

ASSORTMENT GAMES WITH EFFORT IN ONLINE MARKETPLACES

by

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To my parents...

Saadet ehrelil & Tuncay ehrelil

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ABSTRACT

ASSORTMENT GAMES WITH EFFORT IN ONLINE MARKETPLACES

This thesis studies an assortment game of duopolistic retailers competing in assortment and advertising effort decisions in an online marketplace. We suggest ways to maximize players' payoffs and search for an answer to the question if the marketplace can provide a value-added assortment and advertising service to its sellers. In this regard, we consider two different systems a) when retailers have overlapping assortments b) when retailers have access to an exclusive product. We experiment each case under a centralized regime, in which retailers are centrally managed by the marketplace, and a decentralized regime, in which retailers compete in assortment and ad effort decisions. We assume that prices are determined by the marketplace, ad opportunity is given only to one retailer and applies to all products in the retailer's offered assortment, customers are rational utility maximizers and their choice process is governed by the multinomial Logit framework. We augment the utility function of customers by an advertising effort mechanism. In our case, products' displayed positions at the marketplace are linked to retailers' advertising effort. We first characterize this problem as a non-linear mathematical optimization problem for a single retailer. Then using a computational framework, we show that the advertising offering causes marketplace to increase profits in both decentralized and centralized settings. A retailer has a substantial advantage if he wins the advertising opportunity. Although ad effort makes the other retailer out of the game, our results show that centralized system always protects the retailer, who otherwise loses much more in the decentralized system. In addition, offering an attractive exclusive product gives a competitive power to the retailer, who lost the ad effort game. We also observe that in all cases, competition causes system to use more ad effort. We observe that competition always causes system to use more ad effort.

ÖZET

ÇEVİRİMİÇİ PAZARLARDA REKLAM ÇABASI İLE ÜRÜN ÇEŞİTLİLİĞİ OYUNLARI

Bu tezde duopolist satıcıların çevrimiçi pazar yerindeki ürün çeşitliliği ve reklam çabası oyunları ele alınmıştır. Oyuncuların kârlılıklarını eniyileme önerileri üzerine çalışılmış, online pazar yerinin satıcılarına katma değer katacak bir ürün çeşitliliği veya reklam hizmetinde bulunup bulunamayacağı sorusuna cevap aranmıştır. Bu kapsamda a) oyuncuların aynı ürün çeşitliliğine sahip oldukları b) oyuncuların ortak ürünlere ek olarak kendilerine münhasır ürün çeşitlerine sahip oldukları durumlar gözlemlenmiştir. Çalışılan iki durum için de hem pazar yerinin satıcıları tek merkezden yöneterek karar mekanizması olduğu *merkezileştirilmiş*, hem de satıcıların kendi ürün çeşitliliği ve reklam çabası kararlarını vererek bir rekabet oyunu yarattıkları *merkezi olmayan* iki yönetim biçimi altında uygulamalar yapılmıştır. Bu çalışmada, fiyatların pazar yeri tarafından belirlendiği, reklam fırsatının yalnızca bir oyuncuya verildiği ve oyuncunun ürün yelpazesindeki tüm ürünleri için geçerli olduğu, müşterilerin rasyonel ve menfaatlerini eniyilemek amaçlı alışveriş aktivitelerinde bulunduğu varsayılmıştır. Müşterilerin tercih süreçleri MNL çerçevesinde modellenmiş ve müşteri fayda fonksiyonuna satıcıların reklam çabası mekanizması eklenmiştir. Oyuncuların reklam aktivitelerinin, ürünlerinin çevrimiçi pazar yerinde gösterilme pozisyonları ile bağlantılı olduğu düşünülmüştür. Böylelikle ilk aşamada tek satıcı için doğrusal olmayan bir matematiksel eniyileme problemi modellenmiş, sonrasında sayısal çalışma yapılmıştır. Bulgularımız pazar yerinin reklam teklifi fırsatıyla karlılığını iki yönetim biçiminde de arttırdığını gösteriyor. Satıcılar için reklam önemli ölçüde karlılık avantajı sağlamaktadır. Merkezi sistem rekabet durumunda kaybeden oyuncuyu daimi olarak korurken, ek olarak kendine münhasır bir ürün fırsatı da bu oyuncuya bir rekabet gücü kazandırmaktadır. Rekabet her durumda sistemin daha fazla reklam çabası kullanmasına neden olmuştur.

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LIST OF SYMBOLS

A_r	Assortment for retailer r
B	Coefficient that is related to retailer r 's daily operational cost in the absence of add effort - <i>used in empirical study</i>
$c_{rj}(g_{rj})$	Total operation cost of retailer r resulting from offering product j
F	Represents the operational cost of retailer r when using ad effort - <i>used in empirical study</i>
g_r	Ad effort factor (inorganic) utility for retailer r
j	Products $j = 1, \dots, N$
k	Parameter values for mean utility - <i>used in empirical study</i>
q_{rj}	Probability of a customer choosing product j from retailer r
p_r	Selling price of product j from retailer r
r	Retailers $r = n, m$
$u_{rj}(t)$	A customer's mean utility from purchasing product j offered by retailer r
$U_{rj}(t)$	A customer's total utility from purchasing product j offered by retailer r
v_0	Attraction of no purchase option
v_{rj}	Attraction of a product j offered by retailer r
α_j	Price sensitivity of product j
β_{rj}	Ad sensitivity of customers to product j offered by retailer r
δ_{nj}	The split of market share between retailers when the product is offered by both
$\epsilon_{r,j}^t$	Random variable representing the heterogeneity of the utility of customer t from buying product j offered by retailer r
π_r	Expected profit of retailer r
θ_{nj}	Ranking factor of product j for retailer r

LIST OF ACRONYMS/ABBREVIATIONS

Cg	The optimal value of ad effort in centralized management regime
CR1	Total profit of retailer n in the absence of ad effort when the system is centrally managed
CR2	Total profit of retailer m in the absence of ad effort when the system is centrally managed
CMP	Total profit of marketplace in the absence of ad effort when the system is centrally managed
CR1Wg	Total profit of retailer n in the existence of ad effort when the system is centrally managed
CR2Wg	Total profit of retailer m in the existence of ad effort when the system is centrally managed
CMPWg	Total profit of the marketplace in the existence of ad effort when the system is centrally managed
Dg	The optimal value of ad effort in decentralized management regime
DR1	Total profit of retailer n in the absence of ad effort when the system is decentrally managed
DR2	Total profit of retailer m in the absence of ad effort when the system is decentrally managed
DMP	Total profit of marketplace in the absence of ad effort when the system is decentrally managed
DR1Wg	Total profit of retailer n in the existence of ad effort when the system is decentrally managed
DR2Wg	Total profit of retailer m in the existence of ad effort when the system is decentrally managed
DMPWg	Total profit of marketplace in the existence of ad effort when the system is decentrally managed
MNL	Multinomial Logit

1. INTRODUCTION

Online marketplaces are two-sided platforms that integrate shoppers on one side, and third party sellers on the other side [1, 2]. They enable shopping from different merchants acting as intermediaries [3]. A pure online marketplace enables suppliers to sell directly to customers via an online platform [4]. If a marketplace also takes ownership over products from suppliers and resells them to buyers, it is defined as a reseller/hybrid marketplace. Some examples of pure online marketplaces are n11.com, eBay, Airbnb, and Craigslist. Some reseller marketplaces can be listed as Hepsiburada.com, Amazon, and Alibaba. In 2015, more than two billion items worldwide are sold by the Amazon Marketplace and around 50% of the them were realized by two million third-party sellers [5]. It shows that an important part of Amazon's business acts as an online platform for goods. With growing mobile website browsing, it is expected that online marketplaces maintain the rapid growth in the following years [6]. In this thesis, we consider a two-sided online platform that acts as a pure marketplace.

Online marketplaces can provide value-added services to its sellers. Almost all of them provide mechanisms of *e-store campaigns* such as display allocation, listing rank offerings, search advertisements, category advertisements etc., for their sellers. For example, Amazon Marketplace recently made a *discount provided by Amazon* campaign to subsidize its merchants' sales by making prices more attractive to customers. The Wall Street Journal [7] stated that the discount was around 9%. In this thesis, we investigate if an online marketplace can provide a value-added assortment and advertising service to its competing sellers. We search for suggesting ways to optimize their assortment plannings and maximize their payoffs. The set of products offered by a retailer at each point in time is defined as an assortment [8]. Sellers need to revise their assortments periodically, so they engage in assortment planning activities. From an operations point of view, a retailer may not be able to simultaneously display all products to its customers due to capacity related considerations. Thus, assortment planning aims to find the optimal variety of products and maximize the total profit of a retailer from sales with respect to given costs and constraints; see [8] for an overview.

Both online and offline assortment optimization problems have applications in many industries mainly in retail, airline, hotel and transportation. Traditional bricks-and-mortar stores' main objective is to decide which products to carry in the store. By this way, they have an advantage to create a touch and feel among the customers. Nowadays a growing number of firms sell to their customers also through online channels. This has introduced new levels of operational flexibility. Through an online platform, a seller can offer a broader set of products with lower inventory costs by limiting shelf space to the consumer's own interest. However, it is still important for online retailers to decide how to allocate the screen space on their websites among its products. Display constraint is theoretically does not exist in an online marketplace but there are some practical considerations such as consumer perceptions of product attractiveness due to product's ranking position on the site. In this thesis, it is assumed that the marketplace offers advertisement opportunity to its sellers. By this opportunity, a retailer's products are screened at a higher position than the competitor's.

Understanding customer preferences and responding accordingly with updated assortment offerings is an important aspect in assortment planning process. Multinomial Logit model (MNL), pioneered by Luce [9], is commonly used to address customer choice behavior in the economics, operations and marketing literature [10]. MNL is a utility-based model assuming that customers are utility maximizers and choose among finite number of choices based on their utility and a random component. Firm level demand is the aggregation of individual demands. In this thesis, we assume that customers' demand follows MNL model.

Assortment planning problem has been discussed by literature and industry to a great extend across different retailers and product categories [11]. In revenue management problems, airlines and hotels update their product offerings considering the remaining time in the selling period and the remaining capacity. Thus assortment problems have more of an operational nature. The present thesis studies assortment planning problem of duopolistic retailers competing in assortment and effort decisions in an online marketplace.

On the customers' side, we presume that customers choose from the assortment sets offered by retailers according to an MNL framework to maximize their utility. On the retailers' side, they select a set of products to offer in an assortment in the existence of advertising opportunity with the aim to maximize their payoffs. We assume that prices are determined by the marketplace, and advertising opportunity is given only to one retailer and applies to all products in the retailer's offered assortment. In our case, products' displayed positions at the site are linked to retailers' advertising effort. The assortment of a retailer who has the ad opportunity has higher display position than the competitor's. By this way, advertising opportunity causes the retailer r to gain an inorganic mean utility. Thus, we call this inorganic ranking utility as "ad effort factor" throughout the thesis.

The main aim of this thesis is to find an answer to the question if the marketplace can provide a value-added service to its sellers in terms of assortment and advertising opportunity. Also, we aim to show how players can benefit from this kind of service by suggesting ways to maximize/optimize their payoffs. We observe that advertising offering causes marketplace to increase profits in both decentralized and centralized settings. A retailer also has a substantial advantage if he wins the advertising opportunity. Although ad effort makes the other retailer out of the game, our results show that centralized system always protects the retailer who otherwise loses much more in the decentralized system. Centralized marketplace profit is always found to be higher than the decentralized marketplace profit. In addition, in all cases, competition causes system to use more ad effort. Our findings show that price sensitivity is found to be negatively correlated with players' equilibrium profits, since high price sensitivity means that customers are highly sensitive to price changes.

On the other hand, we reveal that at higher levels of price sensitivity the retailer who uses the ad effort increases his market share by allocating more advertising spending. This would mean that price sensitive customers are more likely to be affected by the advertisement activities and more likely to purchase attractive products. In cases when price sensitivity is at lower levels, we indicate that centralized system cuts advertising spending considerably compared to the decentralized system.

Our results show that when effort cost is high, retailer cuts advertising spending, and increase his assortment variety instead. Also we find that if the assortment set has already high attractiveness, the system does not prefer spending more on advertising and keeping various products in the assortment. Exclusive product is found to be an important aspect for the game in this thesis. When we experiment with retailers having access to exclusive products we observe that an attractive exclusive product gives a competitive power to the retailer who lost the ad effort game. To our knowledge, this study contributes to the assortment planning literature by augmenting the utility function of customers by an advertising effort mechanism. We claim that marketplace can provide a value-added assortment and advertising service to its sellers.

The remainder of this thesis is organized as follows: Chapter 2 provides the literature review necessary for this thesis. Chapter 3 formulates and explains the model development. Chapter 4 presents the results of a computational study for the proposed settings and scenarios. Related tables are relegated to Appendix A, Appendix B and Appendix C.

2. LITERATURE SURVEY

The history of assortment planning goes long way back to 1950's when Sadowski [12] – as far as is known – is the first to mention about assortment problem [13]. Increasing number of works focus on assortment optimization problems, since these problems has many strategic and tactical applications in retail and revenue management settings [14]. In the academic literature, authors mainly focus on assortment planning problem in terms of the consumer demand and choice model, substitution behavior, inventory level decisions, and capacity problem. Increasing number of works focus on assortment optimization problems nowadays, since these problems have many strategic and tactical applications in retail and revenue management settings [14]. Kök and Fisher [15] clearly illustrate the value of assortment planning by developing an optimization based methodology and report that their recommendations for a grocery store chain result in profit increases of more than 50% when compared with the existing approach. Similarly, Rajaram [16] models assortment planning problem by using a non-linear integer programming approach for a large catalog retailer specializing in women's apparel, and reports a profit increase of 40%.

In this thesis, we consider a case where duopolistic retailers make assortment decisions in a competitive environment. In this regard, we first review the monopolistic assortment optimization literature, then we will focus on the literature that studies competitive models. Assortment optimization is a complex problem because of its combinatorial nature since it computes the optimal strategies in a given setting [17]. The main challenges arise from substitution effects, and from the existence of operational limitations such as display constraint [18]. For retailers, one of the main ways to increase customer satisfaction is to increase variety of the products. However, this brings relevant costs and complexities as well. On one hand, a rich assortment with high variety increases the customer traffic. On the other hand, a narrow assortment with a lower depth can help customers to decide easily, so that that probability of purchase increases [19].

The literature on assortment planning problem that considers *inventory decisions* starts with the work of van Ryzin and Mahajan [20], who study the logit demand and assume customers do not substitute when their choice is stocked out. They conclude that the assortment planning problem can be simplified significantly since only a limited number of candidates are considered for the optimal assortment. Maddah and Bish [21] extend this study by also considering price selection of retailers. Aydın and Ryan [22] consider a problem in the absence of inventory decisions. Stock-out based substitution is defined as the case of customers searching for substitutes if their choice is stock-out [18]. Stock-out based substitution is studied together with inventory decisions by Smith and Agrawal [23] and Mahajan and van Ryzin [24]. Chen and Hausman [25] study the mathematical properties of a monopolistic setting with logit demand and fixed prices where retailers have display constraints. Similar setting is studied by Rusmevichientong *et al.* [26]. They develop an algorithm to find an optimal assortment. Fisher and Vaidyanathan [27] emphasize display constraints exist in real world practice. In the present thesis, we do not consider inventory limitations and assume that product offerings in a retailer's assortment are always available when requested. Thus, there is no stock-out based substitution. Also, it is assumed that there are no display constraints.

When there is no display constraint, the assortment planning problem can be classified under revenue management literature [18]. Gallego *et al.* [28] study airline networks and model a linear program to approximate the expected revenue. Talluri and van Ryzin [29] study a single leg airline seat allocation problem and find that offering only revenue ordered assortments is optimal. They assume customers' choice process is governed by multinomial Logit model (MNL) by implying that incorporating customer choice behavior is important when demand is modeled. They assert that customers compare the products in terms of price, quality and probably other features before making a choice among the available products. This choice process leads to interactions among the demand for different products, and it is critical not to miss including these interactions. Gallego *et al.* [28] and Liu and van Ryzin [30] also used multinomial Logit (MNL) model to study monopolistic optimization problem.

Understanding customer preferences and responding accordingly with updated assortment offerings has always been an important aspect in assortment planning process. Briesch, Chintagunta, and Fox [31] claim that customers' can be more sensitive to assortments than to prices while making store choice decisions. Saure and Zeevi [32] claim that assortment decision affects demand for individual product or ad. Firms need to consider changes in the customer preferences over time and accordingly make assortment planning [8]. Cachon *et al.* [33] consider the assortment planning problem by claiming that customer expectations may cause lost sales for the retailer. MNL model is widely used in the economics, operations and marketing literatures (see Ben-Akiva and Lerman [34]) since it allows easy incorporation of other decisions such as pricing into the customer choice model. Gallego *et al.* [35] investigate generalizations of the multinomial logit model when more restricted assortments are offered to customers. They draw attention to that the attractiveness of the no purchase option increases due to restricted assortment offering. The main criticism about the MNL model is the Independence from Irrelevant Alternatives (IIA). This property does not hold when products within subgroups are more similar than across subgroups in the choice set [8]. MNL-based models cannot address the interactions in a category with heterogeneous products since MNL models assume a homogenous group of products in a category. For categories that have heterogeneous product groups, a nested multinomial Logit (NMNL) model can be a better alternative [36]. NMNL model assumes that consumers make purchasing decisions after a hierarchical choice process. Bernstein *et al.* [37] categorize the earlier research mainly according to demand models: the multinomial logit, exogenous demand, and locational choice models. Exogenous demand model is the most commonly used demand model in the inventory management literature for substitutable products. In locational choice model, which is pioneered by Lancaster [38], product location is considered as the main attribute that affects consumer choice. Consumers are assumed to opt for the locationally nearest products and substitute with the locationally uttermost products. When assortment planning is conducted together with demand learning, it is defined as dynamic assortment planning [32]. In dynamic assortment planning problems, the offered assortment is adjusted over time to better understand customer choice processes or changes in customer tastes.

Rusmevichientong *et al.* [26] consider the problem of a retailer who is subject to capacity constraint when choosing an offered assortment set in order to maximize his profit. They model the demand under substitution and study both a static and dynamic case by developing a policy that learns the unknown parameters from past data and optimizes the profit. Caro and Gallien [39] and Ulu *et al.* [40] study the assortment planning problem when the offered assortment needs to be adjusted over time in response to a better understanding of the customer choice process. Golrezaei *et al.* [41] develop a model to dynamically customize the assortment offerings based on the each customer preference and remaining product inventories. Caro *et al.* [42] and Çınar and Martinez-de-Albeniz [43] study the assortment planning problem by searching for optimal policies to replace the products that lose attractiveness over time. In this study, we do not consider demand learning process, customers demand is assumed to be a known function of assortments and advertisement activities. Monopolistic assortment optimization literature and industry practice is reviewed by Kök *et al.* [8] in detail.

Assortment planning problem in a competitive setting is relatively unexplored compared to the monopolistic setting [17]. In this thesis, assortment decisions of retailers are considered in a competitive environment. In competitive settings, most of the literature consider Logit model and its extensions and price competition is widely studied under choice models [18]. Anderson *et al.* [44] consider single-product firms having Logit demand and analyze the oligopoly pricing. They also consider duopolistic multi-product firms under nested Logit demand and focus on the symmetric equilibria. Bernstein and Federgruen [45] determine that if firms have a single product in their assortment offering, and consumer choice is defined with an attractiveness model, then an equilibrium always exist and that is unique for profit maximizing firms. Gallego and Wang [46] analyze the price competition of firms under the nested Logit model.

Misra [47] studies the problem of retailers who compete jointly on assortment and price assuming the retailers offer exclusive products with MNL demand and face display constraints. He analyzes the effect of competition on assortment size and prices by conducting an empirical analysis. He implies that competition between retailers leads to an increase in the total number of products offered and reduction in the prices.

He finds that when assortment size is reduced, total profit decreases consequently. His analytical results do not provide equilibrium existence and uniqueness results. In this work, we also assume that customers make purchasing decisions according to MNL framework. We compute the probability of a customer choosing an alternative as a function of the attributes of all the alternatives available. Hopp and Xu [48] add additional dimensions to competition by analyzing the joint pricing, service rate, and assortment competition under MNL demand with random market size. Their results indicate the existence of an equilibrium and they provide sufficient conditions for equilibrium uniqueness. Cachon *et al.* [49] show that equilibrium assortments and prices are affected by consumer search process. Cachon and K ok [50] consider retailers competing on price and assortment decisions under NMNL framework in such a case that retailers offer two categories and basket shopping consumers are present with a focus on the impact of centralized category management. Assortment competition under a hierarchical customer choice model has also been studied by K ok and Xu [36]. They study joint assortment optimization and pricing problem under the two-stage nested logit model focusing on the differences in the properties of best responses. In the brand primary nest structure, customers first choose a brand, and then, choose a product type within the selected brand. In the type-primary nest structure, customers first choose a product type, and then, choose a brand for the selected product type. Their results show that centralized and decentralized assortments and prices have quite different properties. They demonstrate that for the brand-primary model, both the centralized and decentralized assortments for each brand include the most popular product types within each brand. With the type-primary choice model, the assortment offered by both retailers covers the set of most popular products. Similarly, in our thesis, we claim that retailers' equilibrium assortments cover the most popular products in both centrally and decentrally managed systems. They underline the importance of the alignment between an assortment planning process and the hierarchical choice process of customers. They also claim that decentralized setting has lower profits and higher assortment variety levels as compared to centralized setting. In this thesis, we also state that competition causes a profit loss, however we have the opposite result in assortment variety.

We observe competition causes retailers to have more product variety compared to the centrally managed system. Unlike Besbes and Saure’s work [17], they do not provide an equilibrium existence and uniqueness result. Instead, they provide a numerical study to point out the cases with equilibrium. Saure [18] show that the existence of common products can cause different properties for the assortment equilibrium. Allon *et al.* [51] determine conditions for equilibrium existence and uniqueness under MNL demand with latent classes.

Besbes and Saure [17] study a model of assortment and price competition of duopolistic retailers under display constraint. They analyze the equilibrium behavior for two different settings: assortment only competition where prices are predetermined, and joint assortment with price competition. They use MNL framework for consumer choice, retailers are assumed to have access to predefined assortment sets. They consider the case when retailers have exclusive products and when retailers have overlapping assortments. Their results show that when retailers have non-overlapping assortment sets, an equilibrium always exist that Pareto-dominates others. If retailers have common products, an equilibrium exist when retailers do not have display constraints. They also claim that competition causes a firm to offer a broader set of products in the market compared to a centralized setting. This result is in parallel of that we claim in this thesis. In our model, competition causes retailers to have broader assortment set except for the case when the price sensitivity is high.

Our thesis can be positioned similar to Kök and Xu’s [36] and Besbes and Saure’s [17] works, however we do not consider pricing decisions of retailers. We also add a new mechanism to customers’ mean utility, which we call the advertising effort. The order of products displayed to consumers is decided by the marketplace according to the advertising spending of the retailers. Choi and Mela [52] state that sellers who do advertise are moved to an upper position in the product feed. They claim that the products’ positions can improve substantially with advertising. However, the customers cannot distinguish between advertised and non-advertised items. They first observe the consideration sequence of customers and conclude that that 83% search occur from top to bottom.

They claim that actual utility of an item is not fully revealed until the customer considers the products' positions on the feed therefore top-rank products will indirectly yield higher perceived utility than low-rank products based on customers' beliefs. Baye *et al.* [53] estimate the determinants of clicks received by online retailers and claim that if a retailer offers the lowest price at the price comparison site, there will be 60% jump in its clicks. They demonstrate that estimates of the determinants of a firm's clicks can be used in order to have insights about its demand parameters, including standard elasticity of demand.

3. MODEL DEVELOPMENT

In this chapter we first describe the model setting with an overview of main parameters and basic assumptions. Figure 3.1 demonstrates an overview for the online marketplace business model. We continue by explaining the demand model considered, and then present two management settings: a) one where retailers compete in assortments and ad effort, b) one in which retailers are centrally managed by the marketplace.

3.1. Decentralized Model Overview

We study the assortment planning problem of a firm, who needs to decide the portfolio of products to offer out of a possible set in an online marketplace. In our model, we consider two duopolistic retailers that compete in product assortment decisions. The index r denotes retailer r , $r = n, m$ and j represents the product type $j = 1, \dots, N$. It is assumed that there is only one product from each product type. The assortment selection of retailer r among the set of products, $j = 1, \dots, N$ is defined as, A_r . Since we denote sellers by $r = n, m$, we denote A_n to be the assortment chosen by retailer n and A_m to be the assortment chosen by retailer m .

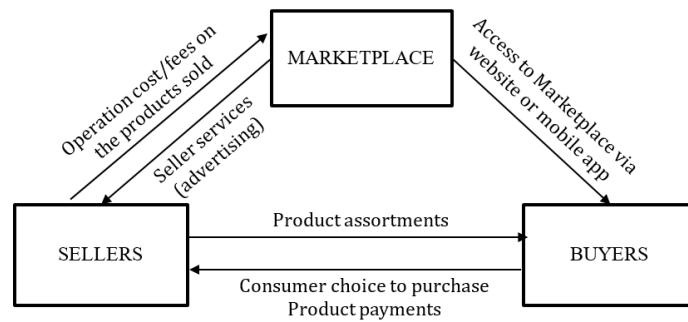


Figure 3.1. Business Model of an Online Marketplace

Table 3.1. Model Parameters

Notation	Description
i	Products $j = 1, \dots, N$
r	Retailers $r = n, m$
A_r	Assortment set chosen by retailer r
$U_{rj}(t)$	A customer's utility from purchasing product j offered by retailer r
$u_{rj}(t)$	Mean utility associated with buying product j from retailer r
α_j	Price sensitivity of product j
β_{rj}	Ad sensitivity of customers to product j offered by retailer r
p_{rj}	Price of product j offered by retailer r
v_{rj}	Attraction of a product j offered by retailer r
g_r	Ad effort factor (inorganic) utility for retailer r
q_{rj}	Probability of a customer choosing product j from retailer r
$c_{rj}(g_{rj})$	Total cost of retailer r resulting from offering product j
v_0	Attraction of no purchase option
π_r	Expected profit of retailer r

3.2. Basic Assumptions and Model Parameters

We introduce more specific assumptions while developing the model. General assumptions are as follows:

- The sales horizon is finite,
- Customers are rational and utility maximizers,
- There are no display space constraints,
- There are no search costs,
- Customers have perfect information about product assortments of both retailers,
- We do not consider inventory decisions, and stock-out-based substitutions.

The parameters used in model formulation are summarized in Table 3.1.

In our model, the purchasing choices of the customers are governed by the multinomial logit framework. They can either decide to purchase a product from a specific retailer or select the no-purchase option. As utility maximizing individuals, customers rationally choose the highest utility alternative. We further augment the utility function of a customer by a new mechanism which we call the advertisement effort. We consider an inorganic utility g_{rj} , that a retailer r gains from product j via advertising activities. In our case, advertising spending is done by retailer r to be ranked higher than the competitor on online channels of the marketplace. Thus, we call this inorganic ranking utility, g_{rj} as *ad effort factor* throughout the thesis.

The utility of customer t from purchasing product j from retailer r is

$$\begin{aligned} U_{rj}(t) &= u_{rj} - \alpha_j p_{rj} + \beta_{rj} g_{rj} + \epsilon_j^t \\ U_{r0}(t) &= u_0 + \epsilon_0^t \end{aligned} \tag{3.1}$$

where u_{rj} is the mean utility associated with buying product j from retailer r , which is identical across all customers and u_0 is the expected utility of no-purchase. Without loss of generality, we set $u_0 = 0$. $\alpha_j > 0$ is a parameter of price sensitivity, which is a variable describing how individual customers show their reactions to changes in price levels. It is the awareness of the customers to what they perceive about the cost within which they will buy a particular product or service. Low price sensitivity means that customers' buying decisions are not affected much by price changes. High price sensitivity means that customers will easily reject purchasing based on prices they deem unreasonable for what they would be getting for the money. While this sensitivity can be seller specific, it is usually the case that $\alpha_{rj} = \alpha_j$ for all sellers. β_{rj} indicates how buyers react to advertising activities. High β_{rj} means that customers are more sensitive to advertisement activities and thus they are more likely to make a purchasing decision based on this activity. Low β_{rj} means that a customer is not sensitive to advertisement. ϵ_j^t is a random variable representing the heterogeneity of the utilities across customers and assumed to be independent and identically distributed random variables following a standard Gumbel distribution with location parameter 0 and scale parameter 1.

Particularly, assuming $(\epsilon_0^t, \epsilon_{rj}^t)$ has extreme value distribution leads to the MNL model. The exogenous variable p_{rj} denotes the selling price of product j offered by retailer r . Under the MNL framework, customers choose the alternative that has the highest realized utility. Therefore customer t chooses product j from retailer r if $U_{rj}(t) \geq U_{ri}(t) \forall i \neq j$ and $U_{rj}(t) > U_{r0}(t)$.

3.3. Attraction Model

The MNL model has gained significant attention from various fields including economics, marketing, and operations management [17]. It specifies the market share of a firm as its attraction divided by the total attraction of all the players in the market including the no purchase option. A firm's attraction is a function of the values of its marketing instruments such as brand value, advertising, product features and variety [54]. For $r = n, m$ we define the attractiveness of a product $j \in A_r$ offered by retailer r as a function of mean utility, price, and ad effort factor.

$$v_{rj} = \exp(u_{rj} - \alpha_j p_{rj} + \beta_{rj} g_{rj}) \quad (3.2)$$

Let q_{nj} be the choice probability a customer chooses product $j \in A_n$ from retailer n

$$q_{nj}(A_n, p_{nj}, g_{nj}; A_m, p_{mj}, g_{mj}) = \frac{v_{nj}(1\{j \notin A_m\} + \delta_{nj}1\{j \in A_m\})}{1 + \sum_{j \in A_n \setminus A_m} v_{nj} + \sum_{j \in A_n \cap A_m} (\delta_{nj}v_{nj} + \delta_{mj}v_{mj}) + \sum_{j \in A_m \setminus A_n} v_{mj}} \quad (3.3)$$

where $1\{.\}$ denotes the indicator function and

$$\delta_{nj} = 1\{v_{nj} > v_{mj}\} + 1/2\{v_{nj} = v_{mj}\}$$

is the split of market share between retailers when the product is offered by both. Without loss of generality, the customer population is normalized to one. Therefore, the expected demand of a product type j from retailer r equals to q_{rj} .

The decision variables for retailer r are (A_r, p_{rj}, g_{rj}) . Retailer n 's objective is to find the best set of products to offer among a combinatorial number of possibilities in A_n , determine the price of each product p_{nj} and find the optimal ad effort factor g_{nj} values for given (A_m, p_{mj}, g_{mj}) . The expected profit of retailer n is

$$\pi_n(A_n, p_{nj}, g_{nj}; A_m, p_{mj}, g_{mj}) = \sum_{j \in A_n} (p_{nj} - c_{nj}(g_{nj})) q_{nj}(A_n, p_{nj}, g_{nj}; A_m, p_{mj}, g_{mj}) \quad (3.4)$$

where $c_{rj}(g_{rj})$ denotes the total operation cost to retailer r resulting from offering a unit of product j including the ad factor spending. It is a function of probability and the ad effort factor. We constrain $c_{rj}(g_{rj})$ to be less than or equal to the minimum selling price in the assortment set so that the retailer has positive margins for all products.

$$c_{rj}(g_{rj}) \leq \min_j(p_{rj}) = \bar{p}_r \quad (3.5)$$

When a product is included in the assortment, it increases the total utility of the assortment a customer could benefit. On the other hand, adding a product to the assortment causes an increase in the total operational cost. Therefore, retailers should consider the marginal benefits and costs of including a product in their assortment selections.

We continue with introducing more structural model assumptions so that the results are tractable when answering the research questions posed in Chapter 1.

Assumption 3.1. *We assume that prices are determined by the market and are not under the control of retailers.*

This assumption allows us to isolate the effects of competition and advertisement effort. Therefore, retailers compete only on the assortment and ad effort.

Assumption 3.2. *Ad effort applies to all assortment, thus it is independent of the products $g_{nj} = g_n, g_{mj} = g_m \forall j$.*

This is consistent with retailers buying a "campaign ad" for a category or virtual store from an online marketplace. Then the decision problem of retailer n can be rewritten as

$$\max_{\substack{A_n \in \mathcal{A}_n \\ g_n \leq c^{-1}(\bar{p}_n)}} \pi_n(A_n, g_n; A_m, g_m) \quad (3.6)$$

Assumption 3.3. *The ad opportunity is "won" by player n in this "round" and is not available to retailer m , which means $g_m = 0$.*

By letting only retailer n have this opportunity, we try to isolate the effect of ad effort on the competitor and the marketplace. Therefore the decision problem of retailer n becomes

$$\max_{A, g_n} \pi_n(A, g_n) = \sum_{j \in A} q_{nj}(A, g_n)(p_{nj} - c_{nj}(g_n)) \quad (3.7)$$

Following Rusmevichientong *et al.* [26] and Besbes and Saure [17] we can rewrite the problem in Equation (3.7) as

$$\begin{aligned} & \max_{\lambda, g_n} \lambda \\ & s.t \quad \max_{\substack{A \in \mathcal{A}_n \\ g_n \leq c^{-1}(\bar{p}_n)}} q_{nj}(A, g_n)(p_{nj} - c_{nj}(g_n)) \geq \lambda \end{aligned} \quad (3.8)$$

Problems (3.7) and (3.8) are equivalent. The optimal values for both problems are equal and an assortment is optimal for Equation (3.7) if and only if it maximizes the left-hand side of Equation (3.8) when $\lambda = \lambda^*$, where λ^* represents the optimal objective function of (3.7). To see this, arrange the terms in Equation (3.8):

$$\frac{v_{nj}(g_n)[1\{j \notin A_m\} + \delta_{nj}1\{j \in A_m\}](p_{nj} - c_{nj}(g_n))}{1 + \sum_{j \in A \setminus A_m} v_{nj}(g_n) + \sum_{j \in A \cap A_m} (\delta_{nj}v_{nj}(g_n) + (1 - \delta_{nj})v_{mj} + \sum_{j \in A_m \setminus A} v_{mj})} \geq \lambda$$

$$\begin{aligned}
& v_{nj}(g_n)[1\{j \notin A_m\} + \delta_{nj}1\{j \in A_m\}](p_{nj} - c_{nj}(g_n)) \geq \\
& \lambda + \lambda \sum_{j \in A \setminus A_m} v_{nj}(g_n) + \lambda \left[\sum_{j \in A \cap A_m} (\delta_{nj}(v_{nj}(g_n) - v_{mj}) + v_{mj}) \right] + \lambda \sum_{j \in A_m \setminus A} v_{mj} \quad (3.9)
\end{aligned}$$

By a slight abuse of notation, we explicitly denote that the value function depends on g_n using $v_{nj}(g_n)$. Define $\theta_{nj}(\lambda, g_n)$ for $j \in S_n$ as the *ranking factor* of product j for retailer n such that:

$$\theta_{nj}(\lambda, g_n) = \begin{cases} (p_{nj} - c_{nj}(g_n) - \lambda)v_{nj}(g_n) & j \notin A_m \\ \delta_{nj} [(p_{nj} - c_{nj}(g_n) - \lambda)v_{nj}(g_n) + \lambda v_{mj}] & j \in A_m \end{cases} \quad (3.10)$$

In the absence of capacity constraints and in the monopolistic setting, $\theta_{nj}(\lambda, 0)$ corresponds to the profit margin ranking which is the optimal ranking for products to be selected into an assortment [26]. We also do not have display capacity constraints in an online marketplace. In the competitive setting, $\theta_{nj}(\lambda, 0)$ will vary according to competitor's assortment A_m [17]. In our setting, we allow retailer n to further influence this ranking by the g_n effort. For any possible assortment $A \in \mathcal{A}_n$, $\theta_{nj}(\lambda, g_n^*(A))$ can be computed. Each assortment has an optimal ad effort rate $g_n^*(A)$, which is possibly zero.

Then, (3.8) can be rewritten as

$$\max \left\{ \lambda \in \mathbb{R} : \max_{\substack{A \in \mathcal{A}_n \\ g_n \leq c^{-1}(\bar{p}_n)}} \left[\left(\sum_{i \in A} \theta_{nj}(\lambda, g_n) \right) \right] \geq \lambda(1 + E_m(A_m)) \right\} \quad (3.11)$$

where $E_m(A_m)$ is the total assortment attractiveness of retailer m . By changing g_n , retailer n can influence the product ranking $\theta_{nj}(\lambda, g_n)$ while determining its assortment. In order to solve for the ad effort, we need the following assumption:

Assumption 3.4. $\theta_{nj}(\lambda, g_n)$ is concave in g_n for all $\lambda \in \mathbb{R}$.

It is reasonable to assume that $\theta_{nj}(\lambda, g_n)$ is concave in g_n as higher effort is expected to reflect on the value function with diminishing returns. Since g_n applies to the assortment set A_n at once (by Assumption 3.2), we can solve the inner maximization problem by solving a concave maximization problem for each A_n . Thus we solve the decision problem of retailer n as follows:

- For a given A_m find $g_n^*(A)$ as $\arg \max_{c(g_n) \leq p_n} \pi_n(A, g_n; A_m)$ and find $\theta_{nj}(\lambda, g_n^*)$ for all $A \in \mathcal{A}_n$
- Optimize over \mathcal{A}_n for any λ
- Find optimal λ^* as the best response assortment A_n^* to $A_m \in \mathcal{A}_m$

Thus the decision problem of retailer n is

$$\max \left\{ \lambda \in \mathbb{R} : \max_{A \in \mathcal{A}_n} \left[\max_{c(g_n) \leq p_n} \left(\sum_{j \in A} \theta_{nj}(\lambda, g_n) \right) \right] \geq \lambda(1 + E_m(A_m)) \right\} \quad (3.12)$$

Since $\theta_{nj}(\lambda, g_n)$ is strictly concave in g_n for all λ , there exists:

$$g_n^*(A; A_m) = \arg \max_{c(g_n) \leq p_n} \sum_{i \in A} \theta_{ni}(\lambda, g_n) \text{ for all } A \in \mathcal{A}_n \text{ and } A_m \in \mathcal{A}_m \quad (3.13)$$

Retailer n first decides an optimal ad factor, g_n^* value for all possible assortment pairs (A_n, A_m) . Then, he selects the assortment set that yields the maximum profit. Therefore the problem in (3.8) can be rewritten as:

$$\max \left\{ \lambda \in \mathbb{R} : \max_{A \in \mathcal{A}_n} \left(\sum_{j \in A} \theta_{nj}(\lambda, g_n^*(A; A_m)) \right) \geq \lambda(1 + E_m(A_m)) \right\} \quad (3.14)$$

We conducted an empirical study to analyze the impact of effort factor and competition on the assortment profits and variety by solving Equation (3.14). Our analytical results are obtained via computing iterative best responses.

Retailer n 's best response is the scenario that generates the highest profit for him given retailer m 's assortment decision. Thus, we say that a feasible assortment A_n is a best response to A_m if A_n maximizes the retailer n 's profit. In the decentralized setting, retailer n first solves his maximization problem by finding an optimal effort factor g_n for all given possible assortment pairs (A_n, A_m) . This iterative process results in an optimal g_n value to retailer n for each scenario. Then, he finds the optimal assortment set that maximizes his payoff given retailer m 's assortment decision. Given that there is a finite number of feasible assortments, there always exists at least one best response to each assortment $A_m \in \mathcal{A}_m$. An assortment pair (A_n^*, A_m^*) is an equilibrium if A_n^* is a best response to A_m^* and A_m^* is a best response to A_n^* . Our analysis of the best response correspondence relies on the equivalent profit maximization problem in Equation (3.14). The best response to A_m is found by solving the maximization in Equation (3.14), which is equivalent to the problem (3.8) for all possible values of λ , and then selecting any assortment maximizing the inner problem of Equation (3.14) for λ^* .

3.4. Centralized Model Overview

So far we mentioned and formulated the decentralized regime. Under the decentralized management regime, retailers compete in product assortment decisions given that retailer n has the effort factor advantage. Each retailer makes independent assortment decisions as separate entities. Retailer n decides about the optimal ad factor value for each assortment (A_n, A_m) . In this context, the marketplace's optimal strategy inevitably depends on both customers' demand and retailers' competition on the platform. In this thesis, we analyze both centrally and decentrally managed systems. Under a centralized management regime, the assortment decisions are managed by a single decision maker that is referred to as the marketplace. The marketplace first decides optimal ranking factor value that maximizes the marketplace total profit for all possible assortment pairs (A_n, A_m) .

Then, selects the assortment sets for both retailers that maximizes its total profit π_{mp} .

$$\begin{aligned} & \max_{\substack{A_n \in \mathcal{A}_n, A_m \in \mathcal{A}_m \\ g_n \leq c^{-1}(\bar{p}_n)}} \pi_{mp}(A_n, g_n, A_m) \\ & \pi_{mp}(A_n, g_n, A_m) = \pi_n(A_n, g_n) + \pi_m(A_m) \end{aligned} \quad (3.15)$$

In the centrally managed system, marketplace solves the assortment optimization problem by finding an optimal g_n that maximizes the marketplace profit for each possible assortment pair (A_n, A_m) . In other words, for each scenario, marketplace offers an optimal effort factor to retailer n . Marketplace then selects the optimal assortment sets for both retailers (A_n, A_m) that maximizes the overall profit of the system. In this case, effort cost $c_n(g_n)$ belongs to the system. It could be totally retailer n 's cost or marketplace could make a contribution.

4. COMPUTATIONAL STUDY

In this chapter, we analyze the following aspects of the assortment competition problem:

- The impact of price sensitivity, mean utility, and ad effort cost on equilibrium assortments and ad factor,
- The impact of using ad effort by the marketplace on equilibrium assortments,
- The impact of competition on the ad effort and on equilibrium assortments.

We conduct two sets of computations. Section 4.1 reports a setting where each retailer has access to the same product set, while Section 4.2 discusses a setting where retailers can have exclusive products in their assortment sets. All computations are performed using Matlab R2010b's `fmincon` function, which attempts to find a constrained minimum of a function.

4.1. Computational Study with Common Products

It is assumed that both retailers have access to the same product set $\mathcal{A}_n = \mathcal{A}_m = \{1, 2, 3\}$. We further assume that two retailers are symmetric within each product type when effort factor $g_n = 0$, $u_{nj} = u_{mj}$. Without loss of generality, mean utility is formulated such that the products are ordered as $u_{r1} > u_{r2} > u_{r3}$ and thus, $v_{r1} > v_{r2} > v_{r3}$ when prices are equal. Since ad effort g_n is assumed to be applied to all products in retailer n 's assortment $v_{n1}(g_n) > v_{n2}(g_n) > v_{n3}(g_n)$ also holds for all g_n . Retailer n is given the ad opportunity, that has an upper limit of ten which means retailer n can increase a product's utility up to 80%. This is consistent with Baye *et al.*'s finding [53] that screen location increases demand. They claim that a firm has 60% jump in its clicks when it offers the lowest price and/or appears at the top of the search list at the price comparison site. They also imply that, other things being equal, a firm receives about 17% fewer clicks for every competitor listed above it on the screen. In this thesis, each product has identical predetermined selling price $p = 10$.

As already mentioned, it is assumed that ad effort applies to whole assortment of retailer n if he decides to take the opportunity. However, using an ad effort also brings a cost, which is embedded in retailer n 's total operation cost $c(g_n)$. Total operation cost of retailer $r = n, m$ is formulated as

$$\begin{aligned} c_r(g_r) &= \sum_{j \in A_r} c_{rj}(g_r) \\ c_{rj}(g_r) &= Bq_{rj}(A_r, g_r, A_{-r})F^{(g_r)(j)} \end{aligned} \quad (4.1)$$

where B and F are positive constants and q_{rj} is the choice probability. Therefore, it is independent from the assortment. Total operation cost is composed of daily operational cost and ad effort cost. B is a coefficient that is related to retailer r 's daily operational cost of offering product j in the assortment. $F^{(g_r)(j)}$ represents the operational cost associated with ad effort when retailer r acquires an inorganic utility, g_r as a result of ad effort activities. Since ad effort opportunity is not given to retailer m , retailer m only bears the daily operational cost. $c_{rj}(g_r)$ is formulated such that, it will be more costly for products that have less utility to be ranked at the top. As it can be observed in Figure 4.1, total cost $c_r(g_r)$ is increasing and convex in the effort factor g_n while it is increasing and concave in the expected demand of the product. We also show that $\theta_{nj}(\lambda, g_n)$ is concave in g_n in our computational study setting as shown in Figure 4.2. This demonstration is in parallel with our Assumption (3.4) in Chapter 3.

The cost function $c_{rj}(g_r)$ represents retailer r 's advertising spending on product j . By Assumption 3.3, we know that advertising applies to whole assortment set of a retailer. Therefore, retailer r 's total advertising spending is independent of his assortment set. Its effect on the cost function is formulated as multiplicative. The case when $g_n = 0$ demonstrates a "base" cost without advertising, which is acquired due to transactions. Ad factor, g_n , enters to the utility function via the value function as defined in Equation 3.2 and brings additional utility when its first derivative is observed:

$$\frac{dv_{nj}}{dg_n} = \beta_{nj}v_{nj}(g_n)$$

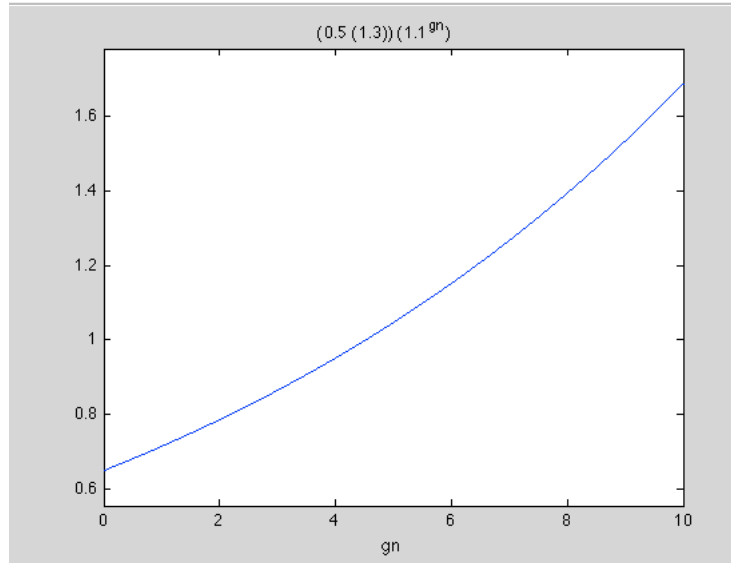


Figure 4.1. Operation Cost Convexity in the Effort Factor

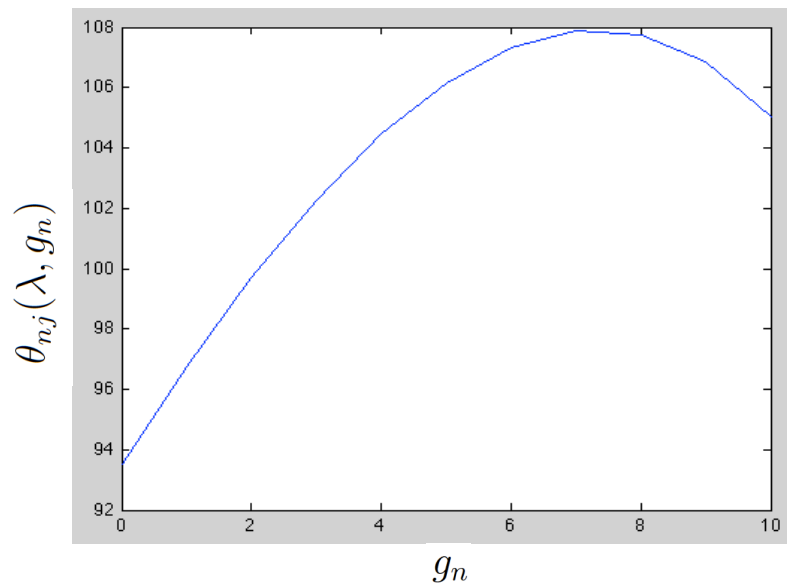


Figure 4.2. Ranking Factor Concavity

Table 4.1. Cases for Illustrative Example

A1	$A_n=1, A_m=1$
A2	$A_n=1,2, A_m=1$
A3	$A_n=1,2,3, A_m=1,2$
A4	$A_n=1,2,3, A_m=1,2,3$

Table 4.2. Total Demand of Retailer n Under Different Effort Factor Levels

g_n	0	1	2	3	4	5	6	7	8	9	10
A1	0.34	0.56	0.75	0.87	0.94	0.97	0.986	0.993	0.997	0.999	0.999
A2	0.50	0.70	0.85	0.93	0.97	0.98	0.992	0.996	0.998	0.999	0.999
A3	0.49	0.73	0.85	0.94	0.97	0.99	0.994	0.997	0.999	0.999	0.999
A4	0.42	0.65	0.82	0.92	0.96	0.98	0.993	0.997	0.990	0.999	0.999

To elaborate it more, some examples for advertising spending mechanisms could be given as click-based (bottom-up) or lump sum-money based (top down) advertising activities. In the former, retailer n would pay $c_{nj}(g_n)$ for each click he gets on product j from the marketplace, which is proportional to q_{nj} . By increasing his impression on the marketplace via clicks, he increases his conversion rate and his total sales. Second, retailer n would pay a lump sum money for a carousel ad to show his products, for example, on the main page of the marketplace for a period of time. An illustrative example from our computational study results is shown in Table 4.1, Table 4.2 and Table 4.3 indicating that a retailer can increase his total demand and market share by this type of advertising activity via attractiveness, however usage of ad effort brings also an additional cost. Table 4.4 and Table 4.5 show the % changes from the case with no advertising activities.

The value of having advertising opportunity is more deducible from Table 4.2 and Table 4.3. We observe that when there is no advertising activity, $g_n = 0$, total demand is 0.339 and total cost is 0.441. However, with a total cost of 1.787, retailer n could have 0.939 total demand with $g_n = 4$. The real cost of advertising spending is then calculated as 1.346.

Table 4.3. Total Cost of Retailer n Under Different Effort Factor Levels

g_n	0	1	2	3	4	5	6	7	8	9	10
A1	0.44	0.80	1.18	1.51	1.79	2.03	2.27	2.52	2.779	3.06	3.37
A2	0.65	1.03	1.39	1.71	2.01	2.31	2.63	2.98	3.37	3.81	4.31
A3	0.64	1.19	1.57	2.05	2.58	3.10	3.94	4.88	6.06	7.59	9.57
A4	0.55	1.13	1.51	2.02	2.56	3.18	3.94	4.88	6.06	7.59	9.57

Table 4.4. Changes of Market Share of Retailer n due to Ad Effort

g_n	1	2	3	4	5	6	7	8	9	10
A1	65%	121%	157%	177%	186%	191%	193%	194%	194%	194%
A2	40%	85%	86%	87%	93%	96%	98%	99%	99%	99%
A3	47%	85%	90%	90%	97%	100%	101%	102%	102%	102%
A4	55%	82%	119%	123%	131%	135%	136%	137%	138%	138%

% changes indicates the deviation from the case when $g_n=0$

Table 4.5. Changes of Total Cost of Retailer n due to Ad Effort

g_n	1	2	3	4	5	6	7	8	9	10
A1	81%	168%	243%	305%	361%	415%	471%	530%	594%	664%
A2	23%	81%	131%	174%	211%	248%	286%	326%	369%	416%
A3	25%	84%	135%	178%	217%	254%	292%	333%	377%	425%
A4	46%	116%	177%	227%	272%	316%	361%	409%	460%	561%

% changes indicates the deviation from the case when $g_n=0$

Table 4.6. Parameter Values for Computational Study

Variable	Retailer n	Retailer m
Assortment Set	$\mathcal{A}_n = \{1, 2, 3\}$	$\mathcal{A}_m = \{1, 2, 3\}$
Mean Utility	$u_{nj} = 12 + kexp(-j)$	$u_{mj} = 12 + kexp(-j)$
Attraction	$v_{nj} = exp(u_{nj} - \alpha_{nj}p_{nj} + \beta_{nj}g_n)$	$v_{mj} = exp(u_{mj} - \alpha_{mj}p_{mj})$
Selling Price	$p_{nj} = 10$	$p_{mj} = 10$
Operation Cost	$c_{nj} = (1.3q_{nj})F^{(g_{nj})(j)}$	$c_{mj} = (1.3q_{mj})$

Table 4.7. Experimented Parameter Value Levels in the Computational Study

ad effort cost (F)	organic mean utility (k)	price sensitivity (α)
1.01 (low)	0.5 (low)	0.75 (low)
1.1 (medium)	1.5 (base)	1 (medium)
1.4 (high)	3 (high)	1.5 (high)

To sum up, while including a new product in the assortment brings more utility to retailers, on the other hand, it brings marginal costs due to daily operations and ad effort. Thus, in this thesis, decision problem of retailer n is to maximize his profit over g_n and assortments. Since the profit function of retailer n is concave in g_n , we calculate an optimum g_n value for each possible assortment pair (A_n, A_m) , and then find the optimum A_n that yields the maximum profit.

4.1.1. The Impact of Price Sensitivity, Effort Cost and Mean Utility

Parameters for computational study are shown in Tables 4.6 and 4.7. We normalize ad effort sensitivity β_{nj} to one so that we can isolate the effects of price sensitivity.

As already defined in Section 4.1, the coefficient B , that is related to retailer r 's daily operation cost is determined as $B = 1.3$ for the computational study.

According to Choi and Mela [52], an online marketplace can take commissions from sellers varying between 6% to 25% as a percentage of the total sale amount. They also state that Amazon charges 15% of the transaction price in average. In this study, selling price is predetermined by the marketplace and equals to 10, thus we can say that our daily operation cost values are at a reasonable level. F is the coefficient associated with advertising effort cost, when retailer n acquires g_n amount of inorganic utility as a result of advertising activities. Organic utility strength parameter k determines the level of retailers' total organic assortment attractiveness. In other words, it shows how attractive an assortment is in the absence of advertising activities. Price sensitivity, α , represents the price perception of customers and indicates how individual customers react to changes in price levels in an assortment. The parameter values for price sensitivity (α), ad effort cost (F), and organic mean utility (k) used in computational study are shown in Table 4.7.

We begin by considering two model settings: a) none of the retailers is given the effort factor advantage b) ad effort factor advantage is given to retailer n only. Since we have three factors with three levels in each, we experimented 27 different scenarios under both centrally and decentrally managed systems. This totals to 108 different experiments. All computational results can be found in Appendix A.

In order to observe *the impact of price sensitivity*, the retailers' and marketplace's profits are grouped under each price sensitivity scenario considering three levels of price sensitivity: low, medium and high. In this context, Table 4.11 represents the average value of the equilibrium centralized and decentralized profits of retailers and the marketplace and the value of the ad effort in each management regime. Figure 4.3 demonstrates the equilibrium assortment varieties of retailers'.

Table 4.8. Experimental Design and Results for the Decentralized System

R	F	k	α	DR1	DR2	DMP	DR1W_g	DR2W_g	DMPW_g	D_g
1	L	L	L	4.19	4.19	8.38	8.55	0.02	8.57	9.6
2	L	L	M	3.57	3.57	7.14	8.54	0.02	8.56	10*
3	L	L	H	0.53	0.53	1.06	8.39	0.01	8.40	10*
4	L	B	L	4.21	4.21	8.43	8.55	0.02	8.57	9.33
5	L	B	M	3.66	3.66	7.31	8.54	0.01	8.56	9.83
6	L	B	H	0.59	0.59	1.19	8.41	0.05	8.42	10*
7	L	H	L	4.24	4.24	8.48	8.55	0.01	8.57	9.02
8	L	H	M	3.78	3.78	7.55	8.55	0.01	8.56	9.41
9	L	H	H	0.72	0.72	1.44	8.44	0.01	8.42	10
10	M	L	L	4.19	4.19	8.38	7.51	0.32	7.83	4.22
11	M	L	M	3.57	3.57	7.14	7.37	0.23	7.61	4.61
12	M	L	H	0.53	0.53	1.06	6.51	0.03	6.54	9
13	M	B	L	4.21	4.21	8.42	7.56	0.31	7.87	4.17
14	M	B	M	3.66	3.66	7.31	7.44	0.23	7.66	4.52
15	M	B	H	0.6	0.6	1.19	6.33	0.02	6.36	7.36
16	M	H	L	4.24	4.24	8.47	7.63	0.29	7.92	4.09
17	M	H	M	3.78	3.78	7.55	7.53	0.22	7.75	4.39
18	M	H	H	0.72	0.72	1.44	6.75	0.03	6.79	8.25
19	H	L	L	4.19	4.19	8.38	5.44	1.75	7.19	1.98
20	H	L	M	3.57	3.57	7.14	5.02	1.45	6.47	2.14
21	H	L	H	0.53	0.53	1.05	1.64	0.26	1.90	3.19
22	H	B	L	4.21	4.21	8.42	5.56	1.67	7.23	1.97
23	H	B	M	3.66	3.66	7.31	5.19	1.41	6.6	2.12
24	H	B	H	0.60	0.60	1.19	1.90	0.33	2.23	4.27
25	H	H	L	4.24	4.24	8.47	5.73	1.56	7.29	1.96
26	H	H	M	3.78	3.78	7.55	5.43	1.36	6.79	2.09
27	H	H	H	0.72	0.72	1.44	2.34	0.34	2.67	4.11

F represents the ad effort cost, k represents the organic mean utility, and α represents price sensitivity. L, M, and H represents low, medium, and high values, respectively. (*) is the upper bound imposed on g_n .

Table 4.9. Experimental Design and Results for the Centralized System

R	F	k	α	CR1	CR2	CMP	CR1Wg	CR2Wg	CMPWg	Cg
1	L	L	L	4.19	4.19	8.38	8.34	0.26	8.6	5.96
2	L	L	M	3.57	3.57	7.14	8.52	0.04	8.56	8.58
3	L	L	H	0.53	0.53	1.06	8.39	0.01	8.39	10*
4	L	B	L	4.21	4.21	8.43	8.32	0.28	8.61	5.5
5	L	B	M	3.66	3.66	7.31	8.52	0.04	8.57	8.23
6	L	B	H	0.59	0.59	1.19	8.42	0.01	8.42	10
7	L	H	L	4.24	4.24	8.48	8.28	0.34	8.61	5
8	L	H	M	3.78	3.78	7.55	8.52	0.05	8.58	7.68
9	L	H	H	0.72	0.72	1.44	8.42	0.01	8.43	10*
10	M	L	L	4.19	4.19	8.38	4.19	4.19	8.38	0
11	M	L	M	3.57	3.57	7.14	7.01	0.75	7.76	4.36
12	M	L	H	0.53	0.53	1.06	6.51	0.03	6.55	8.91
13	M	B	L	4.21	4.21	8.42	4.21	4.21	8.42	0
14	M	B	M	3.66	3.66	7.31	7.02	0.75	7.82	4.05
15	M	B	H	0.6	0.6	1.19	6.61	0.03	6.64	8.61
16	M	H	L	4.24	4.24	8.47	4.23	4.23	8.47	0
17	M	H	M	3.78	3.78	7.55	6.99	0.92	7.92	3.54
18	M	H	H	0.72	0.72	1.44	6.75	0.03	6.78	8.15
19	H	L	L	4.19	4.19	8.38	4.19	4.19	8.38	0
20	H	L	M	3.57	3.57	7.14	3.57	3.57	7.14	0
21	H	L	H	0.53	0.53	1.05	1.62	0.34	1.96	4.23
22	H	B	L	4.21	4.21	8.42	4.21	4.21	8.42	0
23	H	B	M	3.66	3.66	7.31	3.65	3.65	7.31	0
24	H	B	H	0.60	0.60	1.19	1.89	0.34	2.24	4.13
25	H	H	L	4.24	4.24	8.47	4.23	4.23	8.47	0
26	H	H	M	3.78	3.78	7.55	3.77	3.77	7.55	0
27	H	H	H	0.72	0.72	1.44	2.32	0.36	2.68	3.96

F represents the ad effort cost, k represents the organic mean utility, and α represents price sensitivity. L, M, and H represents low, medium, and high values, respectively. (*) is the upper bound imposed on g_n .

Table 4.10. Abbreviations used in Computational Study

DR1	Retailer n's equilibrium profit under decentralized regime
DR2	Retailer m's equilibrium profit under decentralized regime
DMP	Marketplace's equilibrium profit under decentralized regime
CR1	Retailer n's equilibrium profit under centralized regime
CR2	Retailer m's equilibrium profit under centralized regime
CMP	Marketplace's equilibrium profit under centralized regime
Dg	Optimal value of ad effort under decentralized regime
Cg	Optimal value of ad effort under centralized regime

Table 4.11. Average Profits under Different Price Sensitivity Scenario

Price Sensitivity	High	Medium	Low
Average of DR1 profit	5.68(98%)	7.07(93%)	7.23(91%)
Average of DR2 profit	0.11(2%)	0.55(7%)	0.66(9%)
Average of DMP profit	5.75	7.62	7.89
Average of CR1 profit	5.66(97%)	6.40(81%)	6.58(69%)
Average of CR2 profit	0.13(13%)	1.51(19%)	2.91(31%)
Average of CMP profit	5.79	7.91	8.49
Average of Dg value	7.36	5.46	5.15
Average of Cg value	7.35	4.05	1.84

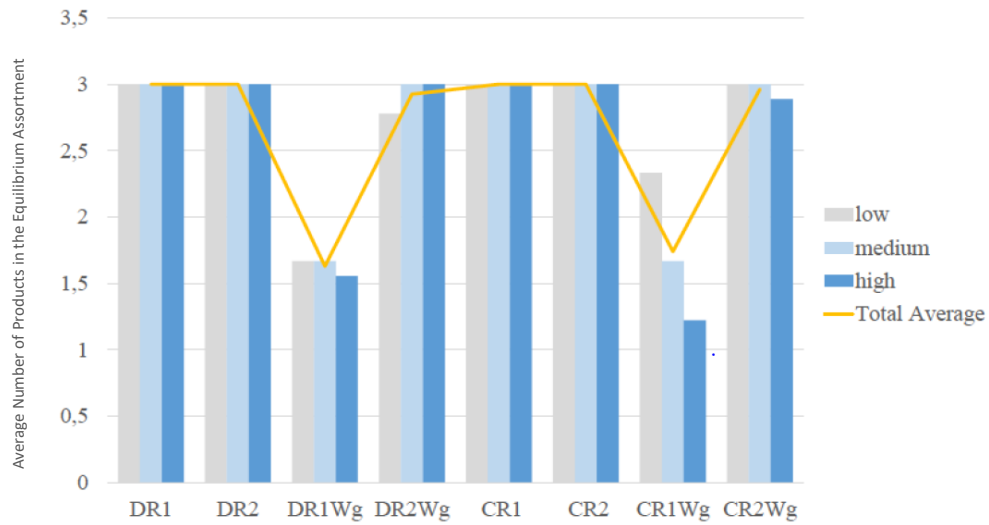


Figure 4.3. Assortment Variety Changes due to Price Sensitivity

Observations:

- We observe that price sensitivity is negatively correlated with retailers' and marketplace's profits under both management regimes. Players lose profit as customers get more price sensitive.
- Centralized marketplace profit is always higher than the decentralized marketplace profit under each price sensitivity policy with an average of 5.7%. The maximum deviation occurs when the price sensitivity is low (7.60%).
- As price sensitivity of customers decreases, Retailer n 's share from the total profit decreases although his profit shows an increase. This experiment revealed that price sensitive customers are more likely to be affected by the advertising activities and are more likely to prefer the popular products in both centralized and decentralized cases.
- Under the same price sensitivity policy, centralized management regime causes retailer n to lose share from the total profit. The amount of this loss increases as the price sensitivity of customers increases.

On the contrary, centralized regime is in favor of retailer m causing his share from the total profit to increase significantly. Centralized regime "protects" seller m from losing too much due to ad effort of seller n .

- Marketplace's total profit is maximized when price sensitivity is low and the management regime is centralized. This is the case when two retailers' shares are closer to each other and ad effort g has its least value.
- The impact of price sensitivity on ad effort is worth noting. As price sensitivity increases, ad effort factor g_n under both management regimes increases as well. In other words, when a product's price affects its demand significantly, the retailer has to allocate more advertising spending on the product. This increase is more significant in the centralized setting (299.46%). On the other hand, when price sensitivity is low, the centralized system does not use the ad effort for retailer n as much as the decentralized system.
- Competition causes 35.72% increase in effort factor on average. When price sensitivity is low, competition causes a significant increase in the effort factor g_n (179.89%). When price sensitivity high, it is observed that competition has almost no impact on the effort factor g_n .
- As Figure 4.3 shows, when price sensitivity increases, retailer n decreases its assortment variety while utilizing more effort factor g_n simultaneously under both management regimes. However, the reduction in assortment variety due to price sensitivity is steeper in centrally managed systems.

From the perspective of the marketplace, different *ad effort cost structures* are considered to observe the impact of effort cost on equilibrium values. Choi and Mela [52] list advertising fees under the fee structure models of an online marketplace by saying that:

"As for the advertising fees, Amazon uses an auction-based pricing model for each keyword, similar to keyword search engines. Etsy asks sellers to list several keywords and set one weekly maximum budget. Both charge sellers on a cost-per-click basis. On the other hand, the website in our empirical application asks sellers about the willingness to pay extra 17% of the sale price when the item is sold, and the platform has full discretion on how the sponsored products are displayed."

Table 4.12. Average Profits under Different Ad Effort Cost Structures

Effort Cost	Low	Medium	High
Average of DR1Wg profit	8.51(99%)	7.18(97%)	4.25(79%)
Average of DR2Wg profit	0.01(1%)	0.19(3%)	1.13(21%)
Average of DMPWg profit	8.52	7.37	5.38
Average of CR1Wg profit	8.42(98%)	5.95(77%)	3.28(54%)
Average of CR2Wg profit	0.11(2%)	1.69(23%)	2.74(46%)
Average of CMPWg profit	8.53	7.64	6.02
Average of Dg value	9.69	5.63	2.65
Average of Cg value	7.90	4.18	1.37

The base value for F is determined as 1.1, and other ad effort cost values for scenario analysis are represented in Table 4.7. It is observable that when the ad effort cost is at base level, $F = 1.1$, the average value of g_n is 4,91. Thus the ad effort cost becomes 1,60, and it is 16% of the selling price. Hence, we can say that our results are compliant with the normal values. Retailers' equilibrium assortment variety changes are shown in Figure 4.4. Low means ad effort cost is minimum, and high means ad effort is more expensive.

Observations

- As anticipated, when effort cost increases, the profit of retailer n decreases, while the profit of retailer m increases under both management regimes. Taken together, total profit of the marketplace decreases. These results correlate favorably with retailers' shares from the total profit. As ranking fee increases, retailer n 's share from the total profit decreases, while retailer m 's increases.
- We have found that optimal ad effort factor, g_n , decreases as effort cost increases. When the effort cost goes up, retailer n spends less on advertising by decreasing effort factor g_n in order to offset the increase in effort factor under both management regimes.

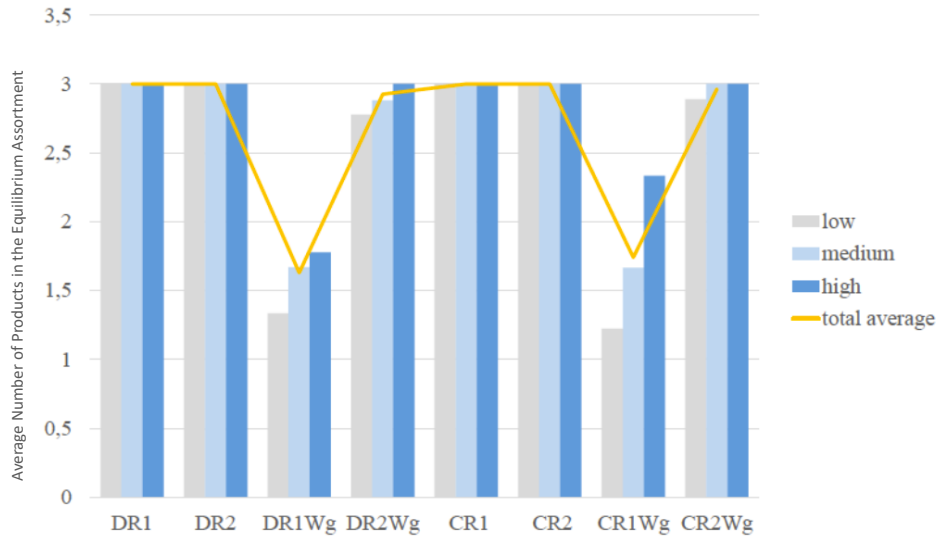


Figure 4.4. Assortment Variety Changes due to Ad Effort Cost

- Centralized marketplace profit is always higher than the decentralized marketplace profit under each effort cost policy.
- Under the same ad effort cost policy, centralized management regime causes retailer n to lose share from the total profit. The amount of this loss increases as the effort cost increases.
- Marketplace's total profit is maximized when effort cost is low and the management regime is centralized.
- An important highlight here would be the impact of competition on effort factor g_n under each effort cost scenarios. Competition causes 33.6% increase in ad effort on average. This means that marketplace has the power to have more profits despite using less ad effort under the centralized regime.
- As it can be seen in Figure 4.4, while ad effort cost $c_n(g_n)$ increases, retailer n increases its assortment variety while using less effort factor g_n under both management regimes.

We proceed by observing the *impact of the mean utility*, $u_{r,j}$, on equilibrium profits. It is the utility that a player acquires without any means of advertisement. A higher mean utility implies that a product assortment of retailer r has a high attraction and more likely to be selected by the customer in the absence of advertising.

Table 4.13. Average Profits under Different Mean Utility Levels

Mean Utility	Low	Base	High
Average of DR1Wg profit	6.55(93.4%)	6.61(93.6%)	6.77(94.1%)
Average of DR2Wg profit	0.45(6.6%)	0.45(6.4%)	0.43(5.9%)
Average of DMPWg profit	7.01	7.06	7.20
Average of CR1Wg profit	5.82(79.7%)	5.88(79.6%)	5.95(79.3%)
Average of CR2Wg profit	1.49(20.3%)	1.51(20.4%)	1.55(20.7%)
Average of CMPWg profit	7.30	7.38	7.50
Average of Dg value	6.09	5.96	5.93
Average of Cg value	4.67	4.51	4.26

The retailers' and marketplace's profits are grouped under each mean utility levels. Table 4.13 represents the average value of the centralized and decentralized profits of the players. Figure 4.5 shows retailers' assortment variety changes.

Observations

- In the decentralized setting, as the mean utility increases, retailer n 's profit slightly increases, retailer m 's profit decreases and the overall profit of the marketplace increases. In centralized setting, as mean utility of retailers increase, the profit of both retailers and marketplace increases,
- The shares of retailers from total profit are not affected much by the organic utility strength.
- Centralized marketplace profit is always higher than the decentralized marketplace profit under each scenario.
- Under the same organic utility strength policy, centralized management regime causes retailer n to lose significant share from the total profit.
- Marketplace's total profit is maximized when mean utility is high and the management regime is centralized.
- As organic utility strength is getting higher, effort factor g_n decreases under both management regimes. Since the attraction of products already high, retailer n does not prefer spend more on advertising.

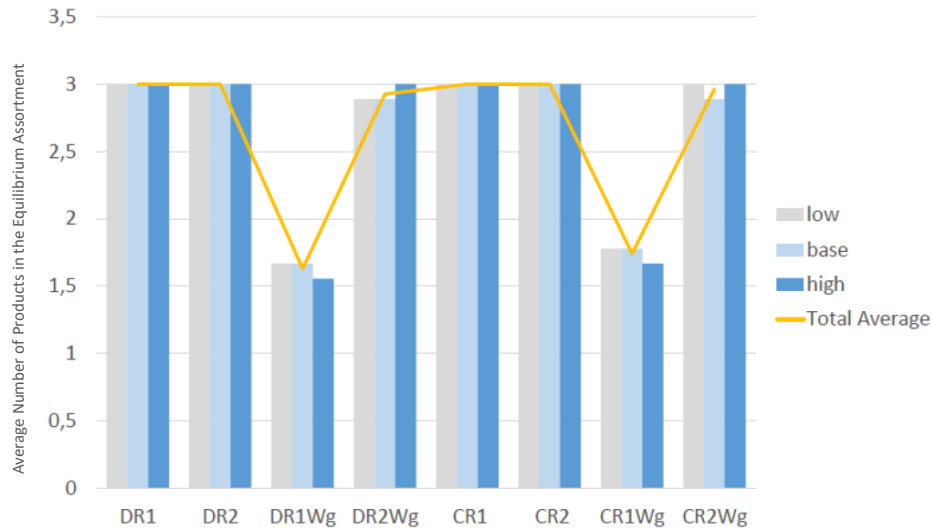


Figure 4.5. Assortment Variety Changes due to Mean Utility

- Competition causes an increase in effort factor g_n 33.78% on average. This means that marketplace has the power to have more profits despite using less ad effort factor under centralized regime.
- As it is shown in Figure 4.5, although its a slight change, as mean utility increases, retailer n reduces its assortment variety under both management regimes.

Our results show that effort factor g_n causes retailer n to reduce assortment variety in all scenarios (min 33%, max 67%). It is observed that when effort cost is low, as price sensitivity increases, retailer n either keeps the same assortment or increases product variety. When effort cost is medium or high, it is found to be that retailer n decreases its product variety as price sensitivity of customers increases.

Taken together, these findings suggest that centralized marketplace profit is always higher than the decentralized marketplace profit under all policies. Competition causes an increase in effort factor g_n , meaning that there is more advertising spending when the management regime is decentralized. Thus marketplace would suggest retailers not to compete but cooperate with the marketplace.

Table 4.14. The % Changes of Effort Factor due to Competition at Parameter Levels

Parameters	Levels	% Change
Price Sensitivity	Low	64.22%
Price Sensitivity	Medium	25.81%
Price Sensitivity	High	0.14%
Mean Utility	Low	23.20%
Mean Utility	Base	24.25%
Mean Utility	High	28.10%
Effort Cost	Low	18.48%
Effort Cost	Medium	25.71%
Effort Cost	High	48.40%
	Average	25.16%

4.1.2. The Impact of Competition

Our experiments provide considerable insight into the impact of competition on effort factor, g_n . It is found that competition causes retailer n to use 25.16% more ad effort factor than in non-competitive centrally managed environment. Findings at each parameter level are summarized in Table 4.14.

This analysis has further strengthened our conviction that decentralized effort factor, g_n is higher than the centralized effort factor, g_n . The correlation between competition and effort factor is noteworthy. We continue by analyzing the impact of competition on equilibrium profits of all players in the marketplace. We have found that competition in the existence of effort factor increases retailer n 's profit by 13% while decreases retailer m 's profit by 71% on average. Marketplace profit declines by 4.17% due to competition. Table 4.15 shows a summary of the results obtained from this analysis.

Table 4.15. The % Changes of Profits due to Competition at Parameter Levels

Parameters	Levels	R1 change	R2 change	MP change
Price Sensitivity	Low	29.56%	-77.16%	-6.98%
Price Sensitivity	Medium	10.42%	-63.57%	-3.72%
Price Sensitivity	High	-0.44%	-10.59%	-0.66%
Mean Utility	Low	12.63%	-69.38%	-4.05%
Mean Utility	Base	12.53%	-70.45%	-4.43%
Mean Utility	High	13.81%	-72.43%	-4.02%
Effort Cost	Low	1.06%	-89.14%	-0.14%
Effort Cost	Medium	21.14%	-88.81%	-3.52%
Effort Cost	High	30.01%	-58.90%	-10.69%
	Average	12.99%	-70.77%	- 4.17%

As it is seen from Table 4.15, competition always helps retailer n to increase his profits using the ad effort while causing a significant decrease in the retailer m 's and total marketplace profit. As price sensitivity increases, the impact of competition on profits moderates. Mean utility is not found to be an important factor in this analysis. As effort cost increases, the impact of competition on retailer n and marketplace profits also increases. This observation tends to indicate that the marketplace must regulate the ad effort offered to retailers carefully in a competitive market.

4.1.3. The Impact of Using the Ad Effort Factor

Our findings would seem to show that effort factor g_n has increased the profit of retailer n 134.64% while causing retailer m to lose 84.4% of profits on average in the decentralized system. We observe that the marketplace profit increases by 25.14%. Table 4.16 shows the profit percent changes of retailers due to effort factor under each parameter scenarios when the management regime is decentralized.

Table 4.16. The % Changes of Profits due to Effort Factor at Parameter Levels in the Decentralized Setting

Parameters	Levels	DR1 change	DR2 change	DMP change
Price Sensitivity	Low	79.61%	-84.30%	-6.32%
Price Sensitivity	Medium	92.70%	-85%	3.68%
Price Sensitivity	High	815%	-81.50%	367%
Mean Utility	Low	137%	-83.50%	26.79%
Mean Utility	Base	134%	-84.20%	25.07%
Mean Utility	High	132%	-85.30%	23.63%
Effort Cost	Low	200%	-99.60%	50.38%
Effort Cost	Medium	153%	-93.30%	30.13%
Effort Cost	High	50%	-60.20%	-5.10%
	Average	134.64%	-84.40%	25.14%

Observations

- In all cases, effort factor increased retailer n 's profit while causing retailer m to lose profit. Except the cases when price sensitivity is low and effort cost is high, effort factor always increases the total marketplace profit.
- As price sensitivity of customers increases, the impact of effort factor increases significantly for retailer n .
- When organic utility strength increases, the effect of effort factor on retailer n slightly decreases.
- As effort cost increases, its impact on retailer n 's profit significantly decreases.

In centralized system, our results revealed that effort factor g_n increases the profit of retailer n 107.66% while causing retailer m to lose 46.51% of profits on average. Marketplace profit increases by an average of 30.58%. Table 4.17 shows the profit (%) changes of retailers due to effort factor under each scenario when the management regime is centralized.

Table 4.17. The % Changes of Profits due to Effort Factor at Parameter Levels in the Centralized Setting

Parameters	Levels	CR1 change	CR2 change	CMP change
Price Sensitivity	Low	32.46%	-31.04%	0.71%
Price Sensitivity	Medium	74.51%	-58.77%	7.87%
Price Sensitivity	High	819.92%	-79.30%	370.31%
Mean Utility	Low	110.53%	-46.26%	32.14%
Mean Utility	Base	108.25%	-46.50%	30.88%
Mean Utility	High	104.36%	-46.74%	28.81%
Effort Cost	Low	197.18%	-96%	50.59%
Effort Cost	Medium	110%	-40.34%	34.88%
Effort Cost	High	16%	-3.18%	6.26%
	Average	107.66%	-46.51%	30.58%

Observations

- Under each parameter scenario, effort factor increases retailer n 's and market-place's overall profit while causing a decrease in retailer m 's profit.
- As price sensitivity increases, the impact of effort factor is more significant on retailers' profit.
- Retailers' profits are not affected much from the organic utility strength. As organic utility strength increases, the profit of retailer n shows a slight decrease.
- The impact of effort factor is more significant when the effort cost is at the lowest level.

Table 4.18 summarizes the min, average, max (%) changes of assortment profits due to effort factor under centrally and decentrally managed systems. Figure 4.6 shows that using effort factor decreases the product variety of the retailer n , who utilizes the ad effort under both management regimes.

Table 4.18. Summary of the % Changes of Assortment Profits due to Effort Factor

	DR1Wg	DR2Wg	DMPWg	CR1Wg	CR2Wg	CMPWg
min	29.70%	99.60%	-14.29%	0%	-99.43%	0%
average	134.64%	-84.40%	25.14%	107.66%	-46.51%	30.58%
max	1487%	-45.20%	693.92%	1487.08%	0%	693.92%

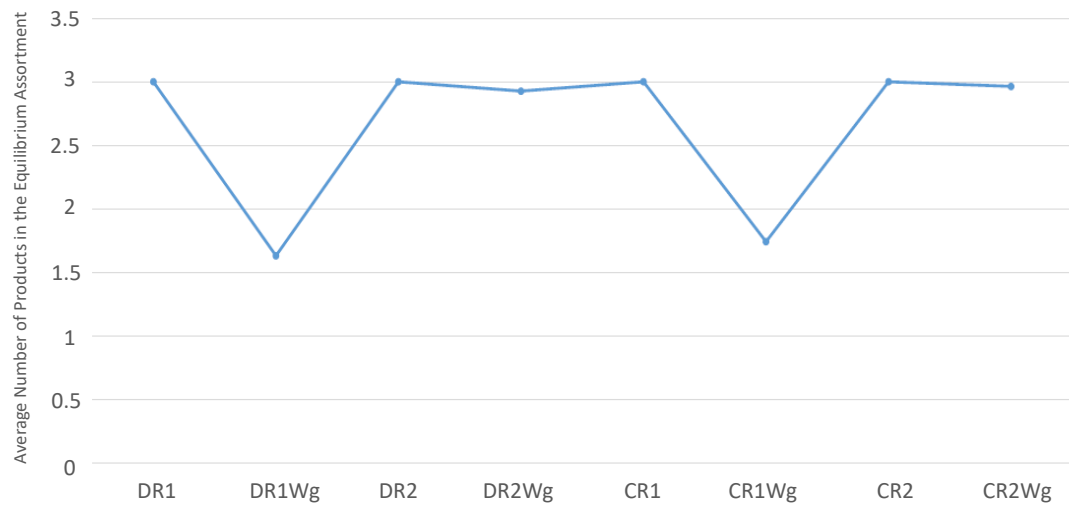


Figure 4.6. Assortment Variety Changes due to Effort Factor

Table 4.19. % Changes of Profits due to Exclusive Product in the Decentralized Setting

Attraction Level	DR1Wg	DR2Wg	DMPWg	Dg
8	7.86(98.6%)	0.11(1.4%)	7.97	4.11
10	7.84(98.4%)	0.13(1.6%)	7.96	4.18
12	7.78(98%)	0.16(2%)	7.94	4.44
14	7.60(96.9%)	0.25(3.1%)	7.85	5.16
16	7.28(95.4%)	0.35(4.6%)	7.63	6.41
18	6.83(93.8%)	0.45(6.2%)	7.28	8.02
20	6.29(91.7%)	0.57(8.3%)	6.86	9.66

4.2. Computational Study with Exclusive Products

In this section, our model is extended by removing one of the modeling assumptions. Now, retailers have access to different product sets $\mathcal{A}_n \neq \mathcal{A}_m$, thus exclusive products exist in the assortment planning problem. $\mathcal{A}_n = \{1, 2, 3\}$ and $\mathcal{A}_m = \{2, 3, 4\}$. When exclusive products have the same utility, $u_{n1} = u_{m4}$, we observe observations in Section 4.1 still holds for this setting at parameter level. On the other hand, we found out that having a more attractive product exclusively gives a competitive advantage to retailer m and protects her from the ad effort effects of retailer n .

4.2.1. Impact of the Exclusive Product Utility

So far, we have found out that retailer n 's ad effort usage makes retailer m worse off. In this part, we give retailer m the opportunity to have an exclusive product and experimented at different v_{m4} levels, while $v_{n1} = 12$ and common products have the same attraction. Results are summarized in Table 4.19, Table 4.20 and in Figure 4.7. All computational results can be found in Appendix B.

Table 4.20. % Changes of Profits due to Exclusive Product in the Centralized Setting

Attraction Level	CR1Wg	CR2Wg	CMPWg	Cg
8	8.01(99.8%)	0.01(0.2%)	8.012	3.14
10	7.97(99.4%)	0.05(0.6%)	8.017	3.32
12	7.94(99.1%)	0.07(0.9%)	8.02	3.66
14	7.83(97.3%)	0.21(2.7%)	8.03	3.8
16	1.36(16.4%)	6.93(83.6%)	8.29	0
18	0.44(5.2%)	8.13(94.8%)	8.57	0
20	0.12(1.4%)	8.55(98.6%)	8.86	0

In the decentralized setting, we observe that a more attractive exclusive product makes retailer m more competitive by increasing its total profit and share from the total profit. It causes the marketplace and retailer n to lose profits and forces retailer n to use more ad effort g_n at the same time. As v_{m4} increases, retailer m drops the products that have least utility. Stated in other words, retailer m prefers to include only the most attractive product in the assortment while causing retailer n to use more ad effort and lose profits. In the centralized setting, the results are more significant. We infer that there is a threshold $E_m(A_m)$, and above this value marketplace does not use ad effort for retailer n as it can be seen in Table 4.20. Therefore, retailer m acquires the majority of shares from the total profit. Marketplace's profit also increases. In this case, since retailer n loses his market leadership, retailer m chooses to include more products in the assortment as v_{m4} increases.

4.2.2. The Impact of Price Sensitivity, Mean Utility and Effort Cost in the Existence of Exclusive Product

In this part, it is assumed that, $u_{n1} = u_{m4}$. Experimental design and corresponding results of the extended computational study are shown in Table 4.21 and Table 4.22, respectively. All computational results can be found in Appendix C. The results are qualitatively similar to what we have stated in Section 4.1 for common products. We first consider the impact of price sensitivity.

Table 4.21. Experimental Design of the Extended Computational Study

Run	Regime	Mean Utility	Price Sensitivity	Effort Cost
1	Decentralized	low	low	low
2	Decentralized	low	low	high
3	Decentralized	low	high	low
4	Decentralized	low	high	high
5	Decentralized	high	low	low
6	Decentralized	high	low	high
7	Decentralized	high	high	low
8	Decentralized	high	high	high
9	Decentralized	low	low	low
10	Centralized	low	low	high
11	Centralized	low	high	low
12	Centralized	low	high	high
13	Centralized	high	low	low
14	Centralized	high	low	high
15	Centralized	high	high	low
16	Centralized	high	high	high

Table 4.22. Average Profits under Different Price Sensitivity Levels in the Existence of Exclusive Product

Value	Low	High
Average of $DR1Wg$ profit	6.99(87%)	5.16(96%)
Average of $DR2Wg$ profit	1.06(13%)	0.24(4%)
Average of $DMPWg$ profit	8.04	5.39
Average of $CR1Wg$ profit	6.41(75%)	5.16(96%)
Average of $CR2Wg$ profit	2.14(25%)	0.24(4%)
Average of $CMPWg$ profit	8.54	5.39
Average of Dg value	5.62	6.01
Average of Cg value	4.43	6.01

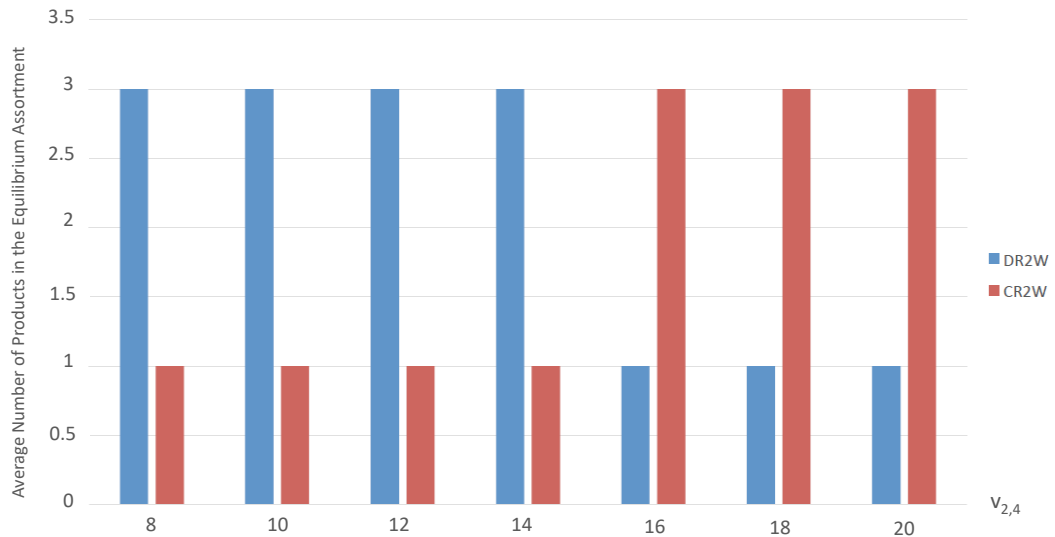


Figure 4.7. The Impact of Exclusive Product to Retailer m 's Assortment Variety DR2W (*first bar*) and CR2W (*second bar*) denotes respectively retailer m 's decentralized and centralized assortment variety in the case when retailer n utilizes effort factor

- Price sensitivity is negatively correlated with retailers' and marketplace's profit under both management regimes,
- Centralized marketplace profit is always higher than the decentralized marketplace profit under each price sensitivity policies,
- As price sensitivity of customers decreases, Retailer n 's share from the total profit decreases although his profit shows an increase. This experiment revealed that price sensitive customers are more likely to be affected by the advertising activities and are more likely to prefer the popular products in both centralized and decentralized cases,
- Marketplace's total profit is maximized when price sensitivity is low and the management regime is centralized. This is the case when two retailers' shares are closer to each other and effort factor g_n has its least value,
- Similarly to what we have stated in Section 4.1 the impact of price sensitivity on effort factor g_n is significant. As price sensitivity increases, effort factor g_n under both management regimes increases as well. In other words, when a product's price affects its demand significantly, the retailer has to allocate more advertising spending on the product in order to acquire the same profit margin.

Table 4.23. Average Profits under Different Mean Utility Levels in the Existence of Exclusive Product

Value	Low	High
Average of $DR1Wg$ profit	6.01(91%)	6.13(90%)
Average of $DR2Wg$ profit	0.63(9%)	0.66(10%)
Average of $DMPWg$ profit	6.64	6.79
Average of $CR1Wg$ profit	5.72(83%)	5.84(83%)
Average of $CR2Wg$ profit	1.17(17%)	1.20(17%)
Average of $CMPWg$ profit	6.89	7.04
Average of Dg value	5.83	5.81
Average of Cg value	5.24	5.20

- Competition causes an increase in the effort factor in both management regimes (11.5% on average). This increase is much sharper when price sensitivity is low (25% when price sensitivity is low, and 2% when price sensitivity is high).

What is surprising is that, competition does not change the effort factor significantly (16.82%) as it does in Section 4.1 when price sensitivity is low (179%), where retailers have overlapping assortments.

When we consider the impact of mean utility, the observations shown in Table 4.23 are in the same direction as in Section 4.1.

- Under both settings, as the mean utility increases, retailers' and marketplace's profits slightly increase.
- The shares of retailers from total profit are not affected much by the mean utility.
- Centralized marketplace profit is always higher than the decentralized marketplace profit under each scenario.
- Under the same mean utility policy, centralized management regime causes retailer n to lose significant share from the total profit.
- Marketplace's total profit is maximized when mean utility is high and the management regime is centralized.

Table 4.24. Average Profits under Different Effort Cost Levels in the Existence of Exclusive Product

Value	High	Low
Average of $DR1Wg$ profit	3.68(74%)	8.46(98%)
Average of $DR2Wg$ profit	1.27(26%)	0.02(2%)
Average of $DMPWg$ profit	4.96	8.48
Average of $CR1Wg$ profit	3.09(57%)	8.48(99%)
Average of $CR2Wg$ profit	2.36(43%)	0.009(1%)
Average of $CMPWg$ profit	5.45	8.49
Average of Dg value	1.64	10*
Average of Cg value	1.01	9.43

(*) represents the upper bound imposed on g_n .

- As mean utility increases, effort factor g_n decreases under both management regimes.
- Competition causes an 33.78% increase in effort factor g_n on average. This means that marketplace has the power to have more profits despite using less ranking factor under centralized regime.

When we consider the impact of effort cost as shown in Table 4.24, we have the following observations:

- As effort cost increases, the profit of retailer n decreases, while the profit of retailer m increases under both management regimes. Taken together, total profit of the marketplace decreases. These results correlate favorably with retailers' share from the total profit. As effort cost increases, retailer n 's share from the total profit decreases, while retailer m 's increases.
- As the effort cost goes up, retailer n cuts advertising spending by decreasing effort factor g_n drastically in order to offset the increase in effort cost under both management regimes.
- Centralized marketplace profit is always higher than the decentralized marketplace profit under each effort cost policy.

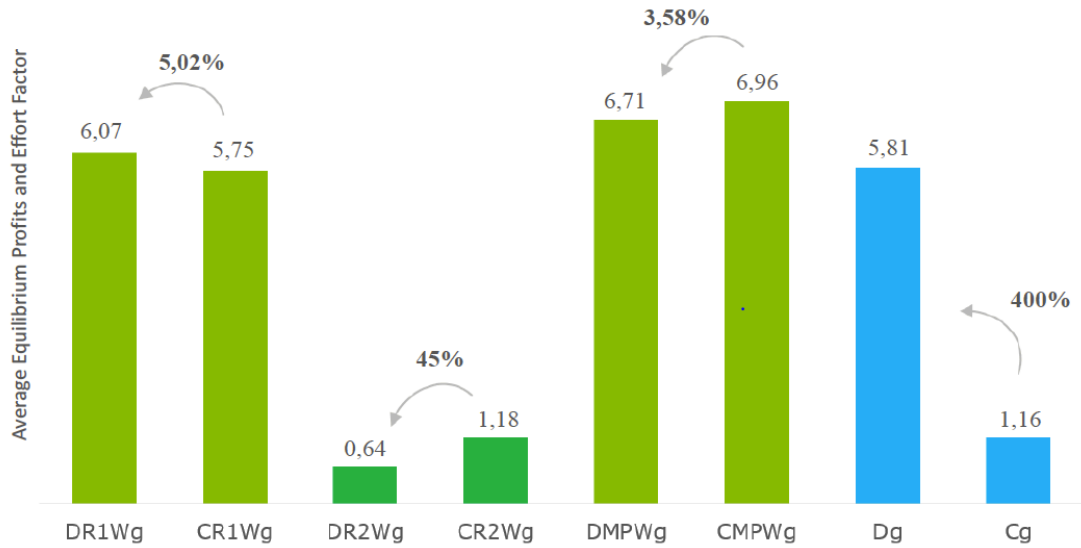


Figure 4.8. The Impact of Competition on Effort Factor and Assortment Profits

- Under the same effort cost policy, centralized management regime causes retailer n to lose share from the total profit.
- Marketplace's total profit is maximized when effort cost is low and the management regime is centralized,
- As predicted, we have found that optimal effort factor g_n decreases as effort cost increases. An important highlight here would be the impact of competition on effort factor g_n under each effort cost scenarios. Competition causes an increase in effort factor. This means that marketplace has the power to have more profits despite using less effort factor under centralized regime.

To sum up, it is observed that competition causes retailer n to use quadrupled effort factor when compared to non-competitive centralized environment. We have found that competition in the existence of effort factor increases retailer n 's profit by 5.02% while decreases retailer m 's profit by 45% on average. Marketplace profit declines by 3.58% due to competition as it is shown in Figure 4.8.

5. CONCLUSION

The purpose of this thesis is to analyze the assortment game of competing retailers in an online marketplace and suggest ways to maximize/optimize their payoffs. We also would like to reveal if the marketplace can provide a value-added assortment and advertising service to its sellers. We assume duopolistic retailers competing in product assortment and advertisement opportunity decisions. In our case, products' displayed positions at the online marketplace are linked to retailers' advertising effort. The assortment of a retailer who has the ad opportunity has higher display position than the competitor's and presumptively higher attractiveness. We consider two different systems a) when retailers have overlapping assortments b) when retailers have access to an exclusive product. The main assumptions made in the thesis are: (i) prices are determined by the market, and are not under the control of the retailers (ii) ad effort applies to all assortment, thus it is independent of products (iii) the ad effort opportunity is given to player n only and is not available to retailer m (iv) higher ad effort is expected to reflect on the value function with diminishing returns. Under these assumptions, we experiment both problem cases with centralized and decentralized management regimes and with different parameter scenarios: price sensitivity, mean utility, and effort cost. Under the decentralized setting, each retailer makes independent product assortment decisions as separate entities. Under the centralized system, the product assortment decisions are managed by a single decision maker that is referred to as the marketplace.

Our work reveals that offering advertisement causes the marketplace to increase profits in both decentralized and centralized settings by 25.14% and 30.58% respectively. We find that the retailer has a substantial advantage if he wins the advertising opportunity. As a player who has the advertisement offering, retailer n gains advantage by increasing his profit by 134.64% in the decentralized and 107.66% in the centralized system. However, ad opportunity makes retailer m out of the game, causing him to lose on average 65.45% profit.

Although ad effort makes the other retailer out of the game, our results show that centralized system always protects the retailer who otherwise loses much more in the decentralized system by causing him to save 37.86% profit on average. We also observe that, competition is in favor of retailer n who uses the ad opportunity. Competition increases retailer n 's profit by 12.99% while causing retailer m and marketplace to lose profit when compared to the centralized system. Our results also reveal that centralized marketplace profit is always higher than the decentralized marketplace profit with an average of 4.36%. Furthermore, competition causes retailer n to use on average 39,41% more ad effort. This would mean that marketplace may have more profits despite using less ad effort factor under centralized regime. In addition, our findings indicate that except for the case when price sensitivity is high, retailer n has wider assortment variety in centralized management regime.

Price sensitivity is found to be negatively correlated with players' equilibrium profits, since high price sensitivity means that customers are highly sensitive to price changes. On the other hand, our findings would seem to show that as price sensitivity of customers increases, retailer n 's market share also increases although his profit and assortment variety decreases. In other words, price sensitive customers are more likely to be affected by the advertisement activities and more likely to purchase attractive products. In return, retailer n is observed to allocate more advertisement spending on less and attractive products to capture price sensitive customers. This result is more significant when the system is managed centrally (300%). In the case when customers are not price sensitive, centralized system cuts advertisement spending by 64,27% compared to the decentralized case. Also, marketplace's profit is maximized when customers are not price sensitive, and the system is managed centrally.

As anticipated, we observe that when the effort cost is high, retailer n prefers to cut advertising spending and increase assortment variety instead. However, retailer n cannot avoid losing profit due to effort cost increase, which also causes a decrease in marketplace's profit. Marketplace total profit is maximized when the regime is centralized and the effort cost is low.

The most important result for the organic mean utility strength is that when organic mean utility of the assortment is getting higher, ad effort factor decreases. In other words, retailer n has more profit with less advertising effort and with less assortment variety. This implies that if the assortment set has already high attractiveness, the system does not prefer spending more on advertising and keeping various products in the assortment.

So far, our results have led us to conclude that ad effort opportunity makes retailer m worse off by causing him to lose significant profit. Thus, we extend the model by giving retailers access to an exclusive product. We then observe that whether an attractive exclusive product gives a competitive power to retailer m . Our findings show that, in the competitive environment, retailer m 's offering of an attractive exclusive product causes retailer n to use almost double effort factor besides having less profit. An attractive exclusive product helps retailer m to be more competitive by having five-fold profit, and six-fold market share. When the system is centrally managed, the results are more interesting. Our results point to the likelihood that in the centralized setting, there is a threshold value for $E_m(A_m)$ when retailers offer an exclusive product. Beyond the threshold, retailer n does not even use the ad opportunity, and loses market leadership. We also find that in the case where customers are not price sensitive, offering exclusive product softens the effect of competition on effort factor. Both systems use almost the same effort factor.

To our knowledge, this study contributes to the assortment planning literature by augmenting the utility function of customers by an advertising mechanism. Our results show that marketplace can provide a value-added assortment and advertising service to its sellers. Sellers would know that whoever wins the advertising opportunity, he will be advantageous in the assortment game. Moreover, the retailer who loses the ad opportunity knows how to stay competitive: by offering an attractive product. Marketplace can also offer to its sellers to cooperate under a centrally managed system to protect the retailer who lost the ad effort.

To persuade retailer n in the centralized regime, marketplace may consider giving commissions or any other opportunity to convince retailer n to renounce competition since he is already substantially profitable with the ad opportunity. Marketplace could also share the cost of the ad effort with retailer n . This study can be extended in order to analyze the first stage ad effort game deeply. Multi-period analysis could be considered where the retailers engage in effort competition at the beginning of each period.

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APPENDIX A: COMPUTATIONS WITH COMMON PRODUCTS

This section includes the equilibrium values for Chapter 4.1. Experimental Design is shown in Table 4.8 and Table 4.9. The letter a represents Decentralized Management Regime without Effort Factor, b represents Decentralized Management Regime with Effort Factor, c represents Centralized Management Regime without Effort Factor and d represents Centralized Management Regime with Effort Factor.

1a	1	(3.9310,3.9310,0.0000,7.8621)	(3.8281,4.1528,0.0000,7.9808)	(3.7640,4.2074,0.0000,7.9714)	(5.5473,2.5987,0.0000,8.1461)	(5.5155,2.6250,0.0000,8.1405)	(5.2859,2.9101,0.0000,8.1960)	(6.3277,1.9555,0.0000,8.2832)	
	2	(4.1528,3.8281,0.0000,7.9808)	(3.8992,3.8992,0.0000,7.9833)	(3.9119,4.0308,0.0000,7.9427)	(5.6966,2.4093,0.0000,8.1359)	(5.5135,2.6825,0.0000,8.1960)	(5.5732,2.5395,0.0000,8.1128)	(6.4502,1.8273,0.0000,8.2775)	
	3	(4.2074,3.7640,0.0000,7.9714)	(4.0308,3.9119,0.0000,7.9427)	(3.8869,3.8869,0.0000,8.1960)	(4.1214,4.1214,0.0000,8.1264)	(5.7193,2.4072,0.0000,8.2832)	(4.0101,2.4673,0.0000,8.1088)	(6.4936,1.7819,0.0000,8.2754)	
	1.2	(2.5987,5.5473,0.0000,8.1461)	(2.4393,5.6966,0.0000,8.1359)	(2.6034,5.5927,0.0000,8.1960)	(4.1214,4.1214,0.0000,8.2429)	(4.1088,4.1743,0.0000,8.2832)	(4.0101,2.4673,0.0000,8.2775)	(5.0989,3.2415,0.0000,8.3405)	
	1.3	(2.6250,5.5155,0.0000,8.1405)	(2.6825,5.5135,0.0000,8.1960)	(2.4072,5.7193,0.0000,8.1264)	(4.1743,4.1088,0.0000,8.2832)	(4.1183,4.1183,0.0000,8.2366)	(4.0419,4.2336,0.0000,8.2754)	(5.1303,3.2087,0.0000,8.3390)	
	2.3	(2.9101,5.2859,0.0000,8.1960)	(2.5395,5.5732,0.0000,8.1128)	(2.4810,5.6278,0.0000,8.1088)	(4.2673,4.0101,0.0000,8.2775)	(4.2336,4.0419,0.0000,8.2178)	(4.1089,4.1089,0.0000,8.2178)	(5.2220,3.1127,0.0000,8.3347)	
	1.2.3	(1.9555,6.3277,0.0000,8.2832)	(1.8273,6.4502,0.0000,8.2775)	(1.7819,6.4936,0.0000,8.2754)	(3.2415,5.0989,0.0000,8.3405)	(3.2087,5.1303,0.0000,8.3390)	(3.1127,5.2220,0.0000,8.3347)	(4.1914,4.1914,0.0000,8.3828)	
	2a	1	(2.6956,2.6956,0.0000,5.3911)	(2.7474,2.9804,0.0000,5.7278)	(2.6914,3.0085,0.0000,5.6998)	(4.2574,1.9944,0.0000,6.2518)	(4.2230,2.0098,0.0000,6.2329)	(4.1437,2.2813,0.0000,6.4250)	(5.1528,1.5924,0.0000,6.7453)
	2	(2.9804,2.7474,0.0000,5.7278)	(2.6113,2.6113,0.0000,5.2226)	(2.7662,2.8503,0.0000,5.6165)	(4.3534,1.8642,0.0000,6.2176)	(4.3221,2.1029,0.0000,6.4250)	(4.2183,1.9221,0.0000,6.1404)	(5.2393,1.4842,0.0000,6.7235)	
	3	(3.0085,2.6914,0.0000,5.6998)	(2.8503,2.7662,0.0000,5.6165)	(2.5800,2.5800,0.0000,5.1599)	(4.3842,2.0408,0.0000,6.4250)	(4.3535,1.8323,0.0000,6.1858)	(4.2571,1.8748,0.0000,6.1275)	(5.2698,1.4460,0.0000,6.7158)	
1.2	(1.9944,4.2574,0.0000,6.2518)	(1.8642,4.3534,0.0000,6.2176)	(2.0408,4.3842,0.0000,6.4250)	(3.2970,3.2970,0.0000,6.5941)	(3.3460,3.3993,0.0000,6.7453)	(3.2573,3.4662,0.0000,6.7235)	(4.2610,2.7088,0.0000,6.9698)		
1.3	(2.0098,4.2230,0.0000,6.2329)	(2.1029,4.3221,0.0000,6.4250)	(1.8323,4.3535,0.0000,6.1858)	(3.3993,3.3460,0.0000,6.7453)	(3.2856,3.2856,0.0000,6.5712)	(3.2801,3.4357,0.0000,6.7158)	(4.2843,2.6796,0.0000,6.9639)		
2.3	(2.2813,4.1437,0.0000,6.4250)	(1.9221,4.2183,0.0000,6.1404)	(1.8748,4.2527,0.0000,6.1275)	(3.4662,3.2573,0.0000,6.7235)	(3.4357,3.2801,0.0000,6.7158)	(3.2514,3.2514,0.0000,6.5027)	(4.3524,2.5943,0.0000,6.9468)		
1.2.3	(1.5924,5.1528,0.0000,6.7453)	(1.4842,5.2393,0.0000,6.7235)	(1.4460,5.2698,0.0000,6.7158)	(2.7088,4.2610,0.0000,6.9698)	(2.6796,4.2843,0.0000,6.9468)	(2.5943,4.3524,0.0000,6.9468)	(3.5717,3.5717,0.0000,7.1433)		
3a	1	(0.2037,0.2037,0.0000,0.4074)	(0.2292,0.2486,0.0000,0.4778)	(0.2226,0.2488,0.0000,0.4714)	(0.4236,0.1984,0.0000,0.6220)	(0.4173,0.1986,0.0000,0.6159)	(0.4403,0.2424,0.0000,0.6828)	(0.6264,0.1936,0.0000,0.8200)	
	2	(0.2486,0.2292,0.0000,0.4778)	(0.1885,0.1885,0.0000,0.3770)	(0.2231,0.2299,0.0000,0.4530)	(0.4278,0.1832,0.0000,0.6110)	(0.4593,0.2235,0.0000,0.6828)	(0.4032,0.1837,0.0000,0.5869)	(0.6307,0.1787,0.0000,0.8094)	
	3	(0.2488,0.2226,0.0000,0.4714)	(0.2299,0.2231,0.0000,0.4530)	(0.1831,0.1831,0.0000,0.3663)	(0.4659,0.2169,0.0000,0.6828)	(0.4229,0.1780,0.0000,0.6009)	(0.4046,0.1784,0.0000,0.5830)	(0.6322,0.1735,0.0000,0.8057)	
	1.2	(0.1984,0.4236,0.0000,0.6220)	(0.1832,0.4278,0.0000,0.6110)	(0.2169,0.4659,0.0000,0.6828)	(0.3753,0.3753,0.0000,0.7506)	(0.4067,0.4132,0.0000,0.8200)	(0.3921,0.4173,0.0000,0.8094)	(0.5761,0.3662,0.0000,0.9423)	
	1.3	(0.1986,0.4173,0.0000,0.6159)	(0.2235,0.4593,0.0000,0.6828)	(0.1780,0.4229,0.0000,0.6009)	(0.4132,0.3703,0.0000,0.8200)	(0.3704,0.3704,0.0000,0.7409)	(0.3935,0.4122,0.0000,0.8057)	(0.5776,0.3612,0.0000,0.9388)	
	2.3	(0.2424,0.4403,0.0000,0.6828)	(0.1837,0.4032,0.0000,0.5869)	(0.1784,0.4046,0.0000,0.5830)	(0.4173,0.3921,0.0000,0.8094)	(0.4122,0.3935,0.0000,0.8057)	(0.3564,0.3564,0.0000,0.7128)	(0.5818,0.3468,0.0000,0.9285)	
	1.2.3	(0.1936,0.6264,0.0000,0.8200)	(0.1787,0.6307,0.0000,0.8094)	(0.1735,0.6322,0.0000,0.8057)	(0.3662,0.5761,0.0000,0.9423)	(0.3612,0.5776,0.0000,0.9388)	(0.3468,0.5818,0.0000,0.9285)	(0.5288,0.5288,0.0000,1.0575)	
	4a	1	(4.0189,4.0189,0.0000,8.0379)	(3.5546,4.5381,0.0000,8.0926)	(3.3673,4.7032,0.0000,8.0705)	(5.4614,2.7805,0.0000,8.2419)	(5.3733,2.8562,0.0000,8.2294)	(4.9536,3.3041,0.0000,8.2578)	(6.1731,2.1695,0.0000,8.3426)
	2	(4.5381,3.5546,0.0000,8.0926)	(3.9361,3.9361,0.0000,7.8721)	(3.8142,4.1728,0.0000,7.9870)	(5.9156,2.3005,0.0000,8.2161)	(5.6697,2.5880,0.0000,8.2578)	(5.5430,2.6083,0.0000,8.1514)	(6.5541,1.7730,0.0000,8.3271)	
	3	(4.7032,3.3673,0.0000,8.0705)	(4.1728,3.8142,0.0000,7.9870)	(3.9012,3.9012,0.0000,7.8023)	(5.8921,2.3656,0.0000,8.2578)	(5.9902,2.2029,0.0000,8.1931)	(5.7079,2.4324,0.0000,8.1403)	(6.6792,1.6428,0.0000,8.3220)	
1.2	(2.7805,5.4614,0.0000,8.2419)	(2.3005,5.9156,0.0000,8.2161)	(2.3656,5.8921,0.0000,8.2578)	(4.1579,4.1579,0.0000,8.3159)	(4.0814,4.2612,0.0000,8.3426)	(3.7678,4.5592,0.0000,8.3271)	(5.0257,3.3635,0.0000,8.3893)		
1.3	(2.8562,5.3733,0.0000,8.2294)	(2.3605,5.6697,0.0000,8.2578)	(2.2029,5.9902,0.0000,8.1931)	(4.2612,4.0814,0.0000,8.3426)	(4.1507,4.1507,0.0000,8.3015)	(3.8549,4.4670,0.0000,8.3220)	(5.1124,3.2733,0.0000,8.3837)		
2.3	(3.3041,4.9536,0.0000,8.2578)	(2.6083,5.5430,0.0000,8.1514)	(2.4324,5.7079,0.0000,8.1403)	(4.5592,3.7678,0.0000,8.3271)	(4.4670,3.8549,0.0000,8.3220)	(4.1234,4.1234,0.0000,8.2469)	(5.4054,2.9684,0.0000,8.3738)		
1.2.3	(2.1695,6.1731,0.0000,8.3426)	(1.7730,6.5541,0.0000,8.3271)	(1.6428,6.6792,0.0000,8.3220)	(3.3635,5.0257,0.0000,8.3893)	(3.2733,5.1124,0.0000,8.3837)	(2.9684,5.4054,0.0000,8.3738)	(4.2112,4.2112,0.0000,8.4224)		

Figure A.1 Decentralized Management Regime without Effort Factor

5a												
	1	(2.9504,2.9504,0.0000,5.9008)	(2.6681,3.4064,0.0000,6.0745)	(2.5048,3.4986,0.0000,6.0034)	(4.3671,2.2234,0.0000,6.5906)	(4.2734,2.2715,0.0000,6.5449)	(3.9888,2.6060,0.0000,6.6494)	(3.9888,2.6060,0.0000,6.6494)	(5.1636,1.8147,0.0000,6.9783)			
	2	(3.4064,2.6681,0.0000,6.0745)	(2.7092,2.7092,0.0000,5.4185)	(2.7440,3.0020,0.0000,5.7460)	(4.6777,1.8190,0.0000,6.4967)	(4.5654,2.0839,0.0000,6.6494)	(4.2036,2.0063,0.0000,6.2699)	(5.4437,1.4726,0.0000,6.9163)				
	3	(3.4986,2.5048,0.0000,6.0034)	(3.0020,2.7440,0.0000,5.7460)	(2.6164,2.6164,0.0000,5.2329)	(4.7445,1.9048,0.0000,6.6494)	(4.6899,1.7247,0.0000,6.4146)	(4.3700,1.8623,0.0000,6.2323)	(5.5348,1.3613,0.0000,6.8961)				
	1,2	(2.2234,4.3671,0.0000,6.5906)	(1.8190,4.6777,0.0000,6.4967)	(1.9048,4.7445,0.0000,6.6494)	(3.4360,3.4360,0.0000,6.8720)	(3.4140,3.5843,0.0000,6.9163)	(3.1295,3.7868,0.0000,6.9163)	(4.2956,2.8749,0.0000,7.1705)				
	1,3	(2.2715,4.2734,0.0000,6.5449)	(2.0839,4.5654,0.0000,6.6494)	(1.7247,4.6899,0.0000,6.4146)	(3.5643,3.4140,0.0000,6.9783)	(3.4079,3.4079,0.0000,6.8158)	(3.1943,3.7017,0.0000,6.8961)	(4.3625,2.7932,0.0000,7.1557)				
	2,3	(2.6606,3.9888,0.0000,6.6494)	(2.0063,4.2636,0.0000,6.2699)	(1.8623,4.3700,0.0000,6.2323)	(3.7868,3.1295,0.0000,6.9163)	(3.7017,3.1945,0.0000,6.8961)	(3.3045,3.3045,0.0000,6.6089)	(4.5870,2.5189,0.0000,7.1060)				
	1,2,3	(1.8147,5.1636,0.0000,6.9783)	(1.4726,5.4437,0.0000,6.9163)	(1.3613,5.5348,0.0000,6.8961)	(2.8749,4.2956,0.0000,7.1705)	(2.7932,4.3625,0.0000,7.1557)	(2.5189,4.5870,0.0000,7.1060)	(3.6561,3.6561,0.0000,7.3121)				
6a												
	1	(0.2600,0.2600,0.0000,0.5200)	(0.2492,0.3182,0.0000,0.5674)	(0.2284,0.3190,0.0000,0.5473)	(0.4964,0.2527,0.0000,0.7491)	(0.4766,0.2533,0.0000,0.7299)	(0.4649,0.3101,0.0000,0.7749)	(0.7011,0.2464,0.0000,0.9475)				
	2	(0.3182,0.2492,0.0000,0.5674)	(0.2063,0.2063,0.0000,0.4126)	(0.2302,0.2518,0.0000,0.4820)	(0.5115,0.1989,0.0000,0.7104)	(0.5321,0.2429,0.0000,0.7749)	(0.4271,0.2010,0.0000,0.6280)	(0.7169,0.1939,0.0000,0.9108)				
	3	(0.3190,0.2284,0.0000,0.5473)	(0.2518,0.2302,0.0000,0.4820)	(0.1894,0.1894,0.0000,0.3787)	(0.5529,0.2220,0.0000,0.7749)	(0.4963,0.1825,0.0000,0.6789)	(0.4317,0.1840,0.0000,0.6157)	(0.7218,0.1775,0.0000,0.8993)				
	1,2	(0.2527,0.4964,0.0000,0.7491)	(0.1989,0.5115,0.0000,0.7104)	(0.2220,0.5529,0.0000,0.7749)	(0.4429,0.4429,0.0000,0.8858)	(0.4650,0.4840,0.0000,0.9475)	(0.4121,0.4987,0.0000,0.9108)	(0.6456,0.4320,0.0000,1.0776)				
	1,3	(0.2533,0.4766,0.0000,0.7299)	(0.2429,0.5321,0.0000,0.7749)	(0.1825,0.4963,0.0000,0.6789)	(0.4840,0.4636,0.0000,0.9475)	(0.4278,0.4278,0.0000,0.8557)	(0.4166,0.4827,0.0000,0.8993)	(0.6503,0.4163,0.0000,1.0666)				
	2,3	(0.3101,0.4649,0.0000,0.7749)	(0.2010,0.4271,0.0000,0.6280)	(0.1840,0.4317,0.0000,0.6157)	(0.4987,0.4121,0.0000,0.9108)	(0.4827,0.4166,0.0000,0.8993)	(0.3785,0.3785,0.0000,0.7570)	(0.6655,0.3655,0.0000,1.0309)				
	1,2,3	(0.2464,0.7011,0.0000,0.9475)	(0.1939,0.7169,0.0000,0.9108)	(0.1775,0.7218,0.0000,0.8993)	(0.4320,0.6456,0.0000,1.0776)	(0.4163,0.6503,0.0000,1.0666)	(0.3655,0.6655,0.0000,1.0309)	(0.5964,0.5964,0.0000,1.1927)				
7a												
	1	(4.1194,4.1194,0.0000,8.2389)	(3.1316,5.1042,0.0000,8.2358)	(2.7811,5.4255,0.0000,8.2066)	(5.3259,3.0344,0.0000,8.3603)	(5.1731,3.1718,0.0000,8.3449)	(4.4190,3.9241,0.0000,8.3431)	(5.9345,2.4871,0.0000,8.4216)				
	2	(5.1042,3.1316,0.0000,8.2358)	(3.9863,3.9863,0.0000,7.9727)	(3.6642,4.3857,0.0000,8.0499)	(6.2440,2.0770,0.0000,8.3210)	(5.9356,2.4075,0.0000,8.3431)	(5.4961,2.7095,0.0000,8.2056)	(6.7382,1.6676,0.0000,8.3957)				
	3	(5.4255,2.7811,0.0000,8.2066)	(4.3857,3.6642,0.0000,8.0499)	(3.9218,3.9218,0.0000,7.8435)	(6.3312,2.0115,0.0000,8.3431)	(6.4055,1.8832,0.0000,8.2887)	(5.8287,2.3567,0.0000,8.1853)	(6.9603,1.4279,0.0000,8.3882)				
	1,2	(3.0344,5.3259,0.0000,8.3603)	(2.0770,6.2440,0.0000,8.3210)	(2.0115,6.3316,0.0000,8.3431)	(4.2042,4.2042,0.0000,8.4083)	(4.0563,4.3653,0.0000,8.4216)	(3.3825,5.0132,0.0000,8.3957)	(4.9187,3.5360,0.0000,8.4547)				
	1,3	(3.1718,5.1731,0.0000,8.3449)	(2.4075,5.9356,0.0000,8.3431)	(1.8832,6.4055,0.0000,8.2887)	(4.3653,4.0563,0.0000,8.4216)	(4.1948,4.1948,0.0000,8.3896)	(3.5315,4.8567,0.0000,8.3882)	(5.0689,3.3809,0.0000,8.4498)				
	2,3	(3.9241,4.4190,0.0000,8.3431)	(2.7095,5.4961,0.0000,8.2056)	(2.3567,5.8287,0.0000,8.1853)	(5.0132,3.3825,0.0000,8.3957)	(4.8567,3.5315,0.0000,8.2881)	(4.1440,4.1440,0.0000,8.2881)	(5.7039,2.7252,0.0000,8.4291)				
	1,2,3	(2.4871,5.9345,0.0000,8.4216)	(1.6676,6.7282,0.0000,8.3957)	(1.4279,6.9603,0.0000,8.3882)	(3.5360,4.9187,0.0000,8.4547)	(3.3809,5.0689,0.0000,8.4498)	(2.7252,5.7039,0.0000,8.4291)	(4.2384,4.2384,0.0000,8.4768)				
8a												
	1	(3.2897,3.2897,0.0000,6.5793)	(2.4974,4.0707,0.0000,6.5681)	(2.1900,4.2724,0.0000,6.4625)	(4.4914,2.5589,0.0000,7.0504)	(4.3318,2.6560,0.0000,6.9878)	(3.6973,3.2832,0.0000,6.9805)	(5.1502,2.1584,0.0000,7.3086)				
	2	(4.0707,2.4974,0.0000,6.5681)	(2.8518,2.8518,0.0000,5.7036)	(2.7031,3.2533,0.0000,5.9383)	(5.1720,1.7204,0.0000,6.8923)	(4.9662,2.0143,0.0000,6.9805)	(4.3262,2.1328,0.0000,6.4590)	(5.7682,1.4296,0.0000,7.1978)				
	3	(4.2724,1.9000,0.0000,6.4625)	(3.2553,2.7031,0.0000,5.9383)	(2.6707,2.6707,0.0000,5.3414)	(5.2975,1.6830,0.0000,6.9805)	(5.2292,1.5374,0.0000,6.7666)	(4.5483,1.8390,0.0000,6.3873)	(5.9461,1.2198,0.0000,7.1659)				
	1,2	(2.5589,4.4914,0.0000,7.0504)	(1.7204,5.1720,0.0000,6.8923)	(1.6830,5.2975,0.0000,6.9805)	(3.6257,3.6257,0.0000,7.2514)	(3.5202,3.7884,0.0000,7.1978)	(2.8999,4.2979,0.0000,7.1978)	(4.3368,3.1176,0.0000,7.4544)				
	1,3	(2.6560,4.3318,0.0000,6.9878)	(2.0143,4.9662,0.0000,6.9805)	(1.5374,5.2292,0.0000,7.0504)	(3.7884,3.5202,0.0000,7.3086)	(3.5859,3.5859,0.0000,7.1718)	(3.0169,4.1490,0.0000,7.1659)	(4.4587,2.9739,0.0000,7.4326)				
	2,3	(3.2832,3.6973,0.0000,6.9805)	(2.1328,4.3262,0.0000,6.4590)	(1.8390,4.5483,0.0000,6.3873)	(4.2979,2.8999,0.0000,7.1978)	(4.1490,3.0169,0.0000,7.1659)	(3.4820,3.3820,0.0000,6.7640)	(4.9678,2.3735,0.0000,7.3413)				
	1,2,3	(2.1584,5.1502,0.0000,7.3086)	(1.4296,5.7682,0.0000,7.1978)	(1.2198,5.9461,0.0000,7.1659)	(3.1176,4.3368,0.0000,7.4544)	(2.9739,4.5870,0.0000,7.4326)	(2.3735,4.9678,0.0000,7.3413)	(3.7773,3.7773,0.0000,7.5547)				

Figure A.1 Decentralized Management Regime without Effort Factor (cont.)

9a	1	(0.3722,0.3722,0.0000,0.7443)	(0.2812,0.4584,0.0000,0.7396)	(0.2362,0.4608,0.0000,0.6970)	(0.6328,0.3605,0.0000,0.9933)	(0.5910,0.3624,0.0000,0.9534)	(0.5026,0.4463,0.0000,0.9489)	(0.8383,0.3513,0.0000,1.1896)	
	2	(0.4584,0.2812,0.0000,0.7396)	(0.2361,0.2361,0.0000,0.4723)	(0.2411,0.2886,0.0000,0.5298)	(0.6732,0.2239,0.0000,0.8972)	(0.6751,0.2738,0.0000,0.9489)	(0.4660,0.2297,0.0000,0.6957)	(0.8802,0.2182,0.0000,1.0984)	
	3	(0.4608,0.2362,0.0000,0.6970)	(0.2886,0.2411,0.0000,0.5298)	(0.1991,0.1991,0.0000,0.3981)	(0.2288,0.7201,0.0000,0.9489)	(0.6418,0.1887,0.0000,0.8305)	(0.4763,0.1926,0.0000,0.6689)	(0.8913,0.1829,0.0000,1.0742)	
	1.2	(0.3605,0.6328,0.0000,0.9933)	(0.2239,0.6732,0.0000,0.8972)	(0.2288,0.7201,0.0000,0.9489)	(0.5705,0.5705,0.0000,1.1411)	(0.5730,0.6166,0.0000,1.1896)	(0.4425,0.6559,0.0000,1.0984)	(0.7738,0.5563,0.0000,1.3300)	
	1.3	(0.3624,0.5910,0.0000,0.9534)	(0.2738,0.6751,0.0000,0.9489)	(0.1887,0.6418,0.0000,0.8305)	(0.6166,0.5730,0.0000,1.1896)	(0.5393,0.5393,0.0000,1.0742)	(0.4522,0.6219,0.0000,1.0742)	(0.7842,0.5231,0.0000,1.3073)	
	2.3	(0.4463,0.5026,0.0000,0.9489)	(0.2297,0.4660,0.0000,0.6957)	(0.1926,0.4763,0.0000,0.6689)	(0.6559,0.4425,0.0000,1.0984)	(0.6219,0.4522,0.0000,1.0742)	(0.4146,0.4146,0.0000,0.8292)	(0.8248,0.3941,0.0000,1.2189)	
	1.2.3	(0.3513,0.8383,0.0000,1.1896)	(0.2182,0.8802,0.0000,1.0984)	(0.1829,0.8913,0.0000,1.0742)	(0.5563,0.7738,0.0000,1.3300)	(0.5231,0.7842,0.0000,1.3073)	(0.3941,0.8248,0.0000,1.2189)	(0.7217,0.7217,0.0000,1.4434)	
	10a	1	(3.9310,3.9310,0.0000,7.8621)	(3.8281,4.1528,0.0000,7.9808)	(3.7640,4.2074,0.0000,7.9714)	(5.5473,2.5987,0.0000,8.1461)	(5.5155,2.6250,0.0000,8.1405)	(5.2859,2.9101,0.0000,8.1960)	(6.3277,1.9555,0.0000,8.2832)
	2	(4.1528,3.8281,0.0000,7.9808)	(3.8992,3.8992,0.0000,7.7983)	(3.9119,4.0308,0.0000,7.9427)	(5.6966,2.4393,0.0000,8.1359)	(5.5135,2.6825,0.0000,8.1960)	(5.5732,2.5395,0.0000,8.1128)	(6.4502,1.8273,0.0000,8.2775)	
	3	(4.2074,3.7640,0.0000,7.9714)	(4.0308,3.9119,0.0000,7.9427)	(3.8869,3.8869,0.0000,7.7738)	(5.5927,2.6034,0.0000,8.1960)	(5.7193,2.4072,0.0000,8.1264)	(5.6278,2.4810,0.0000,8.1088)	(6.4936,1.7819,0.0000,8.2754)	
1.2	(2.5987,5.4773,0.0000,8.1461)	(2.4393,5.6966,0.0000,8.1359)	(2.6034,5.5927,0.0000,8.1960)	(4.1214,4.1214,0.0000,8.2429)	(4.1088,4.1743,0.0000,8.2832)	(4.0101,4.2673,0.0000,8.2775)	(5.0989,3.2415,0.0000,8.3405)		
1.3	(2.6250,5.5155,0.0000,8.1405)	(2.6825,5.5135,0.0000,8.1960)	(2.4072,5.7193,0.0000,8.1264)	(4.1743,4.1088,0.0000,8.2832)	(4.1183,4.1183,0.0000,8.2754)	(4.0419,4.2336,0.0000,8.2754)	(5.1303,3.2087,0.0000,8.3390)		
2.3	(2.9101,5.2859,0.0000,8.1960)	(2.5395,5.5732,0.0000,8.1128)	(2.4810,5.6278,0.0000,8.1088)	(4.2673,4.0101,0.0000,8.2775)	(4.2336,4.0419,0.0000,8.2754)	(4.1089,4.1089,0.0000,8.2178)	(5.2220,3.1127,0.0000,8.3347)		
1.2.3	(1.9555,6.3277,0.0000,8.2832)	(1.8273,6.4502,0.0000,8.2775)	(1.7819,6.4936,0.0000,8.2754)	(3.2415,5.0989,0.0000,8.3405)	(3.2087,5.1303,0.0000,8.3390)	(3.1127,5.2220,0.0000,8.3347)	(4.1914,4.1914,0.0000,8.3828)		
11a	1	(2.6956,2.6956,0.0000,5.3911)	(2.7474,2.9804,0.0000,5.7278)	(2.6914,3.0085,0.0000,5.6998)	(4.2574,1.9944,0.0000,6.2518)	(4.2230,2.0098,0.0000,6.2329)	(4.1437,2.2813,0.0000,6.4250)	(5.1528,1.5924,0.0000,6.7453)	
	2	(2.9804,2.7474,0.0000,5.7278)	(2.6113,2.6113,0.0000,5.2226)	(2.7662,2.8503,0.0000,5.6165)	(4.3534,1.8642,0.0000,6.2176)	(4.3221,2.1029,0.0000,6.4250)	(4.2183,1.9221,0.0000,6.1404)	(5.2393,1.4842,0.0000,6.7235)	
	3	(3.0085,2.6914,0.0000,5.6998)	(2.8503,2.7662,0.0000,5.6165)	(2.5800,2.5800,0.0000,5.1599)	(4.3842,2.0408,0.0000,6.4250)	(4.3535,1.8323,0.0000,6.1858)	(4.2527,1.8748,0.0000,6.1275)	(5.2698,1.4460,0.0000,6.7158)	
	1.2	(1.9944,4.2574,0.0000,6.2518)	(1.8642,4.3534,0.0000,6.2176)	(2.0408,4.3842,0.0000,6.4250)	(3.2970,3.2970,0.0000,6.5941)	(3.3460,3.3993,0.0000,6.7235)	(3.2573,3.4662,0.0000,6.7235)	(4.2610,2.7088,0.0000,6.9698)	
	1.3	(2.0098,4.2230,0.0000,6.2329)	(2.1029,4.3221,0.0000,6.4250)	(1.8323,3.3535,0.0000,6.1858)	(3.3993,3.3460,0.0000,6.7453)	(3.2856,3.2856,0.0000,6.5712)	(3.2801,3.4357,0.0000,6.7158)	(4.2843,2.6796,0.0000,6.9639)	
	2.3	(2.2813,4.1437,0.0000,6.4250)	(1.9221,4.2183,0.0000,6.1404)	(1.8748,4.2527,0.0000,6.1275)	(3.4662,3.2573,0.0000,6.7235)	(3.4357,3.2801,0.0000,6.7158)	(3.2514,3.2514,0.0000,6.5027)	(4.3524,2.5943,0.0000,6.9468)	
	1.2.3	(1.5924,5.1528,0.0000,6.7453)	(1.4842,5.2393,0.0000,6.7235)	(1.4460,5.2698,0.0000,6.7158)	(2.7088,4.2610,0.0000,6.9698)	(2.6796,4.2843,0.0000,6.9639)	(2.5943,4.3524,0.0000,6.9468)	(3.5717,3.5717,0.0000,7.1433)	
	12a	1	(0.2037,0.2037,0.0000,0.4074)	(0.2292,0.2486,0.0000,0.4778)	(0.2226,0.2488,0.0000,0.4714)	(0.4236,0.1984,0.0000,0.6220)	(0.4173,0.1986,0.0000,0.6159)	(0.4403,0.2424,0.0000,0.6828)	(0.6264,0.1936,0.0000,0.8200)
	2	(0.2486,0.2292,0.0000,0.4778)	(0.1885,0.1885,0.0000,0.3770)	(0.2231,0.2299,0.0000,0.4530)	(0.4278,0.1832,0.0000,0.6110)	(0.4593,0.2235,0.0000,0.5869)	(0.4032,0.1837,0.0000,0.5869)	(0.6307,0.1787,0.0000,0.8094)	
	3	(0.2488,0.2226,0.0000,0.4714)	(0.2299,0.2231,0.0000,0.4530)	(0.1831,0.1831,0.0000,0.3663)	(0.4659,0.2169,0.0000,0.6828)	(0.4229,0.1780,0.0000,0.6009)	(0.4046,0.1784,0.0000,0.5830)	(0.6322,0.1735,0.0000,0.8057)	
1.2	(0.1984,0.4236,0.0000,0.6220)	(0.1832,0.4278,0.0000,0.6110)	(0.2169,0.4659,0.0000,0.6828)	(0.3753,0.3753,0.0000,0.7506)	(0.4067,0.4132,0.0000,0.8200)	(0.3912,0.4173,0.0000,0.8094)	(0.5761,0.3662,0.0000,0.9423)		
1.3	(0.1986,0.4173,0.0000,0.6159)	(0.2235,0.4593,0.0000,0.6828)	(0.1780,0.4229,0.0000,0.6009)	(0.4132,0.4067,0.0000,0.8200)	(0.3704,0.3704,0.0000,0.7409)	(0.3935,0.4122,0.0000,0.8057)	(0.5776,0.3612,0.0000,0.9388)		
2.3	(0.2424,0.4403,0.0000,0.6828)	(0.1837,0.4032,0.0000,0.5869)	(0.1784,0.4046,0.0000,0.5830)	(0.4173,0.3921,0.0000,0.8094)	(0.4122,0.3935,0.0000,0.8057)	(0.3564,0.3564,0.0000,0.7128)	(0.5818,0.3468,0.0000,0.9285)		
1.2.3	(0.1936,0.6264,0.0000,0.8200)	(0.1787,0.6307,0.0000,0.8094)	(0.1735,0.6322,0.0000,0.8057)	(0.3662,0.5761,0.0000,0.9423)	(0.3612,0.5776,0.0000,0.9388)	(0.3468,0.5818,0.0000,0.9285)	(0.5288,0.5288,0.0000,1.0575)		

Figure A.1 Decentralized Management Regime without Effort Factor (cont.)

13a	1	(4.0189,4.0189,0.0000,8.0379)	(5.5546,4.5381,0.0000,8.0926)	(3.3673,4.7032,0.0000,8.0705)	(5.4614,2.7805,0.0000,8.2419)	(5.3733,2.8562,0.0000,8.2294)	(4.9536,3.3041,0.0000,8.2578)	(6.1731,2.1695,0.0000,8.3426)
	2	(4.5381,5.5546,0.0000,8.0926)	(3.9361,3.9361,0.0000,7.8721)	(3.8142,4.1728,0.0000,7.9870)	(5.9156,2.3005,0.0000,8.2161)	(5.6697,2.5880,0.0000,8.2578)	(5.5430,2.6083,0.0000,8.1514)	(6.5541,1.7730,0.0000,8.3271)
	3	(4.7032,3.3673,0.0000,8.0705)	(4.1728,3.8142,0.0000,7.9870)	(3.9012,3.9012,0.0000,7.8023)	(5.8921,2.3656,0.0000,8.2578)	(5.9902,2.2029,0.0000,8.1931)	(5.7079,2.4324,0.0000,8.1403)	(6.6792,1.6428,0.0000,8.3220)
	1,2	(2.7805,5.4614,0.0000,8.2419)	(2.3005,5.9156,0.0000,8.2161)	(2.3656,5.8921,0.0000,8.3159)	(4.1579,4.1579,0.0000,8.3426)	(4.0814,4.2612,0.0000,8.3426)	(3.7678,4.5592,0.0000,8.3271)	(5.0257,3.3635,0.0000,8.3893)
	1,3	(2.8562,3.3733,0.0000,8.2294)	(2.5880,5.6697,0.0000,8.2578)	(2.2029,5.9902,0.0000,8.1931)	(4.2612,4.0814,0.0000,8.3426)	(4.1507,4.1507,0.0000,8.3015)	(3.8549,4.4670,0.0000,8.3220)	(5.1124,3.2733,0.0000,8.3857)
	2,3	(3.3041,4.9536,0.0000,8.2578)	(2.6083,5.5430,0.0000,8.1514)	(2.4324,5.7079,0.0000,8.1403)	(4.5592,3.7678,0.0000,8.3271)	(4.4670,3.8549,0.0000,8.3220)	(4.1234,4.1234,0.0000,8.2469)	(5.4054,2.9684,0.0000,8.3738)
	1,2,3	(2.1695,6.1731,0.0000,8.3426)	(1.7730,6.5541,0.0000,8.3271)	(1.6428,6.6792,0.0000,8.3220)	(3.3635,5.0257,0.0000,8.3893)	(3.2733,5.1124,0.0000,8.3857)	(2.9684,5.4054,0.0000,8.3738)	(4.2112,4.2112,0.0000,8.4224)
14a	1	(2.9504,2.9504,0.0000,5.9008)	(2.6681,3.4064,0.0000,6.0745)	(2.5048,3.4986,0.0000,6.0034)	(4.3671,2.2234,0.0000,6.5906)	(4.2734,2.2715,0.0000,6.5494)	(3.9888,2.6606,0.0000,6.6494)	(5.1636,1.8147,0.0000,6.9783)
	2	(3.4064,2.6681,0.0000,6.0745)	(2.7092,2.7092,0.0000,5.4185)	(2.7440,3.0020,0.0000,5.7460)	(4.6777,1.8190,0.0000,6.4967)	(4.5654,2.0839,0.0000,6.6494)	(4.2636,2.0063,0.0000,6.2699)	(5.4437,1.4726,0.0000,6.9163)
	3	(3.4986,2.5048,0.0000,6.0034)	(3.0020,2.7440,0.0000,5.7460)	(2.6164,2.6164,0.0000,5.2329)	(4.7445,1.9048,0.0000,6.6494)	(4.6899,1.7247,0.0000,6.4146)	(4.3700,1.8623,0.0000,6.2323)	(5.5348,1.3613,0.0000,6.8961)
	1,2	(2.2234,3.3671,0.0000,6.5906)	(1.8190,4.6777,0.0000,6.4967)	(1.9048,4.7445,0.0000,6.6494)	(3.4360,3.4360,0.0000,6.8720)	(3.4140,3.5643,0.0000,6.9783)	(3.1295,3.7868,0.0000,6.9163)	(4.2956,2.8749,0.0000,7.1705)
	1,3	(2.2715,4.2734,0.0000,6.5449)	(2.0839,4.5654,0.0000,6.6494)	(1.7247,4.6899,0.0000,6.4146)	(3.5643,3.4140,0.0000,6.9783)	(3.4079,3.4079,0.0000,6.8158)	(3.1945,3.7017,0.0000,6.8961)	(4.3625,2.7932,0.0000,7.1557)
	2,3	(2.6606,3.9888,0.0000,6.6494)	(2.0063,4.2636,0.0000,6.2699)	(1.8623,4.3700,0.0000,6.2323)	(3.7868,3.1295,0.0000,6.9163)	(3.7017,3.1945,0.0000,6.8961)	(3.3045,3.3045,0.0000,6.6089)	(4.5870,2.5189,0.0000,7.1060)
	1,2,3	(1.8147,5.1636,0.0000,6.9783)	(1.4726,5.4437,0.0000,6.9163)	(1.3613,5.5348,0.0000,6.8961)	(2.8749,4.2956,0.0000,7.1705)	(2.7932,4.3625,0.0000,7.1557)	(2.5189,4.5870,0.0000,7.1060)	(3.6561,3.6561,0.0000,7.3121)
15a	1	(0.2600,0.2600,0.0000,0.5200)	(0.2492,0.3182,0.0000,0.5674)	(0.2284,0.3190,0.0000,0.5473)	(0.4964,0.2527,0.0000,0.7491)	(0.4766,0.2533,0.0000,0.7299)	(0.4649,0.3101,0.0000,0.7749)	(0.7011,0.2464,0.0000,0.9475)
	2	(0.3182,0.2492,0.0000,0.5674)	(0.2063,0.2063,0.0000,0.4126)	(0.2302,0.2518,0.0000,0.4820)	(0.5115,0.1989,0.0000,0.7104)	(0.5321,0.2429,0.0000,0.7749)	(0.4271,0.2010,0.0000,0.6280)	(0.7169,0.1939,0.0000,0.9108)
	3	(0.3190,0.2284,0.0000,0.5473)	(0.2518,0.2302,0.0000,0.4820)	(0.1894,0.1894,0.0000,0.3787)	(0.5529,0.2220,0.0000,0.7749)	(0.4963,0.1825,0.0000,0.6789)	(0.4317,0.1840,0.0000,0.6157)	(0.7218,0.1775,0.0000,0.8993)
	1,2	(0.2527,0.4964,0.0000,0.7491)	(0.1989,0.5115,0.0000,0.7104)	(0.2220,0.5529,0.0000,0.7749)	(0.4429,0.4429,0.0000,0.8858)	(0.4636,0.4840,0.0000,0.9475)	(0.4121,0.4987,0.0000,0.9108)	(0.6456,0.4320,0.0000,1.0776)
	1,3	(0.2533,0.4766,0.0000,0.7299)	(0.2429,0.5321,0.0000,0.7749)	(0.1825,0.4963,0.0000,0.6789)	(0.4840,0.4636,0.0000,0.9475)	(0.4278,0.4278,0.0000,0.8557)	(0.4166,0.4827,0.0000,0.8993)	(0.6503,0.4163,0.0000,1.0666)
	2,3	(0.3101,0.4649,0.0000,0.7749)	(0.2010,0.4271,0.0000,0.6280)	(0.1840,0.4317,0.0000,0.6157)	(0.4987,0.4121,0.0000,0.9108)	(0.4827,0.4166,0.0000,0.8993)	(0.3785,0.3785,0.0000,0.7570)	(0.6655,0.3655,0.0000,1.0309)
	1,2,3	(0.2464,0.7011,0.0000,0.9475)	(0.1939,0.7169,0.0000,0.9108)	(0.1775,0.7218,0.0000,0.8993)	(0.4320,0.6456,0.0000,1.0776)	(0.4163,0.6503,0.0000,1.0666)	(0.3655,0.6655,0.0000,1.0309)	(0.5964,0.5964,0.0000,1.1927)
16a	1	(4.1194,4.1194,0.0000,8.2389)	(3.1316,5.1042,0.0000,8.2358)	(2.7811,5.4255,0.0000,8.2066)	(5.3259,3.0344,0.0000,8.3603)	(5.1731,3.1718,0.0000,8.3449)	(4.4190,3.9241,0.0000,8.3431)	(5.9345,2.4871,0.0000,8.4216)
	2	(5.1042,3.1316,0.0000,8.2358)	(3.9863,3.9863,0.0000,7.9727)	(3.6642,4.3857,0.0000,8.0499)	(6.2440,0.0770,0.0000,8.3210)	(5.9356,2.4075,0.0000,8.3431)	(5.4961,2.7095,0.0000,8.2056)	(6.7282,1.6676,0.0000,8.3957)
	3	(5.4255,2.7811,0.0000,8.2066)	(4.3857,3.6642,0.0000,8.0499)	(3.9218,3.9218,0.0000,7.8435)	(6.3316,2.0115,0.0000,8.3431)	(6.4055,1.8832,0.0000,8.2887)	(5.8287,2.5670,0.0000,8.1853)	(6.9603,1.4279,0.0000,8.3882)
	1,2	(3.0344,5.3259,0.0000,8.3603)	(2.0770,6.2440,0.0000,8.3210)	(2.0115,6.3316,0.0000,8.3431)	(4.2042,4.2042,0.0000,8.4083)	(4.0563,4.3653,0.0000,8.4216)	(3.3825,5.0132,0.0000,8.3957)	(4.9187,3.5360,0.0000,8.4547)
	1,3	(3.1718,5.1731,0.0000,8.3449)	(2.4075,5.9356,0.0000,8.3431)	(1.8832,6.4055,0.0000,8.1853)	(4.3653,4.0563,0.0000,8.4216)	(4.1948,4.1948,0.0000,8.3882)	(3.5315,4.8567,0.0000,8.3882)	(5.0689,3.3809,0.0000,8.4498)
	2,3	(3.9241,4.4190,0.0000,8.3431)	(2.7095,5.4961,0.0000,8.2056)	(2.3567,5.8287,0.0000,8.3957)	(5.0132,3.3825,0.0000,8.3882)	(4.8567,3.5315,0.0000,8.3882)	(4.1440,4.1440,0.0000,8.2881)	(5.7039,2.7252,0.0000,8.4291)
1,2,3	(2.4871,5.9345,0.0000,8.4216)	(1.6676,6.7282,0.0000,8.3957)	(1.4279,6.9603,0.0000,8.3882)	(3.5360,4.9187,0.0000,8.4547)	(3.3809,5.0689,0.0000,8.4498)	(2.7252,5.7039,0.0000,8.4291)	(4.2384,4.2384,0.0000,8.4768)	

Figure A.1 Decentralized Management Regime without Effort Factor (cont.)

17a	1	(3.2897,3.2897,0.0000,6.5793)	(2.4974,4.0707,0.0000,6.5681)	(2.1900,4.2724,0.0000,6.4625)	(4.4914,2.5589,0.0000,7.0504)	(4.3318,2.6560,0.0000,6.9878)	(3.6973,3.2832,0.0000,6.9805)	(5.1502,2.1584,0.0000,7.3086)
	2	(4.0707,4.0000,6.5681)	(2.8518,2.8518,0.0000,5.7036)	(2.7031,3.2353,0.0000,5.9383)	(5.1720,1.7204,0.0000,6.8923)	(4.9662,2.0143,0.0000,6.9805)	(4.3262,1.1238,0.0000,6.4590)	(5.7682,1.4296,0.0000,7.1978)
	3	(4.2724,2.1900,0.0000,6.4625)	(3.2353,2.7031,0.0000,5.9383)	(2.6707,2.6707,0.0000,5.3414)	(5.2975,1.6830,0.0000,6.8923)	(5.2292,1.5374,0.0000,6.7666)	(4.5483,1.8390,0.0000,6.3873)	(5.9461,1.2198,0.0000,7.1659)
	1.2	(2.5589,4.4914,0.0000,7.0504)	(1.7204,5.1720,0.0000,6.8923)	(1.6830,5.2975,0.0000,6.9805)	(3.6257,3.6257,0.0000,7.2514)	(3.5203,2.7884,0.0000,7.3086)	(2.8999,4.2979,0.0000,7.1978)	(4.3368,3.1176,0.0000,7.4544)
	1.3	(2.6560,4.3318,0.0000,6.9878)	(2.0143,4.9662,0.0000,6.9805)	(1.5374,5.2292,0.0000,6.7666)	(3.7884,3.5202,0.0000,7.3086)	(3.5859,3.5859,0.0000,7.1659)	(3.0169,4.1490,0.0000,7.1659)	(4.4587,2.9739,0.0000,7.4326)
	2.3	(3.2832,3.6973,0.0000,6.9805)	(2.1328,4.3262,0.0000,6.4590)	(1.8390,4.5483,0.0000,6.3873)	(4.2979,2.8999,0.0000,7.1978)	(4.1490,3.0169,0.0000,7.1659)	(3.3820,3.3820,0.0000,6.7040)	(4.9678,2.3735,0.0000,7.3413)
	1.2,3	(2.1584,5.1502,0.0000,7.3086)	(1.4296,5.7682,0.0000,7.1978)	(1.2198,5.9461,0.0000,7.1659)	(3.1176,4.3368,0.0000,7.4544)	(2.9739,4.4587,0.0000,7.4326)	(2.3735,4.9678,0.0000,7.3413)	(3.7773,3.7773,0.0000,7.5547)
	1	(0.3722,0.3722,0.0000,0.7443)	(0.2812,0.4584,0.0000,0.7396)	(0.2362,0.4608,0.0000,0.6970)	(0.6328,0.3605,0.0000,0.9933)	(0.5910,0.3624,0.0000,0.9534)	(0.5026,0.4463,0.0000,0.9489)	(0.8383,0.3513,0.0000,1.1896)
	2	(0.4584,0.2812,0.0000,0.7396)	(0.2361,0.2361,0.0000,0.4723)	(0.2411,0.2886,0.0000,0.5298)	(0.6732,0.2239,0.0000,0.8972)	(0.6751,0.2738,0.0000,0.9489)	(0.4660,2.297,0.0000,0.6957)	(0.8802,0.2182,0.0000,1.0984)
	3	(0.4608,0.2362,0.0000,0.6970)	(0.2886,0.2411,0.0000,0.5298)	(0.1991,0.1991,0.0000,0.3981)	(0.7201,0.2288,0.0000,0.9489)	(0.6418,0.1887,0.0000,0.8305)	(0.4763,0.1926,0.0000,0.6689)	(0.8913,0.1829,0.0000,1.0742)
	1.2	(0.3605,0.6328,0.0000,0.9933)	(0.2239,0.6732,0.0000,0.8972)	(0.2288,0.7201,0.0000,0.9489)	(0.5705,0.5705,0.0000,1.1411)	(0.5730,0.6166,0.0000,1.1896)	(0.4425,0.6559,0.0000,1.0984)	(0.7738,0.5563,0.0000,1.3300)
	1.3	(0.3624,0.5910,0.0000,0.9534)	(0.2738,0.6751,0.0000,0.9489)	(0.1887,0.6418,0.0000,0.8305)	(0.6166,0.5730,0.0000,1.1896)	(0.5393,0.5393,0.0000,1.0785)	(0.4522,0.6219,0.0000,1.0742)	(0.7842,0.5231,0.0000,1.3073)
2.3	(0.4463,0.5026,0.0000,0.9489)	(0.2297,0.4660,0.0000,0.6957)	(0.1926,0.4763,0.0000,0.6689)	(0.6559,0.4425,0.0000,1.0984)	(0.6219,0.4522,0.0000,1.0742)	(0.4146,0.4146,0.0000,0.8292)	(0.8248,0.3941,0.0000,1.2189)	
1.2,3	(0.3513,0.8383,0.0000,1.1896)	(0.2182,0.8802,0.0000,1.0984)	(0.1829,0.8913,0.0000,1.0742)	(0.5563,0.7738,0.0000,1.3300)	(0.5231,0.7842,0.0000,1.3073)	(0.3941,0.8248,0.0000,1.2189)	(0.7217,0.7217,0.0000,1.4434)	
19a	1	(3.9310,3.9310,0.0000,7.8621)	(3.8281,4.1528,0.0000,7.9808)	(3.7640,4.2074,0.0000,7.9714)	(5.5473,2.5987,0.0000,8.1461)	(5.5155,2.6250,0.0000,8.1405)	(5.2859,2.9101,0.0000,8.1960)	(6.3277,1.9555,0.0000,8.2832)
	2	(4.1528,3.8281,0.0000,7.9808)	(3.8992,3.8992,0.0000,7.7983)	(3.9119,4.0308,0.0000,7.9427)	(5.6966,2.4393,0.0000,8.1359)	(5.5135,2.6825,0.0000,8.1960)	(5.5732,2.5395,0.0000,8.1128)	(6.4502,1.8273,0.0000,8.2775)
	3	(4.2074,3.7640,0.0000,7.9714)	(4.0308,3.9119,0.0000,7.9427)	(3.8869,3.8869,0.0000,7.7738)	(5.5927,2.6034,0.0000,8.1960)	(5.7193,2.4072,0.0000,8.1264)	(5.6278,2.4810,0.0000,8.1088)	(6.4936,1.7819,0.0000,8.2754)
	1.2	(2.5987,5.5473,0.0000,8.1461)	(2.4393,5.6966,0.0000,8.1359)	(2.6034,5.5927,0.0000,8.1960)	(4.1214,4.1214,0.0000,8.2429)	(4.1088,4.1743,0.0000,8.2832)	(4.0101,4.2673,0.0000,8.2775)	(5.0989,3.2415,0.0000,8.3405)
	1.3	(2.6250,5.5155,0.0000,8.1405)	(2.6825,5.5135,0.0000,8.1960)	(2.4072,5.7193,0.0000,8.1264)	(4.1743,4.1088,0.0000,8.2832)	(4.1183,4.1183,0.0000,8.2366)	(4.0419,4.2336,0.0000,8.2754)	(5.1303,3.2087,0.0000,8.3390)
	2.3	(2.9101,5.2859,0.0000,8.1960)	(2.5395,5.5732,0.0000,8.1128)	(2.4810,5.6278,0.0000,8.1088)	(4.2673,4.0101,0.0000,8.2775)	(4.2336,4.0419,0.0000,8.2754)	(4.1089,4.1089,0.0000,8.2178)	(5.2220,3.1127,0.0000,8.3347)
	1.2,3	(1.9555,6.3277,0.0000,8.2832)	(1.8273,6.4502,0.0000,8.2775)	(1.7819,6.4936,0.0000,8.2754)	(3.2415,5.0989,0.0000,8.3405)	(3.2087,5.1303,0.0000,8.3390)	(3.1127,5.2220,0.0000,8.3347)	(4.1914,4.1914,0.0000,8.3828)
	1	(2.6956,2.6956,0.0000,5.3911)	(2.7474,2.9804,0.0000,5.7278)	(2.6914,3.0085,0.0000,5.6998)	(4.2574,1.9944,0.0000,6.2518)	(4.2230,2.0098,0.0000,6.2329)	(4.1437,2.2813,0.0000,6.4250)	(5.1528,1.5924,0.0000,6.7453)
	2	(2.9804,2.7474,0.0000,5.7278)	(2.6113,2.6113,0.0000,5.2226)	(2.7662,2.8503,0.0000,5.6165)	(4.3534,1.8642,0.0000,6.2176)	(4.3221,2.1029,0.0000,6.4250)	(4.2183,1.9221,0.0000,6.1404)	(5.2393,1.4842,0.0000,6.7235)
	3	(3.0855,2.6914,0.0000,5.6998)	(2.8503,2.7662,0.0000,5.6165)	(2.5800,2.5800,0.0000,5.1599)	(4.3842,2.0408,0.0000,6.4250)	(4.3535,1.8323,0.0000,6.1858)	(4.2527,1.8748,0.0000,6.1275)	(5.2698,1.4460,0.0000,6.7158)
	1.2	(1.9944,4.2574,0.0000,6.2518)	(1.8642,4.3534,0.0000,6.2176)	(2.0408,4.3842,0.0000,6.4250)	(3.2970,3.2970,0.0000,6.5941)	(3.3460,3.3993,0.0000,6.7453)	(3.2573,3.4662,0.0000,6.7235)	(4.2610,2.7088,0.0000,6.9698)
	1.3	(2.0098,4.2230,0.0000,6.2329)	(2.1029,4.3221,0.0000,6.4250)	(1.8323,4.3535,0.0000,6.1858)	(3.3993,3.3460,0.0000,6.7453)	(3.2856,3.2856,0.0000,6.5712)	(3.2801,3.4357,0.0000,6.7158)	(4.2843,2.6796,0.0000,6.9639)
2.3	(2.2813,4.1437,0.0000,6.4250)	(1.9221,4.2183,0.0000,6.1404)	(1.8748,4.2527,0.0000,6.1275)	(3.4662,3.2573,0.0000,6.7235)	(3.4357,3.2801,0.0000,6.7158)	(3.2514,3.2514,0.0000,6.5027)	(4.3524,2.5943,0.0000,6.9468)	
1.2,3	(1.5924,5.1528,0.0000,6.7453)	(1.4842,5.2393,0.0000,6.7235)	(1.4460,5.2698,0.0000,6.7158)	(2.7088,4.2610,0.0000,6.9639)	(2.6796,4.2843,0.0000,6.9639)	(2.5943,4.3524,0.0000,6.9468)	(3.5717,3.5717,0.0000,7.1483)	

Figure A.1 Decentralized Management Regime without Effort Factor (cont.)

21a	1	(0.2037,0.2037,0.0000,0.4074)	(0.2292,0.2486,0.0000,0.4778)	(0.2226,0.2488,0.0000,0.4714)	(0.4236,0.1984,0.0000,0.6220)	(0.4173,0.1986,0.0000,0.6159)	(0.4403,0.2424,0.0000,0.6828)	(0.6264,0.1936,0.0000,0.8200)	
	2	(0.2486,0.2292,0.0000,0.4778)	(0.1885,0.1885,0.0000,0.3770)	(0.2231,0.2299,0.0000,0.4530)	(0.4278,0.1832,0.0000,0.6110)	(0.4593,0.2235,0.0000,0.6828)	(0.4033,0.1837,0.0000,0.5869)	(0.6307,0.1787,0.0000,0.8094)	
	3	(0.2488,0.2226,0.0000,0.4714)	(0.2299,0.2231,0.0000,0.4530)	(0.1831,0.1831,0.0000,0.3663)	(0.4659,0.2169,0.0000,0.6828)	(0.4229,0.1780,0.0000,0.6009)	(0.4046,0.1784,0.0000,0.5830)	(0.6322,0.1735,0.0000,0.8057)	
	1.2	(0.1984,0.4236,0.0000,0.6220)	(0.1832,0.4278,0.0000,0.6110)	(0.2169,0.4659,0.0000,0.6828)	(0.3753,0.3753,0.0000,0.7506)	(0.4067,0.4132,0.0000,0.8200)	(0.3921,0.4173,0.0000,0.8094)	(0.5761,0.3662,0.0000,0.9423)	
	1.3	(0.1986,0.4173,0.0000,0.6159)	(0.2235,0.4593,0.0000,0.6828)	(0.1780,0.4229,0.0000,0.6009)	(0.4132,0.4067,0.0000,0.8200)	(0.3704,0.3704,0.0000,0.7409)	(0.3935,0.4122,0.0000,0.8057)	(0.5776,0.3612,0.0000,0.9388)	
	2.3	(0.2424,0.4403,0.0000,0.6828)	(0.1837,0.4032,0.0000,0.5869)	(0.1784,0.4046,0.0000,0.5830)	(0.4173,0.3921,0.0000,0.8094)	(0.4122,0.3935,0.0000,0.8057)	(0.3564,0.3564,0.0000,0.7128)	(0.5818,0.3468,0.0000,0.9285)	
	1.2,3	(0.1936,0.6264,0.0000,0.8200)	(0.1787,0.6307,0.0000,0.8094)	(0.1735,0.6322,0.0000,0.8057)	(0.3662,0.5761,0.0000,0.9423)	(0.3612,0.5776,0.0000,0.9388)	(0.3468,0.5818,0.0000,0.9285)	(0.5288,0.5288,0.0000,1.0575)	
	22a	1	(4.0189,4.0189,0.0000,8.0379)	(3.5546,4.5381,0.0000,8.0926)	(3.3673,4.7032,0.0000,8.0705)	(5.4614,2.7805,0.0000,8.2419)	(5.3733,2.8562,0.0000,8.2294)	(4.9536,3.3041,0.0000,8.2578)	(6.1731,2.1695,0.0000,8.3426)
		2	(4.5381,3.5546,0.0000,8.0926)	(3.9361,3.9361,0.0000,7.8721)	(3.8142,4.1728,0.0000,7.9870)	(5.9156,2.3005,0.0000,8.2161)	(5.6697,2.5880,0.0000,8.2578)	(5.5430,2.6083,0.0000,8.1514)	(6.5541,1.7730,0.0000,8.3271)
		3	(4.7032,3.3673,0.0000,8.0705)	(4.1728,3.8142,0.0000,7.9870)	(3.9012,3.9012,0.0000,7.8023)	(5.8921,2.3656,0.0000,8.2578)	(5.9902,2.2029,0.0000,8.1931)	(5.7079,2.4324,0.0000,8.1403)	(6.6792,1.6428,0.0000,8.3220)
		1.2	(2.7805,5.4614,0.0000,8.2419)	(2.3005,5.9156,0.0000,8.2161)	(2.3656,5.8921,0.0000,8.2578)	(4.1579,4.1579,0.0000,8.3159)	(4.0814,4.2612,0.0000,8.3426)	(3.7678,4.5592,0.0000,8.3271)	(5.0257,3.3633,0.0000,8.3893)
		1.3	(2.8562,5.3733,0.0000,8.2294)	(2.5880,5.6697,0.0000,8.2578)	(2.2029,5.9902,0.0000,8.1931)	(4.2612,4.0814,0.0000,8.3159)	(4.1507,4.1507,0.0000,8.3220)	(3.8549,4.4670,0.0000,8.3220)	(5.1124,3.2733,0.0000,8.3857)
2.3		(3.3041,4.9536,0.0000,8.2578)	(2.6083,5.5430,0.0000,8.1514)	(2.4324,5.7079,0.0000,8.1403)	(4.5592,3.7678,0.0000,8.3271)	(4.4670,3.8549,0.0000,8.3220)	(4.1234,4.1234,0.0000,8.2469)	(5.4054,2.9684,0.0000,8.3738)	
1.2,3		(2.1695,6.1731,0.0000,8.3426)	(1.7730,6.5541,0.0000,8.3271)	(1.6428,6.6792,0.0000,8.3220)	(3.3635,5.0257,0.0000,8.3893)	(3.2733,5.1124,0.0000,8.3857)	(2.9684,5.4054,0.0000,8.3738)	(4.2112,4.2112,0.0000,8.4224)	
23a		1	(2.9504,2.9504,0.0000,5.9008)	(2.6681,3.4064,0.0000,6.0745)	(2.5048,3.4986,0.0000,6.0034)	(4.3671,2.2234,0.0000,6.5906)	(4.2734,2.2715,0.0000,6.5449)	(3.9888,2.6606,0.0000,6.6494)	(5.1636,1.8147,0.0000,6.9783)
		2	(3.4064,2.6681,0.0000,6.0745)	(2.7092,2.7092,0.0000,5.4185)	(2.7440,3.0020,0.0000,5.7460)	(4.6771,1.8190,0.0000,6.4967)	(4.5654,2.0839,0.0000,6.6494)	(4.2636,2.0063,0.0000,6.2699)	(5.4437,1.4726,0.0000,6.9163)
		3	(3.4986,2.5048,0.0000,6.0034)	(3.0020,2.7440,0.0000,5.7460)	(2.6164,2.6164,0.0000,5.2329)	(4.7445,1.9048,0.0000,6.6494)	(4.6899,1.7247,0.0000,6.4146)	(4.3700,1.8623,0.0000,6.2323)	(5.5348,1.3613,0.0000,6.8961)
		1.2	(2.2234,4.3671,0.0000,6.5906)	(1.8190,4.6777,0.0000,6.4967)	(1.9048,4.7445,0.0000,6.6494)	(3.4360,3.4360,0.0000,6.8720)	(3.4140,3.5643,0.0000,6.9783)	(3.1295,3.7868,0.0000,6.9163)	(4.2956,2.8749,0.0000,7.1705)
		1.3	(2.2715,4.2734,0.0000,6.5449)	(2.0839,4.5654,0.0000,6.6494)	(1.7247,4.6899,0.0000,6.4146)	(3.5643,3.4140,0.0000,6.9783)	(3.4079,3.4079,0.0000,6.8158)	(3.1945,3.7017,0.0000,6.8961)	(4.3625,2.7932,0.0000,7.1557)
	2.3	(2.6606,3.9888,0.0000,6.6494)	(2.0663,4.2636,0.0000,6.2699)	(1.8623,4.3700,0.0000,6.2323)	(3.7868,3.1295,0.0000,6.8961)	(3.7017,3.1945,0.0000,6.8961)	(3.3045,3.3045,0.0000,6.6089)	(4.5870,2.5189,0.0000,7.1060)	
	1.2,3	(1.8147,5.1636,0.0000,6.9783)	(1.4726,5.4437,0.0000,6.9163)	(1.3613,5.5348,0.0000,6.8961)	(2.8749,4.2956,0.0000,7.1705)	(2.7932,4.3625,0.0000,7.1557)	(2.5189,4.5870,0.0000,7.1060)	(3.6561,3.6561,0.0000,7.3121)	
	24a	1	(0.2600,0.2600,0.0000,0.5200)	(0.2492,0.3182,0.0000,0.5674)	(0.2284,0.3190,0.0000,0.5473)	(0.4964,0.2527,0.0000,0.7491)	(0.4766,0.2533,0.0000,0.7299)	(0.4649,0.3101,0.0000,0.7749)	(0.7011,0.2464,0.0000,0.9475)
		2	(0.3182,0.2492,0.0000,0.5674)	(0.2063,0.2063,0.0000,0.4126)	(0.2302,0.2518,0.0000,0.4820)	(0.5115,0.1989,0.0000,0.7104)	(0.5321,0.2429,0.0000,0.7749)	(0.4271,0.2010,0.0000,0.6280)	(0.7169,0.1939,0.0000,0.9108)
		3	(0.3190,0.2284,0.0000,0.5473)	(0.2518,0.2302,0.0000,0.4820)	(0.1894,0.1894,0.0000,0.3787)	(0.5529,0.2220,0.0000,0.7749)	(0.4963,0.1825,0.0000,0.6789)	(0.4317,0.1840,0.0000,0.6157)	(0.7218,0.1775,0.0000,0.8993)
		1.2	(0.2527,0.4964,0.0000,0.7491)	(0.1989,0.5115,0.0000,0.7104)	(0.2220,0.5529,0.0000,0.7749)	(0.4429,0.4429,0.0000,0.8858)	(0.4636,0.4840,0.0000,0.9475)	(0.4121,0.4987,0.0000,0.9108)	(0.6456,0.4320,0.0000,1.0776)
		1.3	(0.2533,0.4766,0.0000,0.7299)	(0.2429,0.5321,0.0000,0.7749)	(0.1825,0.4963,0.0000,0.6789)	(0.4840,0.4636,0.0000,0.9475)	(0.4278,0.4278,0.0000,0.8993)	(0.4165,0.4827,0.0000,0.8993)	(0.6503,0.4163,0.0000,1.0660)
2.3		(0.3101,0.4649,0.0000,0.7749)	(0.2010,0.4271,0.0000,0.6280)	(0.1840,0.4317,0.0000,0.6157)	(0.4987,0.4121,0.0000,0.9108)	(0.4827,0.4166,0.0000,0.8993)	(0.3785,0.3785,0.0000,0.7570)	(0.6655,0.3655,0.0000,1.0309)	
1.2,3		(0.2464,0.7011,0.0000,0.9475)	(0.1939,0.7169,0.0000,0.9108)	(0.1775,0.7218,0.0000,0.8993)	(0.4320,0.6456,0.0000,1.0776)	(0.4163,0.6503,0.0000,1.0666)	(0.3655,0.6655,0.0000,1.0309)	(0.5964,0.5964,0.0000,1.1927)	

Figure A.1 Decentralized Management Regime without Effort Factor (cont.)

25a	1	(4.1194,4.1194,0.0000,8.2389)	(3.1316,5.1042,0.0000,8.2358)	(2.7811,5.4255,0.0000,8.2066)	(5.3259,3.0344,0.0000,8.3603)	(5.1731,3.1718,0.0000,8.3449)	(4.4190,3.9241,0.0000,8.3431)	(5.9345,2.4871,0.0000,8.4216)
	2	(5.1042,3.1316,0.0000,8.2358)	(3.9863,3.9863,0.0000,7.9727)	(3.6642,4.3857,0.0000,8.0499)	(6.2440,2.0770,0.0000,8.3210)	(5.9356,2.4075,0.0000,8.3431)	(5.4961,2.7095,0.0000,8.2056)	(6.7282,1.6676,0.0000,8.3957)
	3	(5.4255,2.7811,0.0000,8.2066)	(4.3857,3.6642,0.0000,8.0499)	(3.9218,3.9218,0.0000,7.8433)	(6.3316,2.0115,0.0000,8.3431)	(6.4055,1.8832,0.0000,8.2887)	(5.8287,2.3567,0.0000,8.1853)	(6.9603,1.4279,0.0000,8.3882)
	1,2	(3.0344,5.3259,0.0000,8.3603)	(2.0770,6.2440,0.0000,8.3210)	(2.0115,6.3316,0.0000,8.3431)	(4.2042,4.2042,0.0000,8.4083)	(4.0563,4.3653,0.0000,8.4216)	(3.3825,5.0132,0.0000,8.3957)	(4.9187,3.5360,0.0000,8.4547)
	1,3	(3.1718,5.1731,0.0000,8.3449)	(2.4075,5.9356,0.0000,8.3431)	(1.8832,6.4055,0.0000,8.2887)	(4.3653,4.0563,0.0000,8.4216)	(4.1948,4.1948,0.0000,8.3896)	(3.5315,4.8567,0.0000,8.3882)	(5.0689,3.5809,0.0000,8.4498)
26a	1	(3.9241,4.4190,0.0000,8.3431)	(2.7095,5.4961,0.0000,8.2056)	(2.3567,5.8287,0.0000,8.1853)	(5.0132,3.3825,0.0000,8.3957)	(4.8567,3.5315,0.0000,8.3882)	(4.1440,4.1440,0.0000,8.2881)	(5.7039,2.7252,0.0000,8.4291)
	2	(2.4871,5.9345,0.0000,8.4216)	(1.6676,6.7282,0.0000,8.3957)	(1.4279,6.9603,0.0000,8.3882)	(3.5360,4.9187,0.0000,8.4547)	(3.3809,5.0689,0.0000,8.4498)	(2.7252,5.7039,0.0000,8.4291)	(4.2384,4.2384,0.0000,8.4768)
	3	(3.2897,3.2897,0.0000,6.5793)	(2.4974,4.0707,0.0000,6.5681)	(2.1900,4.2724,0.0000,6.4625)	(4.4914,2.5589,0.0000,7.0504)	(4.3318,2.6560,0.0000,6.9878)	(3.6973,3.2832,0.0000,6.9805)	(5.1502,2.1584,0.0000,7.3086)
	1,2	(4.0707,2.4974,0.0000,6.5681)	(2.8518,2.8518,0.0000,5.7036)	(2.7031,3.2353,0.0000,5.9383)	(5.1720,1.7204,0.0000,6.8923)	(4.9662,2.0143,0.0000,6.9805)	(4.3262,2.1328,0.0000,6.4590)	(5.7682,1.4296,0.0000,7.1978)
	1,3	(2.5589,4.4914,0.0000,7.0504)	(1.7204,5.1720,0.0000,6.8923)	(1.6830,5.2975,0.0000,6.9805)	(3.6257,3.6257,0.0000,7.2514)	(3.5202,3.7884,0.0000,7.3086)	(2.8999,4.2979,0.0000,6.3873)	(5.9461,1.2198,0.0000,7.1659)
27a	1	(2.6560,4.3318,0.0000,6.9878)	(2.0143,4.9662,0.0000,6.9805)	(1.5374,5.2292,0.0000,6.7666)	(3.7884,3.5202,0.0000,7.3086)	(3.5859,3.5859,0.0000,7.1718)	(3.0169,4.1490,0.0000,7.1659)	(4.4587,2.9739,0.0000,7.4326)
	2	(3.2832,3.6973,0.0000,6.9805)	(2.1328,4.3262,0.0000,6.4590)	(1.8390,4.5483,0.0000,6.3873)	(4.2979,2.8999,0.0000,7.1978)	(4.1490,3.0169,0.0000,7.1659)	(3.3820,3.3820,0.0000,6.7640)	(4.9678,2.3735,0.0000,7.3413)
	3	(2.1584,5.1502,0.0000,7.3086)	(1.4296,6.5768,0.0000,7.1978)	(1.2198,6.9461,0.0000,7.1659)	(3.1176,4.3368,0.0000,7.4544)	(2.9739,4.4587,0.0000,7.4326)	(2.3735,4.9678,0.0000,7.3413)	(3.7773,3.7773,0.0000,7.5547)
	1,2	(0.3722,0.3722,0.0000,0.7443)	(0.2812,0.4584,0.0000,0.7396)	(0.2362,0.4608,0.0000,0.6970)	(0.6328,0.3605,0.0000,0.9933)	(0.5910,0.3624,0.0000,0.9534)	(0.5026,0.4463,0.0000,0.9489)	(0.8383,0.3513,0.0000,1.1896)
	1,3	(0.4584,0.2812,0.0000,0.7396)	(0.2361,0.2361,0.0000,0.4723)	(0.2411,0.2886,0.0000,0.5298)	(0.6732,0.2239,0.0000,0.8972)	(0.6751,0.2738,0.0000,0.9489)	(0.4660,0.2297,0.0000,0.6957)	(0.8802,0.2182,0.0000,1.0984)

Figure A.1 Decentralized Management Regime without Effort Factor (cont.)

1b	1	2	3	1.2	1.3	2.3	1.2.3
1	(8.5875,0.0069,7.1346,8.5944)	(8.4943,0.0276,8.3255,8.5219)	(8.3178,0.0008,7.2346,8.3787)	(8.5768,0.0101,6.1047,8.3869)	(8.5169,0.0180,5.5398,8.5349)	(8.4381,0.0430,6.7230,8.4811)	(8.5409,0.0169,5.2047,8.5578)
2	(8.5613,0.0173,8.7632,8.5786)	(8.5366,0.0112,6.6508,8.5478)	(8.3225,0.0599,7.1408,8.3824)	(8.5776,0.0098,6.0523,8.5874)	(8.4720,0.0366,6.7750,8.5086)	(8.4941,0.0204,5.2697,8.5145)	(8.5423,0.0165,5.1485,8.587)
3	(8.5618,0.0172,8.7277,8.5790)	(8.4973,0.0271,8.1942,8.5244)	(8.4008,0.0269,5.7734,8.4277)	(8.5480,0.0216,7.4687,8.5697)	(8.5190,0.0173,5.4636,8.5363)	(8.4948,0.0203,5.3479,8.5150)	(8.5428,0.0163,5.1262,8.5591)
1.2	(8.5600,0.0170,8.8928,8.5770)	(8.4924,0.0273,8.4444,8.5197)	(8.2778,0.0673,8.0221,8.3452)	(8.5066,0.0123,6.5593,8.5819)	(8.4674,0.0359,6.9848,8.5033)	(8.4335,0.0423,6.9022,8.4758)	(8.5291,0.0199,5.6923,8.5490)
1.2.3	(8.5605,0.0169,8.8615,8.5774)	(8.4763,0.0301,9.1149,8.5064)	(8.3123,0.0600,7.3880,8.3723)	(8.5457,0.0213,7.6426,8.5670)	(8.4047,0.0214,6.0027,8.5261)	(8.4336,0.0424,6.8967,8.4760)	(8.5294,0.0199,5.6799,8.5493)
2.3	(8.5492,0.0189,9.6078,8.5681)	(8.4951,0.0268,8.3285,8.5219)	(8.3165,0.0591,7.3081,8.3756)	(8.5459,0.0213,7.6301,8.5672)	(8.4679,0.0360,6.9646,8.5038)	(8.4791,0.0249,5.8536,8.5040)	(8.5302,0.0197,5.6465,8.5500)
1.2,3	(8.5487,0.0187,9.6639,8.5674)	(8.4754,0.0299,9.1692,8.5053)	(8.2752,0.0665,8.0972,8.3417)	(8.5439,0.0211,7.7754,8.5650)	(8.4640,0.0355,7.1310,8.4995)	(8.4296,0.0417,7.0511,8.4713)	(8.5213,0.0215,5.9990,8.5429)
2b	1	2	3	1.2	1.3	2.3	1.2.3
1	(8.5618,0.0013,8.7772,8.5631)	(8.4774,0.0165,9.0613,8.4939)	(8.2812,0.0366,7.9591,8.3178)	(8.5473,0.0023,7.5632,8.5496)	(8.4708,0.0047,6.8816,8.4755)	(8.4119,0.0258,7.4522,8.4377)	(8.5006,0.0047,6.4921,8.5033)
2	(8.5500,0.0099,9.5543,8.5599)	(8.4971,0.0023,8.2455,8.4993)	(8.2839,0.0351,7.9028,8.3191)	(8.5474,0.0022,7.5496,8.5496)	(8.4480,0.0214,7.5438,8.4694)	(8.4403,0.0053,6.7204,8.4456)	(8.5010,0.0044,6.4745,8.5053)
3	(8.5502,0.0098,9.5328,8.5600)	(8.4791,0.0155,8.9893,8.4947)	(8.3221,0.0064,7.2017,8.3286)	(8.5335,0.0124,8.2675,8.5458)	(8.4713,0.0043,6.8592,8.4756)	(8.4405,0.0052,6.7139,8.4457)	(8.5011,0.0043,6.4675,8.5054)
1.2	(8.5494,0.0101,9.6142,8.5595)	(8.4765,0.0167,9.1253,8.4932)	(8.2545,0.0491,8.4734,8.3036)	(8.5453,0.0039,7.7058,8.5492)	(8.4458,0.0220,7.6491,8.4678)	(8.4086,0.0285,7.5421,8.4361)	(8.4968,0.0075,6.6721,8.5043)
1.2.3	(8.5497,0.0100,9.5942,8.5596)	(8.4655,0.0217,9.5826,8.4872)	(8.2784,0.0376,8.0339,8.3159)	(8.5324,0.0127,8.3491,8.5451)	(8.4670,0.0076,7.0418,8.4746)	(8.4096,0.0265,7.5391,8.4362)	(8.4969,0.0074,6.6667,8.5043)
2.3	(8.5421,0.0143,10.0000,8.5565)	(8.4781,0.0158,9.0541,8.4940)	(8.2810,0.0361,7.9861,8.3171)	(8.5325,0.0127,8.3428,8.5452)	(8.4460,0.0220,7.6385,8.4680)	(8.4358,0.0088,6.8943,8.4445)	(8.4972,0.0072,6.6525,8.5044)
1.2,3	(8.5417,0.0147,10.0000,8.5565)	(8.4649,0.0217,9.6241,8.4866)	(8.2528,0.0493,8.5191,8.3021)	(8.5315,0.0130,8.4182,8.5445)	(8.4440,0.0226,7.7282,8.4666)	(8.4075,0.0272,7.6207,8.4346)	(8.4936,0.0095,6.8151,8.5031)
3b	1	2	3	1.2	1.3	2.3	1.2.3
1	(8.3136,0.0004,10.0000,8.3140)	(8.2124,0.0083,10.0000,8.2207)	(7.9717,0.0085,10.0000,7.9803)	(8.3961,0.0002,10.0000,8.3963)	(8.2830,0.0002,10.0000,8.2832)	(8.2295,0.0043,10.0000,8.2338)	(8.3495,0.0001,10.0000,8.3497)
2	(8.3072,0.0071,10.0000,8.3143)	(8.2198,0.0004,10.0000,8.2202)	(7.9723,0.0079,10.0000,7.9802)	(8.3962,0.0002,10.0000,8.3963)	(8.2796,0.0038,10.0000,8.2834)	(8.2334,0.0002,10.0000,8.2336)	(8.3495,0.0001,10.0000,8.3497)
3	(8.3074,0.0069,10.0000,8.3143)	(8.2132,0.0074,10.0000,8.2206)	(7.9792,0.0004,10.0000,7.9796)	(8.3928,0.0036,10.0000,8.3965)	(8.2830,0.0002,10.0000,8.2832)	(8.2334,0.0002,10.0000,8.2336)	(8.3495,0.0001,10.0000,8.3497)
1.2	(8.3068,0.0075,10.0000,8.3143)	(8.2120,0.0087,10.0000,8.2207)	(7.9645,0.0164,10.0000,7.9809)	(8.3960,0.0004,10.0000,8.3964)	(8.2794,0.0040,10.0000,8.2834)	(8.2293,0.0045,10.0000,8.2338)	(8.3494,0.0003,10.0000,8.3497)
1.2.3	(8.3070,0.0072,10.0000,8.3143)	(8.2054,0.0157,10.0000,8.2211)	(7.9714,0.0089,10.0000,7.9803)	(8.3926,0.0008,10.0000,8.3965)	(8.2828,0.0004,10.0000,8.2832)	(8.2293,0.0045,10.0000,8.2338)	(8.3494,0.0003,10.0000,8.3497)
2.3	(8.3007,0.0139,10.0000,8.3146)	(8.2128,0.0078,10.0000,8.2206)	(7.9720,0.0083,10.0000,7.9802)	(8.3927,0.0038,10.0000,8.3965)	(8.2794,0.0040,10.0000,8.2834)	(8.2332,0.0004,10.0000,8.2336)	(8.3494,0.0003,10.0000,8.3497)
1.2,3	(8.3003,0.0143,10.0000,8.3146)	(8.2050,0.0161,10.0000,8.2211)	(7.9642,0.0168,10.0000,7.9810)	(8.3925,0.0040,10.0000,8.3965)	(8.2792,0.0042,10.0000,8.2834)	(8.2292,0.0047,10.0000,8.2338)	(8.3495,0.0004,10.0000,8.3497)
4b	1	2	3	1.2	1.3	2.3	1.2.3
1	(8.5898,0.0080,6.9957,8.5978)	(8.4902,0.0287,8.5051,8.5189)	(8.3049,0.0037,7.4877,8.3686)	(8.5796,0.0110,6.0938,8.5906)	(8.5263,0.0184,5.6146,8.5447)	(8.4327,0.0443,6.9548,8.4770)	(8.5458,0.0176,5.2853,8.5634)
2	(8.5648,0.0175,8.5134,8.5824)	(8.5380,0.0118,6.5992,8.5498)	(8.3194,0.0069,7.2027,8.3803)	(8.5821,0.0102,5.9276,8.5923)	(8.4861,0.0348,6.7570,8.5210)	(8.4964,0.0210,5.3737,8.5174)	(8.5499,0.0164,5.1098,8.5663)
3	(8.5664,0.0173,8.4063,8.5836)	(8.4994,0.0272,8.1029,8.5266)	(8.4018,0.0273,7.5708,8.4291)	(8.5541,0.0213,7.2804,8.5753)	(8.5321,0.0166,5.3819,8.5487)	(8.4983,0.0204,5.3110,8.5187)	(8.5514,0.0160,5.0457,8.5674)
1.2	(8.5633,0.0171,8.6753,8.5804)	(8.4886,0.0283,8.6057,8.5169)	(8.2684,0.0685,8.2079,8.3370)	(8.5728,0.0128,6.5219,8.5856)	(8.4811,0.0339,7.0032,8.5150)	(8.4289,0.0456,7.1043,8.4724)	(8.5352,0.0199,5.7287,8.5551)
1.2.3	(8.5646,0.0169,8.5840,8.5815)	(8.4746,0.0305,9.1891,8.5051)	(8.3006,0.0628,7.6080,8.3634)	(8.5511,0.0209,7.5045,8.5720)	(8.5160,0.0209,6.0269,8.5369)	(8.4292,0.0457,7.0919,8.4728)	(8.5359,0.0198,5.7064,8.5557)
2.3	(8.5532,0.0189,9.3309,8.5721)	(8.4970,0.0268,8.2489,8.5238)	(8.3138,0.0600,7.3607,8.3738)	(8.5517,0.0206,7.4607,8.5727)	(8.4874,0.0341,6.6411,8.5165)	(8.4819,0.0250,5.8467,8.5069)	(8.5386,0.0193,5.5980,8.5578)
1.2,3	(8.5525,0.0187,9.4025,8.5712)	(8.4738,0.0302,9.2433,8.5040)	(8.2663,0.0679,8.2683,8.3342)	(8.5492,0.0207,7.6449,8.5699)	(8.4781,0.0336,7.1386,8.5117)	(8.4258,0.0429,7.2272,8.4687)	(8.5284,0.0211,6.0165,8.5495)

Figure A.2 Decentralized Management Regime with Effort Factor

5b		1	2	3	1.2	1.3	2.3	1.2.3	
		(8.5664,0.0018,8.4692,8.5682)	(8.4760,0.0187,9.1183,8.4947)	(8.2740,0.0415,8.0980,8.3155)	(8.5532,0.0030,7.3971,8.5562)	(8.4868,0.0055,6.8200,8.4923)	(8.4109,0.0288,7.5666,8.4398)	(8.5108,0.0056,6.4431,8.5163)	
		(8.5542,0.0104,9.2604,8.5646)	(8.4997,0.0025,8.1322,8.5023)	(8.2831,0.0369,7.9181,8.3200)	(8.5538,0.0025,7.3484,8.5563)	(8.4651,0.0209,7.4869,8.4859)	(8.4451,0.0057,6.6696,8.4508)	(8.5120,0.0046,6.3741,8.5166)	
		(8.5551,0.0099,9.1973,8.5650)	(8.4816,0.0158,8.8822,8.4974)	(8.3242,0.0067,7.1626,8.3309)	(8.5401,0.0123,8.0612,8.5524)	(8.4884,0.0042,6.7455,8.4926)	(8.4456,0.0053,6.6506,8.4509)	(8.5124,0.0043,6.3535,8.5167)	
		(8.5535,0.0106,9.3365,8.5641)	(8.4751,0.0187,9.1826,8.4939)	(8.2482,0.0523,8.5941,8.3005)	(8.5511,0.0046,7.5515,8.5556)	(8.4625,0.0217,7.6106,8.4841)	(8.4088,0.0293,7.6503,8.4381)	(8.5069,0.0082,6.6226,8.5151)	
		(8.5543,0.0102,9.2777,8.5645)	(8.4651,0.0227,9.0062,8.4879)	(8.2716,0.0421,8.1651,8.3137)	(8.5387,0.0128,8.1696,8.5515)	(8.4832,0.0081,6.9791,8.4913)	(8.4089,0.0293,7.6430,8.4383)	(8.5072,0.0080,6.6074,8.5152)	
		(8.5466,0.0137,9.7896,8.5603)	(8.4805,0.0161,8.9525,8.4966)	(8.2802,0.0378,7.9989,8.3180)	(8.5390,0.0127,8.1470,8.5517)	(8.4832,0.0215,7.5769,8.4846)	(8.4405,0.0092,6.8480,8.4496)	(8.5082,0.0074,6.5584,8.5156)	
		1.2.3	(8.5461,0.0139,9.8390,8.5600)	(8.4646,0.0228,9.6393,8.4874)	(8.2467,0.0524,8.6346,8.2991)	(8.5377,0.0131,8.2458,8.5508)	(8.4069,0.0297,7.7201,8.4367)	(8.5039,0.0100,6.7027,8.5139)	
			1	2	3	1.2	1.3	2.3	1.2.3
	6b		(8.3691,0.0004,10.0000,8.3695)	(8.2345,0.0098,10.0000,8.2443)	(7.9787,0.0107,10.0000,7.9893)	(8.4208,0.0002,10.0000,8.4210)	(8.3192,0.0002,10.0000,8.3194)	(8.2407,0.0052,10.0000,8.2459)	(8.3717,0.0002,10.0000,8.3719)
		(8.3636,0.0061,10.0000,8.3697)	(8.2434,0.0004,10.0000,8.2438)	(7.9808,0.0084,10.0000,7.9892)	(8.4209,0.0002,10.0000,8.4210)	(8.3160,0.0056,10.0000,8.3195)	(8.2455,0.0002,10.0000,8.2457)	(8.3717,0.0001,10.0000,8.3719)	
		(8.3641,0.0055,10.0000,8.3697)	(8.2371,0.0070,10.0000,8.2441)	(7.9881,0.0004,10.0000,7.9885)	(8.4180,0.0031,10.0000,8.4211)	(8.3192,0.0002,10.0000,8.3194)	(8.2455,0.0002,10.0000,8.2457)	(8.3717,0.0001,10.0000,8.3719)	
		1.2	(8.3633,0.0064,10.0000,8.3697)	(8.2341,0.0102,10.0000,8.2443)	(7.9710,0.0190,10.0000,7.9904)	(8.4206,0.0004,10.0000,8.4210)	(8.3158,0.0038,10.0000,8.3195)	(8.2405,0.0054,10.0000,8.2459)	(8.3716,0.0003,10.0000,8.3719)
		1.3	(8.3638,0.0059,10.0000,8.3697)	(8.2278,0.0168,10.0000,8.2446)	(7.9783,0.0111,10.0000,7.9894)	(8.4178,0.0034,10.0000,8.4211)	(8.3190,0.0004,10.0000,8.3194)	(8.2406,0.0054,10.0000,8.2459)	(8.3716,0.0003,10.0000,8.3719)
		2.3	(8.3583,0.0116,10.0000,8.3699)	(8.2367,0.0074,10.0000,8.2441)	(7.9804,0.0088,10.0000,7.9892)	(8.4178,0.0033,10.0000,8.4211)	(8.3158,0.0037,10.0000,8.3195)	(8.2453,0.0004,10.0000,8.2457)	(8.3716,0.0002,10.0000,8.3719)
		1.2.3	(8.3580,0.0120,10.0000,8.3699)	(8.2275,0.0172,10.0000,8.2447)	(7.9706,0.0194,10.0000,7.9901)	(8.4176,0.0035,10.0000,8.4211)	(8.3156,0.0040,10.0000,8.3196)	(8.2404,0.0056,10.0000,8.2459)	(8.3715,0.0004,10.0000,8.3719)
			1	2	3	1.2	1.3	2.3	1.2.3
7b			(8.5927,0.0004,6.8319,8.6021)	(8.4837,0.0300,8.7900,8.5137)	(8.2845,0.0670,7.8912,8.3515)	(8.5833,0.0121,6.0956,8.5954)	(8.5397,0.0185,5.7385,8.5582)	(8.4243,0.0457,7.3184,8.4700)	(8.5531,0.0180,5.4205,8.5711)
			(8.5701,0.0178,8.1435,8.5879)	(8.5399,0.0127,6.5280,8.5526)	(8.3146,0.0623,7.2983,8.3769)	(8.5888,0.0107,5.7356,8.5994)	(8.5069,0.0321,6.7058,8.5390)	(8.4998,0.0217,5.3822,8.5215)	(8.5613,0.0162,5.0413,8.5775)
		(8.5732,0.0173,7.9272,8.5905)	(8.5024,0.0274,7.9665,8.5298)	(8.4032,0.0280,5.7331,8.4312)	(8.5630,0.0208,6.9811,8.5838)	(8.5510,0.0156,5.2392,8.5666)	(8.5036,0.0206,5.2551,8.5242)	(8.5642,0.0154,4.9106,8.5795)	
		1.2	(8.5679,0.0172,8.3657,8.5852)	(8.4825,0.0296,8.8670,8.5121)	(8.2532,0.0706,8.4989,8.3238)	(8.5773,0.0134,6.4772,8.5906)	(8.5011,0.0309,7.0177,8.5320)	(8.4215,0.0450,7.4302,8.4665)	(8.5442,0.0197,5.8132,8.5639)
		1.3	(8.5705,0.0167,8.1934,8.5873)	(8.4714,0.0311,9.3302,8.5024)	(8.2815,0.0662,7.9747,8.3477)	(8.5589,0.0202,7.3049,8.5791)	(8.5319,0.0201,6.0696,8.5520)	(8.4219,0.0452,7.4123,8.4671)	(8.5455,0.0195,5.7579,8.5649)
		2.3	(8.5592,0.0190,8.9128,8.5782)	(8.4997,0.0269,8.1319,8.5267)	(8.3095,0.0614,7.4428,8.3708)	(8.5603,0.0204,7.1945,8.5807)	(8.5037,0.0314,6.8829,8.5351)	(8.4189,0.0253,5.8377,8.5112)	(8.5510,0.0185,5.5138,8.5695)
		1.2.3	(8.5581,0.0196,9.0255,8.5777)	(8.4707,0.0308,9.3750,8.5015)	(8.2515,0.0702,8.5435,8.3217)	(8.5569,0.0199,7.4541,8.5768)	(8.4987,0.0306,7.1373,8.5293)	(8.4193,0.0444,7.5196,8.4637)	(8.5388,0.0205,6.0482,8.5593)
			1	2	3	1.2	1.3	2.3	1.2.3
	8b		(8.5729,0.0028,8.0422,8.5756)	(8.4730,0.0216,9.2605,8.4946)	(8.2611,0.0487,8.3478,8.3098)	(8.5615,0.0042,7.1648,8.5657)	(8.5093,0.0068,6.7314,8.5161)	(8.4082,0.0331,7.7782,8.4413)	(8.5254,0.0070,6.3614,8.5324)
			(8.5605,0.0111,8.8167,8.5716)	(8.5037,0.0030,7.9666,8.5067)	(8.2816,0.0395,7.9495,8.3211)	(8.5632,0.0029,7.0376,8.5661)	(8.4896,0.0201,7.3722,8.5097)	(8.5283,0.0050,6.6017,8.4585)	(8.5283,0.0050,6.2104,8.5333)
		(8.5624,0.0102,8.6855,8.5726)	(8.4853,0.0162,8.7168,8.5015)	(8.3273,0.0071,7.1046,8.3344)	(8.5500,0.0122,7.7357,8.5622)	(8.5129,0.0042,6.5505,8.5170)	(8.4531,0.0056,6.5546,8.4587)	(8.5291,0.0044,6.1650,8.5335)	
		1.2	(8.5593,0.0113,8.9401,8.5707)	(8.4722,0.0216,9.3083,8.4939)	(8.2371,0.0570,8.8040,8.2941)	(8.5593,0.0057,7.3331,8.5649)	(8.4864,0.0209,7.5419,8.5073)	(8.4063,0.0333,7.8507,8.4396)	(8.5215,0.0094,6.5553,8.5309)
		1.3	(8.5611,0.0105,8.8245,8.5715)	(8.4637,0.0246,9.6652,8.4883)	(8.2592,0.0489,8.9997,8.3081)	(8.5479,0.0129,7.9009,8.5608)	(8.5061,0.0089,6.8849,8.5150)	(8.4066,0.0333,7.8388,8.4399)	(8.5221,0.0090,6.5257,8.5312)
		2.3	(8.5530,0.0141,9.3454,8.5671)	(8.4840,0.0166,8.7991,8.5006)	(8.2788,0.0401,8.0293,8.3189)	(8.5486,0.0127,7.8407,8.5613)	(8.4879,0.0062,7.4632,8.5044)	(8.4473,0.0098,6.7802,8.4572)	(8.5246,0.0076,6.4040,8.5321)
		1.2.3	(8.5523,0.0143,9.4161,8.5666)	(8.4632,0.0246,9.6967,8.4877)	(8.2359,0.0570,8.8368,8.2929)	(8.5467,0.0132,7.9881,8.5599)	(8.4849,0.0212,7.6159,8.5061)	(8.4049,0.0334,7.9068,8.4383)	(8.5188,0.0108,6.6883,8.5296)

Figure A.2 Decentralized Management Regime with Effort Factor (cont.)

9b	1	2	3	1.2	1.3	2.3	1.2.3
1	(8.4305,0.0004,10.0000,8.4308)	(8.2634,0.0126,10.0000,8.2766)	(7.9875,0.0149,10.0000,8.0025)	(8.4523,0.0002,10.0000,8.4524)	(8.3692,0.0003,10.0000,8.3693)	(8.2564,0.0069,10.0000,8.2633)	(8.4033,0.0002,10.0000,8.4035)
2	(8.4262,0.0048,10.0000,8.4310)	(8.2750,0.0004,10.0000,8.2754)	(7.9928,0.0092,10.0000,8.0020)	(8.4524,0.0001,10.0000,8.4525)	(8.3664,0.0032,10.0000,8.3694)	(8.2628,0.0002,10.0000,8.2630)	(8.4034,0.0001,10.0000,8.4035)
3	(8.4270,0.0040,10.0000,8.4310)	(8.2692,0.0064,10.0000,8.2757)	(8.0009,0.0004,10.0000,8.0013)	(8.4501,0.0025,10.0000,8.4526)	(8.3693,0.0001,10.0000,8.3694)	(8.2628,0.0002,10.0000,8.2630)	(8.4034,0.0001,10.0000,8.4035)
1.2	(8.4258,0.0052,10.0000,8.4310)	(8.2631,0.0129,10.0000,8.2766)	(7.9791,0.0241,10.0000,8.0032)	(8.4521,0.0004,10.0000,8.4524)	(8.3661,0.0034,10.0000,8.3694)	(8.2562,0.0071,10.0000,8.2633)	(8.4032,0.0003,10.0000,8.4035)
1.3	(8.4266,0.0044,10.0000,8.4310)	(8.2573,0.0190,10.0000,8.2763)	(7.9872,0.0153,10.0000,8.0023)	(8.4499,0.0027,10.0000,8.4526)	(8.3691,0.0004,10.0000,8.3694)	(8.2562,0.0071,10.0000,8.2633)	(8.4032,0.0003,10.0000,8.4035)
2.3	(8.4224,0.0088,10.0000,8.4311)	(8.2689,0.0068,10.0000,8.2757)	(7.9925,0.0096,10.0000,8.0020)	(8.4499,0.0027,10.0000,8.4526)	(8.3663,0.0033,10.0000,8.3694)	(8.2626,0.0004,10.0000,8.2630)	(8.4033,0.0002,10.0000,8.4035)
1.2.3	(8.4220,0.0091,10.0000,8.4311)	(8.2569,0.0194,10.0000,8.2763)	(7.9788,0.0245,10.0000,8.0032)	(8.4497,0.0029,10.0000,8.4526)	(8.3660,0.0036,10.0000,8.3694)	(8.2560,0.0073,10.0000,8.2634)	(8.4031,0.0004,10.0000,8.4035)
10b	1	2	3	1.2	1.3	2.3	1.2.3
1	(7.8704,0.1391,4.1104,8.0095)	(7.1358,0.4763,4.1697,7.6121)	(5.9994,1.2006,2.7350,7.2000)	(7.8505,0.1872,3.1480,8.0376)	(7.4324,0.3796,2.4194,7.8120)	(6.9648,0.7147,2.5719,7.6795)	(7.6701,0.3166,2.2076,7.9866)
2	(7.6553,0.2592,4.8493,7.9145)	(7.4957,0.2498,3.5051,7.7456)	(6.0661,1.1584,2.6761,7.2245)	(7.8660,0.1834,3.0862,8.0494)	(7.1602,0.6120,2.6369,7.7722)	(7.3304,0.4227,2.2620,7.7531)	(7.6949,0.3086,2.1501,8.0035)
3	(7.6621,0.2571,4.8188,7.9192)	(7.1787,0.4591,4.0653,7.6377)	(6.5784,0.6766,2.4376,7.2550)	(7.6559,0.3150,3.5841,7.9708)	(7.4804,0.3671,2.3195,7.8474)	(7.3508,0.4197,2.2383,7.7705)	(7.7095,0.3064,2.1262,8.0159)
1.2	(7.6056,0.2586,5.1537,7.8642)	(7.0464,0.4820,4.4675,7.5284)	(5.4075,1.5767,3.2166,6.9842)	(7.7302,0.2229,3.6314,7.9531)	(6.9580,0.6539,3.0590,7.6119)	(6.7616,0.7569,2.9528,7.5185)	(7.4662,0.3864,2.6706,7.8526)
1.3	(7.6111,0.2567,5.1318,7.8678)	(6.8651,0.5773,4.7953,7.4424)	(5.7211,1.2891,3.0737,7.1002)	(7.5696,0.3185,3.9883,7.8881)	(7.2052,0.4704,2.8493,7.6757)	(6.7736,0.7581,2.9398,7.5317)	(7.4764,0.3862,2.6564,7.8626)
2.3	(7.4881,0.3069,5.5723,7.7949)	(7.0805,0.4670,4.3947,7.5476)	(5.7711,1.2546,3.0379,7.0257)	(7.5763,0.3188,3.9609,7.8951)	(6.9841,0.6530,3.0187,7.6371)	(7.0618,0.5313,2.7184,7.5931)	(7.4923,0.3822,2.6244,7.8744)
1.2.3	(7.4625,0.3038,5.7237,7.7663)	(6.8156,0.5762,4.9512,7.3918)	(5.2420,1.6206,3.4053,6.8626)	(7.5127,0.3233,4.2284,7.8300)	(6.8351,0.6869,3.2882,7.5220)	(6.6236,0.7932,3.1841,7.4167)	(7.3352,0.4309,2.9464,7.7661)
11b	1	2	3	1.2	1.3	2.3	1.2.3
1	(7.6257,0.0526,5.0733,7.6783)	(6.8823,0.3132,4.7569,7.1955)	(5.4583,0.8465,3.1776,6.3049)	(7.5863,0.0843,3.9382,7.6706)	(6.9977,0.2067,3.0071,7.2045)	(6.5879,0.4933,3.0745,7.0812)	(7.3142,0.1727,2.8039,7.4869)
2	(7.4985,0.1605,5.5293,7.6590)	(7.1045,0.1062,4.3434,7.2107)	(5.5006,0.8011,3.1449,6.3016)	(7.5933,0.0800,3.9094,7.6733)	(6.8037,0.4136,3.1725,7.2173)	(6.8399,0.2271,2.8607,7.0670)	(7.3276,0.1639,2.7741,7.4914)
3	(7.5026,0.1577,5.5117,7.6603)	(6.9090,0.2924,4.6972,7.2014)	(5.8364,0.3675,2.9909,6.2039)	(7.4592,0.1973,4.2447,7.6565)	(7.0251,0.1928,2.9644,7.2178)	(6.8528,0.2234,2.8465,7.0762)	(7.3368,0.1612,2.7598,7.4980)
1.2	(7.4718,0.1724,5.6865,7.6442)	(6.8309,0.3390,4.9210,7.1699)	(5.0447,1.2698,3.4821,6.3145)	(7.5267,0.1264,4.1896,7.6531)	(6.7866,0.4865,3.4133,7.1651)	(6.4604,0.5681,3.2968,7.0285)	(7.1950,0.2553,3.0714,7.4504)
1.3	(7.4755,0.1700,5.6720,7.6455)	(6.6943,0.4438,5.1622,7.1381)	(5.2853,0.9797,3.3762,6.2650)	(7.4110,0.2200,4.4599,7.6309)	(6.8682,0.3087,3.2494,7.1769)	(6.4697,0.5680,3.2868,7.0377)	(7.2026,0.2543,3.0611,7.4568)
2.3	(7.3859,0.2285,5.9904,7.6143)	(6.8545,0.3317,4.8711,7.1762)	(5.3210,0.9424,3.3520,6.2634)	(7.4152,0.2188,4.4431,7.6340)	(6.6974,0.4819,3.3861,7.1793)	(6.6884,0.3484,3.1159,7.0368)	(7.2129,0.2488,3.0403,7.4617)
1.2.3	(7.3688,0.2326,6.0882,7.6014)	(6.6600,0.4549,5.2664,7.1149)	(4.9245,1.3442,3.6155,6.2687)	(7.3747,0.2356,4.6120,7.6103)	(6.5937,0.5365,3.5672,7.1301)	(6.3643,0.6248,3.4524,6.9891)	(7.1076,0.3115,3.2572,7.4191)
12b	1	2	3	1.2	1.3	2.3	1.2.3
1	(6.5382,0.0011,8.9383,6.5393)	(5.1765,0.0351,7.7770,5.2116)	(2.1306,0.1320,5.0999,2.2627)	(6.2132,0.0023,7.4880,6.2155)	(4.2932,0.0119,5.6694,4.3051)	(3.8999,0.0729,5.4953,3.9728)	(5.0320,0.0090,5.6379,5.0469)
2	(6.5283,0.0141,8.9671,6.5425)	(5.1957,0.0032,7.7512,5.1989)	(2.1332,0.1219,5.0988,2.2551)	(6.2134,0.0021,7.4874,6.2155)	(4.2711,0.0593,5.6823,4.3304)	(3.9256,0.0132,5.4815,3.9388)	(5.0327,0.0083,5.6370,5.0409)
3	(6.5286,0.0137,8.9661,6.5424)	(5.1787,0.0315,7.7738,5.2102)	(2.1550,0.0260,5.0951,2.1810)	(6.2010,0.0193,7.5120,6.2203)	(4.2956,0.0107,5.6675,4.3063)	(3.9273,0.0128,5.4805,3.9401)	(5.0338,0.0080,5.6360,5.0418)
1.2	(6.5275,0.0151,8.9706,6.5427)	(5.1746,0.0381,7.7813,5.2127)	(2.1013,0.2492,5.1129,2.3505)	(6.2117,0.0044,7.4929,6.2161)	(4.2640,0.0706,5.6905,4.3446)	(3.8927,0.0854,5.5032,3.9781)	(5.0267,0.0171,5.6455,5.0437)
1.3	(6.5278,0.0147,8.9697,6.5426)	(5.1581,0.0652,7.8033,5.2233)	(2.1224,0.1568,5.1086,2.2792)	(6.1993,0.0214,7.5174,6.2208)	(4.2883,0.0224,5.6759,4.3107)	(3.8944,0.0851,5.5022,3.9794)	(5.0278,0.0169,5.6445,5.0447)
2.3	(6.5181,0.0272,8.9977,6.5454)	(5.1768,0.0345,7.7782,5.2113)	(2.1249,0.1467,5.1075,2.2717)	(6.1996,0.0213,7.5167,6.2208)	(4.2663,0.0694,5.6887,4.3357)	(3.9199,0.0258,5.4885,3.9457)	(5.0285,0.0162,5.6437,5.0446)
1.2.3	(6.5174,0.0282,9.0012,6.5456)	(5.1562,0.0681,7.8075,5.2243)	(2.0933,0.2728,5.1214,2.3661)	(6.1979,0.0234,7.5220,6.2213)	(4.2592,0.0806,5.6968,4.3398)	(3.8872,0.0974,5.5100,3.9846)	(5.0225,0.0249,5.6520,5.0474)

Figure A.2 Decentralized Management Regime with Effort Factor (cont.)

	1	2	3	1.2	1.3	2.3	1.2.3
13b							
1	(7.8879,0.1486,4.0447,8.036)	(7.0762,0.5065,4.3120,7.582)	(5.8130,1.3250,2.8938,7.138)	(7.8616,0.1940,3.1889,8.055)	(7.4682,0.3762,2.5397,8.444)	(6.8694,0.7670,2.7393,7.636)	(7.6763,0.3205,2.3201,7.9968)
2	(7.7028,0.2563,4.6342,7.959)	(7.5064,0.2556,3.4827,7.762)	(6.0222,1.1934,2.7150,7.215)	(7.9054,0.1821,3.0051,8.087)	(7.2609,0.5722,2.6522,7.833)	(7.3380,0.4266,2.2837,7.764)	(7.7465,0.2976,2.1456,8.0441)
3	(7.7330,0.2501,4.5417,7.973)	(7.2081,0.4554,3.9926,7.663)	(6.5856,0.6808,2.4321,7.266)	(7.1899,0.3018,3.2367,8.020)	(7.3800,0.4149,2.2012,7.922)	(7.3800,0.4149,2.2012,7.922)	(7.7762,0.2888,2.0799,8.0660)
1.2	(7.6430,0.2501,5.0036,7.898)	(6.9977,0.5080,4.5720,7.505)	(5.2629,1.6743,3.1344,7.637)	(7.5310,0.2232,3.6310,7.976)	(7.0449,0.6128,3.1344,7.976)	(6.4698,0.7983,3.0726,7.488)	(7.4968,0.3780,2.7408,7.8748)
1.3	(7.6584,0.2497,4.9422,7.908)	(6.8394,0.5905,4.8528,7.439)	(5.5766,1.3941,3.1758,6.870)	(6.1580,0.3058,3.9225,7.931)	(7.2819,0.4462,2.9074,7.728)	(6.7085,0.7983,3.0455,7.508)	(7.5143,0.3754,2.7087,7.8897)
2.3	(7.5446,0.2998,5.3337,8.844)	(7.1035,0.4634,3.3455,7.566)	(5.7383,1.2830,3.0614,7.021)	(6.3533,0.3053,3.8473,7.940)	(7.1038,0.6051,3.0223,7.709)	(7.0804,0.5282,2.7256,7.608)	(7.5801,0.3623,2.6076,7.9225)
1.2.3	(7.5125,0.2965,5.5230,7.809)	(6.7926,0.5893,4.9981,7.381)	(5.1172,1.7112,3.4891,6.828)	(5.5603,0.3105,4.1713,7.870)	(6.9414,0.6391,3.3404,7.580)	(6.5707,0.8273,3.2732,7.398)	(7.3844,0.4146,2.9883,7.7990)
14b							
1	(7.6773,0.0648,4.8664,7.742)	(6.8612,0.3564,4.8039,7.217)	(5.2489,0.9891,3.2611,6.338)	(6.9370,0.0977,3.8679,7.734)	(7.1094,0.2219,3.0449,7.331)	(6.5494,0.5624,3.1591,7.111)	(7.3780,0.1896,2.9360,7.5677)
2	(7.5886,0.1634,5.2728,7.722)	(7.1386,0.1199,4.2744,7.250)	(5.4882,0.8403,3.1545,6.352)	(7.6579,0.0898,3.7665,7.741)	(6.9489,0.3944,3.1655,7.543)	(6.8774,0.2366,2.8510,7.114)	(7.4172,0.1631,2.7403,7.5803)
3	(7.5710,0.1552,5.2186,7.726)	(6.9472,0.2927,4.6119,7.239)	(5.8600,0.3745,2.9738,6.374)	(6.5343,0.1907,3.0854,7.725)	(7.1744,0.1795,2.9197,7.354)	(6.9018,0.2238,2.8163,7.125)	(7.4343,0.1546,2.7028,7.5809)
1.2	(7.5247,0.1771,5.4765,7.701)	(6.8121,0.3775,4.9583,7.189)	(4.9444,1.3894,3.5519,6.333)	(5.5781,0.1357,4.1208,7.713)	(6.8099,0.4692,3.4523,7.279)	(6.4287,0.6253,3.3691,7.054)	(7.2657,0.2613,3.0985,7.5270)
1.3	(7.5354,0.1705,5.4332,7.705)	(6.6881,0.4687,5.1752,7.156)	(5.1918,1.1005,3.4389,6.292)	(7.4747,0.2169,4.3626,7.691)	(6.9960,0.3046,3.2714,7.300)	(6.4437,0.6224,3.3498,7.066)	(7.2783,0.2571,3.0757,7.5354)
2.3	(7.4496,0.2264,5.7313,7.676)	(6.8880,0.3238,4.8014,7.211)	(5.3105,0.9791,3.3591,6.289)	(7.4871,0.2125,4.3090,7.659)	(6.8516,0.4529,3.3768,7.304)	(6.7279,0.3529,3.1060,7.080)	(7.3086,0.2400,3.0086,7.5486)
1.2.3	(7.4277,0.2311,5.8598,7.658)	(6.6542,0.4780,5.2779,7.132)	(4.8344,1.4531,3.6725,6.287)	(7.4379,0.2317,4.5213,7.669)	(6.7356,0.5096,3.5967,7.245)	(6.3421,0.6718,3.5115,7.013)	(7.1874,0.3084,3.2726,7.4958)
15b							
1	(6.6370,0.0015,8.6360,6.638)	(5.2376,0.0441,7.6891,5.281)	(2.1597,0.1679,5.0880,2.327)	(6.3485,0.0029,7.3319,6.351)	(4.6404,0.0134,5.6877,4.653)	(3.9995,0.0904,5.4820,4.089)	(5.2739,0.0105,5.6169,5.2845)
2	(6.6267,0.0149,8.6657,6.641)	(5.2623,0.0336,7.6550,5.265)	(2.1687,0.1323,5.0839,2.301)	(6.3491,0.0023,7.3300,6.351)	(4.6483,0.0571,5.7014,4.675)	(4.0338,0.0140,5.4619,4.047)	(5.2757,0.0083,5.6142,5.2840)
3	(6.6277,0.0136,8.6627,6.641)	(5.2451,0.0318,7.6781,5.277)	(2.1934,0.0267,5.0778,2.220)	(6.3370,0.0187,7.3546,6.355)	(4.6443,0.0096,5.6837,4.653)	(3.9660,0.0128,5.4604,4.048)	(5.2771,0.0076,5.6130,5.2847)
1.2	(6.6256,0.0162,8.6709,6.641)	(5.2354,0.0474,7.6940,5.282)	(2.1276,0.2937,5.1013,2.421)	(6.3468,0.0052,7.3376,6.352)	(4.6400,0.0698,5.7119,4.679)	(3.9918,0.0355,5.4906,4.095)	(5.2685,0.0186,5.6264,5.2871)
1.3	(6.6266,0.0150,8.6679,6.641)	(5.2188,0.0742,7.7162,5.292)	(2.1512,0.1930,5.0968,2.344)	(6.3348,0.0214,7.3620,6.356)	(4.6357,0.0229,5.6944,4.658)	(3.9939,0.0245,5.4891,4.096)	(5.2698,0.0179,5.6293,5.2878)
2.3	(6.6165,0.0278,8.6974,6.644)	(5.2429,0.0352,7.6830,5.278)	(2.1602,0.1577,5.0928,2.317)	(6.3354,0.0208,7.3603,6.356)	(4.6138,0.0662,5.7080,4.680)	(4.0280,0.0267,5.4693,4.054)	(5.2716,0.0157,5.6226,5.2873)
1.2.3	(6.6154,0.0291,8.7022,6.644)	(5.2167,0.0773,7.7210,5.293)	(2.1194,0.3175,5.1099,2.436)	(6.3332,0.0236,7.3675,6.356)	(4.6054,0.0787,5.7183,4.684)	(3.9862,0.0115,5.4976,4.101)	(5.2644,0.0259,5.6329,5.2903)
16b							
1	(7.9080,0.1603,3.9699,8.068)	(6.9787,0.5497,4.5995,7.528)	(5.5089,1.5245,3.1384,7.033)	(7.8761,0.2011,3.2553,8.077)	(7.5285,0.3628,2.7050,7.891)	(6.7162,0.8444,3.0013,7.560)	(7.6908,0.3195,2.4924,8.0103)
2	(7.7719,0.2516,4.3139,8.023)	(7.5209,0.2637,3.4523,7.784)	(5.9537,1.2463,2.7748,7.200)	(7.9631,0.1795,3.2875,8.142)	(7.4139,0.5108,2.6602,7.924)	(7.3489,0.4314,2.3169,7.780)	(7.8257,0.2794,2.1293,8.1050)
3	(7.8115,0.2400,4.1259,8.051)	(7.2516,0.4498,3.8838,7.701)	(6.5961,0.6868,2.4241,7.282)	(7.8114,0.2828,3.1996,8.094)	(7.7346,0.2970,2.2276,8.031)	(7.4236,0.4074,2.1917,8.431)	(7.8753,0.2651,1.9978,8.1404)
1.2	(7.6941,0.2492,4.7995,7.943)	(6.5153,0.5481,4.7452,7.463)	(5.0235,1.8379,3.4969,6.861)	(7.7849,0.2211,3.6375,8.007)	(7.1795,0.5482,3.2470,7.727)	(6.5696,0.8643,2.2685,7.433)	(7.5457,0.3616,2.8523,7.9072)
1.3	(7.7213,0.2396,4.6911,7.960)	(6.7883,0.6145,4.9620,7.402)	(5.3280,1.5718,3.3473,6.899)	(7.6789,0.2877,3.8622,7.966)	(7.3940,0.4089,3.0019,7.802)	(6.5968,0.8633,2.2275,7.460)	(7.5700,0.3569,2.8000,7.9269)
2.3	(7.6285,0.2894,4.9774,7.915)	(7.1367,0.4580,4.2743,7.594)	(5.6863,1.3267,3.0984,7.013)	(7.7215,0.2858,3.6665,8.007)	(7.2829,0.5333,3.0157,7.815)	(7.1077,0.5232,2.7371,7.630)	(7.6636,0.3316,2.5763,7.9842)
1.2.3	(7.5821,0.2843,5.2477,7.866)	(6.1463,0.6116,5.0928,7.357)	(4.9056,1.8647,3.6279,6.770)	(7.6266,0.2922,4.0926,7.938)	(7.1012,0.5666,3.4200,7.667)	(6.4764,0.8836,3.4265,7.360)	(7.4584,0.3882,3.0588,7.8466)
17b							
1	(7.7445,0.0849,4.5991,7.829)	(6.8141,0.4228,4.9065,7.236)	(5.1483,1.2253,3.4084,6.373)	(7.7042,0.1180,3.7833,7.822)	(7.2670,0.2383,3.1130,7.505)	(6.4707,0.6694,3.3148,7.140)	(7.4676,0.2116,2.8969,7.6792)
2	(7.6450,0.1670,4.8952,7.812)	(7.1834,0.1159,4.1759,7.308)	(5.4650,0.9102,3.1725,6.375)	(7.5708,0.0894,3.5696,7.840)	(7.1622,0.3623,3.1359,7.524)	(6.9313,0.2511,2.8386,7.182)	(7.5495,0.1607,2.6798,7.7102)
3	(7.6702,0.1511,4.7825,7.821)	(7.0034,0.2934,4.4827,7.296)	(5.8947,0.3851,2.9486,6.279)	(6.4381,0.1813,3.8306,7.824)	(7.3889,0.1601,2.8364,7.549)	(6.9739,0.2424,2.7699,7.198)	(7.5779,0.1441,2.6061,7.7219)
1.2	(7.5973,0.1835,5.1870,7.780)	(6.7898,0.3713,5.0455,7.206)	(4.6164,1.5860,3.6734,6.352)	(6.4799,0.1490,4.0303,7.796)	(7.0025,0.4578,3.5112,7.470)	(6.8628,0.7103,3.5017,7.078)	(7.3679,0.2673,3.1455,7.6352)
1.3	(7.6175,0.1718,5.1060,7.789)	(6.6648,0.5094,5.2237,7.174)	(5.0166,1.3061,3.5593,6.322)	(6.4764,0.1696,4.0303,7.776)	(7.0025,0.4578,3.5112,7.470)	(6.8628,0.7103,3.5017,7.078)	(7.3679,0.2673,3.1455,7.6352)
2.3	(7.5417,0.2232,5.3457,7.764)	(6.9364,0.3267,4.7004,7.263)	(5.2910,1.0357,3.3724,6.326)	(6.5915,0.2036,4.0947,7.795)	(7.0779,0.4078,3.3426,7.485)	(6.7854,0.3593,3.0923,7.144)	(7.4504,0.2262,2.9495,7.6756)
1.2.3	(7.5100,0.2291,5.5341,7.739)	(6.6326,0.5161,5.3209,7.148)	(4.6724,1.6356,3.7741,6.307)	(7.5261,0.2267,4.3894,7.752)	(6.9433,0.4662,3.6406,7.409)	(6.2907,0.7486,3.6211,7.039)	(7.3033,0.3021,3.3005,7.6055)

Figure A.2 Decentralized Management Regime with Effort Factor (cont.)

18b	1	(6.7802,0.0023,8.1795,6.782)	(6.3247,0.0618,7.5615,5.386)	(2.1982,0.2402,5.0705,2.438)	(6.5447,0.0042,7.0830,6.548)	(5.1640,0.0159,5.6953,5.179)	(4.1448,0.1242,5.4632,4.269)	(5.6376,0.0133,5.5747,5.6509)	
	2	(6.7693,0.0161,8.2115,6.785)	(6.3609,0.0041,7.5116,5.385)	(2.2220,0.1495,5.0597,2.371)	(6.5461,0.0026,7.0801,6.548)	(5.1431,0.0532,5.7095,5.196)	(4.1965,0.0154,5.4303,4.211)	(5.6415,0.0082,5.5681,5.6497)	
	3	(6.7714,0.0135,8.2048,6.784)	(6.3434,0.0324,7.5938,5.375)	(2.2515,0.0279,5.0517,2.279)	(6.5345,0.0177,7.1048,6.552)	(5.1706,0.0082,5.6887,5.178)	(4.1995,0.0129,5.4278,4.212)	(5.6433,0.0069,5.5657,5.6502)	
	1,2	(6.7676,0.0126,8.2000,6.785)	(6.3322,0.0265,7.5672,5.387)	(2.1617,0.3789,5.0871,2.540)	(6.5400,0.0367,7.0899,6.548)	(5.1325,0.0680,5.7246,5.274)	(4.1381,0.1381,5.4730,4.274)	(5.6320,0.0213,5.5845,5.6532)	
	1,3	(6.7696,0.0156,8.2135,6.785)	(6.3056,0.0916,7.5897,5.397)	(2.1894,0.2655,5.0797,2.454)	(6.5313,0.0217,7.1166,6.553)	(5.1597,0.0239,5.7033,5.183)	(4.1931,0.1359,5.4706,4.275)	(5.6337,0.0200,5.5821,5.6537)	
	2,3	(6.7590,0.0288,8.2445,6.787)	(6.3408,0.0367,7.5397,5.377)	(2.2129,0.1788,5.0691,2.288)	(6.5326,0.0202,7.1186,6.552)	(5.1388,0.0609,5.7163,5.199)	(4.1505,0.0281,5.4381,4.218)	(5.6376,0.0150,5.5765,5.6525)	
	1,2,3	(6.7573,0.0398,8.2528,6.788)	(6.3032,0.0951,7.5953,5.398)	(2.1532,0.4029,5.0959,2.556)	(6.5294,0.0240,7.1234,6.553)	(5.1384,0.0756,5.7313,5.203)	(4.1307,0.1496,5.4803,4.219)	(5.6281,0.0278,5.5918,5.6559)	
	19b	1	(6.3313,0.1662,2.1667,7.195)	(4.9897,2.2050,1.5725,7.194)	(3.8962,2.9242,1.0000,6.820)	(6.5862,0.9644,1.3601,7.550)	(5.9310,1.3090,1.0000,7.240)	(5.4098,1.8005,1.0000,7.210)	(6.4887,0.9257,1.0000,7.4143)
		2	(6.8934,1.3510,2.2521,7.244)	(4.9759,1.4414,1.5516,7.017)	(4.0014,2.7683,1.0000,6.769)	(6.6634,0.9760,1.3191,7.589)	(5.7152,1.6329,1.0000,7.348)	(5.7938,1.2619,1.0000,7.054)	(6.5559,0.8585,1.0000,7.4144)
		3	(5.9207,1.3322,2.2324,7.252)	(5.1286,1.0836,1.5174,7.212)	(4.3658,2.1722,1.0000,6.598)	(6.3278,1.3170,1.3195,7.644)	(6.0995,1.1848,1.0000,7.284)	(5.8730,1.2285,1.0000,7.101)	(6.6120,0.8350,1.0000,7.4470)
		1,2	(5.4836,1.5127,2.6585,6.996)	(3.3820,2.5747,1.9184,6.956)	(2.9746,4.2904,1.0000,7.265)	(6.0414,1.2656,1.7431,7.307)	(4.9196,2.5694,1.0000,7.489)	(4.6973,2.6686,1.0000,7.385)	(5.8619,1.6597,1.0000,7.5217)
		1,3	(5.5027,1.4982,2.6478,7.001)	(4.1272,2.9883,1.8839,7.115)	(3.0882,4.0824,1.0000,7.170)	(6.5735,1.5764,1.7562,7.349)	(5.1886,2.2218,1.0223,7.410)	(4.7595,2.6452,1.0000,7.404)	(5.9126,1.6395,1.0000,7.5521)
2,3		(5.2104,1.8252,2.7094,7.035)	(4.4758,2.4828,1.8911,6.958)	(3.1606,3.9743,1.0000,7.134)	(6.5238,1.5564,1.7348,7.380)	(5.0492,2.4789,1.0000,7.528)	(5.0318,2.2541,1.0000,7.285)	(5.9721,1.5808,1.0000,7.5530)	
1,2,3		(4.9623,1.9123,2.9409,6.874)	(3.7476,3.2179,2.0960,6.965)	(2.4322,5.0634,1.0000,7.495)	(6.5361,1.7490,1.9868,7.185)	(4.4016,2.9996,1.1567,7.401)	(4.1610,3.2470,1.0747,7.408)	(5.3765,2.1013,1.1141,7.4778)	
20b		1	(5.5536,0.5130,2.6192,6.066)	(4.1808,1.6104,1.8659,5.791)	(3.0511,2.2899,1.0000,5.341)	(6.8249,0.6264,1.7326,6.451)	(5.0102,1.1058,1.0000,6.116)	(4.6216,1.5382,1.0000,6.159)	(5.7423,0.8192,1.0000,6.5615)
		2	(5.2535,0.9476,2.6826,6.201)	(4.5416,0.9178,1.8718,5.459)	(3.1152,2.1552,1.0000,5.270)	(6.8785,0.5904,1.7103,6.466)	(4.8940,1.3983,1.0000,6.292)	(4.8589,1.0584,1.0000,5.917)	(5.7977,0.7592,1.0000,6.5570)
		3	(5.2705,0.9279,2.6720,6.198)	(4.2645,1.4882,1.8376,5.752)	(3.2559,1.6199,1.0000,4.875)	(6.6319,0.9400,1.7152,6.571)	(5.1431,0.9990,1.0000,6.142)	(4.9237,1.0299,1.0000,5.953)	(5.8459,0.7382,1.0000,6.5842)
		1,2	(4.9973,1.1645,2.9225,6.161)	(3.7894,2.0373,2.0845,5.836)	(2.4554,3.5415,1.0000,5.996)	(6.5769,0.9507,1.9708,6.437)	(4.2797,2.1210,1.0981,6.400)	(4.0640,2.2956,1.0118,6.359)	(5.2337,1.4065,1.0715,6.6401)
		1,3	(5.0111,1.1491,2.9152,6.160)	(3.6081,2.4365,2.0499,6.044)	(2.4882,3.2892,1.0000,5.777)	(6.5677,1.2460,1.9796,6.513)	(4.4717,1.7578,1.1453,6.229)	(4.1172,2.2573,1.0276,6.374)	(5.2796,1.3780,1.0824,6.6576)
	2,3	(4.7860,1.4671,2.9619,6.253)	(3.8540,1.9423,2.0666,5.796)	(2.5349,3.1876,1.0000,5.722)	(6.5072,1.2242,1.9651,6.531)	(4.3882,2.0366,1.1049,6.424)	(4.2892,1.8535,1.0543,6.142)	(5.3276,1.3376,1.0719,6.6652)	
	1,2,3	(4.6057,1.5968,3.1247,6.202)	(3.3295,2.7171,2.2068,6.046)	(2.0440,4.2551,1.0001,6.299)	(6.50206,1.4511,2.1457,6.471)	(3.8971,2.5419,1.2362,6.439)	(3.6588,2.7457,1.1496,6.404)	(4.8672,1.7686,1.2144,6.6358)	
	21b	1	(1.6911,0.0432,4.3551,1.734)	(0.7384,0.2147,7.7772,0.953)	(0.3250,0.2416,1.1034,0.556)	(6.8300,0.0650,3.1746,1.748)	(0.8156,0.1296,1.6022,0.945)	(0.7507,0.2223,1.4635,0.973)	(1.2443,0.1146,1.7364,1.3589)
		2	(1.6750,0.1457,4.3522,1.820)	(0.7384,0.0853,8.0066,0.823)	(0.3257,0.2232,1.1034,0.548)	(6.6904,0.0999,3.1746,1.750)	(0.8376,0.2018,1.5895,1.039)	(0.7362,0.1253,1.4825,0.858)	(1.2693,0.1057,1.7366,1.3560)
		3	(1.6759,0.1414,4.3519,1.817)	(0.7403,0.1926,7.7768,0.932)	(0.3038,0.1425,1.1647,0.446)	(6.6762,0.1508,3.1663,1.827)	(0.8363,0.1153,1.6200,0.951)	(0.7462,0.1209,1.5003,0.867)	(1.2659,0.1020,1.7503,1.3680)
		1,2	(1.6630,0.1869,4.3649,1.849)	(0.7204,0.2957,8.2043,1.016)	(0.3169,0.4527,1.1042,0.769)	(6.6681,0.1232,3.1903,1.791)	(0.7969,0.3258,1.6043,1.122)	(0.7147,0.3417,1.4848,1.056)	(1.2104,0.2168,1.7534,1.4272)
		1,3	(1.6638,0.1828,4.3646,1.846)	(0.7222,0.3979,7.806,1.110)	(0.2955,0.3768,1.1654,0.672)	(6.6541,0.2130,3.1822,1.867)	(0.7957,0.2402,1.6382,1.035)	(0.7274,0.3372,1.5015,1.064)	(1.2261,0.2127,1.7658,1.4389)
2,3		(1.6483,0.2817,4.3617,1.930)	(0.7222,0.2740,2.8039,0.996)	(0.2961,0.3589,1.1654,0.555)	(6.6614,0.2081,3.1824,1.869)	(0.8172,0.3118,1.6220,1.129)	(0.7102,0.2415,1.5193,0.951)	(1.2321,0.2041,1.7662,1.4361)	
1,2,3		(1.6366,0.3212,4.3741,1.957)	(0.7050,0.4753,2.8075,1.180)	(0.2882,0.5817,1.1661,0.869)	(6.6396,0.2688,3.1976,1.908)	(0.7777,0.4313,1.6402,1.209)	(0.6925,0.4521,1.5212,1.144)	(1.1933,0.3116,1.7810,1.5048)	
22b		1	(6.3810,0.8937,2.1368,7.274)	(4.7973,2.4068,1.6464,7.204)	(3.6014,3.3773,1.0000,6.978)	(6.5812,0.9967,1.4085,7.578)	(5.9440,1.4370,1.0000,7.380)	(5.2095,2.0945,1.0000,7.304)	(6.4709,1.0366,1.0000,7.5075)
		2	(6.0829,1.2845,2.1119,7.367)	(5.6025,1.4583,1.5429,7.060)	(3.9322,2.8884,1.0000,6.820)	(6.7821,0.8949,1.2694,7.677)	(5.8886,1.5581,1.0000,7.446)	(5.7985,2.2983,1.0000,7.096)	(6.6621,0.8276,1.0000,7.4896)
		3	(6.1625,1.2332,2.0509,7.394)	(5.2341,2.0384,1.4785,7.262)	(4.3766,2.1775,1.0000,6.554)	(6.9191,1.2266,1.2329,7.742)	(6.3191,1.0654,1.0000,7.130)	(5.9323,1.1980,1.0000,7.130)	(6.7523,0.7610,1.0000,7.5132)
		1,2	(5.6136,1.4608,2.5864,7.074)	(4.2480,2.7330,1.9569,6.980)	(2.7617,4.6184,1.0000,6.350)	(6.0929,2.2666,1.7562,7.349)	(4.9184,1.0411,1.0715,6.534)	(4.5215,2.9284,1.0000,7.449)	(5.8738,1.7802,1.0000,7.6040)
		1,3	(5.6659,1.4224,2.5557,7.088)	(4.0475,3.0884,1.9101,7.135)	(2.8828,4.4038,1.0000,7.286)	(6.5775,1.5144,1.7552,7.391)	(5.2894,2.1573,1.0700,7.446)	(4.6162,2.8623,1.0000,7.478)	(5.9522,1.6741,1.0000,7.6263)
	2,3	(5.4495,1.7063,2.5613,7.149)	(4.5389,2.4498,1.8726,6.988)	(3.1130,4.0606,1.0000,7.173)	(6.0035,1.4598,1.6782,7.462)	(5.2721,2.3904,1.0000,7.602)	(5.0583,2.4594,1.0000,7.317)	(6.1225,1.4892,1.0000,7.6117)	
	1,2,3	(5.1485,1.8055,2.8419,6.954)	(3.6850,3.3044,2.1130,6.989)	(2.2746,5.3101,1.0000,7.584)	(6.55578,1.6730,1.9784,7.230)	(4.5424,2.8772,1.2050,7.471)	(4.0395,3.3853,1.1065,7.424)	(5.4465,2.0506,1.1508,7.4971)	

Figure A.2 Decentralized Management Regime with Effort Factor (cont.)

25b	1	5.7296,0.5762,2.5192,6.306	4.1151,1.8476,1.8879,5.962	3.0963,2.2744,1.0000,5.595	5.5419,0.6912,1.7249,6.633	5.1422,1.2352,1.0091,6.377	4.5169,1.0000,6.332	5.8166,0.9317,1.0000,6.7484	
	2	5.5010,0.9198,2.5236,6.420	4.6295,0.9538,1.8459,5.583	3.0963,2.2744,1.0000,5.595	5.5419,0.6912,1.7249,6.633	5.1422,1.2352,1.0091,6.377	4.5169,1.0000,6.332	5.8166,0.9317,1.0000,6.7484	
	3	5.5190,0.8646,2.4898,6.416	4.3849,1.4684,1.7960,5.853	3.2905,1.6372,1.0000,4.927	5.6656,0.8808,1.6303,6.748	5.4050,0.9173,1.0000,6.337	5.0206,1.0139,1.0000,6.034	6.0540,0.6823,1.0000,6.7362	
	1.2	5.1932,1.1599,2.8179,6.353	3.7381,2.3247,2.0986,5.972	2.3215,3.8823,1.0000,6.203	5.6094,0.9796,1.9575,6.589	4.4834,1.1569,1.1512,5.562	3.9675,2.5160,1.0439,6.483	5.3272,1.4466,1.1081,6.7738	
	1.3	5.2324,1.1186,2.7963,6.350	3.5897,2.5781,2.0554,6.167	2.3660,3.6174,1.0000,5.985	5.5335,1.2242,1.9567,6.657	4.6624,1.7533,1.1842,6.415	4.0477,2.4487,1.0511,6.496	5.3956,1.3972,1.1103,6.7928	
	2.3	5.0512,1.3867,2.8063,6.437	3.9457,1.9384,2.0418,5.884	2.5212,3.2886,1.0000,5.809	5.5283,1.1608,1.9028,6.689	4.6613,1.9294,1.1186,6.590	4.3519,1.8706,1.0575,6.222	5.5317,1.2783,1.0685,6.8100	
	1.2,3	4.8309,1.5232,3.0094,6.363	3.3142,2.8431,2.2107,6.157	1.9417,4.5215,1.0095,6.463	5.3912,1.4138,2.1236,6.604	4.0937,2.4846,1.2798,6.578	3.5972,2.9160,1.1724,6.513	4.9975,1.7578,1.2431,6.7554	
	24b	1	1.9663,0.0534,4.2566,2.019	0.7935,0.2719,2.7654,1.065	0.3332,0.3095,1.1026,0.642	1.9288,0.0785,3.1725,2.007	0.9679,0.1587,1.6753,1.126	0.7949,0.2827,1.4751,1.077	1.4194,0.1402,1.7855,1.5596
		2	1.9494,0.1482,4.2528,2.097	0.7983,0.0927,2.7888,0.891	0.3358,0.2443,1.1024,0.580	1.9409,0.0617,3.1695,2.002	0.9961,0.2142,1.6552,1.210	0.7807,0.1358,1.4945,0.916	1.4396,0.1103,1.7819,1.5439
		3	1.9524,0.1357,4.2517,2.087	0.8006,0.1965,2.7638,0.997	0.3138,0.1472,1.1638,0.461	1.9251,0.1462,3.1619,2.071	1.0006,0.1136,1.6872,1.114	0.7966,0.1236,1.5105,0.920	1.4510,0.1004,1.7933,1.5525
		1.2	1.9330,0.1988,4.2687,2.131	0.7736,0.3587,2.7935,1.132	0.3241,0.5370,1.1035,0.861	1.9122,0.1381,3.1887,2.050	0.9445,0.3656,1.6782,1.310	0.7557,0.4104,1.4975,1.166	1.3828,0.2460,1.8020,1.6288
		1.3	1.9350,0.1955,4.2674,2.132	0.7761,0.4562,2.7691,1.232	0.3028,0.4471,1.1634,0.749	1.9267,0.3214,3.1834,2.118	0.9487,0.2665,1.7083,1.215	0.7710,0.3985,1.5126,1.169	1.4013,0.2359,1.8125,1.6372
2.3		1.9195,0.2783,4.2638,2.197	0.7805,0.2848,2.7924,1.065	0.3051,0.3839,1.1646,0.688	1.9085,0.3052,3.1785,2.113	0.9762,0.3220,1.6902,1.298	0.7571,0.2543,1.5308,1.011	1.4153,0.2068,1.8099,1.6221	
1.2,3		1.9037,0.3268,4.2793,2.230	0.7569,0.5391,2.7969,1.295	0.2947,0.6677,1.1655,0.962	1.8807,0.2784,3.1973,2.159	0.9260,0.4681,1.7109,1.394	0.7331,0.5213,1.5334,1.254	1.3657,0.3383,1.8281,1.7040	
25b		1	6.4373,0.9288,2.1030,7.366	4.4850,2.7219,1.7607,7.206	3.1279,4.0970,1.0000,7.225	6.5719,1.0335,1.4811,7.605	5.9590,1.6160,1.0000,7.575	4.8596,2.5898,1.0000,7.449	6.4353,1.2057,1.0000,7.6411
		2	6.3524,1.1896,1.8995,7.543	5.6387,1.4815,1.5312,7.120	3.8239,3.0729,1.0000,6.896	6.5578,0.8483,1.1886,7.804	6.1630,1.4229,1.0000,7.585	5.8056,1.3825,1.0000,7.158	6.8283,0.7699,1.0000,7.5982
		3	6.5050,1.0972,1.7730,7.602	5.3654,1.9719,1.4197,7.337	4.3921,2.1852,1.0000,6.577	6.7914,1.0951,1.0884,7.889	6.6421,0.8872,1.0000,7.529	6.0208,1.1516,1.0000,7.172	6.9608,0.6502,1.0000,7.6110
		1.2	5.7856,1.3899,2.4872,7.175	4.0208,2.9908,2.0209,7.011	2.4268,5.1288,1.0000,7.555	6.1640,1.2382,1.7793,7.402	5.1201,2.4233,1.1431,7.543	4.2211,3.3211,1.0235,7.542	5.8947,1.7421,1.0653,7.6368
		1.3	5.8748,1.3264,2.4363,7.201	3.8904,3.2681,1.9615,7.158	2.5442,4.9263,1.0000,7.470	6.0157,1.4287,1.7605,7.445	5.4450,2.0463,1.1504,7.491	4.3544,3.2188,1.0144,7.573	6.0031,1.6718,1.0471,7.6749
	2.3	5.7774,1.5439,2.3945,7.321	4.6298,2.4020,1.8458,7.031	3.0382,4.1935,1.0000,7.231	6.2652,1.3221,1.5821,7.588	5.6245,2.0824,1.0014,7.707	5.0972,2.2668,1.0000,7.364	6.3568,1.3406,1.0000,7.6974	
	1.2,3	5.4006,1.6633,2.7046,7.083	3.5598,3.4638,2.1459,7.023	2.0222,5.6591,1.0010,7.721	5.7273,1.5669,1.9685,7.294	4.7715,2.6725,1.2826,7.444	3.8268,3.6230,1.1597,7.449	5.5560,1.9661,1.2115,7.5221	
	26b	1	5.9496,0.6672,2.3923,6.616	3.9695,2.2293,1.9352,6.198	2.5984,3.4030,1.0000,6.001	6.0908,0.7808,1.7240,6.671	5.3345,3.4778,1.0955,6.682	4.3050,2.2943,1.0000,6.599	5.9099,1.1072,1.0000,7.0171
		2	5.8521,0.8779,2.2818,6.730	4.7542,1.0071,1.8087,5.761	3.0612,2.4600,1.0000,5.521	6.3557,0.5769,1.5337,6.937	5.5255,1.2757,1.0000,6.801	4.9939,1.1534,1.0000,6.157	6.2489,0.7047,1.0000,6.9547
		3	5.9230,0.7779,2.2088,6.730	4.5635,1.4383,1.7326,6.001	3.3417,1.6626,1.0000,5.004	6.5084,0.7952,1.4873,7.003	5.8904,0.7868,1.0000,6.677	5.1651,0.9875,1.0000,6.153	6.5654,0.5946,1.0000,6.9600
		1.2	5.4543,1.1516,2.6746,6.606	3.6232,2.5548,2.1295,6.177	2.0954,4.4286,1.0000,6.524	5.7884,1.0139,1.9425,6.802	4.6847,0.9899,1.2353,6.783	3.7852,2.8761,1.0986,6.661	5.4663,1.4889,1.1726,6.9552
		1.3	5.5252,1.0842,2.6352,6.609	3.5213,2.8228,2.0761,6.344	2.1523,4.1674,1.0000,6.319	5.6595,1.1957,1.9287,6.855	4.9478,1.7295,1.2492,6.677	3.8983,2.7759,1.0950,6.674	5.5598,1.4192,1.1609,6.9791
2.3		5.4316,1.2734,2.5691,6.705	4.0790,1.9330,2.0047,6.012	2.4956,3.4445,1.0000,5.940	5.8533,1.0676,1.7977,6.920	5.0933,1.1322,1.8441	4.4437,1.8934,1.0632,6.337	5.8469,1.1803,1.0571,7.0272	
1.2,3		5.1399,1.4472,2.8469,6.586	3.2573,3.0605,2.2252,6.317	1.7672,4.9496,1.0262,6.716	5.4298,1.3581,2.0957,6.787	4.4047,3.3691,1.3499,6.773	3.4697,3.2034,1.2125,6.673	5.1926,1.7299,1.2917,6.9225	
27b		1	2.4115,0.0723,4.0908,2.483	0.8791,0.3855,2.7474,1.264	0.3443,0.4467,1.1015,0.791	2.3420,0.1034,3.1522,2.445	1.2677,2.0106,1.7895,1.478	0.8633,0.4033,1.4928,1.266	1.7391,0.1866,1.8587,1.9257
		2	2.4050,0.1506,4.0935,2.546	0.8952,0.1048,2.7630,1.000	0.3512,0.2796,1.1000,0.630	2.3641,0.0640,3.1424,2.428	1.3083,2.2020,1.7649,1.538	0.8582,0.1571,1.5122,1.011	1.7710,0.1157,1.8497,1.8966
		3	2.4020,0.1263,4.0908,2.528	0.8985,0.2021,2.7432,1.000	0.3294,0.1546,1.1604,0.484	2.3468,0.1377,3.1355,2.488	1.3339,1.0188,1.7908,1.432	0.8789,0.1376,1.5255,1.006	1.7940,0.0964,1.8572,1.8804
		1.2	2.3705,0.2190,4.1064,2.589	0.8560,0.4807,2.7770,1.336	0.3327,0.6987,1.1036,1.032	2.3227,0.1642,3.1694,2.486	1.2348,0.4301,1.7938,1.664	0.8190,0.5433,1.5171,1.362	1.6984,0.2959,1.8759,1.9943
		1.3	2.3769,0.1953,4.1035,2.572	0.8595,0.5698,2.7516,1.429	0.3127,0.5968,1.1639,0.899	2.3025,0.2385,3.1629,2.112	1.2497,0.3121,1.8186,1.561	0.8387,0.5193,1.5296,1.358	1.7213,0.2768,1.8841,1.9980
	2.3	2.3616,0.2714,4.0963,2.633	0.8747,0.3018,2.7732,1.176	0.3190,0.4251,1.1634,0.744	2.3270,0.1989,3.1534,2.525	1.2893,0.3329,1.7954,1.622	0.8335,0.2745,1.5479,1.108	1.7525,0.2082,1.8748,1.9606	
	1.2,3	2.3369,0.3367,4.1186,2.673	0.8372,0.6607,2.7809,1.497	0.3033,0.8310,1.1647,1.134	2.2868,0.2948,3.1797,2.581	1.2178,0.5260,1.8226,1.743	0.7959,0.6539,1.5521,1.449	1.6817,0.3825,1.9006,2.0642	

Figure A.2 Decentralized Management Regime with Effort Factor (cont.)

1c	1	2	3	1.2	1.3	2.3	1.2.3
1	(3.9310,3.9310,0.0000,7.9808)	(3.8281,4.1528,0.0000,7.9808)	(3.7640,4.2074,0.0000,7.9714)	(5.5473,2.5987,0.0000,8.1461)	(5.5155,2.6250,0.0000,8.1405)	(5.2859,2.9101,0.0000,8.1960)	(6.3277,1.9555,0.0000,8.2832)
2	(4.1528,3.8281,0.0000,7.9808)	(3.8992,3.8992,0.0000,7.7983)	(3.9119,4.0308,0.0000,7.9427)	(5.6966,2.4939,0.0000,8.1359)	(5.5135,2.6825,0.0000,8.1960)	(5.5732,2.5395,0.0000,8.1128)	(6.4502,1.8273,0.0000,8.2775)
3	(4.2074,3.7640,0.0000,7.9714)	(4.0308,3.9119,0.0000,7.9427)	(3.8869,3.8869,0.0000,7.7738)	(5.5927,2.6034,0.0000,8.1960)	(5.7193,2.4072,0.0000,8.1264)	(5.6278,2.4810,0.0000,8.1088)	(6.4936,1.7819,0.0000,8.2754)
1.2	(2.5987,5.5473,0.0000,8.1461)	(2.4393,5.6966,0.0000,8.1359)	(2.6034,5.5927,0.0000,8.1960)	(4.1214,4.1214,0.0000,8.2429)	(4.1088,4.1743,0.0000,8.2832)	(4.0101,4.2673,0.0000,8.2775)	(5.0989,3.2415,0.0000,8.3405)
1.3	(2.6250,5.5155,0.0000,8.1405)	(2.6825,5.5135,0.0000,8.1960)	(2.4072,5.7193,0.0000,8.1264)	(4.1743,4.1088,0.0000,8.2832)	(4.1183,4.1183,0.0000,8.2366)	(4.0419,4.2336,0.0000,8.2754)	(5.1393,3.2087,0.0000,8.3390)
2.3	(2.9101,5.2859,0.0000,8.1960)	(2.5395,5.5732,0.0000,8.1128)	(2.4810,5.6278,0.0000,8.1088)	(4.2673,4.0101,0.0000,8.2775)	(4.2336,4.0419,0.0000,8.2754)	(4.1089,4.1089,0.0000,8.2178)	(5.2220,3.1127,0.0000,8.3347)
1.2.3	(1.9555,6.3277,0.0000,8.2832)	(1.8273,6.4502,0.0000,8.2775)	(1.7819,6.4936,0.0000,8.2754)	(3.2415,5.0989,0.0000,8.3405)	(3.2087,5.1303,0.0000,8.3390)	(3.1127,5.2220,0.0000,8.3347)	(4.1914,4.1914,0.0000,8.3828)
2c	1	2	3	1.2	1.3	2.3	1.2.3
1	(2.6956,2.6956,0.0000,5.3911)	(2.7474,2.9804,0.0000,5.7278)	(2.6914,3.0085,0.0000,5.6998)	(4.2574,1.9944,0.0000,6.2518)	(4.2230,2.0098,0.0000,6.2329)	(4.1437,2.2813,0.0000,6.4250)	(5.1528,1.5924,0.0000,6.7453)
2	(2.9804,2.7474,0.0000,5.7278)	(2.6113,2.6113,0.0000,5.2226)	(2.7662,2.8503,0.0000,5.6165)	(4.3534,1.8642,0.0000,6.2176)	(4.3221,2.1029,0.0000,6.4250)	(4.2183,1.9221,0.0000,6.1404)	(5.2393,1.4842,0.0000,6.7235)
3	(3.0085,2.6914,0.0000,5.6998)	(2.8503,2.7662,0.0000,5.6165)	(2.5800,2.9800,0.0000,5.1599)	(4.3842,2.0408,0.0000,6.4250)	(4.3535,1.8323,0.0000,6.1858)	(4.2527,1.8748,0.0000,6.1275)	(5.2698,1.4460,0.0000,6.7158)
1.2	(1.9944,4.2574,0.0000,6.2518)	(1.8642,4.3534,0.0000,6.2176)	(2.0408,4.3842,0.0000,6.4250)	(3.2970,3.2970,0.0000,6.5941)	(3.3460,3.3993,0.0000,6.7235)	(3.2573,3.4662,0.0000,6.7235)	(4.2610,2.7088,0.0000,6.9698)
1.3	(2.0098,4.2230,0.0000,6.2329)	(2.1029,4.3221,0.0000,6.4250)	(1.8323,4.3535,0.0000,6.1858)	(3.3993,3.3460,0.0000,6.7453)	(3.3856,3.3856,0.0000,6.5712)	(3.2801,3.4357,0.0000,6.7158)	(4.2843,2.6796,0.0000,6.9639)
2.3	(2.2813,4.1437,0.0000,6.4250)	(1.9221,4.2183,0.0000,6.1404)	(1.8748,4.2527,0.0000,6.1275)	(3.4663,3.2573,0.0000,6.7235)	(3.4357,3.2801,0.0000,6.7158)	(3.2514,3.2514,0.0000,6.5027)	(4.3524,2.5943,0.0000,6.9468)
1.2.3	(1.5924,5.1528,0.0000,6.7453)	(1.4842,5.2393,0.0000,6.7235)	(1.4460,5.2698,0.0000,6.7158)	(2.7088,4.2610,0.0000,6.9698)	(2.6796,4.2843,0.0000,6.9639)	(2.5943,4.3524,0.0000,6.9468)	(3.5717,3.5717,0.0000,7.1433)
3c	1	2	3	1.2	1.3	2.3	1.2.3
1	(0.2037,0.2037,0.0000,0.4074)	(0.2292,0.2486,0.0000,0.4778)	(0.2226,0.2488,0.0000,0.4714)	(0.4236,0.1984,0.0000,0.6220)	(0.4173,0.1986,0.0000,0.6159)	(0.4403,0.2424,0.0000,0.6828)	(0.6264,0.1936,0.0000,0.8200)
2	(0.2486,0.2292,0.0000,0.4778)	(0.1885,0.1885,0.0000,0.3770)	(0.2231,0.2299,0.0000,0.4530)	(0.4278,0.1832,0.0000,0.6110)	(0.4593,0.2235,0.0000,0.6828)	(0.4032,0.1837,0.0000,0.5869)	(0.6307,0.1787,0.0000,0.8094)
3	(0.2488,0.2226,0.0000,0.4714)	(0.2299,0.2231,0.0000,0.4530)	(0.1831,0.1831,0.0000,0.3663)	(0.4659,0.2169,0.0000,0.6828)	(0.4229,0.1780,0.0000,0.6009)	(0.4046,0.1784,0.0000,0.5830)	(0.6322,0.1735,0.0000,0.8057)
1.2	(0.1984,0.4236,0.0000,0.6220)	(0.1832,0.4278,0.0000,0.6110)	(0.2169,0.4659,0.0000,0.6828)	(0.3753,0.3753,0.0000,0.7506)	(0.4067,0.4132,0.0000,0.8200)	(0.3921,0.4173,0.0000,0.8094)	(0.5761,0.3662,0.0000,0.9423)
1.3	(0.1986,0.4173,0.0000,0.6159)	(0.2235,0.4593,0.0000,0.6828)	(0.1780,0.4229,0.0000,0.6009)	(0.4132,0.4067,0.0000,0.8200)	(0.3704,0.3704,0.0000,0.7409)	(0.3935,0.4122,0.0000,0.8057)	(0.5776,0.3612,0.0000,0.9388)
2.3	(0.2424,0.4403,0.0000,0.6828)	(0.1837,0.4032,0.0000,0.5869)	(0.1784,0.4046,0.0000,0.5830)	(0.4173,0.3921,0.0000,0.8094)	(0.4122,0.3935,0.0000,0.8057)	(0.3564,0.3564,0.0000,0.7128)	(0.5818,0.3468,0.0000,0.9285)
1.2.3	(0.1936,0.6264,0.0000,0.8200)	(0.1787,0.6307,0.0000,0.8094)	(0.1735,0.6322,0.0000,0.8057)	(0.3663,0.5761,0.0000,0.9423)	(0.3612,0.5776,0.0000,0.9388)	(0.3468,0.5818,0.0000,0.9285)	(0.5288,0.5288,0.0000,1.0575)
4c	1	2	3	1.2	1.3	2.3	1.2.3
1	(4.0189,4.0189,0.0000,8.0379)	(3.5546,4.5381,0.0000,8.0926)	(3.673,4.7032,0.0000,8.0705)	(5.4614,2.7805,0.0000,8.2419)	(5.3733,2.8562,0.0000,8.2294)	(4.9536,3.3041,0.0000,8.2578)	(6.1731,2.1695,0.0000,8.3426)
2	(4.5381,3.5546,0.0000,8.0926)	(3.9361,0.0000,7.8721)	(3.8142,4.1728,0.0000,7.9870)	(5.9156,2.3005,0.0000,8.2161)	(5.6697,2.5880,0.0000,8.2578)	(5.5430,2.6083,0.0000,8.1514)	(6.5541,1.7730,0.0000,8.3271)
3	(4.7032,3.3673,0.0000,8.0705)	(4.1728,3.8142,0.0000,7.9870)	(3.9012,3.9012,0.0000,8.1931)	(5.8921,2.3656,0.0000,8.2578)	(5.9902,2.2029,0.0000,8.1931)	(5.7079,2.4324,0.0000,8.1403)	(6.6792,1.6428,0.0000,8.3220)
1.2	(2.805,5.4614,0.0000,8.2419)	(2.3005,5.9156,0.0000,8.2161)	(2.3656,5.8921,0.0000,8.2578)	(4.1579,4.1579,0.0000,8.3159)	(4.0814,4.2612,0.0000,8.3426)	(3.7678,5.5592,0.0000,8.3271)	(5.0257,3.3635,0.0000,8.3893)
1.3	(2.8562,5.3733,0.0000,8.2294)	(2.5880,5.6697,0.0000,8.2578)	(2.2029,5.9902,0.0000,8.1931)	(4.2612,4.0814,0.0000,8.3426)	(4.1507,4.1507,0.0000,8.3015)	(3.8549,4.4670,0.0000,8.3220)	(5.1124,3.2733,0.0000,8.3857)
2.3	(3.3041,4.9536,0.0000,8.2578)	(2.6083,5.5430,0.0000,8.1514)	(2.4324,5.7079,0.0000,8.1403)	(4.5592,3.7678,0.0000,8.3271)	(4.4670,3.8549,0.0000,8.3220)	(4.1234,4.1234,0.0000,8.2469)	(5.4054,2.9684,0.0000,8.3738)
1.2.3	(2.1695,6.1731,0.0000,8.3426)	(1.7730,6.5541,0.0000,8.3271)	(1.6428,6.6792,0.0000,8.3220)	(3.3635,5.0257,0.0000,8.3893)	(3.2733,5.1124,0.0000,8.3738)	(2.9684,5.4054,0.0000,8.3738)	(4.2112,4.2112,0.0000,8.4224)

Figure A.3 Centralized Management Regime without Effort Factor

5c	1	(2.9504, 2.9504, 0.0000, 6.9008)	(2.5048, 3.4986, 0.0000, 6.0034)	(4.2734, 2.2234, 0.0000, 6.5906)	(4.2734, 2.2234, 0.0000, 6.5906)	(3.9888, 2.6606, 0.0000, 6.6494)	(5.1636, 1.8147, 0.0000, 6.9783)	
	2	(3.4064, 2.6681, 0.0000, 6.0745)	(2.7092, 2.7092, 0.0000, 5.4185)	(4.6777, 1.8190, 0.0000, 6.4967)	(4.5654, 2.0830, 0.0000, 6.6494)	(4.2636, 2.6606, 0.0000, 6.2699)	(5.4437, 1.4726, 0.0000, 6.9163)	
	3	(3.4986, 2.5048, 0.0000, 6.0034)	(3.0020, 2.7440, 0.0000, 5.7460)	(2.6164, 2.6164, 0.0000, 5.2329)	(4.7445, 1.9048, 0.0000, 6.6494)	(4.6899, 1.7247, 0.0000, 6.4146)	(5.5348, 1.3613, 0.0000, 6.8961)	
	1.2	(2.2234, 4.3671, 0.0000, 6.5906)	(1.8190, 4.6777, 0.0000, 6.4967)	(1.9048, 4.7445, 0.0000, 6.6494)	(3.4360, 3.4360, 0.0000, 6.9783)	(3.4140, 3.5643, 0.0000, 6.9163)	(4.2956, 2.8749, 0.0000, 7.1705)	
	1.3	(2.2715, 4.2734, 0.0000, 6.5449)	(2.0839, 4.5654, 0.0000, 6.6494)	(1.7247, 4.6899, 0.0000, 6.4146)	(3.5643, 3.4140, 0.0000, 6.9783)	(3.4079, 3.4079, 0.0000, 6.8158)	(4.3625, 2.7932, 0.0000, 7.1557)	
	2.3	(2.6606, 3.9888, 0.0000, 6.6494)	(2.0663, 4.2636, 0.0000, 6.2699)	(1.8623, 4.3700, 0.0000, 6.2329)	(3.7888, 3.1295, 0.0000, 6.9163)	(3.7017, 3.1945, 0.0000, 6.8961)	(4.5870, 2.5189, 0.0000, 7.1060)	
	1.2,3	(1.8147, 5.1636, 0.0000, 6.9783)	(1.4726, 5.4437, 0.0000, 6.9163)	(1.3613, 5.5348, 0.0000, 6.8961)	(2.8749, 4.2956, 0.0000, 7.1705)	(2.7932, 4.3625, 0.0000, 7.1557)	(3.6561, 3.6561, 0.0000, 7.3121)	
	1	(0.2600, 0.2600, 0.0000, 0.5200)	(0.2492, 0.3182, 0.0000, 0.5674)	(0.2284, 0.3190, 0.0000, 0.5473)	(0.4964, 0.2527, 0.0000, 0.7749)	(0.4766, 0.2533, 0.0000, 0.7749)	(0.4649, 0.3101, 0.0000, 0.7749)	(0.7011, 0.2464, 0.0000, 0.9475)
	2	(0.3182, 0.2492, 0.0000, 0.5674)	(0.2063, 0.2063, 0.0000, 0.4126)	(0.2302, 0.2518, 0.0000, 0.4820)	(0.5115, 0.1989, 0.0000, 0.7104)	(0.5321, 0.2429, 0.0000, 0.7104)	(0.4271, 0.2010, 0.0000, 0.6280)	(0.7169, 0.1939, 0.0000, 0.9108)
	3	(0.3190, 0.2284, 0.0000, 0.5473)	(0.2518, 0.2302, 0.0000, 0.4820)	(0.1894, 0.1894, 0.0000, 0.3787)	(0.5529, 0.2220, 0.0000, 0.7749)	(0.4963, 0.1825, 0.0000, 0.6157)	(0.4317, 0.1840, 0.0000, 0.6157)	(0.7218, 0.1775, 0.0000, 0.8993)
	1.2	(0.2527, 0.4964, 0.0000, 0.7749)	(0.1989, 0.5115, 0.0000, 0.7104)	(0.2220, 0.5529, 0.0000, 0.7749)	(0.4429, 0.4429, 0.0000, 0.8858)	(0.4636, 0.4840, 0.0000, 0.9108)	(0.4121, 0.4987, 0.0000, 0.9108)	(0.6456, 0.4320, 0.0000, 1.0776)
1.3	(0.2533, 0.4766, 0.0000, 0.7299)	(0.2429, 0.5321, 0.0000, 0.7749)	(0.1825, 0.4963, 0.0000, 0.6789)	(0.4840, 0.4636, 0.0000, 0.9475)	(0.4278, 0.4278, 0.0000, 0.8557)	(0.4166, 0.4827, 0.0000, 0.8993)	(0.6503, 0.4163, 0.0000, 1.0666)	
2.3	(0.3101, 0.4649, 0.0000, 0.7749)	(0.2010, 0.4271, 0.0000, 0.6280)	(0.1840, 0.4317, 0.0000, 0.6157)	(0.4987, 0.4121, 0.0000, 0.9108)	(0.4827, 0.4166, 0.0000, 0.8993)	(0.3785, 0.3785, 0.0000, 0.7570)	(0.6655, 0.3655, 0.0000, 1.0309)	
1.2,3	(0.2464, 0.7011, 0.0000, 0.9475)	(0.1939, 0.7169, 0.0000, 0.9108)	(0.1775, 0.7218, 0.0000, 0.9108)	(0.4320, 0.6456, 0.0000, 1.0776)	(0.4163, 0.6503, 0.0000, 1.0666)	(0.3655, 0.6655, 0.0000, 1.0309)	(0.5964, 0.5964, 0.0000, 1.1927)	
7c	1	(4.1194, 4.1194, 0.0000, 8.2389)	(3.1316, 5.1042, 0.0000, 8.2358)	(2.7811, 5.4255, 0.0000, 8.2066)	(5.3259, 3.0344, 0.0000, 8.3603)	(5.1731, 3.1718, 0.0000, 8.3449)	(4.4190, 3.9241, 0.0000, 8.3431)	(5.9345, 2.4871, 0.0000, 8.4216)
	2	(5.1042, 3.1316, 0.0000, 8.2358)	(3.9863, 3.9863, 0.0000, 7.9727)	(3.6642, 4.3857, 0.0000, 8.0499)	(6.2440, 2.0770, 0.0000, 8.3210)	(5.9356, 2.4075, 0.0000, 8.3431)	(5.4961, 2.7095, 0.0000, 8.2056)	(6.7282, 1.6676, 0.0000, 8.3957)
	3	(5.4255, 2.7811, 0.0000, 8.2066)	(4.3857, 3.6642, 0.0000, 8.0499)	(3.9218, 3.9218, 0.0000, 7.8435)	(6.3316, 2.0115, 0.0000, 8.3431)	(6.4055, 1.8832, 0.0000, 8.2887)	(5.8287, 2.3567, 0.0000, 8.1853)	(6.9603, 1.4279, 0.0000, 8.3882)
	1.2	(3.0344, 5.3259, 0.0000, 8.3603)	(2.0770, 6.2440, 0.0000, 8.3210)	(2.0115, 6.3316, 0.0000, 8.3431)	(4.2042, 4.2042, 0.0000, 8.4083)	(4.0563, 4.3653, 0.0000, 8.4216)	(3.3825, 5.0132, 0.0000, 8.3957)	(4.9187, 3.5360, 0.0000, 8.4547)
	1.3	(3.1718, 5.1731, 0.0000, 8.3449)	(2.4075, 5.9356, 0.0000, 8.3431)	(1.8832, 6.4055, 0.0000, 8.2887)	(4.3653, 4.0563, 0.0000, 8.4216)	(4.1948, 4.1948, 0.0000, 8.3882)	(3.5315, 4.8567, 0.0000, 8.3882)	(5.0689, 3.3809, 0.0000, 8.4498)
	2.3	(3.9241, 4.1900, 0.0000, 8.3431)	(2.7095, 5.4961, 0.0000, 8.2056)	(2.3567, 5.8287, 0.0000, 8.1853)	(5.0132, 3.3825, 0.0000, 8.3957)	(4.8567, 3.5315, 0.0000, 8.3882)	(4.1440, 4.1440, 0.0000, 8.2881)	(5.7039, 2.7252, 0.0000, 8.4291)
	1.2,3	(2.4871, 5.9345, 0.0000, 8.4216)	(1.6676, 6.7282, 0.0000, 8.3957)	(1.4279, 6.9603, 0.0000, 8.3882)	(3.5360, 4.3187, 0.0000, 8.4547)	(3.3809, 5.0689, 0.0000, 8.4498)	(2.7252, 5.7039, 0.0000, 8.4291)	(4.2384, 4.2384, 0.0000, 8.4768)
	1	(3.2897, 3.2897, 0.0000, 6.5793)	(2.4974, 4.0707, 0.0000, 6.5681)	(2.1900, 4.2724, 0.0000, 6.4625)	(4.4914, 2.5589, 0.0000, 7.0504)	(4.3318, 2.6560, 0.0000, 6.9878)	(3.6973, 3.2832, 0.0000, 6.9805)	(5.1502, 2.1584, 0.0000, 7.3086)
	2	(4.0707, 2.4974, 0.0000, 6.5681)	(2.8518, 2.8518, 0.0000, 5.7036)	(2.7093, 3.2353, 0.0000, 5.9383)	(5.1720, 1.7204, 0.0000, 6.8923)	(4.9662, 2.0143, 0.0000, 6.9805)	(4.3262, 2.1328, 0.0000, 6.4590)	(5.7682, 1.4296, 0.0000, 7.1978)
	3	(4.2724, 2.1900, 0.0000, 6.4625)	(3.2353, 2.7093, 0.0000, 5.9383)	(2.6707, 2.6707, 0.0000, 5.3414)	(5.2975, 1.6830, 0.0000, 6.9805)	(5.2292, 1.5374, 0.0000, 6.7666)	(4.5483, 1.8390, 0.0000, 6.3873)	(5.9461, 1.2198, 0.0000, 7.1659)
	1.2	(2.5589, 4.4914, 0.0000, 7.0504)	(1.7204, 5.1720, 0.0000, 6.8923)	(1.6830, 5.2975, 0.0000, 6.9805)	(3.6257, 3.6257, 0.0000, 7.2514)	(3.5202, 3.7884, 0.0000, 7.3086)	(2.8999, 4.2979, 0.0000, 7.1978)	(4.3368, 3.1176, 0.0000, 7.4544)
1.3	(2.6560, 4.3318, 0.0000, 6.9878)	(2.0143, 4.9662, 0.0000, 6.9805)	(1.5374, 5.2292, 0.0000, 6.7666)	(3.7884, 3.5202, 0.0000, 7.3086)	(3.5859, 3.5859, 0.0000, 7.1718)	(3.0169, 4.1490, 0.0000, 7.1659)	(4.4587, 2.9739, 0.0000, 7.4326)	
2.3	(3.2832, 3.6973, 0.0000, 6.9805)	(2.1328, 4.3262, 0.0000, 6.4590)	(1.8390, 4.5483, 0.0000, 6.3873)	(4.2979, 2.8999, 0.0000, 7.1978)	(4.1490, 3.0169, 0.0000, 7.1659)	(3.3820, 3.3820, 0.0000, 6.7640)	(4.9678, 2.3735, 0.0000, 7.3413)	
1.2,3	(2.1584, 5.1502, 0.0000, 7.3086)	(1.4296, 5.7682, 0.0000, 7.1978)	(1.2198, 5.9461, 0.0000, 7.1659)	(3.1176, 4.3368, 0.0000, 7.4544)	(2.9739, 4.4587, 0.0000, 7.4326)	(2.3735, 4.9678, 0.0000, 7.3413)	(3.7773, 3.7773, 0.0000, 7.5547)	
9c	1	(0.3722, 0.3722, 0.0000, 0.7443)	(0.2812, 0.4584, 0.0000, 0.7396)	(0.2362, 0.4608, 0.0000, 0.6970)	(0.6328, 0.3605, 0.0000, 0.9933)	(0.5910, 0.3624, 0.0000, 0.9534)	(0.5026, 0.4463, 0.0000, 0.9489)	(0.8383, 0.3513, 0.0000, 1.1896)
	2	(0.4584, 0.2812, 0.0000, 0.7396)	(0.2361, 0.2361, 0.0000, 0.4723)	(0.2411, 0.2886, 0.0000, 0.5298)	(0.6732, 0.2239, 0.0000, 0.8972)	(0.6751, 0.2738, 0.0000, 0.9489)	(0.4660, 0.2297, 0.0000, 0.6957)	(0.8802, 0.2182, 0.0000, 1.0984)
	3	(0.4608, 0.2362, 0.0000, 0.6970)	(0.2886, 0.2411, 0.0000, 0.5298)	(0.1991, 0.1991, 0.0000, 0.3981)	(0.7201, 0.2288, 0.0000, 0.9489)	(0.6418, 0.1887, 0.0000, 0.8305)	(0.4763, 0.1936, 0.0000, 0.6689)	(0.8913, 0.1829, 0.0000, 1.0742)
	1.2	(0.3605, 0.6328, 0.0000, 0.9933)	(0.2239, 0.6732, 0.0000, 0.8972)	(0.2288, 0.7201, 0.0000, 1.1411)	(0.5795, 0.5705, 0.0000, 1.1411)	(0.5790, 0.6166, 0.0000, 1.1896)	(0.4425, 0.6559, 0.0000, 1.0984)	(0.7738, 0.5563, 0.0000, 1.3300)
	1.3	(0.3624, 0.5910, 0.0000, 0.9534)	(0.2738, 0.6751, 0.0000, 0.9489)	(0.1887, 0.6418, 0.0000, 1.1896)	(0.6166, 0.5790, 0.0000, 1.1896)	(0.5993, 0.5993, 0.0000, 1.0742)	(0.4522, 0.6219, 0.0000, 1.0742)	(0.7842, 0.5231, 0.0000, 1.3073)
	2.3	(0.4463, 0.5026, 0.0000, 0.9489)	(0.2297, 0.4660, 0.0000, 0.6957)	(0.1926, 0.4763, 0.0000, 0.6689)	(0.6559, 0.4425, 0.0000, 1.0984)	(0.6219, 0.4522, 0.0000, 1.0742)	(0.4146, 0.4146, 0.0000, 0.8292)	(0.8248, 0.3941, 0.0000, 1.2189)
	1.2,3	(0.3513, 0.8383, 0.0000, 1.1896)	(0.2182, 0.8802, 0.0000, 1.0984)	(0.1829, 0.8913, 0.0000, 1.0742)	(0.5563, 0.7738, 0.0000, 1.3300)	(0.5231, 0.7842, 0.0000, 1.3073)	(0.3941, 0.8248, 0.0000, 1.2189)	(0.7217, 0.7217, 0.0000, 1.4494)

Figure A.3 Centralized Management Regime without Effort Factor (cont.)

10c	1	(3.9310,3.9310,0.0000,7.8621)	(3.8281,4.1528,0.0000,7.9808)	(3.7640,4.2074,0.0000,7.9714)	(5.5473,2.5987,0.0000,8.1461)	(5.5155,2.6250,0.0000,8.1405)	(5.2859,2.9101,0.0000,8.1960)	(6.3277,1.9555,0.0000,8.2832)
	2	(4.1528,3.8281,0.0000,7.9808)	(3.8992,3.8992,0.0000,7.7983)	(3.9119,4.0308,0.0000,7.9427)	(5.6966,2.4393,0.0000,8.1359)	(5.5732,2.6825,0.0000,8.1960)	(5.5732,2.5395,0.0000,8.1128)	(6.4502,1.8273,0.0000,8.2775)
	3	(4.2074,3.7640,0.0000,7.9714)	(4.0308,3.9119,0.0000,7.9427)	(3.8869,3.8869,0.0000,7.7738)	(5.5927,2.6034,0.0000,8.1960)	(5.7193,2.4072,0.0000,8.1264)	(5.6278,2.4810,0.0000,8.1088)	(6.4936,1.7819,0.0000,8.2754)
	1,2	(2.5987,5.5473,0.0000,8.1461)	(2.4393,5.6966,0.0000,8.1359)	(2.6034,5.927,0.0000,8.1960)	(4.1124,4.1124,0.0000,8.2429)	(4.1088,4.1743,0.0000,8.2832)	(4.0101,4.2673,0.0000,8.2775)	(5.0989,3.2415,0.0000,8.3405)
	1,3	(2.6250,5.5155,0.0000,8.1405)	(2.6825,5.5135,0.0000,8.1960)	(2.4072,7.1193,0.0000,8.1264)	(4.1183,4.1183,0.0000,8.2366)	(4.0419,4.2336,0.0000,8.2754)	(5.1303,3.2087,0.0000,8.3390)	(5.1303,3.2087,0.0000,8.3390)
	2,3	(2.9101,5.2859,0.0000,8.1960)	(2.5395,5.5732,0.0000,8.1128)	(2.4810,5.6278,0.0000,8.1088)	(4.2673,4.0101,0.0000,8.2775)	(4.2336,4.0419,0.0000,8.2754)	(4.1089,4.1089,0.0000,8.2178)	(5.2220,3.1127,0.0000,8.3347)
	1,2,3	(1.9555,6.3277,0.0000,8.2832)	(1.8273,6.4502,0.0000,8.2775)	(1.7819,6.4936,0.0000,8.2754)	(3.2415,5.0989,0.0000,8.3405)	(3.2087,5.1303,0.0000,8.3390)	(3.1127,5.2220,0.0000,8.3347)	(4.1914,4.1914,0.0000,8.3828)
	1	(2.6956,2.6956,0.0000,5.3911)	(2.7474,2.9804,0.0000,5.7278)	(2.6914,3.0085,0.0000,5.6998)	(4.2574,1.9944,0.0000,6.2518)	(4.2230,2.0098,0.0000,6.3329)	(4.1437,2.2813,0.0000,6.4250)	(5.1528,1.5924,0.0000,6.7453)
	2	(2.9804,2.7474,0.0000,5.7278)	(2.6113,2.6113,0.0000,5.2226)	(2.7662,2.8503,0.0000,5.6165)	(4.3534,1.8642,0.0000,6.2176)	(4.3221,2.1029,0.0000,6.4250)	(4.2183,1.9221,0.0000,6.1404)	(5.2393,1.4842,0.0000,6.7235)
	3	(3.0085,2.6914,0.0000,5.6998)	(2.8503,2.7662,0.0000,5.6165)	(2.5800,2.5800,0.0000,5.1599)	(4.3842,2.0408,0.0000,6.4250)	(4.3535,1.8323,0.0000,6.1858)	(4.2527,1.8748,0.0000,6.1275)	(5.2698,1.4460,0.0000,6.7158)
1,2	(1.9944,4.2574,0.0000,6.2518)	(1.8642,4.3534,0.0000,6.2176)	(2.0408,4.3842,0.0000,6.4250)	(3.2970,3.2970,0.0000,6.5941)	(3.3460,3.3993,0.0000,6.7453)	(3.2573,4.4662,0.0000,6.7235)	(4.2610,2.7088,0.0000,6.9698)	
1,3	(2.0098,4.2230,0.0000,6.2329)	(2.1029,4.3221,0.0000,6.4250)	(1.8323,3.5355,0.0000,6.1858)	(3.3993,3.4660,0.0000,6.7453)	(3.2856,3.2856,0.0000,6.5712)	(3.2801,4.3457,0.0000,6.7158)	(4.2843,2.6796,0.0000,6.9639)	
2,3	(2.2813,4.1437,0.0000,6.4250)	(1.9221,4.2183,0.0000,6.1404)	(1.8748,4.2527,0.0000,6.1275)	(3.4662,3.2573,0.0000,6.7235)	(3.4357,2.8011,0.0000,6.7158)	(3.2514,3.2514,0.0000,6.5027)	(4.3524,2.5943,0.0000,6.9468)	
1,2,3	(1.5924,5.1528,0.0000,6.7453)	(1.4842,5.2393,0.0000,6.7235)	(1.4460,5.2698,0.0000,6.7158)	(2.7088,4.2610,0.0000,6.9698)	(2.6796,4.2843,0.0000,6.9639)	(2.5943,4.3524,0.0000,6.9468)	(3.5717,3.5717,0.0000,7.1433)	
11c	1	(0.2037,0.2037,0.0000,0.4074)	(0.2292,0.2486,0.0000,0.4778)	(0.2226,0.2488,0.0000,0.4714)	(0.4236,0.1984,0.0000,0.6220)	(0.4173,0.1986,0.0000,0.6159)	(0.4403,0.2424,0.0000,0.6828)	(0.6264,0.1936,0.0000,0.8200)
	2	(0.2486,0.2292,0.0000,0.4778)	(0.1885,0.1885,0.0000,0.3770)	(0.2231,0.2299,0.0000,0.4530)	(0.4278,0.1832,0.0000,0.6110)	(0.4593,0.2235,0.0000,0.6828)	(0.4032,0.1837,0.0000,0.5869)	(0.6307,0.1787,0.0000,0.8094)
	3	(0.2488,0.2226,0.0000,0.4714)	(0.2299,0.2231,0.0000,0.4530)	(0.1831,0.1831,0.0000,0.3663)	(0.4659,0.2169,0.0000,0.6828)	(0.4229,0.1780,0.0000,0.6009)	(0.4046,0.1784,0.0000,0.5830)	(0.6322,0.1735,0.0000,0.8057)
	1,2	(0.1984,0.4236,0.0000,0.6220)	(0.1832,0.4278,0.0000,0.6110)	(0.2169,0.4659,0.0000,0.6828)	(0.3753,0.3753,0.0000,0.7506)	(0.3921,0.4132,0.0000,0.8200)	(0.3921,0.4173,0.0000,0.8094)	(0.5761,0.3662,0.0000,0.9423)
	1,3	(0.1986,0.4173,0.0000,0.6159)	(0.2235,0.4593,0.0000,0.6828)	(0.1780,0.4229,0.0000,0.6009)	(0.4132,0.4067,0.0000,0.8200)	(0.3704,0.3704,0.0000,0.7409)	(0.3935,0.4122,0.0000,0.8057)	(0.5776,0.3612,0.0000,0.9388)
	2,3	(0.2424,0.4403,0.0000,0.6828)	(0.1837,0.4032,0.0000,0.5869)	(0.1784,0.4046,0.0000,0.5830)	(0.4173,0.3921,0.0000,0.8094)	(0.4122,0.3935,0.0000,0.8057)	(0.3564,0.3564,0.0000,0.7128)	(0.5818,0.3468,0.0000,0.9285)
	1,2,3	(0.1936,0.6264,0.0000,0.8200)	(0.1787,0.6307,0.0000,0.8094)	(0.1735,0.6332,0.0000,0.8057)	(0.3662,0.5761,0.0000,0.9423)	(0.3612,0.5776,0.0000,0.9388)	(0.3468,0.5818,0.0000,0.9285)	(0.5288,0.5288,0.0000,1.0575)
	1	(4.0189,4.0189,0.0000,8.0379)	(3.5546,4.5381,0.0000,8.0926)	(3.5673,4.7032,0.0000,8.0705)	(5.4614,2.7805,0.0000,8.2419)	(5.3733,2.8562,0.0000,8.2294)	(4.9536,3.2041,0.0000,8.2578)	(6.1731,2.1695,0.0000,8.3426)
	2	(4.5381,3.5546,0.0000,8.0926)	(3.9361,3.9361,0.0000,7.8721)	(3.8142,4.1728,0.0000,7.9870)	(5.9156,2.3005,0.0000,8.2161)	(5.6697,2.5880,0.0000,8.2578)	(5.5430,2.6043,0.0000,8.1514)	(6.5541,1.7730,0.0000,8.3271)
	3	(4.7032,3.9673,0.0000,8.0705)	(4.1728,3.8142,0.0000,7.9870)	(3.9012,3.9012,0.0000,7.8023)	(5.8921,2.3656,0.0000,8.2578)	(5.9902,2.2029,0.0000,8.1931)	(5.7079,2.4324,0.0000,8.1403)	(6.6792,1.6428,0.0000,8.3220)
1,2	(2.7805,5.4614,0.0000,8.2419)	(2.3005,5.9156,0.0000,8.2161)	(2.3656,5.8921,0.0000,8.2578)	(4.1579,4.1579,0.0000,8.3159)	(4.0814,4.2612,0.0000,8.3426)	(3.7678,4.5592,0.0000,8.3221)	(5.0257,3.3635,0.0000,8.3893)	
1,3	(2.8562,5.3733,0.0000,8.2294)	(2.5880,5.6697,0.0000,8.2578)	(2.2029,5.9079,0.0000,8.1931)	(4.2612,4.0814,0.0000,8.3426)	(4.1507,4.1507,0.0000,8.3015)	(3.8549,4.4670,0.0000,8.3220)	(5.1124,3.2733,0.0000,8.3857)	
2,3	(3.3041,4.9536,0.0000,8.2578)	(2.6083,5.5430,0.0000,8.1514)	(2.4324,5.7079,0.0000,8.1403)	(4.5592,3.7678,0.0000,8.3271)	(4.4670,3.8549,0.0000,8.3220)	(4.2394,4.1234,0.0000,8.2469)	(5.4054,2.9684,0.0000,8.3738)	
1,2,3	(2.1695,6.1731,0.0000,8.3426)	(1.7730,6.5541,0.0000,8.3271)	(1.6428,6.6792,0.0000,8.3220)	(3.3635,5.0357,0.0000,8.3893)	(3.2733,5.1124,0.0000,8.3857)	(2.9684,5.4054,0.0000,8.3738)	(4.2112,4.2112,0.0000,8.4224)	
14c	1	(2.9504,2.9504,0.0000,5.9008)	(2.6681,3.4064,0.0000,6.0745)	(2.5048,4.4986,0.0000,6.0034)	(4.3671,2.2234,0.0000,6.5906)	(4.2734,2.2715,0.0000,6.5449)	(3.9888,3.6606,0.0000,6.6494)	(5.1656,1.8147,0.0000,6.9783)
	2	(3.4064,2.6681,0.0000,6.0745)	(2.7092,2.7092,0.0000,5.4185)	(2.7440,3.0020,0.0000,5.7460)	(4.6777,1.8190,0.0000,6.4967)	(4.5654,2.0839,0.0000,6.6494)	(4.2636,2.0663,0.0000,6.2699)	(5.4437,1.4726,0.0000,6.9163)
	3	(3.4986,2.5048,0.0000,6.0034)	(3.0020,2.7440,0.0000,5.7460)	(2.6164,3.6164,0.0000,5.2329)	(4.7445,1.9048,0.0000,6.6494)	(4.6899,1.7247,0.0000,6.4146)	(4.3700,1.8623,0.0000,6.2323)	(5.5348,1.3613,0.0000,6.8961)
	1,2	(2.2234,4.3671,0.0000,6.5906)	(1.8190,4.6777,0.0000,6.4967)	(1.9048,4.7445,0.0000,6.6494)	(3.4360,3.4360,0.0000,6.8720)	(3.4140,3.5643,0.0000,6.9783)	(3.1295,3.7868,0.0000,6.9163)	(4.2956,2.8749,0.0000,7.1705)
	1,3	(2.2715,4.2734,0.0000,6.5449)	(2.0839,4.5654,0.0000,6.6494)	(1.7247,4.6899,0.0000,6.4146)	(3.5643,3.4140,0.0000,6.9783)	(3.4079,3.4079,0.0000,6.8158)	(3.1945,3.7017,0.0000,6.8961)	(4.3625,2.7932,0.0000,7.1557)
	2,3	(2.6606,3.9888,0.0000,6.6494)	(2.0663,4.2636,0.0000,6.2699)	(1.8623,4.3700,0.0000,6.2323)	(3.7868,3.1295,0.0000,6.9163)	(3.7017,3.1945,0.0000,6.8961)	(3.3045,3.3045,0.0000,6.6089)	(4.5870,2.5189,0.0000,7.1060)
	1,2,3	(1.8147,5.1636,0.0000,6.9783)	(1.4726,5.4437,0.0000,6.9163)	(1.3613,5.5348,0.0000,6.8961)	(2.8749,4.2956,0.0000,7.1705)	(2.7932,4.3625,0.0000,7.1557)	(2.5189,4.5870,0.0000,7.1060)	(3.6561,3.6561,0.0000,7.3121)

Figure A.3 Centralized Management Regime without Effort Factor (cont.)

15c	1	(0.2600,0.2600,0.0000,0.5200)	(0.2492,0.3182,0.0000,0.5674)	(0.2284,0.3190,0.0000,0.5473)	(0.4964,0.2527,0.0000,0.7491)	(0.4756,0.2533,0.0000,0.7299)	(0.4649,0.3101,0.0000,0.7749)	(0.7011,0.2464,0.0000,0.9475)	
	2	(0.3182,0.2492,0.0000,0.5674)	(0.2063,0.2063,0.0000,0.4126)	(0.2302,0.2516,0.0000,0.4820)	(0.5115,0.1989,0.0000,0.7104)	(0.5321,0.2429,0.0000,0.7749)	(0.4271,0.2010,0.0000,0.6280)	(0.7169,0.1939,0.0000,0.9108)	
	3	(0.3190,0.2284,0.0000,0.5473)	(0.2518,0.2302,0.0000,0.4820)	(0.1894,0.1894,0.0000,0.3787)	(0.5529,0.2220,0.0000,0.7749)	(0.4963,0.1825,0.0000,0.6789)	(0.4317,0.1840,0.0000,0.6157)	(0.7218,0.1775,0.0000,0.8993)	
	1.2	(0.2527,0.4964,0.0000,0.7491)	(0.1989,0.5115,0.0000,0.7104)	(0.2220,0.5529,0.0000,0.7749)	(0.4429,0.4636,0.0000,0.8858)	(0.4636,0.4840,0.0000,0.9475)	(0.4121,0.4987,0.0000,0.9108)	(0.6456,0.4320,0.0000,1.0776)	
	1.3	(0.2533,0.4766,0.0000,0.7299)	(0.2429,0.5321,0.0000,0.7749)	(0.1825,0.4963,0.0000,0.6789)	(0.4840,0.4636,0.0000,0.9475)	(0.4278,0.4278,0.0000,0.8557)	(0.4166,0.4827,0.0000,0.8993)	(0.6503,0.4163,0.0000,1.0666)	
	2.3	(0.3101,0.4649,0.0000,0.7749)	(0.2010,0.4271,0.0000,0.6280)	(0.1840,0.4317,0.0000,0.6157)	(0.4987,0.4121,0.0000,0.9108)	(0.4827,0.4166,0.0000,0.8993)	(0.3785,0.3785,0.0000,0.7570)	(0.6655,0.3655,0.0000,1.0309)	
	1.2,3	(0.2464,0.7011,0.0000,0.9475)	(0.1939,0.7169,0.0000,0.9108)	(0.1775,0.7218,0.0000,0.8993)	(0.4320,0.6456,0.0000,1.0776)	(0.4163,0.6503,0.0000,1.0666)	(0.3655,0.6655,0.0000,1.0309)	(0.5964,0.5964,0.0000,1.1927)	
	16c	1	(4.1194,4.1194,0.0000,8.2389)	(3.1316,5.1042,0.0000,8.2358)	(2.7811,5.4255,0.0000,8.2066)	(5.3259,3.0344,0.0000,8.3603)	(5.1731,3.1718,0.0000,8.3449)	(4.4190,3.9241,0.0000,8.3431)	(5.9345,2.4871,0.0000,8.4216)
		2	(5.1042,3.1316,0.0000,8.2358)	(3.9863,3.9863,0.0000,7.9727)	(3.6642,4.3857,0.0000,8.0499)	(6.2440,2.0770,0.0000,8.3210)	(5.9356,2.4075,0.0000,8.3431)	(5.4961,2.7095,0.0000,8.2056)	(6.7282,1.6676,0.0000,8.3957)
		3	(5.4255,2.7811,0.0000,8.2066)	(4.3857,3.6642,0.0000,8.0499)	(3.9218,3.9218,0.0000,7.8435)	(6.3316,2.0115,0.0000,8.3431)	(6.4055,1.8832,0.0000,8.2887)	(5.8287,2.3567,0.0000,8.1853)	(6.9603,1.4279,0.0000,8.3882)
1.2		(3.0344,5.3259,0.0000,8.3603)	(2.0770,6.2440,0.0000,8.3210)	(2.0115,6.3316,0.0000,8.3431)	(4.2042,4.2042,0.0000,8.4216)	(4.0563,4.3653,0.0000,8.4216)	(3.3825,0.0132,0.0000,8.3957)	(4.9187,3.5360,0.0000,8.4547)	
1.3		(3.1718,5.1731,0.0000,8.3431)	(2.4075,5.9356,0.0000,8.3431)	(1.8832,6.4055,0.0000,8.2887)	(4.3653,4.0563,0.0000,8.4216)	(4.1948,4.1948,0.0000,8.3896)	(3.5315,4.8567,0.0000,8.3882)	(5.0689,3.3809,0.0000,8.4498)	
2.3		(3.9241,4.4190,0.0000,8.3431)	(2.7095,5.4961,0.0000,8.2056)	(2.3567,5.8287,0.0000,8.1853)	(5.0132,3.3825,0.0000,8.3957)	(4.8567,3.5315,0.0000,8.3882)	(4.1440,4.1440,0.0000,8.2881)	(5.7039,2.7252,0.0000,8.4291)	
1.2,3		(2.4871,5.9345,0.0000,8.4216)	(1.6676,6.7282,0.0000,8.3957)	(1.4279,6.9605,0.0000,8.3882)	(3.5360,4.9187,0.0000,8.4547)	(3.3809,5.0689,0.0000,8.4498)	(2.7252,5.7039,0.0000,8.4291)	(4.2384,4.2384,0.0000,8.4768)	
17c		1	(3.2897,3.2897,0.0000,6.5793)	(2.4974,4.0707,0.0000,6.5681)	(2.1900,4.2724,0.0000,6.4625)	(4.4914,2.5589,0.0000,7.0504)	(4.3318,2.6560,0.0000,6.9878)	(3.6973,2.2832,0.0000,6.9805)	(5.1502,2.1584,0.0000,7.3086)
		2	(4.0707,2.4974,0.0000,6.5681)	(2.8518,2.8518,0.0000,5.7036)	(2.7031,3.2353,0.0000,5.9383)	(5.1720,1.7204,0.0000,6.8923)	(4.9662,2.0143,0.0000,6.9805)	(4.3262,2.1328,0.0000,6.4590)	(5.7682,1.4296,0.0000,7.1978)
		3	(4.2724,2.1900,0.0000,6.4625)	(3.2353,2.7031,0.0000,5.9383)	(2.6707,2.6707,0.0000,5.3414)	(5.2975,1.6830,0.0000,6.9805)	(5.2922,1.5374,0.0000,6.7666)	(4.5483,1.8390,0.0000,6.3873)	(5.9461,1.2198,0.0000,7.1659)
	1.2	(2.5589,4.4914,0.0000,7.0504)	(1.7204,5.1720,0.0000,6.8923)	(1.6830,5.2975,0.0000,6.9805)	(3.6257,3.6257,0.0000,7.2514)	(3.5202,3.7884,0.0000,7.3086)	(2.8999,4.2979,0.0000,7.1978)	(4.3368,3.1176,0.0000,7.4544)	
	1.3	(2.6560,4.3318,0.0000,6.9878)	(2.0143,4.9662,0.0000,6.9805)	(1.5374,5.2292,0.0000,6.7666)	(3.7884,3.5202,0.0000,7.3086)	(3.5859,3.5859,0.0000,7.1718)	(3.0169,4.1490,0.0000,7.1659)	(4.4587,2.9739,0.0000,7.4326)	
	2.3	(3.2832,3.6973,0.0000,6.9805)	(2.1328,4.3262,0.0000,6.4590)	(1.8390,4.5483,0.0000,6.3873)	(4.2979,2.8999,0.0000,7.1978)	(4.1490,3.0169,0.0000,7.1659)	(3.3820,3.3820,0.0000,6.7640)	(4.9678,2.3735,0.0000,7.3413)	
	1.2,3	(2.1584,5.1502,0.0000,7.3086)	(1.4296,5.7682,0.0000,7.1978)	(1.2198,5.9461,0.0000,7.1659)	(3.1176,4.3368,0.0000,7.4544)	(2.9739,4.4587,0.0000,7.4326)	(2.3735,4.9678,0.0000,7.3413)	(3.7773,3.7773,0.0000,7.5547)	
	18c	1	(0.3722,0.3722,0.0000,0.7443)	(0.2812,0.4584,0.0000,0.7396)	(0.2362,0.4608,0.0000,0.6970)	(0.6328,0.3605,0.0000,0.9933)	(0.5910,0.3624,0.0000,0.9534)	(0.5026,0.4463,0.0000,0.9489)	(0.8383,0.3513,0.0000,1.1896)
		2	(0.4584,0.2812,0.0000,0.7396)	(0.2361,0.2361,0.0000,0.4723)	(0.2411,0.2886,0.0000,0.5298)	(0.6732,0.2239,0.0000,0.8972)	(0.6751,0.2738,0.0000,0.9489)	(0.4660,0.2297,0.0000,0.6957)	(0.8802,0.2182,0.0000,1.0984)
		3	(0.4608,0.2362,0.0000,0.6970)	(0.2886,0.2411,0.0000,0.3981)	(0.1991,0.1991,0.0000,0.3981)	(0.7201,0.2288,0.0000,0.9933)	(0.6418,0.1887,0.0000,0.8305)	(0.4763,0.1926,0.0000,0.6689)	(0.8913,0.1829,0.0000,1.0742)
1.2		(0.3605,0.6328,0.0000,0.9933)	(0.2239,0.6732,0.0000,0.8972)	(0.2288,0.7201,0.0000,0.9489)	(0.5705,0.5705,0.0000,1.1411)	(0.5730,0.6166,0.0000,1.1896)	(0.4425,0.6559,0.0000,1.0984)	(0.7738,0.5563,0.0000,1.3300)	
1.3		(0.3624,0.5910,0.0000,0.9534)	(0.2738,0.6751,0.0000,0.9489)	(0.1887,0.6418,0.0000,0.8305)	(0.6166,0.5730,0.0000,1.1896)	(0.5393,0.5393,0.0000,1.0785)	(0.4522,0.6213,0.0000,1.0742)	(0.7842,0.5231,0.0000,1.3073)	
2.3		(0.4463,0.5026,0.0000,0.9489)	(0.2297,0.4660,0.0000,0.6957)	(0.1926,0.4763,0.0000,0.6689)	(0.6559,0.4425,0.0000,1.0984)	(0.6219,0.4522,0.0000,1.0742)	(0.4146,0.4146,0.0000,0.8292)	(0.8248,0.3941,0.0000,1.2189)	
1.2,3		(0.3513,0.8383,0.0000,1.1896)	(0.2182,0.8802,0.0000,1.0984)	(0.1829,0.8913,0.0000,1.0742)	(0.5563,0.7738,0.0000,1.3300)	(0.5231,0.7842,0.0000,1.3073)	(0.3941,0.8248,0.0000,1.2189)	(0.7217,0.7217,0.0000,1.4434)	

Figure A.3 Centralized Management Regime without Effort Factor (cont.)

19c	1	(3.9310,3.9310,0.0000,7.8621)	(3.8281,4.1528,0.0000,7.9808)	(3.7640,4.2074,0.0000,7.9714)	(5.5473,2.5987,0.0000,8.1461)	(5.5155,2.6250,0.0000,8.1405)	(5.2859,2.9101,0.0000,8.1960)	(6.3277,1.9555,0.0000,8.2832)	
	2	(4.1528,3.8281,0.0000,7.9808)	(3.8992,3.8992,0.0000,7.7983)	(3.9119,4.0308,0.0000,7.9427)	(5.6966,2.4393,0.0000,8.1359)	(5.5135,2.6825,0.0000,8.1960)	(5.5732,2.5395,0.0000,8.1128)	(6.4502,1.8273,0.0000,8.2775)	
	3	(4.2074,3.7640,0.0000,7.9714)	(4.0308,3.9119,0.0000,7.9427)	(3.8869,3.8869,0.0000,7.7738)	(5.5927,2.6034,0.0000,8.1960)	(5.7193,2.4072,0.0000,8.1264)	(5.6278,2.4810,0.0000,8.1088)	(6.4936,1.7819,0.0000,8.2754)	
	1,2	(2.5987,5.5473,0.0000,8.1461)	(2.4393,5.6966,0.0000,8.1359)	(2.6034,5.5927,0.0000,8.1960)	(4.1214,4.1214,0.0000,8.2429)	(4.1088,4.1743,0.0000,8.2832)	(4.0101,4.2673,0.0000,8.2775)	(5.0989,3.2415,0.0000,8.3405)	
	1,3	(2.6250,5.5155,0.0000,8.1405)	(2.6825,5.5135,0.0000,8.1960)	(2.4072,5.7193,0.0000,8.1264)	(4.1743,4.1088,0.0000,8.2832)	(4.1183,4.1183,0.0000,8.2366)	(4.0419,4.2386,0.0000,8.2754)	(5.1303,3.2087,0.0000,8.3390)	
	2,3	(2.9101,5.2859,0.0000,8.1960)	(2.5395,5.5732,0.0000,8.1128)	(2.4810,5.6278,0.0000,8.1088)	(4.2673,4.0419,0.0000,8.2775)	(4.2336,4.0419,0.0000,8.2178)	(4.1089,4.2386,0.0000,8.2178)	(5.2220,3.1127,0.0000,8.3347)	
	1,2,3	(1.9555,6.3277,0.0000,8.2832)	(1.8273,6.4502,0.0000,8.2775)	(1.7819,6.4936,0.0000,8.2754)	(3.2415,5.0989,0.0000,8.3405)	(3.2087,5.1303,0.0000,8.3390)	(3.1127,5.2220,0.0000,8.3347)	(4.1914,4.1914,0.0000,8.3828)	
	20c	1	(2.6956,2.6956,0.0000,5.3911)	(2.7474,2.9804,0.0000,5.7278)	(2.6914,3.0085,0.0000,5.6998)	(4.2574,1.9944,0.0000,6.2518)	(4.2230,2.0098,0.0000,6.2329)	(4.1437,2.2813,0.0000,6.4250)	(5.1528,1.5924,0.0000,6.7453)
		2	(2.9804,2.7474,0.0000,5.7278)	(2.6113,2.6113,0.0000,5.2226)	(2.662,2.9503,0.0000,5.6165)	(4.3534,1.8642,0.0000,6.2176)	(4.3221,2.1029,0.0000,6.4250)	(4.2183,1.9221,0.0000,6.1404)	(5.2393,1.4842,0.0000,6.7158)
		3	(3.0805,2.6914,0.0000,5.6998)	(2.8503,2.7662,0.0000,5.6165)	(2.5800,2.5800,0.0000,5.1599)	(4.3842,2.0408,0.0000,6.4250)	(4.3535,1.8323,0.0000,6.1858)	(4.2527,1.8748,0.0000,6.1275)	(5.2698,1.4460,0.0000,6.7158)
		1,2	(1.9944,4.2574,0.0000,6.2518)	(1.8642,4.3534,0.0000,6.2176)	(1.8423,4.3842,0.0000,6.4250)	(3.2970,3.2970,0.0000,6.5941)	(3.2430,3.3993,0.0000,6.7453)	(3.2573,3.4662,0.0000,6.7235)	(4.2610,2.7088,0.0000,6.9698)
		1,3	(2.0098,4.2230,0.0000,6.2329)	(2.1029,4.3221,0.0000,6.4250)	(1.8323,4.3555,0.0000,6.1858)	(3.3993,3.3460,0.0000,6.7453)	(3.2856,3.2856,0.0000,6.5712)	(3.2801,3.4357,0.0000,6.7158)	(4.2843,2.6796,0.0000,6.9639)
		2,3	(2.2813,4.1437,0.0000,6.4250)	(1.9221,4.2183,0.0000,6.1404)	(1.8748,4.2527,0.0000,6.1275)	(3.4662,3.2573,0.0000,6.7235)	(3.4357,3.2801,0.0000,6.7158)	(3.2514,3.2514,0.0000,6.5027)	(4.3524,2.5943,0.0000,6.9468)
1,2,3		(1.5924,5.1528,0.0000,6.7453)	(1.4842,5.2393,0.0000,6.7235)	(1.4460,5.2698,0.0000,6.7158)	(2.7088,4.2610,0.0000,6.9698)	(2.6796,4.2843,0.0000,6.9639)	(2.5943,4.3524,0.0000,6.9468)	(3.5717,3.5717,0.0000,7.1433)	
21c		1	(0.2037,0.2037,0.0000,0.4074)	(0.2292,0.2486,0.0000,0.4778)	(0.2226,0.2488,0.0000,0.4714)	(0.4236,0.1984,0.0000,0.6220)	(0.4173,0.1986,0.0000,0.6159)	(0.4403,0.2424,0.0000,0.6828)	(0.6264,0.1936,0.0000,0.8200)
		2	(0.2486,0.2292,0.0000,0.4778)	(0.1885,0.1885,0.0000,0.3770)	(0.2231,0.2299,0.0000,0.4530)	(0.4278,0.1832,0.0000,0.6110)	(0.4593,0.2235,0.0000,0.6828)	(0.4032,0.1837,0.0000,0.5869)	(0.6307,0.1787,0.0000,0.8094)
		3	(0.2488,0.2226,0.0000,0.4714)	(0.2299,0.2231,0.0000,0.4530)	(0.1831,0.1831,0.0000,0.3663)	(0.4659,0.2169,0.0000,0.6828)	(0.4229,0.1780,0.0000,0.6009)	(0.4046,0.1784,0.0000,0.5830)	(0.6322,0.1735,0.0000,0.8057)
		1,2	(0.1984,0.4236,0.0000,0.6220)	(0.1832,0.4278,0.0000,0.6110)	(0.2169,0.4659,0.0000,0.6828)	(0.3753,0.3753,0.0000,0.7906)	(0.4067,0.4132,0.0000,0.8200)	(0.3921,0.4173,0.0000,0.8094)	(0.5761,0.3662,0.0000,0.9423)
		1,3	(0.1986,0.4173,0.0000,0.6159)	(0.2235,0.4593,0.0000,0.6828)	(0.1780,0.4429,0.0000,0.6009)	(0.4132,0.4067,0.0000,0.8200)	(0.3704,0.3704,0.0000,0.7409)	(0.3935,0.4122,0.0000,0.8057)	(0.5776,0.3612,0.0000,0.9388)
		2,3	(0.2424,0.4403,0.0000,0.6828)	(0.1837,0.4032,0.0000,0.5869)	(0.1784,0.4046,0.0000,0.5830)	(0.4173,0.3921,0.0000,0.8094)	(0.4122,0.3935,0.0000,0.8057)	(0.3564,0.3564,0.0000,0.7128)	(0.5818,0.3468,0.0000,0.9285)
	1,2,3	(0.1936,0.6264,0.0000,0.8300)	(0.1787,0.6307,0.0000,0.8094)	(0.1735,0.6322,0.0000,0.8057)	(0.3662,0.5761,0.0000,0.9423)	(0.3612,0.5776,0.0000,0.9388)	(0.3468,0.5818,0.0000,0.9285)	(0.5288,0.5288,0.0000,1.0575)	
	22c	1	(4.0189,4.0189,0.0000,8.0379)	(3.5546,4.5381,0.0000,8.0926)	(3.3673,4.7032,0.0000,8.0705)	(5.4614,2.7805,0.0000,8.2419)	(5.3733,2.8562,0.0000,8.2294)	(4.9536,3.3041,0.0000,8.2578)	(6.1731,2.1695,0.0000,8.3426)
		2	(4.5381,3.5546,0.0000,8.0926)	(3.9361,3.9361,0.0000,7.8721)	(3.8142,4.1728,0.0000,7.9870)	(5.9156,2.3065,0.0000,8.2161)	(5.6697,2.5880,0.0000,8.2578)	(5.5430,2.6083,0.0000,8.1514)	(6.5541,1.7730,0.0000,8.3271)
		3	(4.7032,3.3673,0.0000,8.0705)	(4.1728,3.8142,0.0000,7.9870)	(3.9012,3.9012,0.0000,7.8023)	(5.8921,2.3055,0.0000,8.2578)	(5.9902,2.2029,0.0000,8.1931)	(5.7079,2.4324,0.0000,8.1403)	(6.6792,1.6428,0.0000,8.3220)
		1,2	(2.7805,5.4614,0.0000,8.2419)	(2.3005,5.9156,0.0000,8.2161)	(2.3656,5.8921,0.0000,8.2578)	(4.1579,4.1579,0.0000,8.3159)	(4.0814,4.2612,0.0000,8.3426)	(3.7678,4.5592,0.0000,8.3271)	(5.0257,3.3635,0.0000,8.3893)
		1,3	(2.8562,5.3733,0.0000,8.2294)	(2.5880,5.6697,0.0000,8.2578)	(2.2029,5.9902,0.0000,8.1931)	(4.2612,4.0814,0.0000,8.3426)	(4.1507,4.1507,0.0000,8.3015)	(3.8549,4.4670,0.0000,8.3220)	(5.1124,3.2733,0.0000,8.3857)
		2,3	(3.3041,4.9536,0.0000,8.2578)	(2.6083,5.5430,0.0000,8.1514)	(2.4324,5.7079,0.0000,8.1403)	(4.5592,3.7678,0.0000,8.3220)	(4.4670,3.8549,0.0000,8.3220)	(4.1234,4.1234,0.0000,8.2469)	(5.4054,2.9684,0.0000,8.3738)
1,2,3		(2.1695,6.1731,0.0000,8.3426)	(1.7730,6.5541,0.0000,8.3271)	(1.6428,6.6792,0.0000,8.3893)	(3.3635,5.0257,0.0000,8.3893)	(3.2733,5.1124,0.0000,8.3857)	(2.9684,5.4054,0.0000,8.3738)	(4.2112,4.2112,0.0000,8.4224)	
23c		1	(2.9504,2.9504,0.0000,5.9008)	(2.6681,3.4064,0.0000,6.0745)	(2.5048,3.4986,0.0000,6.0034)	(4.3671,2.2234,0.0000,6.5906)	(4.2734,2.2715,0.0000,6.5449)	(3.9888,2.6606,0.0000,6.6494)	(5.1636,1.8147,0.0000,6.9783)
		2	(3.4064,2.6681,0.0000,6.0745)	(2.7092,2.7092,0.0000,5.4185)	(2.7440,3.0020,0.0000,5.7460)	(4.6771,1.8190,0.0000,6.4967)	(4.5654,2.0839,0.0000,6.6494)	(4.2636,2.0063,0.0000,6.2699)	(5.4437,1.4726,0.0000,6.9163)
		3	(3.4986,2.5048,0.0000,6.0034)	(3.0020,2.7440,0.0000,5.7460)	(2.6164,2.6164,0.0000,5.2329)	(4.7445,1.9048,0.0000,6.6494)	(4.6899,1.7247,0.0000,6.4146)	(4.3700,1.8623,0.0000,6.2323)	(5.5348,1.3613,0.0000,6.8961)
		1,2	(2.2234,4.3673,0.0000,6.5906)	(1.8190,4.6777,0.0000,6.4967)	(1.9048,4.7445,0.0000,6.6494)	(3.4360,3.4360,0.0000,6.9783)	(3.4140,3.5643,0.0000,6.9783)	(3.1295,3.7868,0.0000,6.9163)	(4.2956,2.8749,0.0000,7.1705)
		1,3	(2.2715,4.2734,0.0000,6.5449)	(2.0839,4.5654,0.0000,6.6494)	(1.7247,4.6899,0.0000,6.4146)	(3.5643,3.4140,0.0000,6.9783)	(3.4079,3.4079,0.0000,6.8158)	(3.1945,3.7017,0.0000,6.8961)	(4.3625,2.7932,0.0000,7.1557)
		2,3	(2.6606,3.9888,0.0000,6.6494)	(2.0063,4.2636,0.0000,6.2699)	(1.8623,4.5700,0.0000,6.2323)	(3.7868,3.1295,0.0000,6.9163)	(3.7017,3.1945,0.0000,6.8961)	(3.3045,3.3045,0.0000,6.6089)	(4.5870,2.5189,0.0000,7.1060)
	1,2,3	(1.8147,5.1636,0.0000,6.9783)	(1.4726,5.4437,0.0000,6.9163)	(1.3613,5.5348,0.0000,6.8961)	(2.8749,4.2956,0.0000,7.1705)	(2.7932,4.3625,0.0000,7.1557)	(2.5189,4.5870,0.0000,7.1060)	(3.6561,3.6561,0.0000,7.3121)	

Figure A.3 Centralized Management Regime without Effort Factor (cont.)

24c	1	(0.2600,0.2600,0.0000,0.5200)	(0.2492,0.3182,0.0000,0.5674)	(0.2284,0.3190,0.0000,0.5473)	(0.4964,0.2577,0.0000,0.7491)	(0.4766,0.2533,0.0000,0.7299)	(0.4649,0.3101,0.0000,0.7749)	(0.7011,0.2464,0.0000,0.9475)	
	2	(0.3182,0.2492,0.0000,0.5674)	(0.2063,0.2063,0.0000,0.4126)	(0.2302,0.2518,0.0000,0.4126)	(0.5115,0.1989,0.0000,0.7104)	(0.5321,0.2429,0.0000,0.7749)	(0.5421,0.2010,0.0000,0.6280)	(0.7169,0.1939,0.0000,0.9108)	
	3	(0.3190,0.2284,0.0000,0.5473)	(0.2518,0.2302,0.0000,0.4820)	(0.1894,0.1894,0.0000,0.3787)	(0.5529,0.2220,0.0000,0.7749)	(0.4963,0.1825,0.0000,0.6789)	(0.4317,0.1840,0.0000,0.6157)	(0.7218,0.1775,0.0000,0.8993)	
	1.2	(0.2527,0.4964,0.0000,0.7491)	(0.1989,0.5115,0.0000,0.7104)	(0.2220,0.5529,0.0000,0.7749)	(0.4429,0.4429,0.0000,0.8858)	(0.4636,0.4840,0.0000,0.9475)	(0.4121,0.4987,0.0000,0.9108)	(0.6456,0.4320,0.0000,1.0776)	
	1.3	(0.2533,0.4766,0.0000,0.7299)	(0.2429,0.5321,0.0000,0.7749)	(0.1825,0.4963,0.0000,0.6789)	(0.4840,0.4636,0.0000,0.9475)	(0.4278,0.4278,0.0000,0.8557)	(0.4166,0.4827,0.0000,0.8993)	(0.6503,0.4163,0.0000,1.0666)	
	2.3	(0.3101,0.4649,0.0000,0.7749)	(0.2010,0.4271,0.0000,0.6280)	(0.1840,0.4317,0.0000,0.6157)	(0.4987,0.4121,0.0000,0.9108)	(0.4827,0.4166,0.0000,0.8993)	(0.3785,0.3785,0.0000,0.7570)	(0.6655,0.3655,0.0000,1.0309)	
	1.2,3	(0.2464,0.7011,0.0000,0.9475)	(0.1939,0.7169,0.0000,0.9108)	(0.1775,0.7218,0.0000,0.8993)	(0.4320,0.6456,0.0000,1.0776)	(0.4163,0.6503,0.0000,1.0666)	(0.3655,0.6655,0.0000,1.0309)	(0.5964,0.5964,0.0000,1.1927)	
	25c	1	(4.1194,4.1194,0.0000,8.2389)	(3.1316,5.1042,0.0000,8.2358)	(2.7811,5.4255,0.0000,8.2066)	(5.3259,3.0344,0.0000,8.3603)	(5.1731,3.1718,0.0000,8.3449)	(4.4190,3.9241,0.0000,8.3431)	(5.9345,2.4871,0.0000,8.4216)
	2	(5.1042,3.1316,0.0000,8.2358)	(3.9863,3.9863,0.0000,7.9727)	(3.6642,3.9857,0.0000,8.0499)	(6.2440,2.0770,0.0000,8.3210)	(5.9356,2.4075,0.0000,8.3431)	(5.4961,2.7095,0.0000,8.2056)	(6.7282,1.6676,0.0000,8.3957)	
	3	(5.4255,2.7811,0.0000,8.2066)	(4.3857,3.6642,0.0000,8.0499)	(3.9218,3.9218,0.0000,8.3431)	(6.3316,2.0115,0.0000,8.3431)	(6.4055,1.8832,0.0000,8.2887)	(5.8287,2.3567,0.0000,8.1853)	(6.9603,1.4279,0.0000,8.3882)	
1.2	(3.0344,5.3259,0.0000,8.3603)	(2.0770,6.2440,0.0000,8.3210)	(2.0115,6.3316,0.0000,8.3431)	(4.2042,4.2042,0.0000,4.083)	(4.0563,4.3653,0.0000,8.4216)	(3.3825,5.0132,0.0000,8.3957)	(4.9187,3.5360,0.0000,8.4547)		
1.3	(3.1718,5.1731,0.0000,8.3449)	(2.4075,5.9356,0.0000,8.3431)	(1.8832,6.4055,0.0000,8.2887)	(4.3653,4.0563,0.0000,8.4216)	(4.1948,4.1948,0.0000,8.3896)	(3.5315,4.8567,0.0000,8.3882)	(5.0689,3.3809,0.0000,8.4498)		
2.3	(3.9241,4.4190,0.0000,8.3431)	(2.7095,5.4961,0.0000,8.2056)	(2.3567,5.8287,0.0000,8.1853)	(5.0132,3.3825,0.0000,8.3957)	(4.8567,3.5315,0.0000,8.3882)	(4.1440,4.1440,0.0000,8.2881)	(5.7039,2.7252,0.0000,8.4291)		
1.2,3	(2.4871,5.9345,0.0000,8.4216)	(1.6676,6.7282,0.0000,8.3957)	(1.4779,6.9603,0.0000,8.3882)	(3.5360,4.9187,0.0000,8.4547)	(3.3809,5.0689,0.0000,8.4498)	(2.7252,5.7039,0.0000,8.4291)	(4.2384,4.2384,0.0000,8.4768)		
26c	1	(3.2897,3.2897,0.0000,6.5793)	(2.4974,4.0707,0.0000,6.5681)	(2.1900,4.2724,0.0000,6.4625)	(4.4914,2.5589,0.0000,7.0504)	(4.3318,2.6560,0.0000,6.9878)	(3.6973,3.2832,0.0000,6.9805)	(5.1502,2.1584,0.0000,7.3086)	
2	(4.0707,2.4974,0.0000,6.5681)	(2.8518,2.8518,0.0000,5.7036)	(2.7031,3.2353,0.0000,5.9383)	(5.1720,1.7204,0.0000,6.8923)	(4.9662,2.0143,0.0000,6.9805)	(4.3262,2.1328,0.0000,6.4590)	(5.7682,1.4296,0.0000,7.1978)		
3	(4.2724,2.1900,0.0000,6.4625)	(3.2353,2.7031,0.0000,5.9383)	(2.6707,2.6707,0.0000,5.3414)	(5.2975,1.6830,0.0000,6.9805)	(5.2292,1.5374,0.0000,6.7666)	(4.5483,1.8390,0.0000,6.3873)	(5.9461,1.2198,0.0000,7.1659)		
1.2	(2.5889,4.4914,0.0000,7.0504)	(1.7204,5.1720,0.0000,6.8923)	(1.6830,5.2975,0.0000,6.9805)	(3.6257,3.6257,0.0000,7.2514)	(3.5203,3.7884,0.0000,7.3086)	(2.8999,4.2979,0.0000,7.1978)	(4.3368,3.1176,0.0000,7.4544)		
1.3	(2.6560,4.3318,0.0000,6.9878)	(2.0143,4.9662,0.0000,6.9805)	(1.5374,5.2922,0.0000,6.7666)	(3.7884,3.5202,0.0000,7.0504)	(3.5859,3.5859,0.0000,7.1718)	(3.0169,4.1490,0.0000,7.1659)	(4.4587,2.9739,0.0000,7.4326)		
2.3	(3.2832,3.6973,0.0000,6.9805)	(2.1328,4.3262,0.0000,6.4590)	(1.8390,4.5483,0.0000,6.3873)	(4.2979,2.8999,0.0000,7.1978)	(4.1490,3.0169,0.0000,7.1659)	(3.3870,3.3870,0.0000,6.7640)	(4.9678,2.3735,0.0000,7.3413)		
1.2,3	(2.1584,5.1502,0.0000,7.3086)	(1.4296,5.7682,0.0000,7.1978)	(1.2198,5.9461,0.0000,7.1659)	(3.1176,4.3368,0.0000,7.4544)	(2.9739,4.4587,0.0000,7.4326)	(2.3735,4.9678,0.0000,7.3413)	(3.7773,3.7773,0.0000,7.5547)		
27c	1	(0.3722,0.3722,0.0000,0.7443)	(0.2812,0.4584,0.0000,0.7396)	(0.2362,0.4608,0.0000,0.6970)	(0.6328,0.3605,0.0000,0.9933)	(0.5910,0.3624,0.0000,0.9534)	(0.5036,0.4463,0.0000,0.9489)	(0.8383,0.3513,0.0000,1.1896)	
2	(0.4584,0.2812,0.0000,0.7396)	(0.2361,0.2361,0.0000,0.4723)	(0.2411,0.2886,0.0000,0.5298)	(0.6732,0.2239,0.0000,0.9897)	(0.6751,0.2738,0.0000,0.9489)	(0.4660,0.2297,0.0000,0.6957)	(0.8802,0.2182,0.0000,1.0984)		
3	(0.4608,0.2362,0.0000,0.6970)	(0.2886,0.2411,0.0000,0.5298)	(0.1991,0.1991,0.0000,0.3981)	(0.7201,0.2288,0.0000,0.9489)	(0.6418,0.1887,0.0000,0.6689)	(0.4763,0.1926,0.0000,0.6689)	(0.8913,0.1829,0.0000,1.0742)		
1.2	(0.3605,0.6328,0.0000,0.9933)	(0.2239,0.6732,0.0000,0.8972)	(0.2288,0.7201,0.0000,0.9489)	(0.5705,0.5705,0.0000,1.1411)	(0.5730,0.6166,0.0000,1.1896)	(0.4425,0.6559,0.0000,1.0984)	(0.7738,0.5563,0.0000,1.3300)		
1.3	(0.3624,0.5910,0.0000,0.9534)	(0.2738,0.6751,0.0000,0.9489)	(0.1887,0.6418,0.0000,0.8305)	(0.6166,0.5730,0.0000,1.1896)	(0.5393,0.5393,0.0000,1.0785)	(0.4522,0.6219,0.0000,1.0742)	(0.7842,0.5231,0.0000,1.3073)		
2.3	(0.4463,0.5026,0.0000,0.9489)	(0.2297,0.4660,0.0000,0.6957)	(0.1926,0.4763,0.0000,0.6689)	(0.6559,0.4425,0.0000,1.0984)	(0.6529,0.4522,0.0000,1.0742)	(0.4146,0.4146,0.0000,0.8292)	(0.8248,0.3941,0.0000,1.2189)		
1.2,3	(0.3513,0.8383,0.0000,1.1896)	(0.2182,0.8802,0.0000,1.0984)	(0.1829,0.8913,0.0000,1.0742)	(0.5563,0.7738,0.0000,1.3300)	(0.5231,0.7842,0.0000,1.3073)	(0.3941,0.8248,0.0000,1.2189)	(0.7217,0.7217,0.0000,1.4434)		

Figure A.3 Centralized Management Regime without Effort Factor (cont.)

1d	1	2	3	1.2	1.3	2.3	1.2.3
1	(8.5798.0.0183.8.5981.6.1577)	(8.3641.0.1926.8.5567.5.5197)	(8.0304.0.4246.8.4530.4.3873)	(8.5602.0.0335.8.5937.4.8991)	(8.4807.0.0677.8.5484.4.2015)	(8.2422.0.2917.8.5339.3.9389)	(8.5020.0.0695.8.5715.3.7775)
2	(8.4878.0.1114.8.5992.6.0856)	(8.5231.0.0310.8.5541.5.6310)	(8.0656.0.3885.8.4540.4.4043)	(8.5628.0.0309.8.5937.4.8987)	(8.3215.0.2299.8.5513.4.1143)	(8.4542.0.0756.8.5297.4.0509)	(8.5075.0.0640.8.5715.3.7784)
3	(8.4911.0.1081.8.5991.6.0861)	(8.3848.0.1716.8.5564.5.5291)	(8.3569.0.0889.8.4458.4.5638)	(8.4605.0.1344.8.5949.4.8363)	(8.4876.0.0610.8.5486.4.1964)	(8.4562.0.0737.8.5299.4.0456)	(8.5092.0.0625.8.5717.3.7731)
1.2	(8.4671.0.1323.8.5994.6.0664)	(8.3251.0.2321.8.5572.5.4825)	(7.5539.0.9124.8.4664.4.1386)	(8.5279.0.0662.8.5941.4.8683)	(8.2396.0.3127.8.5524.4.0604)	(8.1479.0.3874.8.5353.3.8810)	(8.4331.0.1392.8.5724.3.7298)
1.3	(8.4701.0.1292.8.5993.6.0663)	(8.1700.0.3896.8.5596.5.3926)	(7.9048.0.5529.8.4577.4.3060)	(8.4222.0.1731.8.5953.4.8052)	(8.4151.0.1345.8.5496.4.1493)	(8.1495.0.3860.8.5355.3.8772)	(8.4344.0.1381.8.5725.3.7238)
2.3	(8.3706.0.2299.8.6004.5.9990)	(8.3485.0.2085.8.5569.5.5046)	(7.9458.0.5109.8.4567.4.3314)	(8.4246.0.1707.8.5953.4.8021)	(8.2466.0.3059.8.5525.4.0561)	(8.3745.0.3587.8.5312.3.9926)	(8.4400.0.1325.8.5725.3.7237)
1.2.3	(8.3445.0.2561.8.6007.5.9670)	(8.1206.0.4396.8.5602.5.3465)	(7.3794.1.0901.8.4695.4.0424)	(8.3837.0.2120.8.5957.4.7676)	(8.1592.0.3944.8.5536.4.0073)	(8.0454.0.4915.8.5369.3.8165)	(8.3609.0.2125.8.5734.3.6829)
2d	1	2	3	1.2	1.3	2.3	1.2.3
1	(8.5617.0.0015.8.5632.8.6379)	(8.4673.0.0329.8.5002.8.0681)	(8.2587.0.0733.8.3320.6.9562)	(8.5470.0.0029.8.5498.7.3669)	(8.4701.0.0059.8.4760.6.6453)	(8.3961.0.0514.8.4475.6.4596)	(8.4998.0.0061.8.5059.6.2285)
2	(8.5443.0.0192.8.5635.8.6145)	(8.4969.0.0026.8.4995.8.0963)	(8.2644.0.0674.8.3317.6.9612)	(8.5472.0.0026.8.5498.7.3654)	(8.4361.0.0409.8.4769.6.6116)	(8.4395.0.0067.8.4462.6.4906)	(8.5003.0.0056.8.5059.6.2284)
3	(8.5450.0.0185.8.5635.8.6252)	(8.4707.0.0294.8.5001.8.0727)	(8.3214.0.0078.8.3292.7.0095)	(8.5267.0.0234.8.5502.7.3497)	(8.4707.0.0053.8.4761.6.6443)	(8.4398.0.0064.8.4462.6.4954)	(8.5005.0.0054.8.5059.6.2275)
1.2	(8.5428.0.0207.8.5635.8.6170)	(8.4646.0.0356.8.5003.8.0685)	(8.1893.0.1456.8.3349.6.8961)	(8.5444.0.0055.8.5499.7.3677)	(8.4302.0.0469.8.4771.6.6134)	(8.3895.0.0582.8.4477.6.4587)	(8.4943.0.0117.8.5060.6.2211)
1.3	(8.5434.0.0201.8.5635.8.6176)	(8.4371.0.0638.8.5009.8.0316)	(8.2503.0.0820.8.3323.6.9456)	(8.5237.0.0265.8.5502.7.3412)	(8.4648.0.0113.8.4762.6.6364)	(8.3896.0.0581.8.4477.6.4549)	(8.4945.0.0116.8.5060.6.2198)
2.3	(8.5257.0.0381.8.5638.8.5988)	(8.4679.0.0323.8.5002.8.0623)	(8.2561.0.0760.8.3320.6.9507)	(8.5241.0.0261.8.5502.7.3478)	(8.4307.0.0464.8.4771.6.6105)	(8.4332.0.0132.8.4464.6.4871)	(8.4949.0.0111.8.5060.6.2191)
1.2.3	(8.5238.0.0420.8.5638.8.5863)	(8.4345.0.0664.8.5009.8.0348)	(8.1800.0.1552.8.3352.6.8855)	(8.5213.0.0290.8.5503.7.3483)	(8.4247.0.0525.8.4772.6.6088)	(8.3826.0.0653.8.4479.6.4491)	(8.4888.0.0173.8.5061.6.2114)
3d	1	2	3	1.2	1.3	2.3	1.2.3
1	(8.3136.0.0004.8.3140.10.0004)	(8.2124.0.0083.8.2207.10.0004)	(7.9717.0.0085.7.9803.10.0004)	(8.3961.0.0002.8.3963.10.0004)	(8.2830.0.0002.8.2832.10.0004)	(8.2295.0.0043.8.2338.10.0004)	(8.3495.0.0001.8.3497.10.0004)
2	(8.3072.0.0071.8.3143.10.0004)	(8.2198.0.0004.8.2202.10.0004)	(7.9723.0.0079.7.9802.10.0004)	(8.3962.0.0002.8.3963.10.0004)	(8.2796.0.0038.8.2834.10.0004)	(8.2334.0.0002.8.2336.10.0004)	(8.3495.0.0001.8.3497.10.0004)
3	(8.3074.0.0069.8.3143.10.0004)	(8.2132.0.0074.8.2206.10.0004)	(7.9792.0.0004.7.9796.10.0004)	(8.3928.0.0036.8.3965.10.0004)	(8.2830.0.0002.8.2832.10.0004)	(8.2334.0.0002.8.2336.10.0004)	(8.3495.0.0001.8.3497.10.0004)
1.2	(8.3068.0.0075.8.3143.10.0004)	(8.2120.0.0087.8.2207.10.0004)	(7.9645.0.0164.7.9809.10.0004)	(8.3960.0.0004.8.3964.10.0004)	(8.2794.0.0040.8.2834.10.0004)	(8.2293.0.0045.8.2338.10.0004)	(8.3494.0.0003.8.3497.10.0004)
1.3	(8.3070.0.0072.8.3143.10.0004)	(8.2054.0.0157.8.2211.10.0004)	(7.9714.0.0089.7.9803.10.0004)	(8.3925.0.0038.8.3964.10.0004)	(8.2828.0.0004.8.2832.10.0004)	(8.2293.0.0045.8.2338.10.0004)	(8.3494.0.0003.8.3497.10.0004)
2.3	(8.3007.0.0139.8.3146.10.0004)	(8.2128.0.0078.8.2206.10.0004)	(7.9720.0.0083.7.9802.10.0004)	(8.3927.0.0038.8.3965.10.0004)	(8.2794.0.0040.8.2834.10.0004)	(8.2332.0.0004.8.2336.10.0004)	(8.3494.0.0003.8.3497.10.0004)
1.2.3	(8.3003.0.0143.8.3146.10.0004)	(8.2050.0.0161.8.2211.10.0004)	(7.9642.0.0168.7.9810.10.0004)	(8.3925.0.0040.8.3965.10.0004)	(8.2792.0.0042.8.2834.10.0004)	(8.2292.0.0047.8.2338.10.0004)	(8.3493.0.0004.8.3497.10.0004)
4d	1	2	3	1.2	1.3	2.3	1.2.3
1	(8.5768.0.0265.8.6032.5.7904)	(8.3077.0.2527.8.5604.5.3543)	(7.8944.0.5661.8.4606.4.2693)	(8.5335.0.0461.8.5996.4.6520)	(8.4751.0.0860.8.5611.4.0602)	(8.1588.0.3808.8.5396.3.8170)	(8.4901.0.0901.8.5802.3.6347)
2	(8.4825.0.1218.8.6043.5.7236)	(8.5213.0.0357.8.5570.5.4878)	(8.0274.0.4298.8.4572.4.3382)	(8.5639.0.0357.8.5995.4.6656)	(8.3271.0.2365.8.5637.3.9820)	(8.4499.0.0842.8.5341.3.9712)	(8.5100.0.0701.8.5800.3.6438)
3	(8.4933.0.1108.8.6041.5.7314)	(8.3825.0.1768.8.5593.5.4008)	(8.3547.0.0934.8.4481.4.5157)	(8.4646.0.1360.8.6007.4.6680)	(8.4997.0.0614.8.5610.4.0652)	(8.4571.0.0772.8.5342.3.9689)	(8.5159.0.0643.8.5801.3.6410)
1.2	(8.4519.0.1526.8.6045.5.6945)	(8.2599.0.3012.8.5610.5.3087)	(7.3332.1.1401.8.4732.3.9884)	(8.5160.0.0840.8.6000.4.6271)	(8.2244.0.3405.8.5648.3.9208)	(8.0491.0.4920.8.5411.3.7578)	(8.4133.0.1677.8.5811.3.5850)
1.3	(8.4632.0.1413.8.6044.5.7029)	(8.0964.0.4670.8.5634.5.2112)	(7.7470.0.7165.8.4635.4.1768)	(8.4125.0.1886.8.6012.4.5676)	(8.4075.0.1547.8.5622.4.0071)	(8.0564.0.4848.8.5412.3.7550)	(8.4191.0.1620.8.5812.3.5815)
2.3	(8.3614.0.2441.8.6055.5.6367)	(8.3996.0.2202.8.5599.5.3639)	(7.8955.0.5645.8.4600.4.2543)	(8.4240.0.1771.8.6011.4.5748)	(8.2526.0.3122.8.5648.3.9285)	(8.3657.0.1699.8.5356.3.9106)	(8.4402.0.1408.8.5810.3.5885)
1.2.3	(8.3240.0.2818.8.6058.5.5947)	(8.0403.0.5238.8.5641.5.1715)	(7.1232.1.3534.8.4766.3.8779)	(8.3692.0.2324.8.6016.4.5355)	(8.1408.0.4252.8.5660.3.8644)	(7.9356.0.6072.8.5428.3.6925)	(8.3366.0.2455.8.5821.3.5348)

Figure A.4 Centralized Management Regime with Effort Factor

5d	1	2	3	1.2	1.3	2.3	1.2.3
1	(8.5661,0.0022,8.5684,8.2737)	(8.4607,0.0427,8.5034,7.9275)	(8.2397,0.0955,8.3352,6.8917)	(8.5527,0.0039,8.5565,7.1379)	(8.4857,0.0075,8.4931,6.5163)	(8.3873,0.0659,8.4532,6.3753)	(8.5095,0.0078,8.5173,6.0978)
2	(8.5477,0.0209,8.5686,8.2545)	(8.4995,0.0030,8.5025,7.9653)	(8.2603,0.0741,8.3343,6.9099)	(8.5355,0.0030,8.5365,7.1349)	(8.4522,0.0418,8.4940,6.4891)	(8.4441,0.0074,8.4515,6.4162)	(8.5112,0.0061,8.5173,6.0986)
3	(8.5494,0.0192,8.5686,8.2510)	(8.4727,0.0304,8.5031,7.9379)	(8.3234,0.0082,8.3316,6.9579)	(8.5331,0.0237,8.5369,7.1192)	(8.4878,0.0053,8.4931,6.5163)	(8.4448,0.0067,8.4515,6.4208)	(8.5117,0.0056,8.5173,6.0978)
1.2	(8.5455,0.0232,8.5687,8.2544)	(8.4575,0.0460,8.5035,7.9230)	(8.1616,0.1768,8.3384,6.8248)	(8.5497,0.0069,8.5566,7.1352)	(8.4454,0.0496,8.4941,6.4827)	(8.3796,0.0737,8.4534,6.3708)	(8.5034,0.0140,8.5174,6.0904)
1.3	(8.5473,0.0214,8.5687,8.2563)	(8.4294,0.0747,8.5041,7.8966)	(8.2306,0.1050,8.3355,6.8901)	(8.5292,0.0277,8.5569,7.1167)	(8.4804,0.0129,8.4933,6.5078)	(8.3802,0.0732,8.4534,6.3682)	(8.5040,0.0135,8.5174,6.0892)
2.3	(8.5285,0.0405,8.5689,8.2369)	(8.4696,0.0336,8.5032,7.9351)	(8.2514,0.0832,8.3347,6.8984)	(8.5301,0.0268,8.5569,7.1181)	(8.4466,0.0475,8.4941,6.4809)	(8.4376,0.0142,8.4517,6.4137)	(8.5056,0.0118,8.5174,6.0878)
1.2.3	(8.5261,0.0429,8.5690,8.2337)	(8.4261,0.0781,8.5042,7.8917)	(8.1515,0.1872,8.3388,6.8137)	(8.5262,0.0308,8.5570,7.1161)	(8.4390,0.0553,8.4943,6.4779)	(8.3724,0.0812,8.4536,6.3619)	(8.4979,0.0197,8.5175,6.0853)
6d							
	1	2	3	1.2	1.3	2.3	1.2.3
1	(8.5691,0.0004,8.5695,10.0000)	(8.2345,0.0098,8.2443,10.0000)	(7.9787,0.0107,7.9893,10.0000)	(8.4208,0.0002,8.4210,10.0000)	(8.3192,0.0002,8.3194,10.0000)	(8.2407,0.0052,8.2459,10.0000)	(8.3717,0.0002,8.3719,10.0000)
2	(8.3636,0.0061,8.3697,10.0000)	(8.2434,0.0004,8.2438,10.0000)	(7.9808,0.0084,7.9892,10.0000)	(8.4209,0.0002,8.4210,10.0000)	(8.3160,0.0036,8.3195,10.0000)	(8.2455,0.0002,8.2457,10.0000)	(8.3717,0.0001,8.3719,10.0000)
3	(8.3641,0.0055,8.3697,10.0000)	(8.2371,0.0070,8.2441,10.0000)	(7.9881,0.0004,7.9885,10.0000)	(8.4180,0.0031,8.4211,10.0000)	(8.3192,0.0002,8.3194,10.0000)	(8.2455,0.0002,8.2457,10.0000)	(8.3717,0.0001,8.3719,10.0000)
1.2	(8.3633,0.0064,8.3697,10.0000)	(8.2341,0.0102,8.2443,10.0000)	(7.9710,0.0190,7.9900,10.0000)	(8.4206,0.0004,8.4210,10.0000)	(8.3158,0.0038,8.3195,10.0000)	(8.2405,0.0054,8.2459,10.0000)	(8.3716,0.0003,8.3719,10.0000)
1.3	(8.3638,0.0059,8.3697,10.0000)	(8.2278,0.0168,8.2446,10.0000)	(7.9783,0.0111,7.9894,10.0000)	(8.4178,0.0035,8.4213,10.0000)	(8.3190,0.0048,8.3194,10.0000)	(8.2406,0.0054,8.2459,10.0000)	(8.3716,0.0003,8.3719,10.0000)
2.3	(8.3583,0.0116,8.3699,10.0000)	(8.2367,0.0074,8.2441,10.0000)	(7.9804,0.0088,7.9892,10.0000)	(8.4178,0.0035,8.4210,10.0000)	(8.3158,0.0037,8.3195,10.0000)	(8.2453,0.0004,8.2457,10.0000)	(8.3716,0.0002,8.3719,10.0000)
1.2.3	(8.3580,0.0120,8.3699,10.0000)	(8.2275,0.0172,8.2447,10.0000)	(7.9706,0.0194,7.9901,10.0000)	(8.4176,0.0035,8.4211,10.0000)	(8.3156,0.0040,8.3196,10.0000)	(8.2404,0.0056,8.2459,10.0000)	(8.3715,0.0004,8.3719,10.0000)
7d							
	1	2	3	1.2	1.3	2.3	1.2.3
1	(8.5644,0.0465,8.6109,5.2238)	(8.1792,0.3872,8.5665,5.0705)	(7.5777,0.8933,8.4710,4.0349)	(8.5346,0.0739,8.6085,4.2771)	(8.4542,0.1252,8.5794,3.8062)	(7.9769,0.5717,8.5487,3.6118)	(8.4581,0.1351,8.5931,3.3862)
2	(8.4721,0.1398,8.6119,5.1748)	(8.5178,0.0437,8.5614,5.2861)	(7.9610,0.5012,8.4621,4.2347)	(8.5633,0.0449,8.6082,4.2890)	(8.3353,0.2459,8.5813,3.7565)	(8.4416,0.0990,8.5406,3.8484)	(8.5122,0.0804,8.5927,3.4207)
3	(8.4958,0.1158,8.6116,5.1909)	(8.3778,0.1858,8.5637,5.1994)	(8.3509,0.1006,8.4515,4.4003)	(8.4702,0.1390,8.6092,4.2420)	(8.5166,0.0623,8.5789,3.8409)	(8.4580,0.0826,8.5406,3.8515)	(8.5255,0.0672,8.5927,3.4222)
1.2	(8.4191,0.1932,8.6123,5.1338)	(8.1131,0.4542,8.5672,5.0163)	(8.8526,1.6333,8.4859,3.7105)	(8.4847,0.1242,8.6089,4.2316)	(8.1860,0.3968,8.5828,3.6698)	(7.8320,0.7184,8.5504,3.5387)	(8.3674,0.2266,8.5940,3.3388)
1.3	(8.4446,0.1675,8.6121,5.1542)	(7.9369,0.6327,8.5696,4.9169)	(7.3869,1.0875,8.4744,3.9332)	(8.3874,0.2225,8.6099,4.1891)	(8.3832,0.1971,8.5804,3.7600)	(7.8550,0.6954,8.5504,3.5463)	(8.3817,0.2124,8.5941,3.3402)
2.3	(8.3445,0.2685,8.6131,5.0879)	(8.3263,0.2381,8.5643,5.1628)	(7.8107,0.6544,8.4652,4.1401)	(8.4202,0.1894,8.6097,4.2095)	(8.2591,0.3232,8.5823,3.7019)	(8.3499,0.1922,8.5422,3.7843)	(8.4386,0.1549,8.5936,3.3657)
1.2.3	(8.2821,0.3314,8.6135,5.0350)	(7.8644,0.7060,8.5704,4.8784)	(6.5819,1.9079,8.4898,3.5876)	(8.3318,0.2786,8.6104,4.1513)	(8.0979,0.4860,8.5838,3.6148)	(7.6907,0.8615,8.5523,3.4621)	(8.2824,0.3126,8.5950,3.2853)
8d							
	1	2	3	1.2	1.3	2.3	1.2.3
1	(8.5723,0.0038,8.5761,7.7264)	(8.4448,0.0635,8.5083,7.7073)	(8.1975,0.1431,8.3406,6.7837)	(8.5604,0.0061,8.5665,6.7757)	(8.5070,0.0106,8.5176,6.2902)	(8.3653,0.0965,8.4618,6.2337)	(8.5228,0.0114,8.5342,5.8803)
2	(8.5524,0.0240,8.5764,7.7084)	(8.5033,0.0037,8.5070,7.7640)	(8.2524,0.0859,8.3383,6.8251)	(8.5627,0.0038,8.5665,6.7731)	(8.4750,0.0433,8.5184,6.2693)	(8.4508,0.0086,8.4594,6.3023)	(8.5272,0.0070,8.5341,5.8833)
3	(8.5562,0.0201,8.5763,7.7080)	(8.4756,0.0320,8.5076,7.7380)	(8.3264,0.0088,8.3351,6.8908)	(8.5426,0.0242,8.5668,6.7574)	(8.5122,0.0054,8.5176,6.2966)	(8.4523,0.0072,8.4594,6.3068)	(8.5283,0.0058,8.5341,5.8830)
1.2	(8.5484,0.0280,8.5764,7.7029)	(8.4408,0.0676,8.5084,7.7027)	(8.1033,0.2409,8.3443,6.7056)	(8.5566,0.0100,8.5666,6.7690)	(8.4639,0.0546,8.5186,6.2534)	(8.3563,0.1058,8.4620,6.2314)	(8.5158,0.0185,8.5343,5.8728)
1.3	(8.5524,0.0240,8.5764,7.7069)	(8.4112,0.0978,8.5090,7.6755)	(8.1870,0.1540,8.3410,6.7705)	(8.5362,0.0307,8.5669,6.7475)	(8.5017,0.0161,8.5178,6.2876)	(8.3578,0.1043,8.4620,6.2316)	(8.5170,0.0173,8.5343,5.8720)
2.3	(8.5323,0.0444,8.5767,7.6953)	(8.4718,0.0359,8.5077,7.7327)	(8.2432,0.0955,8.3387,6.8192)	(8.5389,0.0280,8.5669,6.7575)	(8.4694,0.0491,8.5185,6.2620)	(8.4437,0.0159,8.4596,6.2942)	(8.5213,0.0129,8.5343,5.8709)
1.2.3	(8.5280,0.049,8.5777,7.6829)	(8.4070,0.1021,8.5091,7.6707)	(8.0916,0.2531,8.3447,6.6934)	(8.5326,0.0343,8.5670,6.7534)	(8.4584,0.0603,8.5187,6.2537)	(8.3482,0.1141,8.4623,6.2228)	(8.5100,0.0245,8.5344,5.8664)

Figure A.4 Centralized Management Regime with Effort Factor (cont.)

9d	1	2	3	1.2	1.3	2.3	1.2.3
1	(8.4305,0.0004,8.4309,10.000)	(8.2634,0.0126,8.2760,10.000)	(7.9875,0.0149,8.0025,10.000)	(8.4523,0.0002,8.4525,10.000)	(8.3692,0.0003,8.3695,10.000)	(8.2564,0.0069,8.2633,10.000)	(8.4033,0.0002,8.4035,10.000)
2	(8.4262,0.0048,8.4310,10.000)	(8.2750,0.0004,8.2754,10.000)	(7.9928,0.0092,8.0020,10.000)	(8.4524,0.0001,8.4525,10.000)	(8.3664,0.0032,8.3696,10.000)	(8.2628,0.0002,8.2630,10.000)	(8.4034,0.0001,8.4035,10.000)
3	(8.4270,0.0040,8.4310,10.000)	(8.2692,0.0064,8.2757,10.000)	(8.0009,0.0004,8.0013,10.000)	(8.4501,0.0025,8.4526,10.000)	(8.3693,0.0001,8.3695,10.000)	(8.2628,0.0002,8.2630,10.000)	(8.4034,0.0001,8.4035,10.000)
1.2	(8.4258,0.0052,8.4310,10.000)	(8.2631,0.0129,8.2760,10.000)	(7.9791,0.0241,8.0032,10.000)	(8.4521,0.0004,8.4525,10.000)	(8.3661,0.0034,8.3696,10.000)	(8.2562,0.0071,8.2633,10.000)	(8.4032,0.0003,8.4035,10.000)
1.3	(8.4266,0.0044,8.4310,10.000)	(8.2573,0.0190,8.2763,10.000)	(7.9872,0.0153,8.0025,10.000)	(8.4499,0.0027,8.4526,10.000)	(8.3691,0.0004,8.3695,10.000)	(8.2562,0.0071,8.2633,10.000)	(8.4032,0.0003,8.4035,10.000)
2.3	(8.4224,0.0088,8.4311,10.000)	(8.2689,0.0068,8.2757,10.000)	(7.9925,0.0096,8.0020,10.000)	(8.4499,0.0026,8.4526,10.000)	(8.3663,0.0033,8.3696,10.000)	(8.2626,0.0004,8.2630,10.000)	(8.4033,0.0002,8.4035,10.000)
1.2.3	(8.4220,0.0092,8.4312,10.000)	(8.2569,0.0194,8.2763,10.000)	(7.9788,0.0245,8.0032,10.000)	(8.4497,0.0029,8.4526,10.000)	(8.3660,0.0036,8.3696,10.000)	(8.2560,0.0073,8.2634,10.000)	(8.4031,0.0004,8.4035,10.000)
10d	1	2	3	1.2	1.3	2.3	1.2.3
1	(7.3861,0.7607,8.1468,2.3106)	(5.6599,2.4279,8.0878,1.3725)	(3.7640,4.2074,7.9714,0.0000)	(7.1183,1.1167,8.2350,1.1829)	(5.5155,2.6250,8.1405,0.0000)	(5.2859,2.9101,8.1960,0.0000)	(6.3277,1.9555,8.2832,0.0000)
2	(6.7347,1.4586,8.1933,2.1168)	(6.6450,1.3436,7.9886,1.6393)	(3.9119,4.0308,7.9427,0.0000)	(7.2220,1.0121,8.2340,1.2124)	(5.5135,2.6825,8.1960,0.0000)	(5.5732,2.5395,8.1128,0.0000)	(6.4502,1.8273,8.2775,0.0000)
3	(6.7798,1.4109,8.1907,2.1314)	(5.9026,2.1670,8.0696,1.4383)	(5.6125,2.1722,7.7847,1.0000)	(6.7684,1.4981,8.2665,1.0916)	(6.9568,1.1848,8.1416,1.0000)	(5.6278,2.4810,8.1088,0.0000)	(6.4936,1.7819,8.2754,0.0000)
1.2	(5.6310,2.6057,8.2367,1.7702)	(4.1216,4.0482,8.1698,1.0001)	(2.6034,5.5927,8.1960,0.0000)	(6.0237,2.2385,8.2822,1.0001)	(4.1088,4.1743,8.2832,0.0000)	(4.0101,4.2673,8.2775,0.0000)	(5.0989,3.2415,8.3405,0.0000)
1.3	(5.6849,2.5493,8.2342,1.7838)	(4.0206,4.1999,8.2205,1.0000)	(2.4072,5.7193,8.1264,0.0000)	(5.7969,2.5128,8.3098,1.0000)	(4.1183,4.1183,8.2366,0.0000)	(4.0419,4.2336,8.2754,0.0000)	(5.1303,3.2087,8.3390,0.0000)
2.3	(5.2073,3.0649,8.2722,1.6459)	(4.3241,3.8292,8.1533,1.0432)	(2.4810,5.6278,8.1088,0.0000)	(5.8631,2.4457,8.3088,1.0000)	(4.2336,4.0419,8.2754,0.0000)	(4.1089,4.1089,8.2178,0.0000)	(5.2220,3.1127,8.3347,0.0000)
1.2.3	(3.9768,4.3373,8.3141,1.2872)	(3.2796,4.9984,8.2781,1.0000)	(1.7819,6.4936,8.2754,0.0000)	(5.1084,3.2373,8.3457,1.0000)	(3.2087,5.1303,8.3390,0.0000)	(3.1127,5.2220,8.3347,0.0000)	(4.1914,4.1914,8.3828,0.0000)
11d	1	2	3	1.2	1.3	2.3	1.2.3
1	(7.6117,0.0768,7.6885,4.6840)	(6.7139,0.5894,7.3032,3.7529)	(5.1429,1.3818,6.5247,2.2416)	(7.5558,0.1357,7.6915,3.4413)	(6.9144,0.3448,7.2592,2.4450)	(6.3851,0.8331,7.2182,2.1946)	(7.2403,0.2946,7.5349,2.2229)
2	(7.4135,0.3005,7.7140,4.5833)	(7.0733,0.1599,7.2332,3.9102)	(5.2247,1.2728,6.4975,2.2688)	(7.5667,0.1252,7.6919,3.4412)	(6.6474,0.6776,7.3250,2.3635)	(6.7528,0.3728,7.1256,2.3090)	(7.2634,0.2707,7.5341,2.2282)
3	(7.4219,0.2910,7.7130,4.5880)	(6.7704,0.5228,7.2933,3.7784)	(5.7002,0.5946,6.2949,2.4219)	(7.3666,0.3511,7.7177,3.6446)	(6.9564,0.3083,7.2646,2.4490)	(6.7700,0.3624,7.1324,2.3082)	(7.2758,0.2633,7.5390,2.2268)
1.2	(7.3275,0.3952,7.7227,4.5288)	(6.5283,0.8008,7.3292,3.6610)	(4.1986,2.6215,6.8201,1.9311)	(7.4312,0.2743,7.7055,3.3768)	(6.2922,1.0769,7.3691,2.2517)	(6.0004,1.2713,7.2717,2.0762)	(6.9688,0.5969,7.5656,2.1373)
1.3	(7.3365,0.3852,7.7217,4.5335)	(6.1956,1.1925,7.3881,3.5314)	(4.5645,2.0938,6.6583,2.0517)	(7.2203,0.5113,7.7316,3.2968)	(6.6119,0.6977,7.3096,2.3397)	(6.0194,1.2586,7.2780,2.0785)	(6.9813,0.5891,7.5704,2.1369)
2.3	(7.1163,0.6312,7.7475,4.4283)	(6.5907,0.7283,7.3190,3.6884)	(4.6529,1.9790,6.6319,2.0799)	(7.2323,0.4997,7.7320,3.2981)	(6.3383,1.0358,7.3741,2.2590)	(6.3979,0.7896,7.1875,2.1889)	(7.0066,0.5630,7.5696,2.1428)
1.2.3	(7.0104,0.7465,7.7569,4.3679)	(5.9611,1.4547,7.4158,3.4276)	(3.5846,3.3569,6.9415,1.7334)	(7.0696,0.6768,7.7463,3.2250)	(5.9384,1.4808,7.4192,2.1399)	(5.5833,1.7494,7.3326,1.9506)	(6.6763,0.9255,7.6018,2.0442)
12d	1	2	3	1.2	1.3	2.3	1.2.3
1	(6.5382,0.0011,6.5393,8.9333)	(5.1760,0.0362,5.2122,7.7257)	(2.1293,0.1347,2.2640,5.0411)	(6.2132,0.0023,6.2155,7.4809)	(4.2932,0.0120,4.3052,5.6557)	(3.8990,0.0748,3.9737,5.4459)	(5.0319,0.0090,5.0410,5.6253)
2	(6.5281,0.0145,6.5427,8.9236)	(5.1956,0.0033,5.1989,7.7438)	(2.1321,0.1241,2.2562,5.0447)	(6.2134,0.0022,6.2155,7.4808)	(4.2704,0.0066,4.3311,5.6387)	(3.9255,0.0133,3.9389,5.4669)	(5.0326,0.0083,5.0410,5.6254)
3	(6.5284,0.0141,6.5425,8.9239)	(5.1783,0.0324,5.2106,7.7279)	(2.1349,0.0264,2.1812,5.0723)	(6.2008,0.0198,6.2206,7.4705)	(4.2956,0.0108,4.3063,5.6553)	(3.9272,0.0129,3.9402,5.4663)	(5.0338,0.0081,5.0419,5.6248)
1.2	(6.5273,0.0156,6.5429,8.9223)	(5.178,0.0396,5.2134,7.7229)	(2.0965,0.2587,2.3552,4.9987)	(6.2116,0.0045,6.2161,7.4792)	(4.2628,0.0729,4.3357,5.6334)	(3.8912,0.0884,3.9796,5.4391)	(5.0265,0.0174,5.0439,5.6213)
1.3	(6.5276,0.0152,6.5428,8.9226)	(5.1560,0.0691,5.2252,7.7068)	(2.1199,0.1617,2.2816,5.0269)	(6.1990,0.0222,6.2211,7.4689)	(4.2881,0.0229,4.3110,5.6501)	(3.8928,0.0881,3.9809,5.4386)	(5.0276,0.0172,5.0448,5.6207)
2.3	(6.5173,0.0288,6.5462,8.9129)	(5.1762,0.0357,5.2119,7.7251)	(2.1227,0.1512,2.2738,5.0304)	(6.1992,0.0220,6.2212,7.4689)	(4.2652,0.0717,4.3368,5.6329)	(3.9196,0.0264,3.9460,5.4600)	(5.0283,0.0165,5.0448,5.6208)
1.2.3	(6.5165,0.0299,6.5464,8.9114)	(5.1538,0.0726,5.2264,7.7041)	(2.0865,0.2863,2.3728,4.9850)	(6.1974,0.0244,6.2218,7.4673)	(4.2575,0.0840,4.3415,5.6276)	(3.8849,0.1019,3.9888,5.4320)	(5.0221,0.0256,5.0478,5.6167)

Figure A.4 Centralized Management Regime with Effort Factor (cont.)

13d	1	1	(7.1363,1.0757,8.2120,1.9228	(5.1163,3.0377,8.1539,1.1317	(3.3673,4.7032,8.0705,0.0000)	(6.9014,1.3907,8.2920,1.0001	(5.3733,2.8562,8.2294,0.0000	(4.9536,3.3041,8.2578,0.0000)	(6.1731,2.1695,8.3426,0.0000)	
		2	(6.7206,1.5243,8.2449,1.8106	(6.5240,1.5022,8.0262,1.5056	(3.8142,4.1728,7.9870,0.0000)	(7.1867,1.0960,8.2827,1.0243	(5.5430,2.6083,8.1514,0.0000)	(6.5541,1.7730,8.3271,0.0000)		
		3	(6.8556,1.3824,8.2380,1.8512	(5.9128,2.1839,8.0967,1.3403	(5.6263,2.1775,7.8038,1.0000)	(6.9049,1.4022,8.3071,1.0001	(7.1297,1.0654,8.1951,1.0000	(6.6792,1.6428,8.3220,0.0000)		
	1.2	1.2	(5.2772,3.0187,8.2959,1.4015	(3.9392,4.2913,8.2305,1.0000	(2.3656,5.8921,8.2578,0.0000)	(0.6607,2.2718,8.3325,1.0000	(4.0814,4.2612,8.3426,0.0000)	(3.7678,4.5592,8.3271,0.0000)	(5.0257,3.3635,8.3893,0.0000)	
		1.3	(5.4343,2.8548,8.2891,1.4435	(3.9117,4.3555,8.2673,1.0000	(2.2029,5.9902,8.1931,0.0000)	(5.9002,2.4510,8.3512,1.0000	(4.1507,4.1507,8.3015,0.0000)	(3.8549,4.4670,8.3220,0.0000)	(5.1124,3.2733,8.3857,0.0000)	
		1.2,3	(5.2633,3.0507,8.3140,1.3876	(4.3369,3.8462,8.1832,1.0001	(2.4324,5.7079,8.1403,0.0000)	(6.1026,2.2419,8.3445,1.0000	(4.4670,3.8549,8.3220,0.0000)	(4.1234,4.1234,8.2469,0.0000)	(5.4054,2.9684,8.3738,0.0000)	
	14d	1	1	(3.7949,4.5664,8.3613,1.0001	(1.7730,6.5541,8.3271,0.0000)	(1.6428,6.6792,8.3220,0.0000)	(3.3635,5.0257,8.3893,0.0000)	(3.2733,5.1124,8.3857,0.0000)	(2.9684,5.4054,8.3738,0.0000)	(4.2112,4.2112,8.4224,0.0000)
			2	(7.6529,0.1059,7.7589,4.3601	(6.6057,0.7616,7.3673,3.5864	(4.8793,1.7664,6.6456,2.1177)	(7.5879,0.1777,7.7656,3.2428	(6.9892,0.4145,7.4036,2.3602	(6.2480,1.0525,7.3005,2.0936)	(7.2683,0.3647,7.6329,2.1246)
			3	(7.4638,0.3179,7.7817,4.2697	(7.0984,0.1789,7.2772,3.7966	(5.1698,1.3834,6.5532,2.2128)	(7.6258,0.1377,7.7635,3.2574	(6.7827,0.6718,7.4545,2.3000)	(6.7755,0.4049,7.1804,2.2539)	(7.3451,0.2818,7.6269,2.1467)
	1.2	1.2	(7.4897,0.2891,7.7788,4.2822	(6.8042,0.5300,7.3342,3.6742	(5.7153,0.6150,6.3302,2.3875)	(7.4416,0.3440,7.7856,3.1875	(7.1071,0.2921,7.3991,2.3887)	(6.8148,0.3690,7.1838,2.2604)	(7.3726,0.2572,7.6298,2.1506)	
		1.3	(7.3434,0.4493,7.7928,4.1966	(6.3828,1.0130,7.3958,3.4821	(3.8809,3.0639,6.9448,1.7911)	(7.4454,0.3347,7.7801,3.1723	(6.3510,1.1513,7.5023,2.1669)	(5.8142,1.5421,7.3563,1.9638)	(6.9755,0.6871,7.6627,2.0347)	
		1.2,3	(7.3718,0.4180,7.7898,4.2109	(6.0611,1.3897,7.4508,3.3633	(4.2621,2.5160,6.7781,1.9203)	(7.2504,0.5519,7.8023,3.1029	(6.6904,0.7575,7.4479,2.2591)	(5.8613,1.4978,7.3590,1.9733)	(7.0061,0.6593,7.6654,2.0404)	
	15d	1	1	(6.6370,0.0015,6.6385,8.6286	(5.2366,0.0459,5.2825,7.6235	(2.1575,0.1723,2.3298,5.0110)	(6.3485,0.0030,6.3514,7.3228	(4.6403,0.0136,4.6539,5.6710)	(3.9981,0.0933,4.0914,5.4187)	(5.2739,0.0107,5.2845,5.6019)
2			(6.6265,0.0153,6.6418,8.6186	(5.2603,0.0036,5.2659,7.6469	(2.1674,0.1350,2.3024,5.0234)	(6.3491,0.0023,6.3514,7.3212	(4.6176,0.0586,4.6762,5.6550)	(4.0337,0.0142,4.0479,5.4466)	(5.2757,0.0083,5.2840,5.6027)	
3			(6.6275,0.0140,6.6415,8.6196	(5.2447,0.0327,5.2774,7.6310)	(2.1933,0.0271,2.2204,5.0546)	(6.3367,0.0192,6.3559,7.3118	(4.6443,0.0097,4.6540,5.6717)	(4.0359,0.0130,4.0489,5.4463)	(5.2771,0.0076,5.2847,5.6023)	
1.2	1.2	(6.6253,0.0168,6.6421,8.6181	(5.2342,0.0496,5.2839,7.6204	(2.1208,0.3071,2.4279,4.9659)	(6.3468,0.0053,6.3521,7.3209	(4.6086,0.0725,4.6810,5.6490)	(3.9895,0.1080,4.0975,5.4122)	(5.2682,0.0191,5.2873,5.5981)		
	1.3	(6.6263,0.0155,6.6418,8.6190	(5.2161,0.0793,5.2954,7.6044	(2.1475,0.2004,2.3478,4.9966)	(6.3344,0.0222,6.3566,7.3112	(4.6354,0.0234,4.6589,5.6659)	(3.9917,0.1068,4.0985,5.4120)	(5.2696,0.0184,5.2880,5.5976)		
	1.2,3	(6.6156,0.0295,6.6451,8.6082	(5.2423,0.0364,5.2787,7.6280)	(2.1576,0.1629,2.3204,5.0092)	(6.3350,0.0215,6.3565,7.3115	(4.6126,0.0685,4.6811,5.6497)	(4.0277,0.0273,4.0550,5.4396)	(5.2715,0.0160,5.2875,5.5984)		
16d	1	1	(6.6144,0.0310,6.6455,8.6067	(5.2136,0.0832,5.2968,7.6014	(2.1100,0.3358,2.4458,4.9508)	(6.3327,0.0245,6.3572,7.3093	(4.6035,0.0825,4.6860,5.6439)	(3.9830,0.1216,4.1046,5.4048)	(5.2640,0.0268,5.2908,5.5937)	
		2	(6.5363,1.7721,8.3085,1.3255	(4.5136,3.7391,8.2526,1.0000)	(2.7811,5.4255,8.2066,0.0000)	(6.8361,1.5303,8.3664,1.0000)	(5.1731,3.1718,8.3449,0.0000)	(4.4190,3.9241,8.3431,0.0000)	(5.9345,2.4871,8.4216,0.0000)	
		3	(6.7000,1.6185,8.3185,1.3609	(6.3149,1.7668,8.0818,1.3052	(3.6642,4.3857,8.0499,0.0000)	(7.3606,0.9881,8.3487,1.0000)	(5.9356,2.4075,8.3431,0.0000)	(5.4961,2.7095,8.2056,0.0000)	(6.7282,1.6676,8.3957,0.0000)	
1.2	1.2	(6.9687,1.3380,8.3067,1.4339	(5.9303,2.2063,8.1366,1.1961	(3.9218,3.9218,7.8435,0.0000)	(7.2047,1.1572,8.3619,1.0000	(4.4055,1.8833,8.2887,0.0000)	(5.8287,2.3567,8.1853,0.0000)	(6.9603,1.4279,8.3882,0.0000)		
	1.3	(4.8916,3.4879,8.3795,1.0001	(2.0770,6.2440,8.3210,0.0000)	(2.0115,6.3316,8.3431,0.0000)	(4.2042,4.2042,8.4083,0.0000)	(4.0563,3.3653,8.4216,0.0000)	(3.3825,5.0132,8.3957,0.0000)	(4.9187,3.5360,8.4547,0.0000)		
	1.2,3	(5.0503,3.3189,8.3691,1.0001	(2.4075,5.9356,8.3431,0.0000)	(1.8832,6.4055,8.3887,0.0000)	(4.3653,4.0563,8.4216,0.0000)	(4.1948,4.1948,8.3896,0.0000)	(3.5315,4.8567,8.3882,0.0000)	(5.0689,3.3809,8.4498,0.0000)		
1.2,3	1.2,3	(5.3423,3.0318,8.3741,1.0001	(4.4624,3.7622,8.2246,1.0000)	(2.3567,5.8287,8.1853,0.0000)	(5.0132,3.3825,8.3957,0.0000)	(4.8567,3.5315,8.3882,0.0000)	(4.1440,4.1440,8.2881,0.0000)	(5.7039,2.7252,8.4291,0.0000)		
	1.2,3	(4.2184,4.2052,8.4236,1.0000	(1.6676,6.7382,8.3957,0.0000)	(1.4279,6.9603,8.3882,0.0000)	(3.5360,4.9187,8.4547,0.0000)	(3.3809,5.0689,8.4498,0.0000)	(2.7252,5.7039,8.4291,0.0000)	(4.2384,4.2384,8.4768,0.0000)		

Figure A.4 Centralized Management Regime with Effort Factor (cont.)

17d	1	2	3	1.1.2	1.3	2.3	1.2.3
1	(7.6882,0.1738,7.8620,3.8584)	(6.3474,1.1245,7.4719,3.3060)	(4.3347,2.5242,6.8589,1.8880)	(7.6057,0.2689,7.8745,2.9194)	(7.0640,0.5463,7.6103,2.2058)	(5.9397,1.4933,7.4330,1.9141)	(7.2734,0.5039,7.7774,1.9513)
2	(7.5327,0.3467,7.8794,3.7947)	(7.1308,0.2118,7.3425,3.6253)	(5.0721,1.5666,6.6387,2.1249)	(7.7077,0.1600,7.8677,2.9610)	(6.9815,0.6577,7.6392,2.1834)	(6.8030,0.4583,7.2615,2.1682)	(7.4640,0.2987,7.7627,2.0077)
3	(7.5876,0.2865,7.8741,3.8215)	(6.8524,0.5421,7.3945,3.5148)	(5.7361,0.6468,6.3829,2.3356)	(7.5519,0.3326,7.8844,3.9090)	(7.3238,0.2683,7.5921,2.2776)	(6.8804,0.3792,7.2596,2.1866)	(7.5150,0.2479,7.7629,2.0196)
1.2	(7.3339,0.5615,7.8953,3.6878)	(6.0492,1.4557,7.5049,3.1793)	(3.3038,3.8486,7.1523,1.5430)	(7.4281,0.4616,7.8897,2.8376)	(6.4048,1.2877,7.6926,2.0125)	(5.4212,0.0706,7.4918,1.7662)	(6.9454,0.8600,7.8054,1.8565)
1.3	(7.3953,0.4945,7.8898,3.7154)	(5.7603,1.7925,7.5528,3.0805)	(3.6721,3.3142,6.9862,1.6803)	(7.2628,0.6437,7.9065,2.7859)	(6.7692,0.8771,7.6463,2.1095)	(5.5206,1.9684,7.4890,1.7939)	(7.0060,0.7993,7.8053,1.8717)
2.3	(7.2370,0.6700,7.9070,3.6598)	(6.6125,0.8131,7.4256,3.4010)	(4.4327,2.3435,6.7762,1.9222)	(7.3802,0.5191,7.8993,2.8292)	(6.7052,0.9685,7.6738,2.0949)	(6.4171,0.9043,7.3214,2.0452)	(7.2144,0.5760,7.7903,1.9285)
1.2,3	(6.9997,0.9241,7.9239,3.5412)	(5.4030,2.1842,7.5872,2.9402)	(2.6881,4.5718,7.2600,1.3402)	(7.0569,0.8654,7.9222,2.7014)	(6.0690,1.6591,7.7281,1.9151)	(4.9514,2.5967,7.5482,1.6382)	(6.6438,1.1900,7.8337,1.7702)
18d	1	2	3	1.2	1.3	2.3	1.2.3
1	(6.7802,0.0023,6.7825,8.1689)	(5.3229,0.0655,5.3884,7.4666)	(2.1936,0.2494,2.4430,4.9586)	(6.5447,0.0043,6.5489,7.0682)	(5.1639,0.0162,5.1801,5.6724)	(4.1418,0.1302,4.2720,5.3719)	(5.6375,0.0136,5.6511,5.5519)
2	(6.7690,0.0166,6.7857,8.1579)	(5.3608,0.0042,5.3650,7.5006)	(2.2202,0.1531,2.3733,4.9907)	(6.5460,0.0026,6.5487,7.0695)	(5.1423,0.0547,5.1970,5.6587)	(4.1964,0.0156,4.2120,5.4128)	(5.6415,0.0083,5.6498,5.5541)
3	(6.7712,0.0139,6.7851,8.1600)	(5.3429,0.0333,5.3762,7.4848)	(2.2513,0.0283,2.2797,5.0286)	(6.5343,0.0182,6.5525,7.0608)	(5.1705,0.0083,5.1788,5.6749)	(4.1994,0.0131,4.2125,5.4132)	(5.6433,0.0069,5.6502,5.5539)
1.2	(6.7671,0.0190,6.7861,8.1571)	(5.3200,0.0699,5.3899,7.4633)	(2.1499,0.4021,2.5521,4.9071)	(6.5427,0.0069,6.5496,7.0669)	(5.1309,0.0713,5.2022,5.6515)	(4.1320,0.1465,4.2786,5.3647)	(5.6316,0.0220,5.6536,5.5478)
1.3	(6.7693,0.0162,6.7855,8.1590)	(5.3013,0.0998,5.4012,7.4473)	(2.1825,0.2791,2.4616,4.9439)	(6.5309,0.0226,6.5534,7.0585)	(5.1593,0.0246,5.1840,5.6677)	(4.1351,0.1439,4.2790,5.3651)	(5.6334,0.0206,5.6540,5.5477)
2.3	(6.7580,0.0307,6.7887,8.1492)	(5.3401,0.0376,5.3778,7.4815)	(2.2097,0.1822,2.3919,4.9771)	(6.5323,0.0209,6.5532,7.0581)	(5.1377,0.0632,5.2009,5.6540)	(4.1901,0.0288,4.2189,5.4061)	(5.6374,0.0153,5.6527,5.5499)
1.2,3	(6.7561,0.0331,6.7892,8.1471)	(5.2983,0.1044,5.4027,7.4439)	(2.1382,0.4324,2.5706,4.8934)	(6.5288,0.0253,6.5541,7.0549)	(5.1261,0.0799,5.2060,5.6467)	(4.1252,0.1603,4.2855,5.3579)	(5.6275,0.0290,5.6565,5.5436)
19d	1	2	3	1.2	1.3	2.3	1.2.3
1	(3.9310,3.9310,7.8621,0.0000)	(3.8281,4.1528,7.9808,0.0000)	(3.7640,4.2074,7.9714,0.0000)	(5.5472,2.5987,8.1461,0.0000)	(5.5155,2.6250,8.1405,0.0000)	(5.2859,2.9101,8.1960,0.0000)	(6.3277,1.9555,8.2832,0.0000)
2	(4.1528,3.8281,7.9808,0.0000)	(3.8992,3.8992,7.7983,0.0000)	(3.9119,4.0308,7.9427,0.0000)	(5.6966,2.4393,8.1359,0.0000)	(5.5135,2.6825,8.1960,0.0000)	(5.5732,2.5395,8.1128,0.0000)	(6.4502,1.8273,8.2775,0.0000)
3	(4.2074,3.7640,7.9714,0.0000)	(4.0308,3.9119,7.9427,0.0000)	(3.8869,3.8869,7.7738,0.0000)	(5.5927,2.6034,8.1960,0.0000)	(5.7193,2.4072,8.1264,0.0000)	(5.6278,2.4810,8.1088,0.0000)	(6.4936,1.7819,8.2754,0.0000)
1.2	(2.5987,5.5473,8.1461,0.0000)	(2.4393,5.6966,8.1359,0.0000)	(2.6034,5.5927,8.1960,0.0000)	(4.1214,4.1214,8.2429,0.0000)	(4.1088,4.1743,8.2832,0.0000)	(4.0101,4.2673,8.2775,0.0000)	(5.0989,3.2415,8.3405,0.0000)
1.3	(2.6250,5.5155,8.1405,0.0000)	(2.6825,5.5135,8.1960,0.0000)	(2.4072,5.7193,8.1264,0.0000)	(4.1743,4.1088,8.2832,0.0000)	(4.1183,4.1183,8.2366,0.0000)	(4.0419,4.2336,8.2754,0.0000)	(5.1303,3.2087,8.3390,0.0000)
2.3	(2.9101,5.2859,8.1960,0.0000)	(2.5395,5.5732,8.1128,0.0000)	(2.4810,5.6278,8.1088,0.0000)	(4.2673,4.0101,8.2775,0.0000)	(4.2336,4.0419,8.2754,0.0000)	(4.1089,4.1089,8.2178,0.0000)	(5.2220,3.1127,8.3347,0.0000)
1.2,3	(1.9555,6.3277,8.2832,0.0000)	(1.8273,6.4502,8.2775,0.0000)	(1.7819,6.4936,8.2754,0.0000)	(3.2415,5.9989,8.3405,0.0000)	(3.2087,5.1303,8.3390,0.0000)	(3.1127,5.2220,8.3347,0.0000)	(4.1914,4.1914,8.3828,0.0000)
20d	1	2	3	1.2	1.3	2.3	1.2.3
1	(5.3569,0.8688,6.2057,1.9663)	(3.8653,2.1713,6.0366,1.1130)	(2.6914,3.0085,5.6998,0.0000)	(5.5879,1.0203,6.6082,1.0988)	(4.2230,2.0098,6.2329,0.0000)	(4.1437,2.2813,6.4250,0.0000)	(5.1528,1.5924,6.7453,0.0000)
2	(4.9710,1.4360,6.4070,1.8550)	(4.2454,4.1446,5.6600,1.2404)	(2.7662,2.8503,5.6165,0.0000)	(5.6745,0.9300,6.6045,1.1236)	(4.3221,2.1029,6.4250,0.0000)	(4.2183,1.9221,6.1404,0.0000)	(5.2393,1.4842,6.7235,0.0000)
3	(5.0013,1.3944,6.3958,1.8643)	(3.9954,1.9697,5.9651,1.1480)	(2.5800,2.5800,5.1599,0.0000)	(5.4153,1.3196,6.7349,1.0490)	(4.3535,1.8323,6.1858,0.0000)	(4.2527,1.8748,6.1275,0.0000)	(5.2698,1.4460,6.7158,0.0000)
1.2	(4.2096,2.3884,6.5980,1.6329)	(3.0733,3.2742,6.3475,1.1000)	(2.0408,4.3842,6.4250,0.0000)	(4.8548,1.9387,7.9935,1.0000)	(3.3460,3.3993,6.7453,0.0000)	(3.2573,3.4662,6.7235,0.0000)	(4.2610,2.7088,6.9698,0.0000)
1.3	(4.2412,2.3463,6.5875,1.6422)	(3.0637,3.4711,6.5348,1.0000)	(1.8323,4.3535,6.1858,0.0000)	(4.7225,2.1819,9.9043,1.0000)	(3.2856,3.2856,6.5712,0.0000)	(3.2801,3.4357,6.7158,0.0000)	(4.2843,2.6796,6.9639,0.0000)
2.3	(4.0189,2.7224,6.7412,1.5646)	(3.1504,3.1382,6.2885,1.0000)	(1.8748,4.2527,6.1275,0.0000)	(4.7796,2.1216,6.9012,1.0000)	(3.4357,3.2801,6.7158,0.0000)	(3.2514,3.2514,6.5027,0.0000)	(4.3524,2.5943,6.9468,0.0000)
1.2,3	(3.2672,3.6393,6.9064,1.3463)	(2.5450,4.2069,6.7519,1.0000)	(1.4460,5.2698,6.7158,0.0000)	(4.2078,2.8398,7.0476,1.0000)	(2.6796,4.2843,6.9639,0.0000)	(2.5943,4.3524,6.9468,0.0000)	(3.5717,3.5717,7.1433,0.0000)

Figure A.4 Centralized Management Regime with Effort Factor (cont.)

21d	1	2	3	1.1.2	1.3	2.3	1.2.3
1	(1.6907,0.0440,1.7347,4.3227)	(0.7378,0.2158,0.9536,2.7311)	(0.3249,0.2418,0.5667,1.0788)	(1.6823,0.0663,1.7486,3.1360)	(0.8143,0.1321,0.9465,1.5463)	(0.7504,0.2229,0.9733,1.4356)	(1.2433,0.1166,1.3599,1.6932)
2	(1.6740,0.1477,1.8217,4.2998)	(0.7574,0.0874,0.8248,2.7576)	(0.3256,0.2234,0.5490,1.0806)	(1.6899,0.0610,1.7509,3.1393)	(0.8373,0.2023,1.0396,1.5607)	(0.7319,0.1277,0.8597,1.4250)	(1.2494,0.1074,1.3568,1.6971)
3	(1.6749,0.1434,1.8182,4.3011)	(0.7399,0.1935,0.9333,2.7355)	(0.3018,0.1463,0.4481,1.0624)	(1.6755,0.1521,1.8278,3.1255)	(0.8353,0.1173,0.9526,1.5718)	(0.7451,0.1231,0.8682,1.4458)	(1.2651,0.1036,1.3688,1.7123)
1.1	(1.6602,0.1923,1.8525,4.2789)	(0.7172,0.3020,1.0191,2.6928)	(0.3165,0.4535,0.7700,1.0574)	(1.6656,0.1281,1.7993,3.1165)	(0.7943,0.3309,1.1253,1.5238)	(0.7121,0.3468,1.0588,1.3994)	(1.2066,0.2242,1.4308,1.6692)
1.2	(1.6611,0.1879,1.8491,4.2802)	(0.7206,0.4015,1.1221,2.6953)	(0.2926,0.3824,0.6750,1.0400)	(1.6513,0.2183,1.8698,3.1028)	(0.7911,0.2490,1.0401,1.5339)	(0.7250,0.3419,1.0669,1.4207)	(1.2225,0.2197,1.4423,1.6852)
2.1	(1.6444,0.2893,1.9338,4.2589)	(0.7193,0.2797,0.9990,2.6986)	(0.2933,0.3644,0.6577,1.0419)	(1.6588,0.2132,1.8720,3.1062)	(0.8150,0.3161,1.1310,1.5494)	(0.7056,0.2504,0.9560,1.4088)	(1.2288,0.2105,1.4392,1.6892)
1.2.3	(1.6298,0.3345,1.9642,4.2373)	(0.6993,0.4864,1.1857,2.6560)	(0.2843,0.5892,0.8735,1.0175)	(1.6338,0.2802,1.9140,3.0830)	(0.7709,0.4443,1.2152,1.5112)	(0.6856,0.4654,1.1510,1.3835)	(1.1852,0.3268,1.5121,1.6612)
22d	1	2	3	1.1.2	1.3	2.3	1.2.3
1	(4.0189,4.0189,8.0379,0.0000)	(3.5546,4.5381,8.0926,0.0000)	(3.3673,4.7032,8.0705,0.0000)	(5.4614,2.7805,8.2419,0.0000)	(5.3733,2.8562,8.2294,0.0000)	(4.9536,3.3041,8.2578,0.0000)	(6.1731,2.1695,8.3426,0.0000)
2	(4.5381,3.5546,8.0926,0.0000)	(3.9361,3.9361,7.8721,0.0000)	(3.8142,4.1728,7.9870,0.0000)	(5.9156,2.3005,8.2161,0.0000)	(5.6697,2.5880,8.2578,0.0000)	(5.5430,2.6083,8.1514,0.0000)	(6.5541,1.7730,8.3271,0.0000)
3	(4.7032,3.3673,8.0705,0.0000)	(4.1728,3.8142,7.9870,0.0000)	(3.9012,3.9012,7.8023,0.0000)	(5.8921,2.3658,8.2578,0.0000)	(5.9902,2.2029,8.1931,0.0000)	(5.7079,2.4324,8.1403,0.0000)	(6.6792,1.6428,8.3220,0.0000)
1.1	(2.7805,5.4614,8.2419,0.0000)	(2.3005,5.9156,8.2161,0.0000)	(2.3656,5.8921,8.2578,0.0000)	(4.1579,4.1579,8.3159,0.0000)	(4.0814,4.2612,8.3426,0.0000)	(3.7678,4.5592,8.3271,0.0000)	(5.0257,3.3635,8.3893,0.0000)
1.2	(2.8562,5.3733,8.2294,0.0000)	(2.5880,5.6697,8.2578,0.0000)	(2.2029,5.9902,8.1931,0.0000)	(4.2612,4.0814,8.3426,0.0000)	(4.1507,4.1507,8.3015,0.0000)	(3.8549,4.6770,8.3220,0.0000)	(5.1124,3.2733,8.3857,0.0000)
1.3	(3.3041,4.9536,8.2578,0.0000)	(2.6083,5.5430,8.1514,0.0000)	(2.4324,5.7079,8.1403,0.0000)	(4.5592,3.7678,8.3271,0.0000)	(4.4670,3.8549,8.3220,0.0000)	(4.1234,4.1234,8.2469,0.0000)	(5.4054,2.9684,8.3738,0.0000)
1.2.3	(2.1695,6.1731,8.3426,0.0000)	(1.7730,6.5541,8.3271,0.0000)	(1.6428,6.6792,8.3220,0.0000)	(3.3635,5.0257,8.3893,0.0000)	(3.2733,5.1124,8.3857,0.0000)	(2.9684,5.4054,8.3738,0.0000)	(4.2112,4.2112,8.4224,0.0000)
23d	1	2	3	1.1.2	1.3	2.3	1.2.3
1	(5.4041,1.0936,6.4977,1.7224)	(3.6918,2.5982,6.2899,1.0000)	(2.5048,3.4986,6.0034,0.0000)	(5.6337,1.2084,6.8421,1.0000)	(4.2734,2.2715,6.5449,0.0000)	(3.9888,2.6606,6.6494,0.0000)	(5.1636,1.8147,6.9783,0.0000)
2	(5.2009,1.4334,6.6343,1.6610)	(4.2925,1.5139,5.8064,1.1726)	(2.7440,3.0020,5.7460,0.0000)	(5.8497,0.9566,6.8063,1.0160)	(4.5654,2.0839,6.6494,0.0000)	(4.2636,2.0663,6.2699,0.0000)	(5.4437,1.4726,6.9163,0.0000)
3	(5.2922,1.3126,6.6049,1.6869)	(4.1087,1.9612,6.0699,1.0975)	(2.6164,2.6164,5.2329,0.0000)	(5.6783,1.2264,6.9048,1.0000)	(4.6899,1.7247,6.4146,0.0000)	(4.3700,1.8623,6.2323,0.0000)	(5.5348,1.3613,6.8961,0.0000)
1.1	(4.2438,2.6002,6.8440,1.4067)	(3.0127,3.5596,6.5724,1.0000)	(1.9048,4.7445,6.6494,0.0000)	(5.0066,1.9959,7.0025,1.0000)	(3.4140,3.5643,6.9783,0.0000)	(3.1295,3.7868,6.9163,0.0000)	(4.2956,2.8749,7.1705,0.0000)
1.2	(4.3376,2.4794,6.8170,1.4324)	(3.0415,3.6730,6.7145,1.0000)	(1.7247,4.6899,6.4146,0.0000)	(4.9099,2.1709,7.0025,1.0000)	(3.4079,3.4079,6.8158,0.0000)	(3.1945,3.7017,6.8961,0.0000)	(4.3625,2.7932,7.1557,0.0000)
1.3	(4.2746,2.6443,6.9189,1.3984)	(3.2607,3.1366,6.3973,1.0000)	(1.8623,4.3700,6.2323,0.0000)	(5.0736,1.9807,7.0543,1.0000)	(3.7017,3.1945,6.8961,0.0000)	(3.3045,3.3045,6.6089,0.0000)	(4.5870,2.5189,7.1060,0.0000)
1.2.3	(3.3463,3.7539,7.1003,1.1521)	(1.4726,5.4437,6.9163,0.0000)	(1.3613,5.5348,6.8961,0.0000)	(4.4052,2.8012,7.2064,1.0000)	(2.7932,4.3625,7.1557,0.0000)	(2.5189,4.5870,7.1060,0.0000)	(3.6561,3.6561,7.3121,0.0000)
24d	1	2	3	1.1.2	1.3	2.3	1.2.3
1	(1.9656,0.0545,2.0201,4.2171)	(0.7926,0.2738,1.0664,2.7064)	(0.3330,0.3099,0.6429,1.0709)	(1.9278,0.0806,2.0084,3.1269)	(0.9660,0.1625,1.1285,1.6106)	(0.7944,0.2837,1.0781,1.4391)	(1.4177,0.1434,1.5611,1.7332)
2	(1.9481,0.1506,2.0987,4.1974)	(0.7970,0.0952,0.8922,2.7220)	(0.3356,0.2445,0.5802,1.0774)	(1.9403,0.0630,2.0032,3.1338)	(0.9957,0.2149,1.2106,1.6277)	(0.7793,0.1386,0.9179,1.4340)	(1.4326,0.1122,1.5448,1.7418)
3	(1.9512,0.1377,2.0889,4.2008)	(0.8001,0.1975,0.9976,2.7215)	(0.3117,0.1512,0.4629,1.0609)	(1.9243,0.1478,2.0721,3.1203)	(0.9996,0.1154,1.1150,1.6427)	(0.7954,0.1259,0.9213,1.4566)	(1.4513,0.1019,1.5532,1.7572)
1.1	(1.9294,0.2059,2.1353,4.1738)	(0.7694,0.3670,1.1364,2.6690)	(0.3236,0.5381,0.8616,1.0476)	(1.9089,0.1445,2.0533,3.1065)	(0.9406,0.3731,1.3137,1.5859)	(0.7522,0.4171,1.1693,1.4013)	(1.3778,0.2557,1.6335,1.7104)
1.2	(1.9326,0.1929,2.1255,4.1775)	(0.7735,0.4614,1.2350,2.6691)	(0.2995,0.4535,0.7530,1.0311)	(1.8932,0.2285,2.1217,3.0944)	(0.9431,0.2773,1.2204,1.5995)	(0.7680,0.4043,1.1723,1.4244)	(1.3968,0.2447,1.6415,1.7258)
1.3	(1.9152,0.2870,2.2021,4.1583)	(0.7772,0.2913,1.0684,2.6831)	(0.3021,0.3898,0.6919,1.0380)	(1.9057,0.2108,2.1165,3.1015)	(0.9738,0.3268,1.3066,1.6176)	(0.7520,0.2640,1.0160,1.4181)	(1.4118,0.2136,1.6254,1.7345)
1.2.3	(1.8954,0.3429,2.2384,4.1343)	(0.7495,0.5533,1.3029,2.6502)	(0.2902,0.6763,0.9665,1.0071)	(1.8734,0.2925,2.1660,3.0737)	(0.9176,0.4843,1.4018,1.5753)	(0.7248,0.5372,1.2620,1.3856)	(1.3561,0.3566,1.7128,1.7022)

Figure A.4 Centralized Management Regime with Effort Factor (cont.)

	1	2	3	1.2	1.3	2.3	1.2.3
25d							
	1	(4.1194.4.1194.8.2389.0.0000)	(2.7811.5.4255.8.2066.0.0000)	(5.3259.3.0344.8.3603.0.0000)	(5.1731.3.1718.8.3449.0.0000)	(4.4190.3.9241.8.3431.0.0000)	(5.9345.2.4871.8.4216.0.0000)
	2	(5.1042.3.1316.8.2358.0.0000)	(3.6642.4.3857.8.0499.0.0000)	(6.2440.2.0770.8.3210.0.0000)	(5.9556.2.4075.8.3431.0.0000)	(5.4961.2.7095.8.2056.0.0000)	(6.7282.1.6676.8.3957.0.0000)
	3	(5.4255.2.7811.8.2066.0.0000)	(4.3857.3.6642.8.0499.0.0000)	(6.3316.2.0115.8.3431.0.0000)	(6.4055.1.8832.8.2887.0.0000)	(5.8287.2.3567.8.1853.0.0000)	(6.9603.1.4279.8.3882.0.0000)
	1.2	(3.0344.5.3259.8.3003.0.0000)	(2.0770.6.2440.8.3210.0.0000)	(4.2042.2.2042.8.4083.0.0000)	(4.0563.4.3653.8.4216.0.0000)	(3.3825.5.0132.8.3957.0.0000)	(4.9187.3.5360.8.4547.0.0000)
	1.3	(3.1718.5.1731.8.3449.0.0000)	(2.4075.5.9356.8.3431.0.0000)	(4.3653.4.0563.8.4216.0.0000)	(4.1948.4.1948.8.3896.0.0000)	(5.5315.4.8567.8.3882.0.0000)	(5.0689.3.3809.8.4498.0.0000)
	2.3	(3.9241.4.4190.8.3431.0.0000)	(2.7095.5.4961.8.2056.0.0000)	(5.0132.3.3825.8.3957.0.0000)	(4.8567.3.5315.8.3882.0.0000)	(4.1440.4.1440.8.2881.0.0000)	(5.7039.2.7252.8.4291.0.0000)
	1.2.3	(2.4871.5.9345.8.4216.0.0000)	(1.6676.6.7282.8.3957.0.0000)	(3.5360.4.9187.8.4547.0.0000)	(3.3809.5.0689.8.4498.0.0000)	(2.7252.5.7039.8.4291.0.0000)	(4.2384.4.2384.8.4768.0.0000)
26d							
	1	(5.3749.1.5350.6.9100.1.3424)	(3.5089.3.1527.6.6616.1.0000)	(5.7834.1.3752.7.1586.1.0000)	(4.3318.2.6560.6.9878.0.0000)	(3.6973.3.2832.6.9805.0.0000)	(5.1502.2.1584.7.3086.0.0000)
	2	(5.5254.1.4284.6.9539.1.3642)	(4.3478.1.6734.6.0212.1.0696)	(6.2036.0.8832.7.0868.1.0000)	(4.9662.2.0143.6.9805.0.0000)	(4.3262.2.1328.6.4590.0.0000)	(5.7682.1.4296.7.1978.0.0000)
	3	(5.7077.1.1983.6.9060.1.4106)	(4.2750.1.9494.6.2244.1.0178)	(6.1029.1.0404.7.1433.1.0000)	(5.2292.1.5374.6.7666.0.0000)	(4.5483.1.8390.6.3873.0.0000)	(5.9461.1.2198.7.1659.0.0000)
	1.2	(4.2024.2.9869.7.1892.1.0609)	(2.8782.4.0164.6.8946.1.0000)	(5.2100.2.0717.7.2818.1.0000)	(3.5202.3.7884.7.3086.0.0000)	(3.8999.4.2979.7.1978.0.0000)	(4.3368.3.1176.7.4544.0.0000)
	1.3	(4.3796.2.7679.7.1475.1.1037)	(2.9592.4.0217.6.9809.1.0000)	(1.5374.5.2292.6.7666.0.0000)	(3.5859.3.5859.7.1718.0.0000)	(3.0169.4.1490.7.1659.0.0000)	(4.4587.2.9739.7.4326.0.0000)
	2.3	(4.6450.2.5293.7.1744.1.1412)	(3.4230.3.1299.6.5529.1.0000)	(5.5108.1.7562.7.2670.1.0000)	(4.1490.3.0169.7.1659.0.0000)	(3.3820.3.3820.6.7640.0.0000)	(4.9678.2.3735.7.3413.0.0000)
	1.2.3	(3.6074.3.7675.7.3749.1.0000)	(1.4296.5.7682.7.1978.0.0000)	(3.1176.4.3368.7.4544.0.0000)	(2.9739.4.4587.7.4326.0.0000)	(2.3755.4.9678.7.3413.0.0000)	(3.7773.3.7773.7.5547.0.0000)
27d							
	1	(2.4102.0.0749.2.4851.4.0373)	(0.8769.0.3897.1.2666.2.6617)	(0.3438.0.4475.0.7914.1.0551)	(2.3400.0.1072.2.4473.3.0912)	(1.2642.0.2175.1.4816.1.7112)	(0.8622.0.4055.1.2677.1.4402)
	2	(2.3941.0.1537.2.5479.4.0236)	(0.8936.0.1079.1.0015.2.6970)	(0.3511.0.2799.0.6310.1.0721)	(2.3633.0.0655.2.4288.3.1050)	(0.8564.0.1566.1.0130.1.4472)	(1.7698.0.1179.1.8877.1.8088)
	3	(2.4014.0.1285.2.5299.4.0307)	(0.8979.0.2032.1.1011.2.6991)	(0.3272.0.1589.0.4860.1.0585)	(2.3456.0.1396.2.4851.3.0932)	(0.8777.0.1299.1.0077.1.4725)	(1.7932.0.0980.1.8912.1.8235)
	1.2	(2.3646.0.2300.2.5946.3.9933)	(0.8489.0.4946.1.3435.2.6206)	(0.3328.0.7007.1.0334.1.0295)	(2.3176.0.1741.2.4917.3.0715)	(1.2281.0.4431.1.6833)	(0.8136.0.5538.1.3674.1.3997)
	1.3	(2.3722.0.2045.2.5767.4.0005)	(0.8550.0.5789.1.4339.2.6242)	(0.3085.0.5950.0.9035.1.0141)	(2.3000.2.472.2.5472.3.0599)	(1.2419.0.3271.1.5690.1.7026)	(0.8344.0.5278.1.3622.1.4259)
	2.3	(2.3565.0.2814.2.6379.3.9875)	(0.8707.0.3097.1.1803.2.6578)	(0.3156.0.4316.0.7472.1.0317)	(2.3237.0.2052.2.5290.3.0740)	(1.2865.0.3385.1.6250.1.7245)	(0.8276.0.2858.1.1134.1.4314)
	1.2.3	(2.3255.0.3587.2.6843.3.9567)	(0.8262.0.6823.1.5084.2.5822)	(0.2984.0.8411.1.1395.1.0001)	(2.2767.0.3143.2.5910.3.0401)	(1.2057.0.5492.1.7549.1.6752)	(0.7847.0.6754.1.4601.1.3845)

Figure A.4 Centralized Management Regime with Effort Factor (cont.)

APPENDIX B: IMPACT OF AN EXCLUSIVE PRODUCT

This section includes the computational results for Chapter 4.2.1.

	1	2	3	1,2	1,3	2,3	1,2,3
$V_2, r=8$	2 (7.4149, 0.1938, 5.8738)	(7.6704, 0.0630, 4.8942)	(7.6153, 0.1748, 5.0269)	(7.7990, 0.0663, 4.3115)	(7.7238, 0.1649, 4.5379)	(7.8791, 0.0683, 3.9315)	(7.9355, 0.0697, 3.6554)
	3 (7.3519, 0.2302, 6.1261)	(7.4564, 0.2185, 5.7037)	(7.7328, 0.0810, 4.6452)	(7.6080, 0.2020, 5.0587)	(7.8258, 0.0831, 4.2169)	(7.8549, 0.0838, 4.0791)	(7.9107, 0.0849, 3.8093)
	4 (7.6515, 0.0159, 4.9553)	(7.7254, 0.0151, 4.5305)	(7.8158, 0.0143, 4.1051)	(7.8617, 0.0140, 3.8822)	(7.9156, 0.0135, 3.6144)	(7.9469, 0.0133, 3.4557)	(8.0070, 0.0128, 3.1419)
	2,3 (7.2364, 0.2861, 6.5741)	(7.4338, 0.2242, 5.8343)	(7.5728, 0.1889, 5.2849)	(7.5826, 0.2080, 5.2158)	(7.6778, 0.1798, 4.8289)	(7.8082, 0.1093, 4.3490)	(7.8633, 0.1098, 4.0887)
	2,4 (7.4079, 0.1980, 5.9028)	(7.6602, 0.0719, 4.9350)	(7.6088, 0.1787, 5.0553)	(7.7899, 0.0739, 4.3498)	(7.7176, 0.1685, 4.5664)	(7.8706, 0.0751, 3.9683)	(7.9274, 0.0760, 3.6910)
	3,4 (7.3461, 0.2334, 6.1491)	(7.4508, 0.2215, 5.7267)	(7.7242, 0.0879, 4.6796)	(7.6027, 0.2048, 5.0819)	(7.8179, 0.0892, 4.2493)	(7.8472, 0.0896, 4.1109)	(7.9034, 0.0902, 3.8400)
	2,3,4 (7.2322, 0.2879, 6.5900)	(7.4287, 0.2266, 5.8538)	(7.5674, 0.1919, 5.3065)	(7.5779, 0.2104, 5.2353)	(7.6727, 0.1825, 4.8499)	(7.8019, 0.1136, 4.3737)	(7.8573, 0.1137, 4.1123)
	1	2	3	1,2	1,3	2,3	1,2,3
$V_2, r=10$	2 (7.4149, 0.1938, 5.8738)	(7.6704, 0.0630, 4.8942)	(7.6153, 0.1748, 5.0269)	(7.7990, 0.0663, 4.3115)	(7.7238, 0.1649, 4.5379)	(7.8791, 0.0683, 3.9315)	(7.9355, 0.0697, 3.6554)
	3 (7.3519, 0.2302, 6.1261)	(7.4564, 0.2185, 5.7037)	(7.7328, 0.0810, 4.6452)	(7.6080, 0.2020, 5.0587)	(7.8258, 0.0831, 4.2169)	(7.8549, 0.0838, 4.0791)	(7.9107, 0.0849, 3.8093)
	4 (7.5916, 0.0569, 5.1280)	(7.6871, 0.0540, 4.7059)	(7.7790, 0.0514, 4.2807)	(7.8256, 0.0500, 4.0580)	(7.8804, 0.0485, 3.7904)	(7.9122, 0.0476, 3.6318)	(7.9733, 0.0459, 3.3202)
	2,3 (7.2364, 0.2861, 6.5741)	(7.4338, 0.2242, 5.8343)	(7.5728, 0.1889, 5.2849)	(7.5826, 0.2080, 5.2158)	(7.6778, 0.1798, 4.8289)	(7.8082, 0.1093, 4.3490)	(7.8633, 0.1098, 4.0887)
	2,4 (7.3873, 0.2104, 5.9846)	(7.6308, 0.0963, 5.0525)	(7.5898, 0.1900, 5.1362)	(7.7634, 0.0949, 4.4608)	(7.6994, 0.1789, 4.6497)	(7.8458, 0.0941, 4.0750)	(7.9039, 0.0936, 3.7946)
	3,4 (7.3289, 0.2420, 6.2191)	(7.4342, 0.2300, 5.7948)	(7.6990, 0.1071, 4.7797)	(7.5871, 0.2129, 5.1479)	(7.7948, 0.1062, 4.3443)	(7.8247, 0.1059, 4.2042)	(7.8822, 0.1053, 3.9301)
	2,3,4 (7.2197, 0.2933, 6.6372)	(7.4135, 0.2342, 5.9157)	(7.5514, 0.2006, 5.3704)	(7.5638, 0.2173, 5.2932)	(7.6577, 0.1905, 4.9120)	(7.7832, 0.1260, 4.4468)	(7.8397, 0.1251, 4.1824)
	1	2	3	1,2	1,3	2,3	1,2,3
$V_2, r=12$	2 (7.4149, 0.1938, 5.8738)	(7.6704, 0.0630, 4.8942)	(7.6153, 0.1748, 5.0269)	(7.7990, 0.0663, 4.3115)	(7.7238, 0.1649, 4.5379)	(7.8791, 0.0683, 3.9315)	(7.9355, 0.0697, 3.6554)
	3 (7.3519, 0.2302, 6.1261)	(7.4564, 0.2185, 5.7037)	(7.7328, 0.0810, 4.6452)	(7.6080, 0.2020, 5.0587)	(7.8258, 0.0831, 4.2169)	(7.8549, 0.0838, 4.0791)	(7.9107, 0.0849, 3.8093)
	4 (7.4677, 0.1590, 5.6579)	(7.5678, 0.1512, 5.2327)	(7.6642, 0.1436, 4.8094)	(7.7131, 0.1398, 4.5871)	(7.7706, 0.1355, 4.3201)	(7.8040, 0.1329, 4.1618)	(7.8681, 0.1282, 3.8508)
	2,3 (7.2364, 0.2861, 6.5741)	(7.4338, 0.2242, 5.8343)	(7.5728, 0.1889, 5.2849)	(7.5826, 0.2080, 5.2158)	(7.6778, 0.1798, 4.8289)	(7.8082, 0.1093, 4.3490)	(7.8633, 0.1098, 4.0887)
	2,4 (7.3148, 0.2492, 6.2736)	(7.5326, 0.1669, 5.4444)	(7.5226, 0.2248, 5.4269)	(7.6738, 0.1568, 4.8364)	(7.6352, 0.2119, 4.9388)	(7.7617, 0.1508, 4.4387)	(7.8236, 0.1467, 4.1495)
	3,4 (7.2667, 0.2724, 6.4588)	(7.3744, 0.2586, 6.0365)	(7.6127, 0.1654, 5.1251)	(7.5307, 0.2391, 5.3913)	(7.7149, 0.1584, 4.6747)	(7.7469, 0.1563, 4.5297)	(7.8083, 0.1522, 4.2461)
	2,3,4 (7.1731, 0.3123, 6.8117)	(7.3581, 0.2607, 6.1296)	(7.4932, 0.2302, 5.6018)	(7.5122, 0.2414, 5.5033)	(7.6031, 0.2177, 5.1374)	(7.7162, 0.1667, 4.7111)	(7.7766, 0.1627, 4.4369)
	1	2	3	1,2	1,3	2,3	1,2,3
$V_2, r=14$	2 (7.4149, 0.1938, 5.8738)	(7.6704, 0.0630, 4.8942)	(7.6153, 0.1748, 5.0269)	(7.7990, 0.0663, 4.3115)	(7.7238, 0.1649, 4.5379)	(7.8791, 0.0683, 3.9315)	(7.9355, 0.0697, 3.6554)
	3 (7.3519, 0.2302, 6.1261)	(7.4564, 0.2185, 5.7037)	(7.7328, 0.0810, 4.6452)	(7.6080, 0.2020, 5.0587)	(7.8258, 0.0831, 4.2169)	(7.8549, 0.0838, 4.0791)	(7.9107, 0.0849, 3.8093)
	4 (7.1956, 0.3029, 6.7297)	(7.3059, 0.2874, 6.3082)	(7.4121, 0.2730, 5.8848)	(7.4661, 0.2655, 5.6647)	(7.5294, 0.2573, 5.2393)	(7.5663, 0.2524, 5.2393)	(7.6370, 0.2430, 4.9307)
	2,3 (7.2364, 0.2861, 6.5741)	(7.4338, 0.2242, 5.8343)	(7.5728, 0.1889, 5.2849)	(7.5826, 0.2080, 5.2158)	(7.6778, 0.1798, 4.8289)	(7.8082, 0.1093, 4.3490)	(7.8633, 0.1098, 4.0887)
	2,4 (7.1170, 0.3335, 7.0180)	(7.2934, 0.2879, 6.3789)	(7.3392, 0.3000, 6.1761)	(7.4519, 0.2664, 5.7475)	(7.4597, 0.2820, 5.6924)	(7.5509, 0.2533, 5.3334)	(7.6207, 0.2439, 5.0335)
	3,4 (7.0885, 0.3437, 7.1215)	(7.2027, 0.3259, 6.7010)	(7.3932, 0.2741, 5.9958)	(7.3687, 0.3007, 6.0592)	(7.5087, 0.2583, 5.5227)	(7.5449, 0.2536, 5.3696)	(7.6144, 0.2442, 5.0726)
	2,3,4 (7.0282, 0.3643, 7.3363)	(7.1944, 0.3256, 6.7465)	(7.3250, 0.2999, 6.2564)	(7.3592, 0.3005, 6.1139)	(7.4441, 0.2824, 5.7820)	(7.5313, 0.2544, 5.4497)	(7.6001, 0.2451, 5.1582)

Figure B.1 Experiment on Exclusive Product under Decentralized Regime

	1	2	3	1,2	1,3	2,3	1,2,3
$V_{2,t}=16$	2 (7.4149,0.1938,5.8738)	(7.6704,0.0630,4.8942)	(7.6153,0.1748,5.0269)	(7.7990,0.0663,4.3115)	(7.7238,0.1649,4.5379)	(7.8791,0.0683,3.9315)	(7.9355,0.0697,3.6554)
	3 (7.3519,0.2302,6.1261)	(7.4564,0.2185,5.7037)	(7.7328,0.0810,4.6452)	(7.6080,0.2020,5.0587)	(7.8258,0.0831,4.2169)	(7.8549,0.0838,4.0791)	(7.9107,0.0849,3.8093)
	4 (6.7772,0.4389,8.1861)	(6.9028,0.4146,7.7717)	(7.0238,0.3932,7.3515)	(7.0854,0.3821,7.1327)	(7.1577,0.3696,6.8686)	(7.1997,0.3624,6.7122)	(7.2806,0.3484,6.4058)
	2,3 (7.2364,0.2861,6.5741)	(7.4338,0.2242,5.8343)	(7.5728,0.1889,5.2849)	(7.5826,0.2080,5.2158)	(7.6778,0.1798,4.8289)	(7.8082,0.1093,4.3490)	(7.8633,0.1098,4.0887)
	2,4 (6.7488,0.4469,8.2771)	(6.9000,0.4147,7.7835)	(6.9974,0.4004,7.4427)	(7.0822,0.3816,7.1494)	(7.1324,0.3759,6.9618)	(7.1963,0.3618,6.7312)	(7.2769,0.3478,6.4267)
	3,4 (6.7374,0.4494,8.3156)	(6.8644,0.4252,7.8991)	(7.0195,0.3925,7.3737)	(7.0491,0.3913,7.2626)	(7.1530,0.3688,6.8941)	(7.1948,0.3615,6.7390)	(7.2753,0.3475,6.4353)
	2,3,4 (6.7115,0.4563,8.3986)	(6.8620,0.4248,7.9111)	(6.9935,0.3998,7.4623)	(7.0463,0.3908,7.2771)	(7.1281,0.3751,6.9848)	(7.1915,0.3610,6.7572)	(7.2717,0.3469,6.4554)
	1	2	3	1,2	1,3	2,3	1,2,3
$V_{2,t}=18$	2 (7.4149,0.1938,5.8738)	(7.6704,0.0630,4.8942)	(7.6153,0.1748,5.0269)	(7.7990,0.0663,4.3115)	(7.7238,0.1649,4.5379)	(7.8791,0.0683,3.9315)	(7.9355,0.0697,3.6554)
	3 (7.3519,0.2302,6.1261)	(7.4564,0.2185,5.7037)	(7.7328,0.0810,4.6452)	(7.6080,0.2020,5.0587)	(7.8258,0.0831,4.2169)	(7.8549,0.0838,4.0791)	(7.9107,0.0849,3.8093)
	4 (6.2479,0.5741,9.7824)	(6.3921,0.5417,9.3711)	(6.5314,0.5118,8.9578)	(6.6023,0.4966,8.7417)	(6.6857,0.4795,8.4807)	(6.7341,0.4697,8.3260)	(6.8274,0.4510,8.0223)
	2,3 (7.2364,0.2861,6.5741)	(7.4338,0.2242,5.8343)	(7.5728,0.1889,5.2849)	(7.5826,0.2080,5.2158)	(7.6778,0.1798,4.8289)	(7.8082,0.1093,4.3490)	(7.8633,0.1098,4.0887)
	2,4 (6.2392,0.5763,9.8066)	(6.3916,0.5416,9.3733)	(6.5233,0.5137,8.9821)	(6.6017,0.4965,8.7442)	(6.6779,0.4813,8.5053)	(6.7335,0.4696,8.3291)	(6.8267,0.4509,8.0255)
	3,4 (6.2356,0.5772,9.8166)	(6.3803,0.5446,9.4056)	(6.5306,0.5116,8.9614)	(6.5911,0.4990,8.7769)	(6.6848,0.4793,8.4848)	(6.7332,0.4695,8.3304)	(6.8264,0.4508,8.0269)
	2,3,4 (6.2271,0.5794,9.8402)	(6.3798,0.5444,9.4078)	(6.5225,0.5135,8.9857)	(6.5905,0.4989,8.7793)	(6.6770,0.4811,8.5093)	(6.7326,0.4693,8.3334)	(6.8257,0.4507,8.0301)
	1	2	3	1,2	1,3	2,3	1,2,3
$V_{2,t}=20$	2 (7.4149,0.1938,5.8738)	(7.6704,0.0630,4.8942)	(7.6153,0.1748,5.0269)	(7.7990,0.0663,4.3115)	(7.7238,0.1649,4.5379)	(7.8791,0.0683,3.9315)	(7.9355,0.0697,3.6554)
	3 (7.3519,0.2302,6.1261)	(7.4564,0.2185,5.7037)	(7.7328,0.0810,4.6452)	(7.6080,0.2020,5.0587)	(7.8258,0.0831,4.2169)	(7.8549,0.0838,4.0791)	(7.9107,0.0849,3.8093)
	4 (5.3132,1.7188,10.0000)	(5.6439,1.2864,10.0000)	(5.9029,0.9480,10.0000)	(6.0130,0.8040,10.0000)	(6.1252,0.6574,10.0000)	(6.1827,0.5967,9.9630)	(6.2901,0.5717,9.6637)
	2,3 (7.2364,0.2861,6.5741)	(7.4338,0.2242,5.8343)	(7.5728,0.1889,5.2849)	(7.5826,0.2080,5.2158)	(7.6778,0.1798,4.8289)	(7.8082,0.1093,4.3490)	(7.8633,0.1098,4.0887)
	2,4 (5.3077,1.7260,10.0000)	(5.6437,1.2867,10.0000)	(5.8995,0.9524,10.0000)	(6.0129,0.8042,10.0000)	(6.1228,0.6605,10.0000)	(6.1826,0.5967,9.9635)	(6.2900,0.5716,9.6642)
	3,4 (5.3054,1.7290,10.0000)	(5.6378,1.2946,10.0000)	(5.9026,0.9483,10.0000)	(6.0089,0.8095,10.0000)	(6.1250,0.6576,10.0000)	(6.1825,0.5967,9.9637)	(6.2900,0.5716,9.6644)
	2,3,4 (5.2999,1.7362,10.0000)	(5.6375,1.2949,10.0000)	(5.8993,0.9527,10.0000)	(6.0087,0.8097,10.0000)	(6.1226,0.6608,10.0000)	(6.1824,0.5967,9.9641)	(6.2898,0.5716,9.6649)

Figure B.1 Experiment on Exclusive Product under Decentralized Regime (cont.)

	1	2	3	1,2	1,3	2,3	1,2,3
$V_{2,4}=8$	2 (7.4149,0.1938,5.8738) (7.3519,0.2302,6.1261) (7.6315,0.0159,4.9553) (7.2364,0.2861,6.5741)	2 (7.6704,0.0630,4.8942) (7.4564,0.2185,5.7037) (7.7254,0.0151,4.5305) (7.4338,0.2242,5.8343)	3 (7.6153,0.1748,5.0269) (7.7328,0.0810,4.6452) (7.8158,0.0143,4.1051) (7.5728,0.1889,5.2849)	1,2 (7.7990,0.0663,4.3115) (7.6080,0.2020,5.0587) (7.8617,0.0140,3.8822) (7.5826,0.2080,5.2158)	1,3 (7.7238,0.1649,4.5379) (7.8258,0.0831,4.2169) (7.9156,0.0135,3.6144) (7.6778,0.1798,4.8289)	2,3 (7.8791,0.0683,3.9315) (7.8549,0.0838,4.0791) (7.9469,0.0133,3.4557) (7.8082,0.1093,4.3490)	1,2,3 (7.9355,0.0697,3.6554) (7.9107,0.0849,3.8093) (8.0070,0.0128,3.1419) (7.8633,0.1098,4.0887)
	2,3 (7.4079,0.1980,5.9028) (7.3461,0.2334,6.1491)	2 (7.6602,0.0719,4.9350) (7.4508,0.2215,5.7267)	3 (7.6088,0.1787,5.0553) (7.7242,0.0879,4.6796)	1,2 (7.7899,0.0739,4.3498) (7.6027,0.2048,5.0819)	1,3 (7.7176,0.1685,4.5664) (7.8179,0.0892,4.2493)	2,3 (7.8706,0.0751,3.9683) (7.8472,0.0896,4.1109)	1,2,3 (7.9274,0.0760,3.6910) (7.9034,0.0902,3.8400)
	2,3,4 (7.2322,0.2879,6.5900)	2 (7.4287,0.2266,5.8558)	3 (7.5674,0.1919,5.3065)	1,2 (7.5779,0.2104,5.2353)	1,3 (7.6727,0.1825,4.8499)	2,3 (7.8019,0.1136,4.3737)	1,2,3 (7.8573,0.1137,4.1123)
$V_{3,4}=10$	2 (7.4149,0.1938,5.8738) (7.3519,0.2302,6.1261) (7.5916,0.0569,5.1280) (7.2364,0.2861,6.5741)	2 (7.6704,0.0630,4.8942) (7.4564,0.2185,5.7037) (7.6871,0.0540,4.7059) (7.4338,0.2242,5.8343)	3 (7.6153,0.1748,5.0269) (7.7328,0.0810,4.6452) (7.7790,0.0514,4.2807) (7.5728,0.1889,5.2849)	1,2 (7.7990,0.0663,4.3115) (7.6080,0.2020,5.0587) (7.8256,0.0500,4.0580) (7.5826,0.2080,5.2158)	1,3 (7.7238,0.1649,4.5379) (7.8258,0.0831,4.2169) (7.8804,0.0485,3.7904) (7.6778,0.1798,4.8289)	2,3 (7.8791,0.0683,3.9315) (7.8549,0.0838,4.0791) (7.9122,0.0476,3.6318) (7.8082,0.1093,4.3490)	1,2,3 (7.9355,0.0697,3.6554) (7.9107,0.0849,3.8093) (7.9733,0.0459,3.3202) (7.8633,0.1098,4.0887)
	2,4 (7.3873,0.2104,5.9846) (7.3289,0.2420,6.2191)	2 (7.6308,0.0963,5.0525) (7.4342,0.2300,5.7948)	3 (7.5898,0.1900,5.1362) (7.6990,0.1071,4.7797)	1,2 (7.7634,0.0949,4.4608) (7.5871,0.2129,5.1479)	1,3 (7.6994,0.1789,4.6497) (7.7948,0.1062,4.3443)	2,3 (7.8458,0.0941,4.0750) (7.8247,0.1059,4.2042)	1,2,3 (7.9039,0.0936,3.7946) (7.8822,0.1053,3.9301) (7.8397,0.1251,4.1824)
	2,3,4 (7.2197,0.2933,6.6372)	2 (7.4135,0.2342,5.9157)	3 (7.5514,0.2006,5.3704)	1,2 (7.5638,0.2173,5.2932)	1,3 (7.6577,0.1905,4.9120)	2,3 (7.7832,0.1260,4.4468)	1,2,3 (7.8397,0.1251,4.1824)
$V_{3,4}=12$	2 (7.4149,0.1938,5.8738) (7.3519,0.2302,6.1261) (7.4677,0.1590,5.6579) (7.2364,0.2861,6.5741)	2 (7.6704,0.0630,4.8942) (7.4564,0.2185,5.7037) (7.5678,0.1512,5.2327) (7.4338,0.2242,5.8343)	3 (7.6153,0.1748,5.0269) (7.7328,0.0810,4.6452) (7.6642,0.1436,4.8094) (7.5728,0.1889,5.2849)	1,2 (7.7990,0.0663,4.3115) (7.6080,0.2020,5.0587) (7.7131,0.1398,4.5871) (7.5826,0.2080,5.2158)	1,3 (7.7238,0.1649,4.5379) (7.8258,0.0831,4.2169) (7.7706,0.1355,4.3201) (7.6778,0.1798,4.8289)	2,3 (7.8791,0.0683,3.9315) (7.8549,0.0838,4.0791) (7.8040,0.1329,4.1618) (7.8082,0.1093,4.3490)	1,2,3 (7.9355,0.0697,3.6554) (7.9107,0.0849,3.8093) (7.8681,0.1282,3.8508) (7.8633,0.1098,4.0887)
	2,4 (7.3148,0.2492,6.2736) (7.2667,0.2724,6.4588)	2 (7.5326,0.1669,5.4444) (7.3744,0.2586,6.0365)	3 (7.5226,0.2248,5.4269) (7.6127,0.1654,5.1251)	1,2 (7.6738,0.1568,4.8364) (7.5307,0.2391,5.3913)	1,3 (7.6352,0.2119,4.9388) (7.7149,0.1584,4.6747)	2,3 (7.7617,0.1508,4.4387) (7.7469,0.1563,4.5297)	1,2,3 (7.8236,0.1467,4.1495) (7.8083,0.1522,4.2461) (7.7766,0.1627,4.4369)
	2,3,4 (7.1731,0.3123,6.8117)	2 (7.3581,0.2607,6.1296)	3 (7.4932,0.2302,5.6018)	1,2 (7.5122,0.2414,5.5033)	1,3 (7.6031,0.2177,5.1374)	2,3 (7.7162,0.1667,4.7111)	1,2,3 (7.7766,0.1627,4.4369)
$V_{3,4}=14$	2 (7.4149,0.1938,5.8738) (7.3519,0.2302,6.1261) (7.1956,0.3029,6.7297) (7.2364,0.2861,6.5741)	2 (7.6704,0.0630,4.8942) (7.4564,0.2185,5.7037) (7.3059,0.2874,6.3082) (7.4338,0.2242,5.8343)	3 (7.6153,0.1748,5.0269) (7.7328,0.0810,4.6452) (7.4121,0.2730,5.8848) (7.5728,0.1889,5.2849)	1,2 (7.7990,0.0663,4.3115) (7.6080,0.2020,5.0587) (7.4661,0.2655,6.6647) (7.5826,0.2080,5.2158)	1,3 (7.7238,0.1649,4.5379) (7.8258,0.0831,4.2169) (7.5294,0.2573,5.2393) (7.6778,0.1798,4.8289)	2,3 (7.8791,0.0683,3.9315) (7.8549,0.0838,4.0791) (7.5663,0.2524,5.2393) (7.8082,0.1093,4.3490)	1,2,3 (7.9355,0.0697,3.6554) (7.9107,0.0849,3.8093) (7.6370,0.2430,4.9307) (7.8633,0.1098,4.0887)
	2,4 (7.1170,0.3335,7.0180) (1.0602,6.4372,0.0000)	2 (7.2934,0.2879,6.3789) (1.4315,6.1243,0.0000)	3 (7.3392,0.3000,6.1761) (7.3932,0.2741,5.9938)	1,2 (7.4519,0.2664,5.7475) (2.1867,5.4880,0.0000)	1,3 (7.4597,0.2820,5.6924) (7.5087,0.2583,5.5227)	2,3 (7.5090,0.2533,5.3334) (7.4449,0.2536,5.3696)	1,2,3 (7.6207,0.2439,5.0335) (7.6144,0.2442,5.0726) (2.8009,5.0607,0.0000)
	2,3,4 (0.9039,6.7709,0.0000)	2 (1.0546,6.6079,0.0000)	3 (1.4404,6.2611,0.0000)	1,2 (1.7819,5.9793,0.0000)	1,3 (2.1074,5.6859,0.0000)	2,3 (2.5313,0.2544,5.4497)	1,2,3 (2.8009,5.0607,0.0000)

Figure B.2 Experiment on Exclusive Product under Centralized Regime

	1	2	3	1,2	1,3	2,3	1,2,3
	2	(7.4149,0.1938,5.8738)	(7.6704,0.0630,4.8942)	(7.6153,0.1748,5.0269)	(7.7990,0.0663,4.3115)	(7.7238,0.1649,4.5379)	(7.8791,0.0683,3.9315)
$V_{2,4}=16$	3	(7.3519,0.2302,6.1261)	(7.4564,0.2185,5.7037)	(7.7328,0.0810,4.6452)	(7.6080,0.2020,5.0587)	(7.8258,0.0831,4.2169)	(7.9107,0.0849,3.8093)
	4	(0.4678,7.7015,0.0000)	(0.6493,7.5317,0.0000)	(0.8936,7.3032,0.0000)	(1.0515,7.1555,0.0000)	(1.2723,6.9489,0.0000)	(1.7508,6.5012,0.0000)
	2,3	(7.2364,0.2861,6.5741)	(7.4338,0.2242,5.8343)	(7.5728,0.1889,5.2849)	(7.5826,0.2080,5.2158)	(7.6778,0.1798,4.8289)	(7.8633,0.1098,4.0887)
	2,4	(0.4346,7.7723,0.0000)	(0.5040,7.7002,0.0000)	(0.8333,7.3975,0.0000)	(0.8961,7.3318,0.0000)	(1.1903,7.0617,0.0000)	(1.5820,6.6874,0.0000)
	3,4	(0.4221,7.7991,0.0000)	(0.5871,7.6436,0.0000)	(0.6822,7.5450,0.0000)	(0.9554,7.2967,0.0000)	(1.0488,7.2000,0.0000)	(1.5150,6.7612,0.0000)
	2,3,4	(0.3949,7.8572,0.0000)	(0.4577,7.7921,0.0000)	(0.6387,7.6185,0.0000)	(0.8173,7.4521,0.0000)	(0.9849,7.2914,0.0000)	(1.3637,6.9281,0.0000)
$V_{2,4}=18$	2	(7.4149,0.1938,5.8738)	(7.6704,0.0630,4.8942)	(7.6153,0.1748,5.0269)	(7.7990,0.0663,4.3115)	(7.7238,0.1649,4.5379)	(7.8791,0.0683,3.9315)
	3	(7.3519,0.2302,6.1261)	(7.4564,0.2185,5.7037)	(7.7328,0.0810,4.6452)	(7.6080,0.2020,5.0587)	(7.8258,0.0831,4.2169)	(7.9107,0.0849,3.8093)
	4	(0.1262,8.4306,0.0000)	(0.1780,8.3797,0.0000)	(0.2505,8.3084,0.0000)	(0.2992,8.2605,0.0000)	(0.3696,8.1913,0.0000)	(0.5330,8.0306,0.0000)
	2,3	(7.2364,0.2861,6.5741)	(7.4338,0.2242,5.8343)	(7.5728,0.1889,5.2849)	(7.5826,0.2080,5.2158)	(7.6778,0.1798,4.8289)	(7.8633,0.1098,4.0887)
	2,4	(0.1237,8.4361,0.0000)	(0.1428,8.4167,0.0000)	(0.2456,8.3162,0.0000)	(0.2629,8.2985,0.0000)	(0.3624,8.2012,0.0000)	(0.4949,8.0703,0.0000)
	3,4	(0.1226,8.4383,0.0000)	(0.1730,8.3887,0.0000)	(0.1999,8.3615,0.0000)	(0.2908,8.2728,0.0000)	(0.3177,8.2457,0.0000)	(0.4792,8.0867,0.0000)
	2,3,4	(0.1202,8.4434,0.0000)	(0.1388,8.4246,0.0000)	(0.1960,8.3681,0.0000)	(0.2557,8.3096,0.0000)	(0.3115,8.2544,0.0000)	(0.4425,8.1251,0.0000)
$V_{2,4}=20$	2	(7.4149,0.1938,5.8738)	(7.6704,0.0630,4.8942)	(7.6153,0.1748,5.0269)	(7.7990,0.0663,4.3115)	(7.7238,0.1649,4.5379)	(7.8791,0.0683,3.9315)
	3	(7.3519,0.2302,6.1261)	(7.4564,0.2185,5.7037)	(7.7328,0.0810,4.6452)	(7.6080,0.2020,5.0587)	(7.8258,0.0831,4.2169)	(7.9107,0.0849,3.8093)
	4	(0.0318,8.6320,0.0000)	(0.0451,8.6188,0.0000)	(0.0639,8.6001,0.0000)	(0.0767,8.5874,0.0000)	(0.0953,8.5688,0.0000)	(0.1395,8.5249,0.0000)
	2,3	(7.2364,0.2861,6.5741)	(7.4338,0.2242,5.8343)	(7.5728,0.1889,5.2849)	(7.5826,0.2080,5.2158)	(7.6778,0.1798,4.8289)	(7.8633,0.1098,4.0887)
	2,4	(0.0317,8.6324,0.0000)	(0.0365,8.6275,0.0000)	(0.0636,8.6006,0.0000)	(0.0680,8.5962,0.0000)	(0.0948,8.5695,0.0000)	(0.1307,8.5338,0.0000)
	3,4	(0.0316,8.6325,0.0000)	(0.0448,8.6194,0.0000)	(0.0517,8.6125,0.0000)	(0.0761,8.5882,0.0000)	(0.0830,8.5813,0.0000)	(0.1270,8.5375,0.0000)
	2,3,4	(0.0315,8.6329,0.0000)	(0.0363,8.6280,0.0000)	(0.0514,8.6129,0.0000)	(0.0675,8.5969,0.0000)	(0.0825,8.5819,0.0000)	(0.1183,8.5463,0.0000)

Figure B.2 Experiment on Exclusive Product under Centralized Regime (cont.)

APPENDIX C: PARAMETER ANALYSIS WITH EXCLUSIVE PRODUCTS

This section includes the computational results for Chapter 4.2.2. Experimental Design is shown in Table 4.21 .

	1	2	3	1.2	1.3	2.3	1.2.3
1							
2	(8.5534,0.0181,9.3162)	(8.4967,0.0185,6.1511)	(8.4631,0.0369,7.2935)	(8.5476,0.0148,5.8404)	(8.5098,0.0303,7.0012)	(8.5289,0.0196,5.2095)	(8.5521,0.0174,5.0684)
3	(8.5471,0.0188,9.7572)	(8.4275,0.0407,8.1538)	(8.5075,0.0201,6.0650)	(8.4956,0.0312,7.7740)	(8.5450,0.0169,5.8349)	(8.5219,0.0213,5.4748)	(8.5458,0.0190,5.3358)
4	(8.5595,0.0172,8.8892)	(8.4538,0.0367,7.3013)	(8.4753,0.0349,6.8724)	(8.5160,0.0281,6.9224)	(8.5199,0.0287,6.5772)	(8.4944,0.0348,6.1157)	(8.5225,0.0306,5.9378)
2,3	(8.5358,0.0271,10.0000)	(8.4252,0.0401,8.2567)	(8.4580,0.0359,7.5300)	(8.4919,0.0307,7.8880)	(8.5052,0.0294,7.2560)	(8.5102,0.0234,5.9127)	(8.5354,0.0208,5.7783)
2,4	(8.5437,0.0191,10.0000)	(8.4488,0.0359,7.5329)	(8.4433,0.0396,7.9552)	(8.5117,0.0275,7.1714)	(8.4934,0.0223,7.6694)	(8.4878,0.0339,6.4236)	(8.5165,0.0297,6.2598)
3,4	(8.5391,0.0238,10.0000)	(8.4113,0.0424,8.6691)	(8.4681,0.0338,7.2161)	(8.4831,0.0325,8.2921)	(8.5134,0.0277,6.9475)	(8.4855,0.0336,6.5235)	(8.5144,0.0295,6.3652)
2,3,4	(8.5281,0.0349,10.0000)	(8.4099,0.0420,8.7342)	(8.4405,0.0389,8.0818)	(8.4819,0.0321,8.3616)	(8.4910,0.0317,7.8084)	(8.4809,0.0332,6.7217)	(8.5102,0.0291,6.5673)
2							
2	(5.4555,1.6258,2.5355)	(5.1889,1.9838,1.1546)	(5.3697,2.1763,1.0000)	(6.2228,1.3407,1.0937)	(6.1060,1.6061,1.0000)	(6.3805,1.0659,1.0000)	(6.7493,0.8475,1.0000)
3	(5.0830,1.8940,2.7872)	(4.2365,3.1706,1.2118)	(5.3183,1.9743,1.1804)	(5.3685,2.2057,1.2322)	(6.1017,1.4668,1.1332)	(6.0479,1.4580,1.0000)	(6.4722,1.1679,1.0000)
4	(5.7958,1.3855,2.3216)	(5.2527,2.1451,1.0000)	(5.7983,1.6557,1.0000)	(6.2241,1.4332,1.0000)	(6.4582,1.1969,1.0000)	(6.4511,1.8788,0.0000)	(6.8505,1.5451,0.0000)
2,3	(4.4633,2.3617,3.1405)	(3.5699,3.6426,1.4884)	(4.3160,2.9564,1.4051)	(4.8254,2.5218,1.5271)	(5.2263,2.1904,1.4019)	(5.3728,2.0574,1.1445)	(5.8903,1.6973,1.1205)
2,4	(4.8766,2.0456,2.9099)	(4.2075,2.9635,1.3654)	(4.5901,2.9131,1.1820)	(5.4028,2.0215,1.3585)	(5.4259,2.2087,1.1853)	(5.6567,1.9320,1.0000)	(6.1260,1.5726,1.0000)
3,4	(4.6196,2.2404,3.0550)	(3.6058,3.7970,1.3665)	(4.5610,2.6867,1.3523)	(4.7957,2.6766,1.4302)	(5.4461,2.0056,1.3569)	(5.3870,2.1744,1.0560)	(5.8913,1.8021,1.0353)
2,3,4	(4.1488,2.6154,3.3048)	(3.1217,4.1471,1.5716)	(3.8407,3.4076,1.5039)	(4.3930,2.9145,1.6441)	(4.7872,2.5715,1.5250)	(4.8742,2.5041,1.2574)	(5.4365,2.0710,1.2468)
3							
2	(8.2704,0.0108,10.0000)	(8.2154,0.0004,10.0000)	(8.2784,0.0055,10.0000)	(8.3575,0.0002,10.0000)	(8.3720,0.0037,10.0000)	(8.3367,0.0002,10.0000)	(8.3876,0.0001,10.0000)
3	(8.2661,0.0154,10.0000)	(8.2054,0.0110,10.0000)	(8.2832,0.0004,10.0000)	(8.3514,0.0065,10.0000)	(8.3753,0.0003,10.0000)	(8.3366,0.0002,10.0000)	(8.3875,0.0002,10.0000)
4	(8.2735,0.0076,10.0000)	(8.2106,0.0054,10.0000)	(8.2799,0.0039,10.0000)	(8.3546,0.0032,10.0000)	(8.3731,0.0026,10.0000)	(8.3347,0.0023,10.0000)	(8.3860,0.0018,10.0000)
2,3	(8.2558,0.0262,10.0000)	(8.2050,0.0113,10.0000)	(8.2780,0.0059,10.0000)	(8.3512,0.0067,10.0000)	(8.3718,0.0039,10.0000)	(8.3365,0.0004,10.0000)	(8.3874,0.0003,10.0000)
2,4	(8.2632,0.0185,10.0000)	(8.2102,0.0058,10.0000)	(8.2747,0.0093,10.0000)	(8.3544,0.0035,10.0000)	(8.3695,0.0063,10.0000)	(8.3345,0.0024,10.0000)	(8.3859,0.0019,10.0000)
3,4	(8.2589,0.0230,10.0000)	(8.2003,0.0164,10.0000)	(8.2795,0.0042,10.0000)	(8.3484,0.0097,10.0000)	(8.3728,0.0029,10.0000)	(8.3345,0.0025,10.0000)	(8.3838,0.0019,10.0000)
2,3,4	(8.2486,0.0338,10.0000)	(8.1999,0.0168,10.0000)	(8.2743,0.0097,10.0000)	(8.3481,0.0099,10.0000)	(8.3693,0.0065,10.0000)	(8.3343,0.0027,10.0000)	(8.3857,0.0021,10.0000)
4							
2	(1.5353,0.2029,4.4021)	(0.6322,0.1500,1.9750)	(0.9048,0.2622,1.9809)	(1.2508,0.1186,2.3246)	(1.4478,0.2308,2.2403)	(1.3599,0.1318,1.8865)	(1.7940,0.1148,2.0259)
3	(1.5205,0.2848,4.4073)	(0.6363,0.3883,1.9346)	(0.8835,0.1970,2.0270)	(1.2288,0.3385,2.3030)	(1.4436,0.1622,2.2717)	(1.3429,0.1853,1.8973)	(1.7780,0.1615,2.0355)
4	(1.5460,0.1441,4.3972)	(0.6510,0.1972,1.9318)	(0.9129,0.1864,1.9786)	(1.2533,0.1716,2.2983)	(1.4593,0.1640,2.2372)	(1.3714,0.1697,1.8623)	(1.7979,0.1535,2.0065)
2,3	(1.4862,0.4732,4.4193)	(0.6044,0.5254,1.9795)	(0.8575,0.4473,2.0310)	(1.2028,0.4474,2.3332)	(1.4061,0.3836,2.2785)	(1.3065,0.3089,1.9241)	(1.7438,0.2697,2.0595)
2,4	(1.5105,0.3396,4.4108)	(0.6181,0.3406,1.9767)	(0.8860,0.4574,1.9841)	(1.2265,0.2852,2.3290)	(1.4213,0.3858,2.2454)	(1.3338,0.2960,1.8909)	(1.7628,0.2637,2.0318)
3,4	(1.4962,0.4185,4.4158)	(0.6226,0.5684,1.9355)	(0.8650,0.3750,2.0298)	(1.2055,0.4966,2.3073)	(1.4170,0.3195,2.2764)	(1.3173,0.3474,1.9016)	(1.7473,0.3086,2.0414)
2,3,4	(1.4631,0.6003,4.4273)	(0.5915,0.6997,1.9813)	(0.8400,0.6150,2.0356)	(1.1803,0.6011,2.3372)	(1.3808,0.5325,2.2832)	(1.2819,0.4661,1.9282)	(1.7140,0.4125,2.0650)

Figure C.1 Impact of Parameters with Exclusive Product Under Decentralized Regime

6	2	(8.5542,0.0188,9.2641)	(8.5016,0.0210,6.0289)	(8.4646,0.0384,7.2359)	(8.5512,0.0167,5.7206)	(8.5110,0.0314,6.9504)	(8.5328,0.0217,5.1062)	(8.5554,0.0193,4.9682)
	3	(8.5476,0.0194,9.7165)	(8.4286,0.0418,8.1167)	(8.5111,0.0222,5.9690)	(8.4985,0.0320,7.7370)	(8.5478,0.0186,5.7437)	(8.5251,0.0231,5.3917)	(8.5488,0.0205,5.2354)
	4	(8.5605,0.0181,8.8187)	(8.4559,0.0385,7.2325)	(8.4774,0.0367,6.8038)	(8.5176,0.0295,6.8533)	(8.5213,0.0301,6.5086)	(8.4964,0.0265,6.0470)	(8.5243,0.0321,5.8660)
	2,3	(8.5363,0.0271,10.0000)	(8.4363,0.0411,8.2330)	(8.4593,0.0370,7.4901)	(8.4945,0.0314,7.8530)	(8.5063,0.0303,7.2167)	(8.5126,0.0250,5.8476)	(8.5374,0.0220,5.7269)
	2,3,4	(8.5441,0.0191,10.0000)	(8.4506,0.0373,7.4782)	(8.4442,0.0405,7.9238)	(8.5130,0.0265,7.1178)	(8.4945,0.0331,7.6382)	(8.4894,0.0332,6.3730)	(8.5179,0.0308,6.2097)
6	3,4	(8.5395,0.0238,10.0000)	(8.4121,0.0432,6.6427)	(8.4696,0.0351,7.1670)	(8.4837,0.0331,8.2667)	(8.5147,0.0288,6.8994)	(8.4870,0.0348,6.4775)	(8.5137,0.0305,6.3178)
	2,3,4	(8.5285,0.0349,10.0000)	(8.4106,0.0426,8.7117)	(8.4414,0.0395,8.0612)	(8.4825,0.0327,8.3379)	(8.4917,0.0333,7.7813)	(8.4822,0.0343,6.6834)	(8.5113,0.0300,6.5297)
	2	(8.4980,1.6639,2.5256)	(8.2647,2.0379,1.1377)	(8.4253,2.1988,1.0000)	(8.2832,1.3761,1.0731)	(8.1526,1.6183,1.0000)	(8.4284,1.0739,1.0000)	(8.7885,0.8525,1.0000)
	3	(8.1154,1.9266,2.7677)	(8.2817,3.2201,1.2003)	(8.3739,2.0138,1.1676)	(8.4083,2.2387,1.2175)	(8.1477,1.4955,1.1182)	(8.0916,1.4685,1.0000)	(8.5066,1.1746,1.0000)
	4	(8.8506,1.4298,2.3838)	(8.3292,2.1763,1.0000)	(8.8631,1.6743,1.0000)	(8.2844,1.4471,1.0000)	(8.5103,1.2066,1.0000)	(8.5332,1.9027,0.0000)	(8.6220,1.5613,0.0000)
7	2,3	(4.4839,2.3859,3.1293)	(8.6003,3.6837,1.4826)	(4.3481,2.9595,1.9982)	(4.8541,2.5481,1.5191)	(8.2553,2.2142,1.3935)	(8.4060,2.0821,1.1368)	(8.9201,1.7174,1.1119)
	2,4	(4.9045,2.0748,2.8937)	(8.2524,3.0101,1.3543)	(4.6274,2.9508,1.1714)	(8.4420,2.0515,1.3467)	(8.4995,2.2365,1.1728)	(8.6943,1.9449,1.0000)	(8.1591,1.9811,1.0000)
	3,4	(4.6428,2.2662,3.0423)	(8.6363,3.8396,1.3594)	(4.5977,2.7214,1.3443)	(4.8344,2.7045,1.4269)	(8.4787,2.0305,1.3273)	(8.4207,2.2003,1.0473)	(8.5218,1.8234,1.0255)
	2,3,4	(4.1652,2.6363,3.2963)	(8.1444,4.1842,1.5673)	(8.8650,3.4376,1.4990)	(4.4155,2.9382,1.6382)	(4.8101,2.5929,1.5188)	(4.8000,2.5267,1.2517)	(8.4602,2.0892,1.2403)
	2	(8.3519,0.0110,10.0000)	(8.2729,0.0094,10.0000)	(8.3194,0.0055,10.0000)	(8.3920,0.0002,10.0000)	(8.3999,0.0037,10.0000)	(8.3611,0.0002,10.0000)	(8.4066,0.0001,10.0000)
7	3	(8.3475,0.0155,10.0000)	(8.2628,0.0110,10.0000)	(8.3243,0.0094,10.0000)	(8.3860,0.0065,10.0000)	(8.4033,0.0063,10.0000)	(8.3590,0.0023,10.0000)	(8.4050,0.0018,10.0000)
	4	(8.3550,0.0077,10.0000)	(8.2881,0.0035,10.0000)	(8.3209,0.0039,10.0000)	(8.3891,0.0032,10.0000)	(8.4069,0.0026,10.0000)	(8.3590,0.0023,10.0000)	(8.4050,0.0018,10.0000)
	2,3	(8.3370,0.0264,10.0000)	(8.2624,0.0114,10.0000)	(8.3190,0.0059,10.0000)	(8.3857,0.0067,10.0000)	(8.3996,0.0040,10.0000)	(8.3609,0.0004,10.0000)	(8.4084,0.0003,10.0000)
	2,4	(8.3445,0.0186,10.0000)	(8.2677,0.0059,10.0000)	(8.3157,0.0094,10.0000)	(8.3889,0.0035,10.0000)	(8.3973,0.0063,10.0000)	(8.3589,0.0004,10.0000)	(8.4049,0.0019,10.0000)
	3,4	(8.3401,0.0235,10.0000)	(8.2576,0.0165,10.0000)	(8.3206,0.0043,10.0000)	(8.3828,0.0097,10.0000)	(8.4007,0.0039,10.0000)	(8.3588,0.0025,10.0000)	(8.4048,0.0020,10.0000)
8	2,3,4	(8.3297,0.0341,10.0000)	(8.2572,0.0169,10.0000)	(8.3153,0.0098,10.0000)	(8.3826,0.0100,10.0000)	(8.3871,0.0066,10.0000)	(8.3587,0.0027,10.0000)	(8.4047,0.0021,10.0000)
	2	(1.8848,0.2578,4.2765)	(0.8474,0.2033,1.9438)	(1.1852,0.3457,1.9326)	(1.6068,0.1570,2.2594)	(1.8307,0.2965,2.1637)	(1.7411,0.1738,1.8211)	(2.2388,0.1497,1.9399)
	3	(1.8617,0.3605,4.2850)	(0.8446,0.3171,1.8998)	(1.1603,0.2632,1.9835)	(1.5669,0.4569,2.2380)	(1.8389,0.2127,2.1995)	(1.7162,0.2436,1.8344)	(2.2153,0.2100,1.9523)
	4	(1.9015,0.1835,4.2764)	(0.8707,0.2648,1.8957)	(1.1995,0.2465,1.9301)	(1.6076,0.2229,2.2301)	(1.8494,0.2112,2.1600)	(1.7557,0.2189,1.7931)	(2.2416,0.1956,1.9174)
	2,3	(1.8091,0.3938,4.3042)	(0.7981,0.6971,1.9507)	(1.1156,0.5878,1.9908)	(1.5275,0.2768,2.2734)	(1.7682,0.4929,2.2110)	(1.6624,0.4034,1.8667)	(2.1846,0.3481,1.9823)
8	2,4	(1.8464,0.4286,4.3066)	(0.8221,0.4559,1.9477)	(1.1590,0.5727,1.9381)	(1.5664,0.3710,2.2688)	(1.7878,0.4927,2.1719)	(1.6980,0.3941,1.8285)	(2.1894,0.3372,1.9469)
	3,4	(1.8243,0.5265,4.2987)	(0.8304,0.7514,1.9038)	(1.1284,0.4947,1.9883)	(1.5288,0.6369,2.2451)	(1.7857,0.4122,2.2075)	(1.6741,0.4503,1.8416)	(2.1669,0.3944,1.9617)
	2,3,4	(1.7739,0.4914,3.1711)	(0.7757,0.9212,1.9546)	(1.0861,0.8015,1.9955)	(1.4911,0.6922,2.2809)	(1.7278,0.6786,2.2187)	(1.6224,0.6017,1.8731)	(2.1181,0.5255,1.9609)

Figure C.1 Impact of Parameters with Exclusive Product Under Decentralized Regime (cont.)

9	1	1	2	3	1.1	1.2	1.3	2.3	1.1,3
		(8.5334,0.0181,9.3162)	(8.4967,0.0185,6.1511)	(8.4681,0.0366,7.2955)	(8.5476,0.0148,5.8444)	(8.5088,0.0037,0.0012)	(8.5289,0.0194,5.2095)	(8.5521,0.0174,5.0684)	
	2	(8.5471,0.0188,9.7572)	(8.4775,0.0407,8.1538)	(8.5075,0.0201,6.0650)	(8.4956,0.0312,7.7740)	(8.5450,0.0169,5.8349)	(8.5219,0.0213,5.4748)	(8.5458,0.0190,5.3358)	
	4	(8.5592,0.0172,8.8892)	(8.4538,0.0367,7.3013)	(8.4753,0.0348,6.8754)	(8.5160,0.0281,6.9254)	(8.5199,0.0387,6.5772)	(8.4944,0.0348,6.1157)	(8.5225,0.0306,5.9378)	
	2,3	(8.5558,0.0271,10.0600)	(8.4552,0.0401,8.2547)	(8.4580,0.0359,7.5300)	(8.4956,0.0307,7.8880)	(8.5052,0.0394,7.2560)	(8.5102,0.0334,6.9127)	(8.5354,0.0308,5.7383)	
10	2,3,4	(8.5437,0.0191,10.0600)	(8.4488,0.0359,7.5529)	(8.4433,0.0397,7.9552)	(8.5117,0.0275,7.1714)	(8.4934,0.0325,7.6694)	(8.4878,0.0339,6.4236)	(8.5165,0.0287,6.2598)	
	3,4	(8.5391,0.0238,10.0600)	(8.4113,0.0424,8.6691)	(8.4681,0.0338,7.2161)	(8.4831,0.0325,8.2921)	(8.5134,0.0277,6.8475)	(8.4855,0.0336,6.5235)	(8.5144,0.0295,6.3632)	
	2,3,4	(8.5281,0.0346,10.0600)	(8.4099,0.0420,8.7342)	(8.4405,0.0389,8.0818)	(8.4819,0.0321,8.3616)	(8.4910,0.0317,7.8094)	(8.4809,0.0332,6.7217)	(8.5102,0.0291,6.4673)	
	2	(8.3254,0.1196,0.0000)	(4.0077,4.0077,0.0000)	(4.8270,3.4010,0.0000)	(5.3472,2.8656,0.0000)	(5.6634,2.6665,0.0000)	(6.1000,2.2206,0.0000)	(6.5712,1.8181,0.0000)	
	3	(8.7992,5.4572,0.0000)	(3.4010,4.8270,0.0000)	(4.1031,4.1031,0.0000)	(4.5454,3.7845,0.0000)	(5.1315,3.1851,0.0000)	(5.4375,2.9120,0.0000)	(5.8915,2.4175,0.0000)	
11	4	(8.9400,3.9400,0.0000)	(4.1786,3.3254,0.0000)	(5.4572,2.7092,0.0000)	(8.2303,2.4658,0.0000)	(6.2272,2.0659,0.0000)	(6.4511,1.8788,0.0000)	(6.8505,1.5451,0.0000)	
	2,3	(1.8788,6.4511,0.0000)	(2.2206,6.1000,0.0000)	(2.9120,5.4575,0.0000)	(3.3950,4.9944,0.0000)	(3.8948,4.5142,0.0000)	(4.2016,4.2016,0.0000)	(4.8655,3.5816,0.0000)	
	2,4	(8.4658,5.8205,0.0000)	(2.8656,5.3472,0.0000)	(3.7845,4.5454,0.0000)	(4.1597,4.1597,0.0000)	(4.6575,3.7381,0.0000)	(4.9944,3.3959,0.0000)	(5.5650,2.8741,0.0000)	
	3,4	(8.0659,6.2272,0.0000)	(2.6665,5.6834,0.0000)	(3.1851,5.1315,0.0000)	(3.7381,4.4575,0.0000)	(4.1933,4.1933,0.0000)	(4.5142,3.8948,0.0000)	(5.1218,3.3295,0.0000)	
	2,3,4	(1.5451,6.8505,0.0000)	(1.8181,6.5712,0.0000)	(2.4175,5.9915,0.0000)	(2.8741,5.4650,0.0000)	(3.3295,5.1218,0.0000)	(3.5816,4.8655,0.0000)	(4.2398,4.2398,0.0000)	
12	2	(8.2704,0.0108,10.0600)	(8.2154,0.0004,10.0600)	(8.2784,0.0055,10.0600)	(8.3575,0.0002,10.0600)	(8.3720,0.0037,10.0600)	(8.3367,0.0002,10.0600)	(8.3876,0.0001,10.0600)	
	3	(8.2460,0.0154,10.0600)	(8.2054,0.0110,10.0600)	(8.2832,0.0044,10.0600)	(8.3514,0.0065,10.0600)	(8.3753,0.0003,10.0600)	(8.3366,0.0002,10.0600)	(8.3875,0.0002,10.0600)	
	4	(8.2755,0.0076,10.0600)	(8.2106,0.0054,10.0600)	(8.2799,0.0039,10.0600)	(8.3546,0.0031,10.0600)	(8.3731,0.0025,10.0600)	(8.3347,0.0023,10.0600)	(8.3860,0.0018,10.0600)	
	2,3	(8.2558,0.0262,10.0600)	(8.2050,0.0113,10.0600)	(8.2780,0.0059,10.0600)	(8.3512,0.0067,10.0600)	(8.3718,0.0039,10.0600)	(8.3365,0.0004,10.0600)	(8.3874,0.0003,10.0600)	
	2,4	(8.2652,0.0185,10.0600)	(8.2102,0.0058,10.0600)	(8.2747,0.0093,10.0600)	(8.3544,0.0032,10.0600)	(8.3695,0.0063,10.0600)	(8.3345,0.0024,10.0600)	(8.3859,0.0019,10.0600)	
13	3,4	(8.2589,0.0230,10.0600)	(8.2003,0.0164,10.0600)	(8.2795,0.0043,10.0600)	(8.3484,0.0097,10.0600)	(8.3728,0.0029,10.0600)	(8.3345,0.0025,10.0600)	(8.3858,0.0019,10.0600)	
	2,3,4	(8.2486,0.0338,10.0600)	(8.1999,0.0168,10.0600)	(8.2743,0.0097,10.0600)	(8.3481,0.0099,10.0600)	(8.3693,0.0065,10.0600)	(8.3343,0.0027,10.0600)	(8.3857,0.0021,10.0600)	
	2	(1.5353,0.2029,4.4021)	(0.6322,0.1500,1.9750)	(0.9048,0.2822,1.9809)	(1.2508,0.1186,2.3246)	(1.4478,0.2308,2.2403)	(1.3599,0.1318,1.8865)	(1.7940,0.1148,2.0259)	
	3	(1.5205,0.3848,4.4073)	(0.6565,0.3885,1.9546)	(0.8856,0.1970,2.0270)	(1.2288,0.3382,2.3030)	(1.4456,0.1622,2.2717)	(1.3429,0.1853,1.8973)	(1.7780,0.1615,2.0355)	
	4	(1.5460,0.1441,4.3972)	(0.6510,0.1972,1.9318)	(0.9129,0.1844,1.9786)	(1.2533,0.1716,2.2983)	(1.4593,0.1640,2.2372)	(1.3714,0.1697,1.8623)	(1.7979,0.1352,2.0645)	
14	2,3	(1.4862,0.4732,4.4193)	(0.6644,0.2254,1.9795)	(0.8575,0.4473,2.0310)	(1.2028,0.4474,2.3332)	(1.4061,0.3856,2.2785)	(1.3065,0.3089,1.9241)	(1.7438,0.2697,2.0395)	
	2,4	(1.5105,0.3396,4.4108)	(0.6181,0.3406,1.9767)	(0.8860,0.4374,1.9841)	(1.2265,0.2852,2.3290)	(1.4213,0.3858,2.2454)	(1.3338,0.2960,1.8909)	(1.7638,0.2697,2.0318)	
	3,4	(1.4962,0.4185,4.4158)	(0.6226,0.4684,1.9555)	(0.8650,0.3750,2.0298)	(1.2065,0.4966,2.3073)	(1.4170,0.3195,2.2764)	(1.3173,0.3474,1.9016)	(1.7473,0.3086,2.0414)	
	2,3,4	(1.4651,0.6003,4.4273)	(0.5915,0.6997,1.9813)	(0.8400,0.6150,2.0336)	(1.1805,0.6012,2.3372)	(1.3808,0.5252,2.2832)	(1.2819,0.4661,1.9232)	(1.7146,0.4125,2.0650)	

Figure C.2 Impact of Parameters with Exclusive Product Under Centralized Regime

13																					
	2	(8.5542,0.0188,9.2641)	(8.5016,0.0210,6.0236)	(8.4646,0.0384,7.2359)	(8.5512,0.0167,5.7266)	(8.3110,0.0314,6.9304)	(8.3328,0.0217,5.1662)	(8.5554,0.0193,4.9682)													
	3	(8.5476,0.0194,9.7165)	(8.4286,0.0418,8.1167)	(8.5111,0.0222,5.9690)	(8.4965,0.0320,7.7370)	(8.5271,0.0231,5.3917)	(8.5251,0.0231,5.3917)	(8.5486,0.0205,5.2554)													
	4	(8.5605,0.0181,8.8167)	(8.4595,0.0385,7.2325)	(8.4774,0.0367,6.8038)	(8.5176,0.0295,6.8533)	(8.5215,0.0301,6.9086)	(8.4964,0.0365,6.0470)	(8.5243,0.0321,5.8690)													
	2,3	(8.5363,0.0271,10.0000)	(8.4265,0.0411,8.2230)	(8.4593,0.0370,7.4901)	(8.4945,0.0314,7.8550)	(8.5065,0.0303,7.2167)	(8.5126,0.0250,5.8476)	(8.5374,0.0220,5.7269)													
	2,4	(8.5441,0.0191,10.0000)	(8.4506,0.0373,7.7782)	(8.4442,0.0405,7.9238)	(8.5130,0.0286,7.1178)	(8.4942,0.0331,7.9382)	(8.4884,0.0352,6.3730)	(8.5179,0.0308,6.2097)													
	3,4	(8.5395,0.0238,10.0000)	(8.4121,0.0432,8.6427)	(8.4696,0.0351,7.1670)	(8.4837,0.0331,8.2667)	(8.5147,0.0288,6.8994)	(8.4870,0.0348,6.4775)	(8.5137,0.0305,6.3178)													
	2,3,4	(8.5285,0.0349,10.0000)	(1.8375,6.6413,0.0000)	(2.4416,6.0513,0.0000)	(8.4825,0.0327,8.3379)	(8.4917,0.0323,7.7813)	(3.6126,4.9077,0.0000)	(4.2718,4.2718,0.0000)													
14																					
	2	(3.4010,4.8270,0.0000)	(4.1031,4.1031,0.0000)	(4.9056,3.4564,0.0000)	(5.4375,2.9120,0.0000)	(6.7354,2.7065,0.0000)	(6.1786,2.2496,0.0000)	(6.6413,1.8375,0.0000)													
	3	(2.7592,5.5579,0.0000)	(3.4564,4.9056,0.0000)	(4.1730,4.1730,0.0000)	(4.6032,3.8327,0.0000)	(5.1992,3.2271,0.0000)	(5.5030,2.9471,0.0000)	(6.0513,2.4416,0.0000)													
	4	(4.0677,4.0677,0.0000)	(4.8270,3.4010,0.0000)	(5.5579,2.7592,0.0000)	(5.9135,2.4452,0.0000)	(6.3144,2.0948,0.0000)	(6.5321,1.9027,0.0000)	(6.9220,1.5613,0.0000)													
	2,3	(1.8027,6.5332,0.0000)	(2.2496,6.1786,0.0000)	(2.9471,5.5030,0.0000)	(3.4312,5.0476,0.0000)	(3.9337,4.5592,0.0000)	(4.2444,4.2444,0.0000)	(4.9077,3.6126,0.0000)													
	2,4	(2.4452,5.9155,0.0000)	(3.9126,5.4375,0.0000)	(3.8327,4.6032,0.0000)	(4.2142,4.2142,0.0000)	(4.7062,3.7771,0.0000)	(5.0476,3.4312,0.0000)	(5.6131,2.9000,0.0000)													
	3,4	(2.0948,6.3144,0.0000)	(2.7065,5.7354,0.0000)	(3.2271,5.1992,0.0000)	(3.7771,4.7062,0.0000)	(4.2384,4.2384,0.0000)	(4.5592,3.9337,0.0000)	(5.1654,3.5579,0.0000)													
	2,3,4	(1.5613,6.9220,0.0000)	(1.8375,6.6413,0.0000)	(2.4416,6.0513,0.0000)	(2.9000,5.6131,0.0000)	(3.3578,5.1654,0.0000)	(3.6126,4.9077,0.0000)	(4.2718,4.2718,0.0000)													
15																					
	2	(8.3519,0.0110,10.0000)	(8.2729,0.0064,10.0000)	(8.3184,0.0055,10.0000)	(8.3920,0.002,10.0000)	(8.3999,0.0037,10.0000)	(8.3611,0.0002,10.0000)	(8.4066,0.0001,10.0000)													
	3	(8.3475,0.0155,10.0000)	(8.2628,0.0110,10.0000)	(8.3243,0.0084,10.0000)	(8.3891,0.0032,10.0000)	(8.4052,0.0063,10.0000)	(8.3610,0.0002,10.0000)	(8.4065,0.0002,10.0000)													
	4	(8.3550,0.0077,10.0000)	(8.2681,0.0055,10.0000)	(8.3209,0.0039,10.0000)	(8.3891,0.0032,10.0000)	(8.4009,0.0026,10.0000)	(8.3590,0.0023,10.0000)	(8.4050,0.0018,10.0000)													
	2,3	(8.3370,0.0264,10.0000)	(8.2624,0.0114,10.0000)	(8.3190,0.0059,10.0000)	(8.3857,0.0067,10.0000)	(8.3996,0.0040,10.0000)	(8.3609,0.0004,10.0000)	(8.4064,0.0003,10.0000)													
	2,4	(8.3445,0.0186,10.0000)	(8.2677,0.0059,10.0000)	(8.3157,0.0094,10.0000)	(8.3899,0.0035,10.0000)	(8.3975,0.0063,10.0000)	(8.3589,0.0024,10.0000)	(8.4049,0.0019,10.0000)													
	3,4	(8.3401,0.0232,10.0000)	(8.2576,0.0165,10.0000)	(8.3206,0.0043,10.0000)	(8.3838,0.0097,10.0000)	(8.4007,0.0029,10.0000)	(8.3588,0.0025,10.0000)	(8.4048,0.0020,10.0000)													
	2,3,4	(8.3297,0.0341,10.0000)	(8.2572,0.0169,10.0000)	(8.3153,0.0098,10.0000)	(8.3826,0.0100,10.0000)	(8.3971,0.0046,10.0000)	(8.3587,0.0027,10.0000)	(8.4047,0.0021,10.0000)													
16																					
	2	(1.8848,0.2578,4.2765)	(0.8474,0.2033,1.9438)	(1.1852,0.3457,1.9326)	(1.6068,0.1570,2.2594)	(1.8307,0.2965,2.1637)	(1.7411,0.1738,1.8211)	(2.2388,0.1497,1.9399)													
	3	(1.8617,0.3605,4.2850)	(0.8446,0.3171,1.8998)	(1.1603,0.2652,1.9835)	(1.5669,0.4569,2.2380)	(1.8289,0.2127,2.1995)	(1.7162,0.2456,1.8344)	(2.2153,0.2100,1.9523)													
	4	(1.8015,0.1835,4.2704)	(0.8707,0.2648,1.8957)	(1.1993,0.2465,1.9501)	(1.6076,0.2229,2.2301)	(1.8494,0.2112,2.1600)	(1.7537,0.2199,1.7931)	(2.2416,0.1956,1.9174)													
	2,3	(1.8091,0.5938,4.3042)	(0.7981,0.6971,1.9507)	(1.1156,0.5878,1.9908)	(1.5275,0.5768,2.2744)	(1.7682,0.4929,2.1110)	(1.6624,0.4034,1.8667)	(2.1646,0.3481,1.9823)													
	2,4	(1.8464,0.4286,4.2966)	(0.8221,0.4559,1.9477)	(1.1590,0.5727,1.9381)	(1.5664,0.5710,2.2688)	(1.7875,0.4927,2.1719)	(1.6980,0.3841,1.8285)	(2.1894,0.3372,1.9496)													
	3,4	(1.8243,0.5265,4.2987)	(0.8204,0.7514,1.9038)	(1.1284,0.4947,1.9883)	(1.5288,0.6369,2.2451)	(1.7857,0.4122,2.2075)	(1.6741,0.4503,1.8416)	(2.1669,0.3944,1.9617)													
	2,3,4	(1.7739,0.7493,4.3171)	(0.7157,0.9212,1.9546)	(1.0861,0.8015,1.9955)	(1.4911,0.7992,2.2809)	(1.7278,0.6786,2.2187)	(1.6224,0.6071,1.8731)	(2.1181,0.5925,1.9909)													

Figure C.2 Impact of Parameters with Exclusive Product Under Centralized Regime (cont.)