therefore provide a basis for further research. It goes hand in hand with the general bundle models when it describes the positive effect unbundling will have on the consumer surplus.

The dataset is limited to just one geographical area in the US, and as we all know, the demographic dispersion in the country is very high. In my opinion, it is more than likely that areas with different demographic compositions also will have different distributions of the channel reservation prices. The model can therefore not be generalized to the whole market. In fact, this might not be such a big problem in Norway, but more on that later.

When it comes to the input cost estimation, it is very unlikely that the marginal costs are simply a constant multiple (0.28) of the observed subscription price. Furthermore, the market discount in Monterey for the big distributors is not necessarily the same across markets. The most important, and most unrealistic assumption in my opinion, is the assumption of unchanged input costs after a policy change. On a short term basis one could imagine that the affiliate fees paid per subscriber would not change, but they would surely change on the long term. It is unrealistic that channels would charge the same prices as under bundling if they lost 50% of their customers under á-la-carte. Most likely the affiliate fees would be renegotiated.

All these issues raise questions about the model's predictive value for the US and other television markets. I would say that the model is at its most helpful in the discussion of the assumptions taken. These assumptions outline what must be improved in future framework in order to predict welfare consequences more accurately. In the next section, I will present a new model that emerged, partly, from the model above, but which also tries to deal with many of these issues.

3.3 The 2011 Industry Model (Crawford & Yurukoglu, 2011)

In an attempt to deal with all the issues above, a much more sophisticated model was presented in the American Economic Review in April 2012 (Crawford & Yurukoglu, 2011). The new industry model takes into account more variables and is based on a much larger dataset than the geographically limited 2007 model. As a result of this, one would expect that the results are more realistic and can provide better guidelines also for other markets, like the Norwegian.

Again the article authors seek to measure the effect a hypothetical full á-la-carte policy would have on the US television market. Consumer, distributor and channel welfare consequences are all analyzed and the model framework will be presented and discussed in detail in this section of the thesis.

During the discussion of model robustness in the previous section the assumptions about static costs and lack of competition were the most important model shortcomings. Introducing á-la-carte would definitely change the input costs and this must somehow be modeled. The affiliate fees will change, but the question is by how much.

Crawford and Yurukoglu approach the cost issue by incorporating a different field of economics to their model in order to find how input costs are determined. In the model, input costs are determined in a bilateral bargaining setting under oligopoly (Horn & Wolinsky, 1988). The latter theoretical framework will not be presented in detail, but just explained briefly in the context of this industry model. Accounting for the bargaining process, the model will be much more dynamic because it will allow for change in input costs if a policy change occurred. By taking competition between distributors into account, I expect the model to be more realistic.

3.3.1 The model

The model consists of four stages. Channel conglomerates, like Viacom or TV2, and distributors, like Comcast or Canal Digital, will first bargain bilaterally to decide input costs before in stage two the distributors can compose bundles and set prices. In stage 3 households purchase channels and bundles and in the last stage they watch television channels. In the following model presentation these steps are presented in reverse order working backwards from observed market data on ratings and viewership to observed bundle prices. Finally, the bargaining equilibrium resulting from the negotiations between distributor and channel is modeled using elements from game theory.

3.3.2 Household Demand

First of all the household demand for television must be estimated. The industry model assumes that households maximize utility and that the utility function is based on a time allocation model on the form of a Cobb-Douglas in logs. Households value time watching television as well as time doing non-television activities and maximize total utility from this.

(1)

$$v_{ij}(t_{ij}) = \sum_{c \epsilon C_j} \gamma_{ic} \log(1 + t_{ijc})$$

The vector t_{ijc} helps incorporate the number of hours household i watches channel c when they have the bundle j available. Channel taste preferences are denoted γ_{ic} and the distribution of this will later be estimated based on the available ratings data.

For t_{ijc} each household maximizes utility of their time

(2)

$$\max \sum_{c} \gamma_{ic} \log(1 + t_{ijc})$$

subject to

(3)

$$\sum_{c} t_{ijc} \leq T$$

When households maximize utility the resulting indirect utility from viewing the channels in bundle *j* can be found as the term

(4)

$$v_{ij}^{*}(\gamma_i, C_j) = \sum_{c \in C_j} \gamma_{ic} \log(1 + t_{ijc})$$

which will enter the bundle utility function along with price- and other characteristics.

(5) $$u_{ijndm} = v_{ijndm}^{*} + z'_{jndm}\,\psi + \alpha_i p_{jndm} + \xi_{jndm} + \epsilon_{ijndm}$$

The subscripts denote bundle j, cable system n, designated market area (DMA) d and month-year m. One example could be the Family Package offered by Canal Digital in Oslo in March 2013, although the DMA variable does not apply to the Norwegian market where prices are the same for almost all locations. This is not the case in the US market.

Households' indirect utility will just be the first part of the bundle demand function. Each household will have a different marginal utility of income, or in other words different price sensitivity when it comes to the purchasing of television bundles. Some value their TV-time high with high willingness to pay, while others watch TV just occasionally and are more sensitive to price. The price sensitivity parameter is denoted α_i in the bundle utility function (and will be negative since the function is written as a sum). In more detail this can be written as $\alpha_i = \alpha + \pi_p y_i$, to see the relation between the total price sensitivity α_i for each household, the income price sensitivity π_p and the household income y_i.

Which distributor that offers the bundle and in what year the bundle is being offered are some components of z_{jndm}. These components are therefore *observed* characteristics. Individual household taste preferences for these characteristics are denoted with ψ.

Other *unobserved* characteristics in the dataset affecting demand, for instance the extent of HD-service or the quality of technical support, are denoted in two parameters. The first, ξ_{jndm}, represents characteristics that are the same for all households in the market, while the second, ϵ_{ijndm}, is an idiosyncratic term meant to describe individual household deviations. Both these unobserved terms are likely to be correlated with price to some degree.

One can make a distinction between household specific utility variables and general utility variables by separating the function and define

(6)

$$\delta_{jdnm} = z'_{jndm}\,\psi + \alpha_i p_{jndm} + \xi_{jndm}$$

and

(7)

$$\mu_{ijndm} = v^*_{ijndm} + \pi_p y_i p_{jndm}$$

Letting F^n be the distribution of household preferences and demographics, the market share for bundle j in market ndm will be

(8)

$$s_{jndm} = \int \frac{\exp\left(\left(\delta_{jdnm} + \mu_{ijndm}\right)\right) \mathrm{dF^n(i)}}{1 + \sum_{k \in ndm} \exp\left(\left(\delta_{kdnm} + \mu_{ikndm}\right)\right)}$$

3.3.3 Distributor Supply

Distributors want to maximize profit and to achieve this they will want to find optimal bundle sizes with the corresponding profit maximizing prices.

The affiliate fees the distributor f pays per channel c for each household that receives the channel is denoted τ_{fc} and will be input costs for the distributor.

Without taking fixed costs into consideration the profit of distributor f will then be the following

(9) $$\Pi_{fndm}(\boldsymbol{b_{ndm}}, \boldsymbol{p_{n\,dm}}) = \sum_{j \epsilon_{b_{fn\,dm}}} \left(p_{jndm} - \sum_{c \epsilon C_{jndm}} \tau_{fc} \right) s_{jndm}(\boldsymbol{b_{ndm}}, \boldsymbol{p_{n\,dm}})$$

Where $\boldsymbol{b_{ndm}}$ is a list of offered bundles and $\boldsymbol{p_{n\,dm}}$ are the corresponding prices to these bundles. In other words the distributor profit will be the price of the bundle short of the sum of affiliate fees, multiplied by the market share.

It is assumed that the observed bundles and prices in the market form a *Nash Equilibrium* meaning that no party has anything to gain by changing their own strategy assuming other parties hold their strategies constant (Pindyck & Rubinfeld, 2009).

An existing Nash Equilibrium assumes that the distributor's chosen bundle with its corresponding price is the optimal strategy given the strategies chosen by all other distributors in the market. This can be generalized for all distributors f in all markets ndm, formally:

$\forall f$ and $\forall ndm$, $\boldsymbol{b_{fndm}}$ and $\boldsymbol{p_{fn\,dm}}$ maximize $\Pi_{fndm}(\boldsymbol{b_{ndm}}, \boldsymbol{p_{n\,dm}})$ given $\boldsymbol{b_{-fndm}}$ and $\boldsymbol{p_{-fn\,dm}}$

This implies that if a distributor decides to change strategy, either modifying bundle size or changing its price, the new profit will be less than or equal to the original bundle's profit. The article authors cannot prove uniqueness of the equilibrium in this game, but when doing numerical analysis the authors do not find multiple equilibriums (which would have affected the bargaining game).

3.3.4 Modeling the bargaining process

Before any of the above steps can be taken, distributors and channel conglomerates will have to agree to the affiliate fees that will be paid to the channels, usually as a linear function of the number of subscribers. It is assumed that the conglomerates bargain on behalf of all their belonging upstream channels with the distributors (e.g. Viacom bargain on behalf of MTV with Comcast), meaning that each channel's payoff depend on negotiations they do not participate directly in. This is different from early bargaining theory (Nash, 1950 and Rubinstein, 1982) which does not incorporate the case where one agent serves several interests at the same time. Distributors and conglomerates bargain a la Nash in this game.

The *Nash Product* concept (Nash, 1950) is utilized in this section, and therefore requires an explanation. Below it is assumed that the bargaining equilibrium between conglomerates and distributors will occur for the level of input costs that maximize the Nash Product.

Suppose a two player bargaining game where each player seeks to maximize their utility (*u1* and *u2*) of the respective payoffs (*x1* and *x2)* from the game. At the same time there are outcomes that are unacceptable for each player and will result in withdrawal from the game. The so-called disagreement point (*d*) will be the point where no agreement can be found and the negotiations break down – here if the affiliate fees cannot be agreed upon. The Nash Product can be written as the product of the excess utilities for both parties.

(10) $$\text{NP} = \big(U_1(x_1) - U_1(d_1)\big) * \big(U_2(x_2) - U_2(d_2)\big)$$

The bargaining process is modeled as a game where the two parties determine whether to form an agreement or not, and at which affiliate fees. These fees are simply assumed to be a

fixed amount for each subscriber. All distributors and conglomerates meet bilaterally, and in the simulations every conglomerate and distributor meets separately and simultaneously to negotiate.

Let

(11)

$$\Psi = \{\tau_{fc}\}$$

denote the input costs between each pair of distributor (f) and channel (c) while τ_{fK} will be a vector of input costs for conglomerate *K*. This opens for the different input costs incurred by large and small conglomerates which are observed in the US market. I expect this to be the case in Norway as well. Conglomerate size matters significantly when input costs are determined. Conglomerate revenue from all distributors for all channels can be written as

(12)

$$(\Pi_K(\tau_{fK}; \Psi_{-fK}) = \sum_{c \in K}(\sum_f \tau_{fc} Q_{fc}(\Psi)) + r_c^{ad} t_c(\Psi)$$

The conglomerates' revenues come from two sources; subscriptions and advertising. $Q_{fc}(\Psi)$ is the number of subscribers coming from distributor *f* for each channel *c* and the total subscription revenues will be a product of this number and the corresponding affiliate fees. In addition, the advertising revenues add to the conglomerates' revenues. These are modeled as a function of time spent watching each channel, $t_c(\Psi)$, multiplied by the observed advertising rates per household hour for each individual channel.

The Nash Product will be the following

(13)

$$NP_{fK}(\tau_{fK}; \Psi_{-fK}) =$$
$$\left[\Pi_f(\tau_{fK}; \Psi_{-fK}) - \Pi_f(\infty; \Psi_{-fK})\right]^{\varsigma_{fK}} \left[\Pi_K(\tau_{fK}; \Psi_{-fK}) - \Pi_f(\infty; \Psi_{-fK})\right]^{1-\varsigma_{fK}}$$

This is a modification of the general Nash Product (10) where Π_f is the distributor's profit as seen in (9) and Π_K the conglomerate's profit as seen in (12). Remembering from above, the equilibrium affiliate fees τ_{fK} will be the fees that maximize the Nash Product given the set of all other input costs Ψ_{-fK} . These input costs are unknown to the parties because the negotiations are assumed to be simultaneous and separate for all market participants. At the

disagreement point, or threat point, where there is no agreement between the parties, the input costs are set to positive infinity.

The ς_{fK} can be seen as a bargaining parameter which helps distinguish between symmetric and asymmetric Nash Bargaining. When $\varsigma_{fK} \neq 0.5$ there is asymmetry which means that the payoffs from the different strategies in the game will depend on *who* is playing the strategy because the two parties will have different bargaining power.

In the further simulations the bargaining equilibrium will be a result of the following maximization

$\forall f$ and $\forall K$, τ_{fK} maximizes $NP_{fK}(\tau_{fK}; \Psi_{-fK})$ given Ψ_{-fK}

For all distributors and conglomerates the bargaining equilibrium will occur for the input costs that maximize the Nash Product given the set of all other input costs (that are unknown, but assumed for the players in the game).

3.3.5 The Dataset

The model has now been established, and now it is time to put it to work. I have already mentioned that the dataset is very extensive. The data is collected for a wide range of local television markets in the US over several years.

First of all, it is important to clarify that all the data collected in the article is not available to the general public, and that *"the exact methods used (*when collecting) are not disclosed"*. The dataset provides information on a wide range of variables both on the supply and demand side over a significant period of time. This makes it one of the most extensive datasets in the field of quantitative analysis in multichannel television markets. Summary statistics from the article data are provided in the appendix of this thesis.

Compared to the limited dataset from the more simplified 2007 industry model, the new extensive dataset is much more representative for the US market as a whole. Around 25 000 system-bundle-years[3] are in the sample, providing data on price, bundle composition and number of subscribers. The average basic bundle costs $23.70 and consists of 20 channels. A full summary of bundle composition and prices in the US is found in Appendix B.

[3] 8000 systems with their respective bundles over a period up to 10 years.

The data does not only offer information about bundles, but also provide detailed information for each channel. Data on total number of subscribers, affiliate fees and advertising revenue have been collected over a period of 12 years for 120 TV channels. Detailed viewership data on channel level both from tuning data and survey data has also been collected (Appendix C) which in total gives a realistic input to the industry model.

3.3.6 Parameter Estimation

After the industry model has been specified and the data collected, all parameters have to be estimated before the welfare predictions can be done in the final step. These parameters are related to household channel preferences, the input cost function and the bargaining process. The next section will in detail present the parameter estimates together with the logic behind the estimates, provided in the framework.

In the estimation of parameters the term *moments* is applied. Moments provide information about the distribution's shape with the mean and variance being the first- and second statistical moment (Taraldsen, 1999). From the obtained dataset, *sample moments* can be estimated, and these are used in the following estimation of the parameters. The estimation *method of moments* will not be discussed further as the focus will be on the outcomes.

Channel taste preferences (γ_i)

Seven moments, including mean hours watched per household per channel per demographic group, are used in the estimation of the channel taste preferences γ.

The amount of time household *i* spend watching TV channels, t_{ijndm}, in their available bundle *j* will depend on the particular household's channel preferences which in the article is modeled as a vector, γ_i . The distribution of the parameter γ is estimated by matching the moments of time spent viewing *predicted* by the model, with the sample moments obtained from the ratings data (which are measurements of time spent viewing at the individual and market level).

The more simplified 2007 model incorporated the fact that some households would have a WTP of zero for some channels, which is a realistic assumption. This must necessarily be incorporated in the household taste parameter, γ_i in this model as well. The problem is solved by using a vector $\boldsymbol{x_{ic}}$whose components are indicator variables (taking value either zero or one).

(1) $$\boldsymbol{x_{ic}} = \begin{cases} 0, with.prob & \rho_{oic} \\ 1, with.prob\ 1 - & \rho_{oic} \end{cases}$$

So that

(2) $$\boldsymbol{\gamma_i} = \boldsymbol{x_i} \circ (\boldsymbol{\Pi o_i} + \boldsymbol{v_i})$$

If a household has a non-zero WTP for channel *c*, the indicator variable takes the value 1 and the channel will have a positive value for the household. How large this value will be depends linearly on observed household demographics (represented by the vector $\boldsymbol{o_i}$) and some other unobserved household heterogeneity (represented by the vector $\boldsymbol{v_i}$).

Marginal utility of income (α_i) and taste for other bundle characteristics (ψ)

These parameters have been estimated using linear instrumental variables regression, based on existing work (Berry, Levinsohn and Pakes 2004 and Petrin 2003). The estimation is based on the defined δ_{jdnm} from the model's predicted market share equation.

(3) $$\delta_{jdnm} = z'_{jndm}\,\psi + \alpha_i p_{jndm} + \xi_{jndm}$$

Briefly explained the parameterization is done by estimating δ_{jdnm} from observations, and then given δ_{jdnm} estimate the parameters $\boldsymbol{\alpha}$ and $\boldsymbol{\psi}$ from instrumental variables regression. By using instrumental variables it is possible to deal with possible endogeneity problems (where the independent variable is correlated with the error term) that can cause biased parameters. (Stock & Watson, 2012). It is clear that the bundle price *p* will be correlated with the unobserved characteristics (HD-service, quality of tech-support) captured by the error term ξ_{jndm}. This is likely to result in a wrong estimation of α and instrumental variables are therefore more appropriate. If the instrumental variables applied are valid (which the article authors argues) $\boldsymbol{\alpha}$ and $\boldsymbol{\psi}$ will be consistent.

In practice, the bundle price is instrumented with w_{ndm} which is the average price of other cable system's bundles in the same geographical area. Non-price product characteristics z_{jndm} are assumed to be uncorrelated with the error term. This thesis will not go into further detail on the validity discussion, but will just assume that these parameters are consistent.

Cost estimation

Now it is time to parameterize the affiliate fees τ_{fc} paid by the distributor to the channel. The parameter is a pretty straightforward function of the channel characteristics scaled by a

function of firm and channel conglomerate characteristics. The latter will capture the relative size of the distributor and conglomerate as well as any ownership the distributor might have in the channel. As mentioned, it is very likely that this would affect the affiliate fees paid by the distributor.

(4) $$\hat{t}_{fc}(\eta, \varphi) = (\eta_1 + \eta_2 \tau_c)\exp(\varphi_1 MSOSIZE_f + \varphi_2 VI_{fc})$$

τ_c is the observed average input cost from the obtained dataset for channel c. The distributor's number of subscribers is denoted $MSOSIZE_f$ and any ownership share distributor have in the channel is denoted VI_{fc} (vertical integration dummy variable).

The model's predicted aggregated input costs should equal the observed aggregated input costs for the first moment conditions to hold

(5) $$E_f\left[\hat{t}_{fc}(\eta, \varphi)\right] = \tau_c$$

The remaining moment conditions in the cost parameterization are related to the Nash Assumption, and will not be presented in this thesis as the main focus will be on the results. A short discussion will still be necessary.

Since the observed prices and bundles are assumed to form a Nash Equilibrium the bundle's optimal price should be equal to the bundle's input cost plus a mark-up that depends on demand conditions and other bundles in the market. This will hold in each firm in each market given all other bundles and prices. The implied marginal cost for each bundle, $\hat{mc}_{jndm}$, can be found by using the previously estimated demand parameters and the observed prices and bundles.

The next set of moment conditions implies adding a bundle-specific error term to the bundle marginal costs and assuming that this error term is uncorrelated with the firm's actual size and ownership in channels. In practice bundles might be altered with, either adding or dropping channels. With the Nash Assumption this should not occur, but it is nevertheless observed in the market. Firms may have unobservable information about the optimal bundle composition which could cause profit to increase if the bundle is altered with. The final assumption is that the firm's profit is higher for the chosen and observed bundle, than for any other bundles.

With these moment conditions η and φ can be estimated by the method of moments.

Bargaining Parameter

The final unobserved parameter that needs to be estimated is the bargaining parameter, ς_{fK}, describing the relative bargaining power between the distributor and the channel conglomerate. Since the bargaining process ultimately results in input costs, it is natural to estimate ς_{fK} based on a comparison between the model's estimated input costs and the observed input costs. The value for ς_{fK} is simply chosen as the value that minimize the difference between estimated and observed costs. Of course, the agreed upon input costs will also give information about the actual resolution point of the negotiations.

There are also other factors that influence the negotiations, like the respective parties' outside options if they were to pull out, but in the television market the parties' bargaining power is the most important parameter. This parameter is not surprisingly strongly correlated with firm size, according to an experimental FCC report in the industry (FCC, 2002).

Due to the many variables the model has simplified the bargaining game by reducing the number of players in the game. It is assumed that there is one large market and one small market which are served by separate cable distributors. At the same time there are two national satellite television firms that compete with the cable distributor in each market. This way the number of players is been reduced to three for each market; one cable and two satellite options. The benefit of assuming just one cable option in each market is that there is no need to compute many simultaneous negotiations, which would require a lot of computations. Furthermore, it is also assumed that the size of the cable system is either large or small so that there still will be a connection between size and input costs when estimating ς_{fK}, thus capturing the size effect.

3.3.7 Estimation results

Given that the model is specified in a good way, and reasonable assumptions have been taken, the results can provide much insight on the television market. With the extensive dataset the resulting parameters and welfare effects can be relied upon. This is very useful in the section where á-la-carte is compared to bundling. After I have presented the results, I will also here discuss the model's predictive value.

Household Demand

Reported in Table 3 are both the price sensitivity and the price-income interaction parameters. The IV regression yields a significant different result from plain OLS (Ordinary Least

Square), which suggests that the IV approach gives a more accurate estimator for the price sensitivity given that the instrument is valid. One explanation for the higher value will be that the error term in plain OLS captures effects that the consumers value positively, like high extent of HD-service and/or good technical support. Holding all other factors constant one will expect a 0.5% decrease in household utility for a 1% increase in bundle price, though such a relation in itself is difficult to interpret. It is necessary to translate this relation into actual demand effects of changes in price rather than difficult to interpret utility effects.

The simulation results from the article suggest that there are differences in own-price elasticity for different bundles. In most markets there are both a Basic and an Expanded Basic bundle of TV channels, and not surprising the price sensitivity for the Expanded is higher (-6.34) in absolute terms than for the Basic (-4.12) package. This is natural because the expanded bundle must be purchased on top of the basic bundle in these markets. As we can see the model estimates demand to be relatively elastic something that other work and research in the field also finds (FCC2002, Petrin 2004).

Parameter	*Estimate*	*Standard Error*
Price sensitivity (IV)	-0.50	0.03
Price sensitivity (OLS)	-0.29	0.00
Price income interaction	0.11	0.01

Table 3: Estimated price sensitivity parameters (Crawford & Yurukoglu, 2011, p.24)

A summary of the estimated willingness to pay for individual channels can be found in Appendix D, together with an example of the demographic dispersion in WTP for each of these channels. Estimated correlations in reservation prices are also illustrated in Appendix D. For instance, the household WTP for ESPN 2 is highly correlated with the WTP for ESPN, as one would expect.

The simulations reflect both the ratings data (Nielsen) and the survey data (Mediamark) to a large extent. Naturally, when the observed mean and variance of the ratings for a channel like ESPN is high, the industry model will estimate a WTP for ESPN with the same pattern.

Input Cost

Using the model marginal cost for the Basic bundle is estimated to be $11.08, but the most interesting will be the estimated affiliate fees for individual channels. As mentioned the

affiliate fees are estimated using the cost data (Kagan), but the model also accounts for the distributor size and the potential ownership distributor might have in the channel.

	All Moments	
Parameter	*Estimate*	*Standard Error*
Constant	0.16	0.00
Kagan scale	0.91	0.00
MSO size	-0.08	0.00
Vertical integration dummy	-0.14	0.01

Table 4: Estimated input cost parameters (Crawford & Yurukoglu, 2011, p.28)

Table 4 reports the impact of the three factors on the model's estimated input costs. Interestingly, but not surprising, both the size of the distributor (tens of millions of households) and its potential channel ownership (percent) matters significantly to the affiliate fees. The relation is as expected, large distributors with ownership in the channel conglomerates face the lowest input costs. For example, the model predicts that the large distributor Comcast faces input costs 17% below the input costs of the average distributors.

When building the model, ς_{fK} was defined as a bargaining parameter, ranging between zero and one, between distributor and channel conglomerate. Per definition the relative bargaining power for channel conglomerates will be high for small values of ς_{fK}. As one would expect the model predicts higher bargaining power for the distributors in negotiations with small conglomerates. The situation is reversed for small distributors dealing with large channel conglomerates.

3.3.8 Welfare effects of full á-la-carte

The detailed framework built in this article can now be applied to answer the problem I formulated in the introduction chapter. Crawford and Yurukoglu naturally focus on the US market when drawing conclusions, but this thesis will later argue that the model can help understand the Norwegian television market as well.

A lot has been said about the welfare effects of bundling, and how á-la-carte would, in many cases, re-allocate social welfare from producer to consumer. Neither of the basic literature takes into account the bargaining process that was built into the new industry model. A summary of the welfare measures can be found in Table 5.

	Bundling	ALC No Reneg	Percent Change	ALC With Reneg	Percent Change
Non-welfare outcomes					
Cable & sat oenetration	0.880	0.998	13.3%	0.993	12.8%
Total affiliate fees	$18.22	$18.22	0.0%	$36.98	103.0%
Mean consumer expn	$27.63	$21.07	-23.8%	$28.24	2.2%
Number channels received	42.8	22.0	-48.5%	19.3	-54.9%
Number channels watched	22.2	22.0	-0.5%	19.3	-12.8%
Welfare outcomes					
Channel profits					
Total license fee rev	$16.03	$7.95	-50.4%	$15.44	-3.7%
Total advertising rev	$13.38	$14.71	10.0%	$14.73	10.1%
Total channel revenue	$29.41	$22.67	-22.9%	$30.16	2.6%
Distributor profits	$11.59	$13.11	13.1%	$12.81	10.4%
Total industry profits	$41.00	$35.78	-12.7%	$42.97	4.8%
Mean consumers surplus	$45.82	$54.59	19.2%	$45.91	0.2%
Total surplus	$86.82	$90.37	4.1%	$88.88	2.4%

Table 5: Baseline results: Full á-la-carte with and without input cost re-negotiations (Crawford & Yurukoglu, 2011, p.32)

The idea of unbundling does indeed have major consequences in the television market, also indicated in the more simplified 2007 study. The simulations have been conducted on two different scenarios, one that assumes there are no re-negotiations after unbundling, and one that does take this into account. Results are reported in dollars (year 2000) and percentages, but for the rest of this section the main focus will be on the percentage changes. Some of the changes that are reported are close to zero, but given the large dataset even small percentage changes can be statistically significant.

No re-negotiations of affiliate fees

When there are no re-negotiations of the affiliate fees, these fees will be the same as under the bundling alternative. The results are very similar to the outcome of the 2007 model. The industry model predicts that consumers on average will get rid of around half (48.5%) of the channels that were in the original bundle. Without the re-negotiations this will result in a 23.8% decrease in consumers' television expenditure. Consistent with theory presented earlier in this thesis, the consumer surplus under á-la-carte will increase. On average, each household experiences an increased consumer surplus of 19.2% when they are allowed to choose individual channels. Since the affiliate fees cannot be re-negotiated the channel profits from

these fees will decrease dramatically (50.4%), on par with the reduced consumer viewership. Some of the channel profits though are recovered through increased advertising revenues which are assumed to be a linear function of the channel viewership. In other words, today's advertising revenues are multiplied by the percentage change in viewership caused by the new á-la-carte policy. On the whole, channel profits will decrease almost 23% under á-la-carte with no re-negotiations. Distributors are actually better of under á-la-carte (13%). In total the effect on consumers, channels and distributors is a slight increase in total surplus of 4.1%, compared to the baseline bundling scenario.

Re-negotiations of affiliate fees

The first scenario is somewhat unrealistic in the television market because the affiliate fees will most likely be re-negotiated when consumers change their behavior, as described earlier. Television channels would not accept the same affiliate fees, which dramatically reduce their profits, under á-la-carte if the model's prediction is right. Because of this, it would be more realistic to allow for re-negotiations of the affiliate fees when simulating the welfare effects. It is assumed that the in the new equilibrium distributors will set the á-la-carte prices equal to the affiliate fees and then charge fixed fees for access to their platforms. Again this is done for computational reasons, and will only affect the distributors' profits. From the dataset the article authors have found margins of 5-10% on the affiliate fees, and in calculating the distributors' profit this markup will instead be reflected in the fixed access fee giving approximately the same result.

In Appendix E the welfare measures for each individual channel are given. Remember that also under á-la-carte the distributor will have to pay the channel on a per-subscriber basis. Because of this one would expect a large increase in the fees since the number of subscribers for all channels will decrease when unbundling.

As expected, the second scenario has major consequences for the affiliate fees. Under á-la-carte the affiliate fee for Comedy Central are predicted to be 187.5% higher than under the baseline bundle scenario. The predicted changes in costs fluctuate wildly from channel to channel, which naturally affect profits. Similarly, the effects on revenue are drastic where for instance CNN are predicted to increase revenue by 144% whilst Disney Channel are predicted to reduce revenue by almost 60%. These effects are driven by the consumer heterogeneity that under á-la-carte takes into effect. Overall the affiliate fees are expected to increase by 103% when allowing for renegotiations, but since the number of subscribers changes under á-la-

carte the overall channel revenue effect is barely positive with a 2.6% increase. Nevertheless, this is a drastic change from the no re-negotiations scenario where channels were much worse off.

Under the second scenario consumers cannot expect a big difference in their expenditure. In fact the model predicts an overall *increase* of 2.2% in expenditure, even though consumers subscribe to fewer channels (19.3). Compared to the baseline bundle scenario, consumer surplus is unchanged which should be very interesting for policymakers. Consumers will have to face much higher input costs reflected in the subscription prices and will in fact spend a similar amount of money on fewer television channels.

Overall the second scenario predicts a slight increase in total social surplus of 2.4% with the distributors and channels benefiting the most from the new policy. The outcome of these simulations is very interesting to say the least. It contradicts much of the fundamental bundling theory, and actually suggests that distributors are better off under á-la-carte. Consumers experience the same consumer surplus, as under bundling, but will have access to about half of the channels from the original bundle. The main reason for the new results is the strong assumption taken in the earlier models of fixed input costs. In the television market this is highly unlikely and by adding the distributor-channel bargaining game the model becomes much more applicable to the television market.

3.3.9 Robustness

I will now briefly discuss possible weaknesses of the model, and explain why I conclude the model can provide accurate results in the television market.

First of all, I find the 2011 industry model to be much more realistic than all the previous models because more market specific variables are taken into account. Competition and the channel conglomerates are addressed and most importantly, the simulations allow for changes in costs thereby making the model much more dynamic. Of course, the extensive dataset also makes sure that the outcomes are accurate for the US market and that the model predictions must be taken seriously.

When it comes to the demand side I think the bundle utility function is reasonable. It seems to incorporate the most important factors which the consumers value. Nonetheless, the time allocation function is a simple approach, and might be insufficient to predict utility from channels that households value high, but do not watch a long time. Typically this will be the

case for sports channels with a few big events per month. However, if this is incorporated the model would be much more complex, and I think the approach taken in the model is fair. Crawford and Yurukoglu also point this out, and argue that the errors caused by these "time versus value" issues cancel out in total and that the overall welfare predictions will be accurate.

Furthermore, I would suggest dividing the two error terms in order to separate different utility effects. In my opinion there is a consumer trend to demand better platform technology, for instance higher capacity and speed. It would be interesting to measure the utility effect of this factor, even if it increased the model complexity.

On the cost side the dynamic approach allowing for re-negotiations is the only realistic assumption in my opinion. The results from the first scenario are therefore questionable and cannot be used by policymakers. The bargaining game is a good way to add dynamics to the model, but there are still some weaknesses with its design.

First of all, the model takes an important assumption about information asymmetries, and in fact ignores the possible existence of these asymmetries. Once the negotiations have started the players in separate games cannot coordinate with each other, something that seems unrealistic in practice. Another weak assumption that might not hold in practice relates to the result of disagreement between distributor and conglomerate. Every channel conglomerate is treated as a block of channels meaning that the result of a disagreement would be that the distributor would lose access to all channels from the particular conglomerate. The message would be that either you get the rights to all channels or no channels without exceptions. In practice it would be more realistic to assume that the parties could agree to the distribution of a portion of the total channels even if they could not agree to the whole package. This would especially be the case if the conglomerate represents both advertising funded channels and premium channels. Later I will discuss how different types of channels often can call for different bundling strategies.

Even with its simplifications in mind, I think the bargaining game is a good way to account for competition in the market. Crawford and Yurukoglu found that the welfare measures were very sensitive to the bargaining game outcome, but I believe that the assumptions taken about costs are realistic. I think the bargaining power and the degree of vertical integration are the most important determinants of the distributor input costs. Both these factors were incorporated in the model.

Earlier, I mentioned how the monopoly assumption was unrealistic in this setting, and now it will be easier to measure the effects actual market participants will experience under á-la-carte. Most importantly the model becomes more dynamic with respect to changes in input costs under á-la-carte.

With the large dataset and the much more realistic approach compared to the basic framework, I have confidence in the model's predicted results. Still it should be noted that the industry model is meant for short to medium term use. With a longer time perspective some channels could change their profile or even exit the market while new channels could enter the market. This would affect the welfare measures on the long term.

4 The US and Norwegian Markets for television

I will now give a short overview of how the Norwegian market for television relates to the US market. This discussion will be closely linked to the two market specific models and their assumptions, but I will first present the Norwegian television market. After I have given the market presentation I will go on and discuss to what degree the 2011 industry model has any predictive value in the Norwegian market, or if it must be modified. Finally, I will suggest some modifications to the model, if it were to be applied on the Norwegian market. Some of these suggestions will be based on recent trends in the television market.

4.1 Overview

Similar to most television markets, there are also three important forces in the Norwegian market. Consumers, channel conglomerates and distributors participate in the same market space under similar regulations as in the US. I will now present each of the market participants, and outline important similarities and differences between the two markets.

4.2 Households and preferences

The total number of TV-subscribers, usually households, in Norway is around 2.2 million (PT, 2013). Compared to the US, with its more than 100 million subscribers in 2010 (FCC, 2012), this number illustrates the huge difference in market size.

Other than the size there are many differences between the two markets when it comes to the demand side. USA and Norway have a very different demographic composition of people. There is no doubt that the cultural differences are bigger in the US, and that the Norwegian

population are quite homogenous in comparison. One would expect that the consumer taste heterogeneity is even higher in the US because of this, and if this is the case, bundling could be more profitable there than in Norway. Having said this, I cannot with certainty conclude that consumer tastes vary between the markets on an aggregated level. Also, as the globalization continues, the demographic differences between the countries should diminish over time.

In the 2011 industry model designed for the US market, the bundle utility varies both with location and demographic characteristics of each household. Furthermore, every state in the US has the opportunity to regulate the prices of the *basic* bundles as well as imposing different taxes on these bundles (FCC, 2013). This is not the case in Norway. I would not say that location matters for the household utility of a bundle in Norway, but I see how this can be the case in the US. For instance, the median household income in Maryland is almost twice as much as for Mississippi households (US Census Bureau, 2012). One must expect that Mississippi households are more sensitive to price than their Maryland counterparts. Nothing compares to this in Norway, even if there are some small regional differences.

In other words, while Norway more or less can be seen as one integrated market, USA consists of many markets with different regulations and where consumers' purchasing power differ to a significant extent. As a result of this, the prices vary between markets and bundles are often composed differently depending on location even if the bundle is provided by the same firm.

The preferences for specific distributors, represented by ψ, does not seem very significant for the household utility in Norway. Overall, only 14% of households report that they are unsatisfied with their specific provider (Kulturdepartementet, 2011). Furthermore there does not seem to be a pattern between the providers when it comes to consumer satisfaction, except for Altibox who enjoys higher reported satisfaction (Norsk Kundebarometer, 2012). In line with my expectations, it is the bundle composition itself that adds utility to households as well as the additional services, not by which firm the bundle is provided. Altibox probably benefits from their more advanced technology. To implement such a "technology factor" in the model could be useful because I think it is the platform technology, rather than the particular firm, that adds to the households' utility. Of course this factor can be seen as an observed characteristic entering the first error term, but in my opinion it would be best to separate technology preferences from the pool of other characteristics. In this way, it would be easy to

measure its specific effect on household utility and demand. The trend in the market is that the technological platforms gets more and more important to consumers as the extent of online streaming services increase. My guess is that fiber technology will have positive effect on utility compared to ordinary cable.

Finally, I expect that the time allocation function (Cobb-Douglas) used in the industry model to estimate viewership utility is suitable also in Norway. Norwegian households will in the same way maximize their utility of watching channels given their available bundle. If I assume that Norwegians and Americans value their television time the same (with the same Cobb-Douglas function), the household utility functions on the aggregate will not differ too much.

However, when using the time allocation function, it must be assumed that the time watched television reflects the willingness to pay for the subscription in total, and for each channel. This can be questioned, especially for expensive channels carrying big sports events which consumers value high, but do not watch more than a few events.

Even though I have outlined some certain and possible differences, the industry model specification of household utility provides a decent match to Norwegian households. One advantage with having one integrated market and a more homogenous population, in this setting, will be that the potential simulation results in Norway can more easily be generalized to the whole market.

4.3 Distributors

I will now look at the distributors with two main talking points. First, it is important to discuss which platform technology that is used, and whether there are significant differences between the two markets in technology. Also, any differences in the observed bundle characteristics between the markets must be discussed.

Both in the US and in Norway there are a few major companies that distribute channels to a large share of households. As I mentioned earlier, the monopoly assumption taken in many of the previous models is therefore unrealistic. Only in the 2011 industry model, downstream distributor competition was incorporated and therefore I will relate the discussion to this model in particular.

4.3.1 US and Norwegian Distributors and Platforms

When I have talked about the profit maximizing firm in the more general models, I have really talked about the television distributors. These are the companies that decide bundle composition and prices. In Table 6 the market shares of US television distributors are noted, with Comcast being the largest distributor in the cable market, and DIRECTV the largest satellite provider. Time Warner also enjoys a significant market share in the cable market, but after the two big nationwide distributors (which also are part of the so-called *big six* media conglomerates) the market is more fragmented with many smaller distributors. There are only two satellite providers in the US of any significant size; DIRECTV and DISH Network. In the table below, an overview of the cable and satellite markets in the US are given from a few years back. The cable platform on aggregate observes a decline in subscribers, while satellite providers experience an increase.

Year	2006	2007	2008	2009	2010
MVPD Total[449]	**95.8**	**97.7**	**98.9**	**100.7**	**100.8**
Cable[450]	**65.4**	**64.9**	**63.7**	**62.1**	**59.8**
Comcast	24.2	24.1	24.2	23.6	22.8
Time Warner	13.4	13.3	13.1	12.9	12.4
Cox	5.4	5.4	5.3	5.2	4.9
Charter	5.4	5.2	5.0	4.8	4.5
Cablevision	3.1	3.1	3.1	3.1	3.3
Bright House	2.3	2.3	2.3	2.3	2.2
Suddenlink	1.4	1.3	1.3	1.2	1.2
Mediacom	1.4	1.3	1.3	1.2	1.2
All Other Cable[451]	8.8	8.9	8.1	7.8	7.3
DBS[452]	**29.1**	**30.6**	**31.3**	**32.6**	**33.3**
DIRECTV[453]	16.0	16.8	17.6	18.5	19.2
DISH Network[454]	13.1	13.8	13.7	14.1	14.1

Table 6: Number of customers (households) for multichannel video programming distributors (MVPD) and platforms in the US (Millions), (FCC 2012, p60)

There are not that many major distributors operating in Norway either. In the cable market there are two main distributors, Canal Digital (Telenor) and Get, which had a combined market share of more than 90 % on the cable platform at the end of 2012 (PT, 2013). Adding Canal Digital's satellite service, the firm has an aggregated market share of 45.9% in the whole television market. Get, who only operates on the cable platform, has a market share of 17.1%. RiksTV, with their digital terrestrial television (DTT) platform, enjoys a market share of 13.1% while Viasat's satellite service accounts for 6.7% of television subscribers. Altibox, which distribute their service through local fiber providers accounts for around 14% of the market as of 2012.

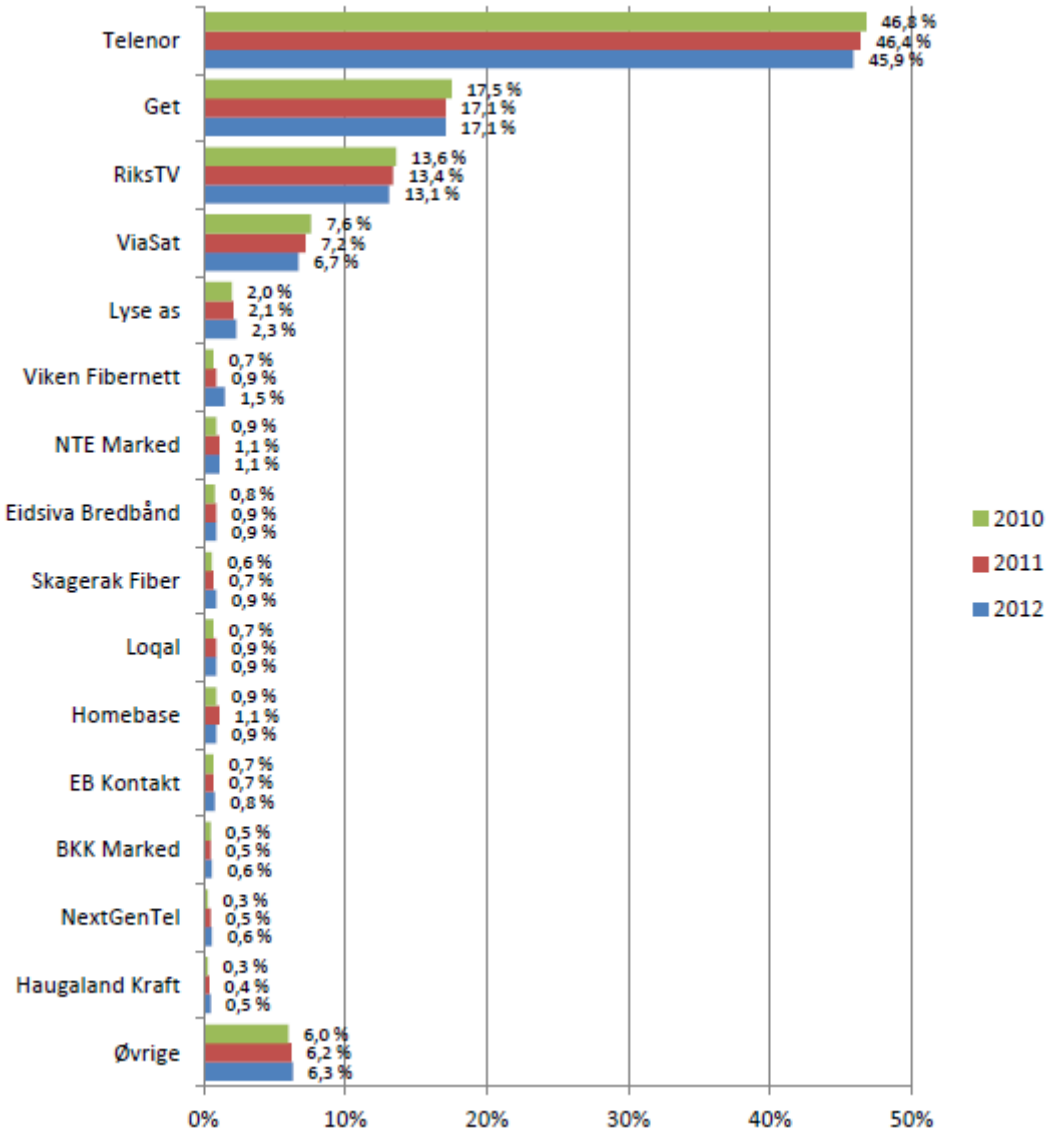

Fig 8: Share of customers for different television distributors in Norway (percent), (PT, 2013)

The different platforms seem to have approximately the same share of consumers in Norway (Figure 9) and the US. Fiber is not as common in the US as of yet.

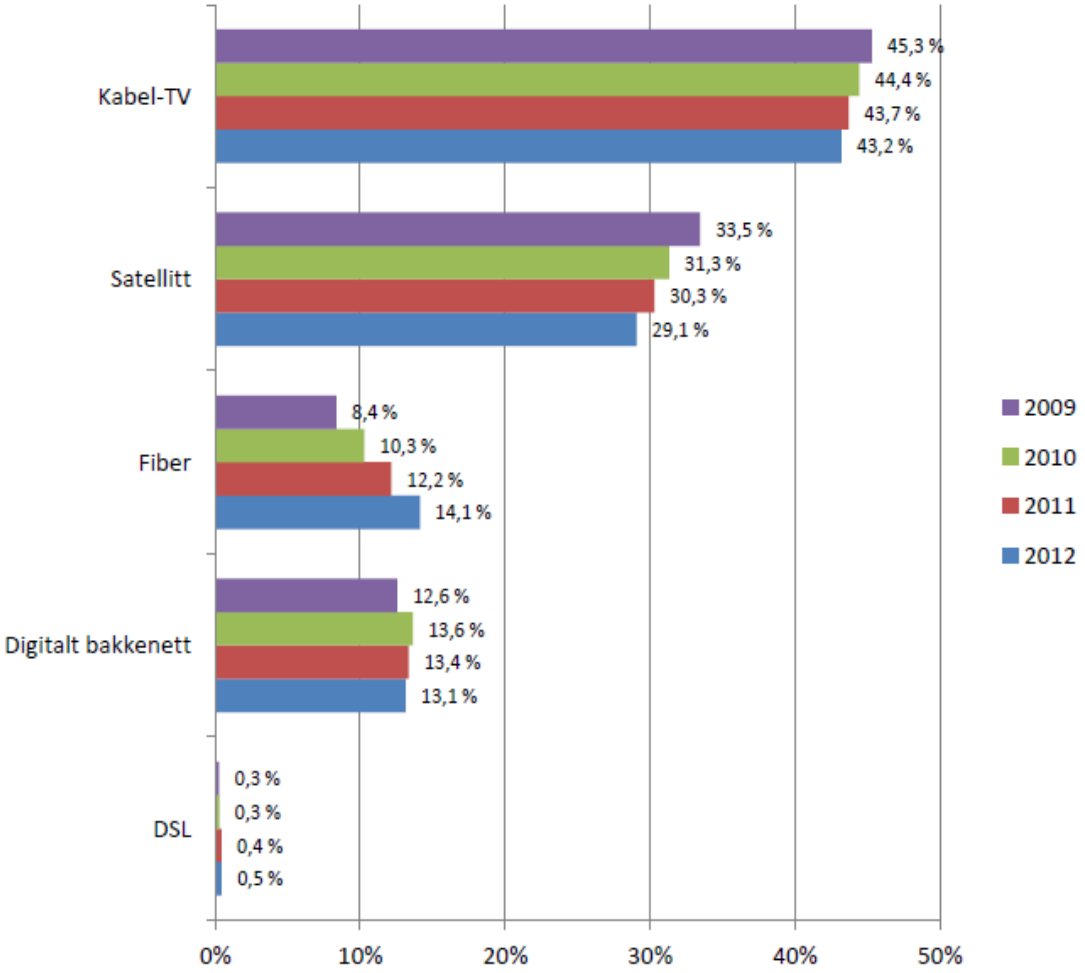

Fig 9: Number of subscribers for different distribution platforms last 4 years (percent) (PT, 2013, p67). (Digitalt Bakkenett - DTT).

The simplifying assumption in the industry model of just two national satellite providers seems reasonable, both in the US (DIRECTV and DISH Network) and in Norway (Canal Digital and Viasat). This assumption was made during the bargaining parameter estimation in the negotiations, in order to reduce the computational complexity of having too many simultaneous negotiations. In fact, there are not that many players in the real world game either, so the model assumptions are reasonable. A final observation is that, unlike Norway, there is an increasing amount of subscribers to satellite television providers in the US. In Norway the trend is reversed, possibly because of better cable and fiber infrastructure.

4.3.2 Bundle composition and prices

All the distributors in the market offer some sort of bundle in line with what theory predicts, and full á-la-carte is non-existent.

Cable				
Comcast[431]	Digital Starter $29.99 (80 channels)	Digital Preferred $39.99 (160 channels)	Digital Premier $84.99 (200 channels)	
Cox[432]	TV Essential $57.99 (95 channels)	Advanced TV Preferred $67.99 (236 channels)	Advanced TV Premier $76.99 (270 channels)	
BendBroadband[433]	Essentials $46.99 (159 channels)	Preferred $54.99 (196 channels)	Gold Package $98.47 (295 channels)	
DBS				
DIRECTV[434]	Choice $29.99 (150 channels)	Choice Extra $34.99 (210 channels)	Choice Ultimate $39.99 (225 channels)	Premier $83.99 (285 channels)
DISH Network[435]	America's Top 120 $29.99 (120 channels)	America's Top 200 $39.99 (200 channels)	America's Top 250 $44.99 (250 channels)	America's "Everything" Pak $79.99 (315 channels)

Table 7: Selected bundle prices in the US (FCC, 2012, p58)

Actually there are differences in the basic bundle compositions and prices in the US seen from Table 7. The satellite distributors evidently offer a higher number of channels for the same price as Comcast. I will not go further than to say that the extra channels offered on satellite are likely to be niche channels from other countries with low mean valuations and affiliate fees. Therefore I assume that the basic bundles for the large distributors are similar both when it comes to valuation and costs. Even though there are differences between bundles, Crawford and Yurukoglu argue that the US market is in a Nash Equilibrium. I will discuss how reasonable this assumption is in the Norwegian market soon.

Below is a comparison of the basic bundles offered by the six largest distributors in the cable-, satellite- and digital terrestrial television (DTT) markets in Norway.

Provider	Technology	Bundle	Price per month(NOK)
Canal Digital	Cable	"Basic"	359
Get	Cable	"Basic"	359
Altibox	Fiber Optic Cable	"Basic"	379
RiksTV	DTT	"RiksPakken"	379
Canal Digital	Satellite	"Family"	378
Viasat	Satellite	"Folkepakken"	299

Table 8: Selected bundle prices in Norway. (Providers websites, May 2013)

When it comes to bundle composition in Norway, the differences are very small. Get and Canal Digital offers almost the exact same bundle at the same price with only a few differing

channels (Providers Websites, 2013). As mentioned, the industry model assumes that observed bundle compositions and prices form a Nash Equilibrium. Given Canal Digital's bundle, Get has nothing to gain by changing the composition or price of their own bundle. In fact, by changing the bundle, Get would get a reduction in profit with this assumption. Looking at the bundles and prices, I think it is fair to assume a Nash Equilibrium also in Norway. The providers seem to follow closely their competitors' actions and this is reflected in the similar prices and bundles. Even though the bundles differ a bit more across the three platforms (e.g. RiksTV does not offer SVT2 and Eurosport2 compared to Altibox), the platform penetration is so high that all distributors seem to participate in the Nash game. If one firm could add to its profit by changing bundle composition or price, it would already have done so.

It should be noted that all the bundles offered are not entirely equal, and the Viasat bundle consists of less channels than the others. In addition, Modern Times Group-owned Viasat is not only a distributor, but also a producer of content through own channels like Viasat4. Their business model may be different as a result of this, something that also could explain the deviation from the average bundle market price.

4.3.3 Other Bundle Characteristics

The extent of HD-service varies between distributors, and the cable companies all offer broadband service at a discounted price for their TV-subscribers. About 41% of cable consumers in Norway report that they have a "double-play" subscription with both television and internet (Kulturdepartementet, 2011).

Consumers value such additional attributes as well. I would say that these attributes will have increasing importance as new technology change how people consume television. Other than Internet connection, examples of additional services provided are Viasat, who offers their On-demand Web-TV service, *Viaplay*, free of charge to their subscribers. Canal Digital offers a similar service, *Canal Digital Go*, which was introduced recently (Providers websites, 2013).

In the industry model these additional attributes enter the consumer utility function in two terms (one common for all households, ξ, and one household specific, ϵ).

Crawford and Yurukoglu argue that the additional attributes will be correlated with price, but in my opinion this is not necessary the case in Norway as of now. In my opinion, prices seem to be driven by competition more than by consumer value. For instance, cable technology

allows for internet services, like movies on demand, unlike DTT and Satellite, but this is not reflected in the prices for television bundles. It is interesting to note the small price differences in general and across platforms which indicate a high level of competition. An independent report prepared for the Norwegian Ministry of Culture (Kulturdepartementet, 2011) concludes that the observed level of competition across platforms partly can be explained by the increasing platform penetration in Norway. More and more households now have several options when choosing their television provider. Particularly, the fiber optic cable infrastructure, which allows for higher speed and capacity, has been built rapidly over the last years. As a result of this, Fiber has captured market share from both the Cable and Satellite platforms.

4.3.4 Distributor Input Costs

The next step will be to discuss the affiliate fees, τ_{fK}, paid per subscriber from distributor to the channel conglomerate. In the industry model, these fees are the result of the bilateral negotiations between the distributors and the channel conglomerates. It is fair to assume that the affiliate fees in Norway, also for historically advertising funded channels, are a linear function of the number of subscribers (E24, 2013).

Both the market specific models suggest that large distributors will get a discount on the input costs as a result of the bargaining power. Comcast was predicted to get a 9% and a 17% discount respectively by the two models. I think it is fair to assume that the bargaining power is a function of the number of subscribers for each distributor. I would therefore expect that also Time Warner, DIRECTV and DISH Network all have significant bargaining power, but still less than Comcast. In Norway, I will expect Canal Digital and Get to get a discount compared to the other distributors.

It is important, however, to remember that the model bargaining parameter measures the *relative* bargaining power between distributor and conglomerate. In other words, the parameter will not be a fixed number for each distributor, but different depending on which conglomerate the firm negotiates with. Because of this, it is also important to have an understanding of the different television channels and channel conglomerates in the US and the Norwegian markets.

4.4 TV Channels

In Norway there are basically three different types of channels. Within the commercial market there are two main categories of channels; the advertising based channels and the premium

subscription channels. After a short description of these I will give an overview of channel conglomerates in the US and in the Norwegian market. I will also come back to the third channel category, the state owned non-commercial broadcaster NRK.

4.4.1 Advertising funded programming

Historically advertising funded programming have had low distribution costs for the providers, but recently conglomerates have started to demand higher affiliate fees. This has led to bitter conflicts between distributors and conglomerates (VG, 2012). In a Norwegian case, Canal Digital and the TV2 Group could not negotiate a deal for the TV2 niche channels. As a consequence, the niche channels had to be removed from the basic bundle, in fact from the whole portfolio of channels Canal Digital could offer. The parties agreed in May 2013 and are now friends again.

The channels in this category will have two main sources of revenue; advertising revenue and subscription fees. This goes well in hand with the channel revenue function derived in the industry model. I expect that all advertiser funded channels operating in Norway also receive a linear affiliate fee, even though distributors are reluctant to share information on this matter. In other words, I assume that *pure* advertiser funded programming is nonexistent in the Norwegian market. Even if such channels existed it would not have implications for the model framework, but simply make the last term in the conglomerate profit function zero.

The industry model incorporates both sources of revenue which is very important to get the right results. Advertising revenues were modeled as a linear function of household time watching television which is the most practical way of dealing with these revenues. In my opinion, this can be a problem for the high valued channels which at the same time are not watched many hours, which can be the case for sports channels as described earlier. The opposite could occur for news channels like CNN, which can be watched more passively than live sporting events, for many hours. If the average advertising rates for every channel reflects these issues the modeling should be accurate, and data material is limited on these figures. Also, modeling the advertising revenues can be subject to whole studies in itself so I see the point of the simple approach taken in the study which helps reduce complexity.

4.4.2 Premium programming

Premium channels are the second category of commercial programming and exist in most markets. Prominent examples are HBO in the US, and CMORE in Norway, both producing various content on their platforms. These channels are ad-free, based on subscriptions, and not

part of basic bundles. Households must purchase these channels on top of their basic bundles. Because I am more interested in the profitability of bundling I will not go into much detail on this category of channels. In my opinion, it is very unlikely that the premium channels, in today's form, will ever enter a basic bundle since they often target a specific crowd like film enthusiasts or football fans. Earlier, I mentioned how Bakos and Brynjolfsson argued that marginal costs could make bundling unprofitable. This would be the case especially if the marginal costs were high compared to the mean valuation for the product, which is the case for most premium channels. It will be better to sell the channels individually (or in theme tiers) in order to exclude the households that value the channels less than the marginal cost. Premium channels are not addressed in the 2011 industry model, and since a Nash Equilibrium is assumed, changing the basic bundle composition to include such channels will not be discussed further.

4.4.3 NRK (Norwegian Broadcasting Corporation)

One very important difference between the US and the Norwegian markets is the presence of the state owned NRK in Norway. All households that own a TV have to pay a significant license fee, set by the Norwegian Parliament every year (2680 NOK, NRK, 2013) to finance NRK.

I expect the bundle price sensitivity of consumers to be affected by this fee, and therefore the distributors will have to take this into account in their strategies. Within the industry model framework it can be discussed whether or not NRK can be seen as an expansion of the bundle where the license fee simply enters the monthly subscription fee for the bundle. I think this is fair to assume, even though many consumers do not think of the access to NRK as a monthly subscription the same way as other channels. If this assumption is right the presence of a license fee will not alter the price sensitivity parameter, but just increase the monthly subscription price for households. In a Norwegian setting it is therefore necessary to portion out the license fee over the 12 months before simulating household demand. Finally, I expect the price sensitivity of households to be higher *relative* to the other attributes in the utility function compared to the US as a result of the license fee.

4.5 Channel Conglomerates

To better understand the industry model bargaining game, an overview of the content producers must also be given. There are close connections between some of the distributors and channels in the US. The content producers have been noted as channel conglomerates

throughout this thesis as the market consist of media conglomerates both in the US and in Norway. First, it is useful to show a summary of viewership ratings in USA (Table 9) and in Norway (Table 10) to get an impression of the size of each channel. Note that the available data is measured differently, but it will still be easy to see the major differences.

Channel	Avg Millions of viewers primetime
USA Network	2.98
Disney Channel	2.47
ESPN	2.21
History Channel	2.19
TNT	2.18
Fox News Channel	2.03
TBS	1.97
Arts & Entertainment	1.63
Adult Swim	1.45
FX	1.44
ABC Family Channel	1.35
SyFy	1.34
Discovery	1.29
Food Network	1.24
Lifetime	1.20
Total	26.97

Table 9: Average viewership ratings top 15 channels in USA 2012 (millions of viewers primetime) (Nielsen Company, 2012)

Clearly there are many channels that compete for ratings in the US. This has most likely to do with the demographic dispersion in the country and the fact that more channels can survive when the market is big. The term critical mass can be used to describe the number of subscribers a channel needs in order cover fixed costs and to survive as a channel. It is fair to assume that the fixed costs in the US and in Norway are similar, but the different market sizes will make sure that more channels can survive in the US. From the table, it is apparent that the market concentration in USA is low compared to Norway. Finally, it is important to note that many of the channels above are part of large media conglomerates. For instance are Disney Channel, ESPN and ABC all owned by the Walt Disney Company (Walt Disney, 2013).

The situation in Norway is very different illustrated by the table below.

Channel	Market share(%)
NRK1	31.9
NRK2	5.3
NRK3/Super	3.9
TV2	19.3
TV2 Zebra	2.3
TV2 Nyhet	2.0
TV2 Film	0.6
TV2 Bliss	1.3
TVN	7.6
FEM	2.2
MAX	2.4
VOX	1.0
TV3	4.4
Viasat 4	2.6
Others	13.0
Total	100

Table 10: Market shares most watched channels Norway 2012 (PT, 2013)

In the Norwegian market there are two very important channel conglomerates, if the industry model's terminology is to be used. The TV2 Group to begin with is the largest commercial channel conglomerate in the Norwegian market. In 2012 the total market share of the conglomerate's channels measured in viewership was 25.5%. NRK and the TV2 Group have a total market share of 66.7%, coincidentally two thirds in 2012, which in turn illustrates the high market concentration. NRK cannot really be compared to the other conglomerates in this setting though as NRK is non-commercial and therefore does not seek to maximize profit.

4.5.1 Cross Ownership

Several companies in the US are both distributors and content producers at the same time. Comcast and Time Warner, the two largest cable providers in the US are subsidiaries of two of the largest media conglomerates in the world; NBC Universal/Comcast and Time Warner Inc. These firms are also big in content production which means that they also own many of the channels that are offered in their bundles. For instance, NBC Universal/Comcast also owns 26 television channels in the US, among others CNBC and Bravo (Comcast, 2013). Time Warner, on the other hand, has full ownership in the premium network HBO and in the news channel CNN among many other holdings (Time Warner, 2013).

The media cross ownership that is observed in the US is more extensive than in Norway. While the largest distributors in the US, Comcast and Time Warner, also produce content, their Norwegian counterparts, Canal Digital and Get, are dedicated distributors. One

exception in the Norwegian market is the 33% ownership share the TV2 Group has in the DTT distributor RiksTV. This could possibly affect the input costs of RiksTV for TV2 channels, but since the ownership share is not higher, I think it can be assumed that this effect is either small or non-existent. The difference between the two markets can have implications for the model's parameters and its predicted input costs.

The industry model explicitly addressed the cross ownership by adding a vertical integration variable, VI_{fc}, into the input cost function. In my opinion, cross ownership relations between distributors and channel conglomerates in Norway is so rare that this factor is unnecessary. Of course, this dummy variable would take the value zero, but I still want to point out that it is almost entirely redundant in a Norwegian setting. I think the small degree of cross ownership is one of the reasons for why the bundle prices between distributors are so similar. I suspect that the input costs for distributors is more even, and that no firm experience the large predicted discount of 17% Comcast enjoys in the US. The bargaining parameter is therefore the decisive factor in Norway affecting each distributor's input costs.

4.5.2 Relative Bargaining Power

In the section about distributors I discussed how important the relative bargaining power between distributors and conglomerates was for the input costs. However, it is not only the size of the distributor that matters, but also the size of the conglomerate. I therefore expect the TV2 Group to have high bargaining power relative to the smaller distributors. The disagreement between Canal Digital and TV2 which led to the parties' withdrawal from the negotiations illustrates this. While all the other smaller distributors could negotiate a deal with TV2, Canal Digital could not. In my opinion the disagreement was a result of the more evenly matched parties when it comes to bargaining power. While small distributors and conglomerates must take the prices as given, bigger parties can negotiate better deals because they are more powerful representing a larger number of customers. The bargaining power parameter is clearly present in the Norwegian market as a function of the number of distributor customers or channel viewership. I do not expect the estimated parameter to differ much from the US market. Because of this, each distributor's input costs should be a similar function of the observed average affiliate fees.

5. Á-la-carte in Norway

Now I will turn my attention to the two policy alternatives; pure bundling and á-la-carte. This

is the last section of this thesis, and I will present the distributor and consumer consequences of a policy change. Furthermore, I will discuss how recent trends in the television markets can affect the model's predicted effects. Finally, I will come back to the problem formulation I started with. What are the effects of bundling in this market, and what should be preferred by firms and consumers? Here, I will sum up why, based on the bundling framework, I believe the á-la-carte policy will neither benefit distributors nor households in the long run although the distributors can profit from á-la-carte under some assumptions

5.1 Welfare effects of á-la-carte

The first market specific model predicted that consumers would be better off under full á-la-carte by a staggering 65.6%. Distributors would on the other hand experience a 44.2% decrease in profit. This goes in line with the basic models, which all suggest that producers extract more consumer surplus under bundling. The main problem with this result is the short time perspective. As I outlined, the market assumptions taken were not realistic, especially the static input costs and the fact that no channel would exit the market. There are too many doubtful assumptions in the first model so I cannot conclude with the effects of á-la-carte.

The second model is much more dynamic and realistic also in the Norwegian setting. In addition, the two markets do not differ on critical assumptions taken in the model. Even though there are differences when it comes to demographic dispersion, distribution technology and the extent of cross-ownership the markets are similar in many ways. I would actually say that it is easier to navigate in the less complex Norwegian market. The industry model should therefore be at least as predictive in Norway as in the US. It is important to note that the market differences will affect the estimated parameters, but not the model framework itself.

I have presented the complete US simulation results from the industry model earlier, but a summary can be found in Table 11.

Introduction of á-la-carte	**2007 Model**	**2011 Model**	**2011 Model**
Cost assumption	*Constant*	*No re-negotiation*	*Re-negotiation*
Consumer Surplus	+65.6%	+19.2%	+0.2%
Distributor Profit	-44.2%	+13.1%	+10.4%
Channel Profit	NA	-22.9%	+2.6%
Total Surplus	-7.4%	+4.1%	+2.4%

Table 11: Summary of predicted welfare effects of á-la-carte introduction.

It is striking how small the effects turn out to be in the most realistic scenario, at least for consumers.

Ask consumers if they want to reduce the number of channels in their bundle by 50% for a $1 decrease in the monthly price and I think most will say no or be indifferent. Even if they value the dropped channels at close to zero. The market simulations in the US actually suggest that the outcome of á-la-carte will be higher consumer expenditure for only half of the original channels. All this will happen because the input costs will be re-negotiated and the simulations suggest that these costs will double which in turn will lead to higher prices.

Since I have found that the US and the Norwegian markets are similar there is no reason to believe that the welfare consequences will be very different in Norway. Some of the estimated parameters will differ because of market differences, but the effect will not be large. I expect that consumers will get rid of the channels they value at zero, but still pay the same price as today. Channel conglomerates will charge more for channels in order to outweigh their loss of subscribers which increase input costs for distributors. However, since distributors pay the affiliate fees per subscriber, the aggregated effect is unclear. The model predicts the aggregate effect to be positive for the distributors and negative for channels. Because of this I expect that some channels' subscription figures will drop below the critical mass, resulting in market exit.

The distributor seems to be better off under á-la-carte, but as discussed earlier additional costs might occur in an á-la-carte world. Norwegian distributors expect increased costs in administration, customer support and infrastructure in order to facilitate á-la-carte, which would reduce the benefits (Kulturdepartementet, 2011). The magnitude of these costs is unclear, but the fact that distributors all follow bundling strategies leads me to expect that the costs outweigh the benefits. Though unlikely, it could also be that the distributors stick to the basic theory in the field and wrongly expect to lose profit if á-la-carte were introduced. If this is the case it is only a matter of time before distributors introduce á-la-carte. A small indication of this last point is Canal Digital's introduction of á-la-carte for a part of their basic bundle (Providers Website, 2013). Customers can choose 15 of the channels in their bundle from a menu of less popular channels, but the majority of channels are still fixed. It will be very interesting to see if this is the beginning of a strategy moving more towards á-la-carte, which distributors actually could profit from.

5.2 Future Trends

One factor that has not been addressed explicitly up till now is the increasing popularity of on-demand streaming services like Netflix or Viaplay. I would argue that if the market shares of such services increase more and more, the traditional cable and satellite television market will shrink. This will especially be a problem for the satellite distributors who cannot deliver internet connection through their technology.

I expect that the price sensitivity of streaming services is lower than for expanded bundles because there is no need to purchase a basic bundle first. However, there are not many households that only resort to streaming in today's market, so as of now it can be assumed that the price sensitivity is similar to expanded bundles. The new services are also sold in bundles and do not offer á-la-carte options as of today.

I would place streaming services in the category of premium programming I discussed earlier, and as I explained, such channels will rarely enter basic bundles. It might be so that streaming takes the place of premium channels like HBO and CMORE, but at the moment these channels offer their content both on television and through streaming so there would not be an immediate threat. The trend is therefore that the content producers simply switch platform from television to streaming which is not that dramatic from the conglomerates' perspective.

Another popular market trend is the option to record television programs on Digital Video Recorders (DVR) to watch later. More and more consumers take advantage of this technology and DVR will definitely have effects on the market. In a 2012 PhD thesis (Bergh, 2012) the future effects on advertising revenue were discussed. With new technology like streaming and DVR , consumers will find it easier to avoid advertising. One would therefore expect that the traditional advertising funded channels would experience a reduction in revenue in the future as more consumers adapt the new technology. At the same time the consumer surplus would increase.

In fact Bergh finds just the opposite, and argues that because the DVR technology comes with a sunk cost for the equipment, it will only be adapted by the most advertising averse consumers. When these consumers are gone, the channel can increase the advertising level because the remaining consumers are not that ad-averse. In the context of the industry model this would mean that even with the new DVR technology, advertising revenues in the future would be quite constant. If the impact of streaming and DVR is not that large as many expect

the industry model should predict accurately the welfare consequences of á-la-carte. From Table 5, it can also be observed that the advertising revenues are much more stable in each of the two model scenarios.

Since my main focus has been on the distributors I will finish with some future predictions for these firms and what will happen with the much debated bundles. As I have already mentioned I expect the platform technology to become a more important factor for consumers in the future. More and more streaming content requires high speed connections, which suits the cable and fiber companies best at the moment. It will be difficult to reverse the trend of customers switching from satellite, and therefore Viasat is particularly vulnerable. I expect that the satellite platform will see a reduction in customers as a function of increasing cable and fiber penetration. However, since Norway is a vast country, the building of cable infrastructure will not be profitable in many low populous areas. Therefore both the Satellite and DTT platforms will have a considerable market presence in many years to come. These technologies will also continue to dominate in the vacation house and cabin markets. One more important factor having an impact on this market is the mobile broadband coverage. When this technology improves, the impact on all the classic distribution platforms can be large. Yet, I do not expect this technology to be ready and available for stable television streaming for the general public in the next 5-10 years.

Bundling has been around for a long time in the multichannel television market and will also be dominant in the years to come. In Norway, the possible regulation of this market to facilitate á-la-carte was investigated in the Sønneland Report (Kulturdepartementet, 2011). The independent report concluded, like I also do in this thesis, that á-la-carte would not necessarily benefit consumers. Therefore, no new market regulations were suggested.

There is no reason to believe, based on my model presentation and discussions, that á-la-carte would reduce consumer expenditure for television channels in Norway. In fact, I would expect consumers to spend more of their budget on television, either on streaming, classic channel bundles or both, than we do today if á-la-carte was introduced. For distributors the outcome would not be as bad as expected in the basic bundling framework. Without accounting for á-la-carte marketing and implementation costs I have explained how the distributors in fact could be better off.

However, I do not expect the distributors to drastically change their pricing strategy from bundling to á-la-carte to possibly gain a few percent increase in profits as was predicted by

the US simulations (10.4%). Therefore, the pricing strategies in the television market will not change in the coming years unless more research indicates the same results as the 2011 industry model. All in all, it will be up to the distributors whether or not to change policy, because there are no governmental indications of a more regulated market in the future.

6. Concluding Remarks

In this thesis I have presented models that all help understand how bundling works and why bundling can be profitable in general and in the multichannel television market. I explained the market specific framework in detail, and presented the results of simulations conducted in the US. I structured the final part of the thesis as a discussion about welfare effects of a hypothetical á-la-carte policy.

I rely much on the 2011 industry model, simply because I find it to take the most realistic assumptions. This model incorporates competition, and allows for re-negotiated input costs if the market is unbundled. I presented the how the US and the Norwegian markets differ both on the demand and the supply side. I found that the framework also can be applied to the Norwegian market. However, the market differences will result in a change in the estimated parameters.

I conclude that the introduction of full á-la-carte will not increase welfare for consumers, which on aggregate will pay the same prices as today for fewer channels. The simulations suggest that distributors are better off under full á-la-carte, but I believe more research is needed before a conclusion can be made on this. Distributors will incur costs when switching strategy and these costs has not been incorporated in the industry model. The long term effect of channel exit is still unclear for distributors.

Finally, I discussed future trends in the market. I argued that new technology like streaming or DVR not necessarily will lead to a change in bundling profitability. However, satellite and DTT distributors are vulnerable because their platforms lack internet connection support. I conclude that distributors will pursue a bundling strategy also in the future market, because there are no indications of legal restrictions. Even though I suggested that distributors should welcome á-la-carte, the full effects of changing strategy are still difficult to predict without more assumptions.

The next natural step would be to obtain data from the Norwegian market, and simulate welfare measures by using the 2011 industry model. I have found that these potential simulations will provide accurate results also for the Norwegian market.

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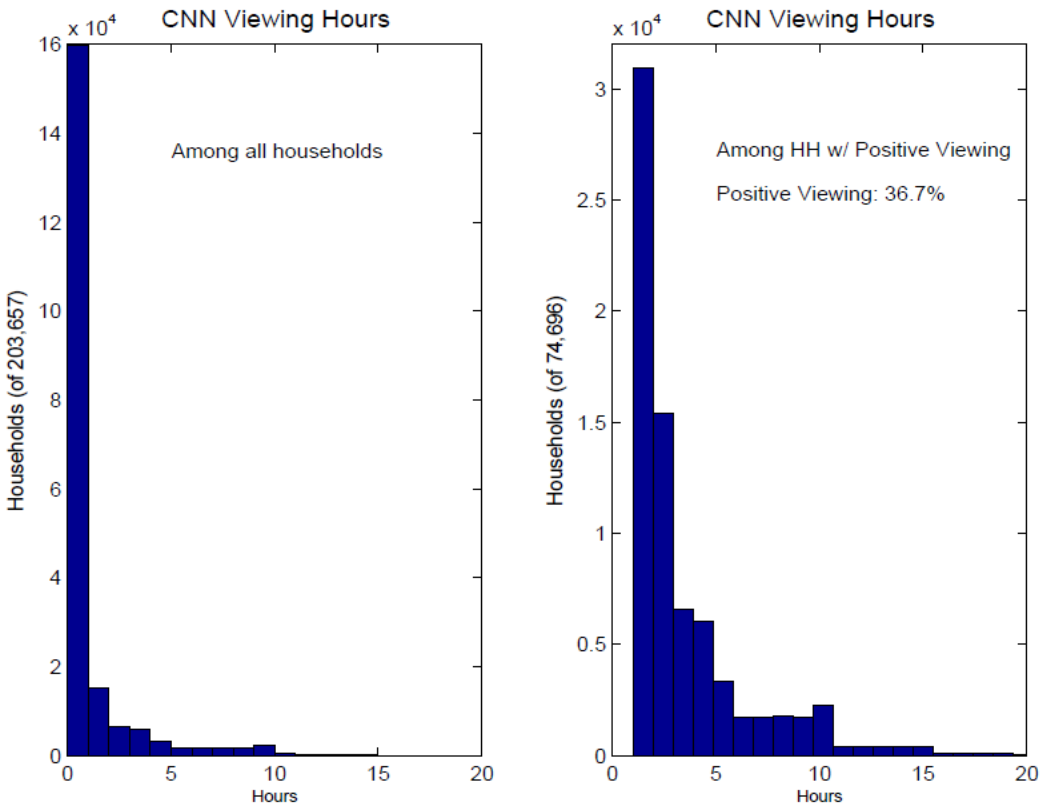
Appendix

(Crawford & Yurukoglu, 2011, pages 18-8-9-26-34 respectively)

Appendix A: Exponentially distributed hours watched for CNN



Appendix B: Bundle Composition and Prices USA

	N	Mean	SD	Min	Max
All bundles					
Price	25,490	23.46	9.20	0.00	87.06
Market share	25,490	0.44	0.27	0.00	0.99
Total cable channels	25,490	20.3	16.1	0	176
Basic only markets					
Basic service					
Price	14,732	23.70	6.36	0.00	80.25
Share	14,732	0.54	0.22	0.00	0.99
Total cable channels	14,732	17.3	9.4	0	95
Basic and exp. basic markets					
Basic service					
Price	4,046	13.49	5.71	0.00	47.67
Share	4,046	0.11	0.15	0.00	0.89
Total cable channels	4,046	8.91	7.68	0	56
Expanded basic service					
Price	4,046	27.39	7.92	0.00	87.06
Share	4,046	0.57	0.19	0.00	0.97
Total cable channels	4,046	26.5	10.0	0	77
Basic, exp. basic, and dig. basic markets					
Basic service					
Price	493	13.26	5.60	0.00	38.68
Share	493	0.09	0.09	0.00	0.65
Total cable channels	493	8.3	6.3	1	35
Expanded basic service					
Price	493	34.62	7.81	0.00	61.51
Share	493	0.39	0.16	0.01	0.84
Total cable channels	493	47.1	10.7	18	89
Digital basic service					
Price	493	44.56	10.07	0.00	70.27
Share	493	0.15	0.10	0.00	0.53
Total cable channels	493	78.8	19.1	37	176

Appendix C: Channel Summary Statistics

	Cable system carriage		Household viewership			
Data source	Factbook		Nielsen	Mediamark		
Channel	Any Tier (Pcntge)	Basic Tier (Pcntge)	Mean Rating	Mean Rating	StdDev Rating	Cume
ABC Family Channel	91.2	75.7	0.4	0.6	1.5	31.6
AMC	55.3	30.9	0.5	0.6	1.4	27.2
Animal Planet	22.8	12.1	0.3	0.6	1.5	34.8
Arts & Entertainment	68.3	48.7	0.7	0.8	1.7	37.8
BET Networks	21.1	10.9	0.4	0.3	1.5	10.6
Bravo	13.3	3.3	0.2	0.2	0.7	14.4
Cartoon Network	29.1	15.7	1.6	0.5	1.8	20.9
CNBC	37.6	19.7	0.2	0.5	1.4	29.5
CNN	94.5	77.5	0.7	1.8	3.0	53.8
Comedy Central	25.1	11.1	0.5	0.5	1.3	27.6
Country Music TV	48.0	37.2	0.2	0.2	1.0	13.5
Court TV	16.2	4.5	0.4	0.4	1.4	18.1
Discovery Channel	88.0	71.6	0.6	1.1	1.9	50.9
Disney Channel	41.6	29.6	1.2	0.5	1.4	21.2
E! Entertainment Television	22.9	11.0	0.3	0.3	0.9	24.4
ESPN	96.7	76.7	0.9	1.1	2.2	40.7
ESPN 2	36.6	21.4	0.3	0.5	1.4	25.2
Food Network	13.6	4.5	0.4	0.5	1.5	26.7
Fox News Channel	20.0	10.0	0.8	1.0	2.2	40.0
Fox Sports Net	19.4	11.3	0.3	0.4	1.2	20.2
FX	21.0	9.9	0.5	0.4	1.2	23.3
GSN	8.7	0.8	0.2	0.2	0.9	7.4
Golf Channel	10.9	1.8	0.0	0.1	0.6	6.9
Hallmark Channel	8.2	3.3	0.3	0.2	1.0	10.8
HGTV	26.3	13.2	0.6	0.6	1.6	27.5
History Channel	32.0	18.5	0.6	0.8	1.7	37.9
Lifetime	63.2	41.8	0.9	1.0	2.2	34.4
MSNBC	14.4	5.0	0.3	0.5	1.3	30.2
MTV	52.7	30.2	0.7	0.4	1.4	21.8
MTV2	1.9	0.1	0.0	0.1	0.7	7.8
National Geographic Channel	6.5	1.1	0.1	0.2	0.8	13.2
Nickelodeon	73.8	52.5	1.8	0.4	1.3	17.7
Oxygen	2.8	0.2	0.1	0.1	0.5	7.2
Syfy	33.4	18.4	0.5	0.4	1.4	20.9
SoapNet	4.0	0.4	0.1	0.1	0.6	2.5
Speed Channel	11.8	3.2	0.1	0.1	0.7	7.8
Spike TV	24.0	15.0	0.5	0.4	1.1	18.9
TBS Superstation	96.3	90.7	1.1	0.9	1.7	39.8
The Weather Channel	64.1	46.0	0.3	0.7	1.3	50.3
TLC	45.1	29.9	0.5	0.5	1.3	29.0
TNT	85.2	63.7	1.3	0.9	1.8	41.3
Toon Disney	8.6	2.1	0.2	0.1	0.7	6.1
Travel Channel	16.8	8.3	0.2	0.2	0.7	18.7
TV Guide Channel	19.3	11.5	0.2	0.2	0.6	17.5
TV Land	23.2	15.0	0.8	0.6	1.8	23.9
USA Network	88.8	66.3	1.2	0.8	1.6	37.4
Versus	9.3	1.4	0.1	0.1	0.5	4.8
VH1	39.6	22.6	0.4	0.3	0.9	18.2
WE: Women's Entertainment	7.2	0.8	0.1	0.1	0.5	5.9

Appendix D: Estimated WTP each channel

Channel	Mean WTP	StdDev WTP	Share Positive	Mean WTP Family HH	Mean WTP Black HH	Highest Correlated Channel
ABC Family Channel	1.59	2.24	0.49	1.68	1.80	'TV Land '
AMC	1.40	1.59	0.51	1.15	1.83	'MSNBC '
Animal Planet	2.05	3.02	0.58	2.08	1.81	'National Geographic Channel '
Arts & Entertainment	2.10	2.63	0.58	1.90	2.23	'History Channel '
BET Networks	1.27	2.74	0.34	1.34	4.54	'MTV2 '
Bravo	0.65	0.67	0.61	0.63	0.76	'ESPN '
Cartoon Network	2.06	4.01	0.49	2.27	2.54	'Nickelodeon '
CNBC	2.02	2.97	0.55	1.84	2.01	'CNN '
CNN	5.38	5.91	0.68	4.94	8.30	'Fox News Channel '
Comedy Central	1.51	2.39	0.61	1.52	1.34	'MTV '
Country Music TV	0.89	1.56	0.57	0.89	0.79	'Food Network '
Court TV	1.76	3.11	0.50	1.79	2.23	'Arts & Entertainment '
Discovery Channel	2.70	2.99	0.65	2.55	2.67	'Animal Planet '
Disney Channel	1.43	2.51	0.65	1.52	1.72	'Nickelodeon '
E! Entertainment Television	1.15	1.69	0.62	1.16	1.10	'VH1 '
ESPN	3.08	4.46	0.64	2.86	3.63	'ESPN 2 '
ESPN 2	1.80	3.12	0.62	1.75	2.02	'ESPN '
Food Network	2.06	3.25	0.71	2.08	2.18	'TV Guide Channel '
Fox News Channel	4.07	5.89	0.60	4.10	4.69	'CNN '
Fox Sports Net	1.63	2.82	0.55	1.58	1.55	'ESPN 2 '
FX	1.45	2.59	0.51	1.47	1.41	'USA Network '
GSN	0.74	2.97	0.08	0.83	1.51	'ESPN 2 '
Golf Channel	0.52	1.86	0.12	0.38	0.68	'CNN '
Hallmark Channel	1.43	3.96	0.16	1.47	2.09	'Country Music TV '
HGTV	2.60	4.67	0.42	2.59	3.02	'Food Network '
History Channel	2.70	4.06	0.40	2.53	3.09	'Arts & Entertainment '
Lifetime	2.25	3.73	0.31	2.46	5.57	'AMC '
MSNBC	1.69	3.23	0.29	1.38	2.61	'AMC '
MTV	1.22	2.28	0.59	1.25	1.36	'VH1 '
MTV2	0.71	1.23	0.52	0.79	0.63	'VH1 '
National Geographic Channel	1.03	1.60	0.69	1.04	0.92	'Animal Planet '
Nickelodeon	1.31	2.55	0.50	1.45	1.35	'Disney Channel '
Oxygen	0.41	0.44	0.60	0.49	0.64	'Disney Channel '
Syfy	1.74	2.97	0.54	1.74	1.82	'USA Network '
SoapNet	0.49	1.04	0.42	0.52	0.58	'TBS Superstation '
Speed Channel	0.33	0.41	0.56	0.41	0.19	'Versus '
Spike TV	1.18	2.00	0.57	1.18	1.07	'The Weather Channel '
TBS Superstation	2.05	2.85	0.69	1.98	2.23	'TNT '
The Weather Channel	1.71	1.83	0.70	1.59	1.66	'Spike TV '
TLC	1.82	2.81	0.61	1.84	1.57	'Discovery Channel '
TNT	2.36	3.10	0.72	2.31	2.54	'USA Network '
Toon Disney	0.44	1.69	0.13	0.57	0.90	'Cartoon Network '
Travel Channel	0.76	2.27	0.15	0.80	0.74	'Nickelodeon '
TV Guide Channel	0.50	0.75	0.57	0.54	0.60	'Food Network '
TV Land	2.06	3.40	0.59	2.11	2.45	'ABC Family Channel '
USA Network	2.12	3.19	0.51	2.19	2.62	'TNT '
Versus	0.23	0.31	0.49	0.28	0.21	'Speed Channel '
VH1	0.74	1.28	0.56	0.75	0.90	'MTV2 '
WE: Women's Entertainment	0.45	0.69	0.50	0.49	0.53	'National Geographic Channel '

Appendix E: Input Costs and Welfare Effects by Channel

	Input Cost Effects			Profit Effects				
Channel	Bundling Input Cost	ALC Input Cost	Percent Change	Total Bundling Revenue	Total ALC Revenue	Percent Change	Percent Change License Fee Rev	Percent Change Advert Rev
ABC Family Channel	$0.32	$0.83	156.9%	$0.46	$0.58	24.5%	29.9%	15.9%
AMC	$0.32	$0.54	67.8%	$0.41	$0.43	3.9%	-2.2%	16.9%
Animal Planet	$0.20	$0.97	372.8%	$0.25	$0.53	109.3%	150.0%	9.8%
Arts & Entertainment	$0.31	$1.08	250.6%	$0.57	$0.91	58.8%	109.4%	13.3%
BET Networks	$0.26	$0.58	127.3%	$0.56	$0.55	-1.7%	-26.8%	15.4%
Bravo	$0.27	$0.51	92.3%	$0.39	$0.40	1.4%	2.0%	0.6%
Cartoon Network	$0.26	$0.78	199.1%	$0.54	$0.62	14.7%	19.4%	11.3%
CNBC	$0.34	$0.93	170.6%	$0.53	$0.70	30.7%	43.7%	13.6%
CNN	$0.49	$2.92	498.0%	$0.81	$1.98	144.1%	265.3%	7.2%
Comedy Central	$0.23	$0.66	187.5%	$0.61	$0.72	18.2%	43.2%	5.8%
Country Music TV	$0.18	$0.56	211.1%	$0.26	$0.29	10.8%	17.7%	0.2%
Court TV	$0.22	$0.85	276.1%	$0.35	$0.49	41.5%	63.9%	12.2%
Discovery Channel	$0.34	$1.47	339.6%	$0.59	$1.16	95.9%	182.0%	10.0%
Disney Channel	$0.77	$0.70	-8.9%	$0.68	$0.27	-59.6%	-59.6%	0.0%
E! Entertainment Television	$0.30	$0.48	62.0%	$0.41	$0.38	-7.6%	-15.8%	7.2%
ESPN	$2.44	$0.87	-64.5%	$3.80	$2.33	-38.6%	-75.9%	9.5%
ESPN 2	$0.33	$0.71	114.2%	$0.46	$0.48	3.9%	1.8%	7.7%
Food Network	$0.19	$0.85	352.9%	$0.49	$0.71	44.0%	122.1%	4.5%
Fox News Channel	$0.36	$1.83	411.8%	$0.70	$1.27	82.4%	171.8%	8.9%
Fox Sports Net	$1.56	$0.79	-49.3%	$1.51	$0.46	-69.4%	-77.4%	8.9%
FX	$0.36	$0.68	90.3%	$0.61	$0.58	-5.3%	-19.8%	10.2%
GSN	$0.19	$0.42	124.3%	$0.23	$0.12	-47.7%	-76.0%	20.7%
Golf Channel	$0.32	$0.14	-57.5%	$0.37	$0.10	-72.6%	-99.9%	14.9%
Hallmark Channel	$0.17	$0.63	272.5%	$0.33	$0.32	-3.7%	-28.6%	17.1%
HGTV	$0.25	$1.04	310.8%	$0.60	$0.82	38.4%	77.2%	15.2%
History Channel	$0.29	$2.29	699.5%	$0.53	$1.16	120.5%	237.0%	13.5%
Lifetime	$0.32	$0.85	166.8%	$0.81	$0.88	9.3%	-4.6%	16.7%
MSNBC	$0.26	$0.69	168.3%	$0.33	$0.31	-4.8%	-14.6%	16.1%
MTV	$0.37	$0.47	28.3%	$1.02	$0.93	-8.4%	-44.6%	8.6%
MTV2	$0.17	$0.54	223.0%	$0.19	$0.21	9.4%	12.4%	-0.5%
National Geographic Channel	$0.29	$0.65	120.9%	$0.34	$0.32	-5.1%	-6.2%	-1.2%
Nickelodeon	$0.48	$0.45	-7.5%	$1.38	$1.23	-10.5%	-61.8%	12.5%
Oxygen	$0.24	$0.09	-63.7%	$0.31	$0.16	-48.0%	-76.1%	16.5%
Syfy	$0.27	$0.70	160.0%	$0.55	$0.63	15.3%	18.3%	13.0%
SoapNet	$0.22	$0.44	98.8%	$0.24	$0.15	-37.9%	-47.0%	3.7%
Speed Channel	$0.27	$0.42	56.7%	$0.32	$0.18	-43.9%	-51.8%	-21.3%
Spike TV	$0.29	$0.60	106.7%	$0.54	$0.53	-1.1%	-8.6%	5.8%
TBS Superstation	$0.38	$0.88	132.0%	$0.89	$1.04	16.5%	33.1%	6.6%
The Weather Channel	$0.22	$0.60	174.4%	$0.34	$0.56	64.7%	102.4%	15.1%
TLC	$0.27	$0.83	205.9%	$0.42	$0.57	35.7%	55.5%	9.5%
TNT	$0.84	$0.93	11.1%	$1.35	$1.15	-15.2%	-33.6%	6.9%
Toon Disney	$0.21	$0.39	86.1%	$0.24	$0.10	-57.9%	-83.2%	17.7%
Travel Channel	$0.26	$0.45	69.7%	$0.32	$0.16	-50.5%	-74.9%	14.4%
TV Guide Channel	$0.16	$0.14	-16.2%	$0.24	$0.18	-24.3%	-49.4%	15.9%
TV Land	$0.21	$0.86	301.1%	$0.34	$0.53	57.0%	92.8%	11.9%
USA Network	$0.51	$0.84	65.0%	$1.13	$1.17	3.7%	-12.2%	14.1%
Versus	$0.25	$0.29	17.7%	$0.26	$0.13	-51.8%	-60.4%	-8.9%
VH1	$0.24	$0.44	80.8%	$0.55	$0.50	-9.7%	-27.3%	1.4%
WE: Women's Entertainment	$0.22	$0.32	46.1%	$0.26	$0.19	-28.5%	-39.8%	5.1%
Total	$18.22	$36.98	103.0%	$29.41	$30.16	2.6%	-3.7%	10.1%