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**ALLOCATIVE DATA ENVELOPMENT ANALYSIS
WITH UNCERTAINTY**

A Thesis in
Industrial Engineering and Operations Research

by
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ABSTRACT

An important objective of managers is to evaluate the performance of their organization in order to continuously improve and grow. One measure is to compute the performance efficiency of each unit within their organization. Data Envelopment Analysis is a specific technique that optimizes and computes the efficiency of decision making units (DMUs) relative to the other units within the organization, using deterministic data collected from past performance results. From these efficiency values, DMUs will be determined to be either efficient or inefficient.

Specifically for a health care organization, managers evaluate the operating performance of the units within their organization based on the resources and expenditures used, and the revenue generated from the services that they provide. Allocation Models are especially useful for these types of evaluations, because they look only at units of dollars and the allocation of budgets and resources.

While it is vital to evaluate past performance, as in the traditional DEA model, it is also important to understand and predict future performance. This thesis, therefore, proposes the use of Allocative Data Envelopment Analysis to consider the uncertainty of future results, with one specific application being the health care industry. There are three types of models considered: Cost Allocation Model, Revenue Allocation Model, and Profit Allocation Model. These models optimize and evaluate the performance of a DMU based on its cost efficiency, revenue efficiency, and profit efficiency, respectively. Methods are also proposed in order to make recommendations to the decision maker to allow for the inefficient units to become efficient. While this thesis focuses on data that follows a discrete distribution, a method is proposed that considers data that follows a continuous distribution. A numerical example is provided to demonstrate the use of these models.

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Chapter 1

Introduction

1.1 Problem Statement

Efficient utilization of resources and minimizing cost are important objectives that many organizations tackle year after year. Methods such as regression and simulation exist that allow an organization to analyze the efficiency of their past performance. Another method ranks the decision making units within the organization by their bottom line budget and how much revenue was generated at that facility. Data envelopment analysis is a common method which looks specifically at the efficiency level. From these analyses, a decision maker or manager may see recommendations of how to become more efficient or how to reach an optimal efficiency level. These analytical methods work well to analyze past performance and are important and vital to the decision makers when looking towards the future, especially when it comes to budget allocation. The efficient utilization and cost minimization objectives, however, can be difficult to manage under uncertain future situations. Even if a specific unit was efficient last year, this does not guarantee future performance and efficiency for the following year.

Specifically in a health care system, the performance of each clinic is analyzed for its efficiency relative to the other clinics within the same organization. Data is collected at each clinic regarding the types of resources they use and the services they provide. For best analytical results, clinics should be grouped by those that have the same types of data available, such as those that offer the same types of services, which is difficult given the differences of data between the clinics. Another difference between the clinics is their reimbursement methodology,

where revenue is dictated by a contractual relationship. For example, a service may or may not be billed as part of the hospital, and the same service will generate different revenue at different clinics. Each clinic also represents a mix of accepted medical insurance policies, which affects the amount of revenue generated. For example, if there are proportionately more patients that use Medicare at one clinic compared to another clinic, there could be the same number of patients served as the other clinic, but less revenue is generated. Another problem is the existence of unique clinics that perform specific services that other clinics do not. These clinics do not fit into any of the subgroups created within which the efficiencies are compared. Currently, the performance of these unique clinics is evaluated solely by their return on investment. With regard to the physical facility, each clinic building may have a different cost structure. This is because the facilities were initially built to system specifications of the services provided.

A model is needed to predict the future performance and efficiency level of the decision making units, taking into account the resources and services available to group the units into similarly performing subgroups and the cost structure of each facility.

1.2 Literature Review

1.2.1 Health Care Efficiency Measures

Many methods have been used to calculate the efficiency of a health care system. Tsai, Chang, and Lin (2010) apply a fuzzy analytical hierarchy process (FAHP) to analyze the efficiency of Taiwan's hospital accreditation policy. After incorporating the Delphi method into the FAHP and performing sensitivity analyses, Tsai et al. find that FAHP provides a more accurate and realistic performance score than the method previously used. They also propose that

hospitals can look at their scores and develop programs in order to increase their performance level.

Oliveira and Bevan (2008) apply allocative efficiency measures to hospital costs in Portugal. They report a new approach that takes into account “unavoidable costs”, costs that are outside the control of the manager, and use it with methods for allocating resources. The model developed identifies different causes of allocative inefficiencies, and produces three estimates of causes of unavoidable costs. They find that after summing these estimates, 78% of costs of national hospitals were “unavoidable” and should not have been taken into account during resource allocation.

Ippoliti and Falavigna (2012) analyze the efficiency of the twenty-one medical care suppliers in Italy, taking into account the effects of clinical research on this efficiency. The goal of their method is to maximize the perceived quality of health treatments, where technical efficiency is computed using a truncated regression model, data envelopment analysis, and Malmquist productivity indices, which are the ratios between outputs and inputs considering changes in time. Ippoliti and Falavigna find that increasing the perceived quality of treatments at a medical care supplier also increases its efficiency.

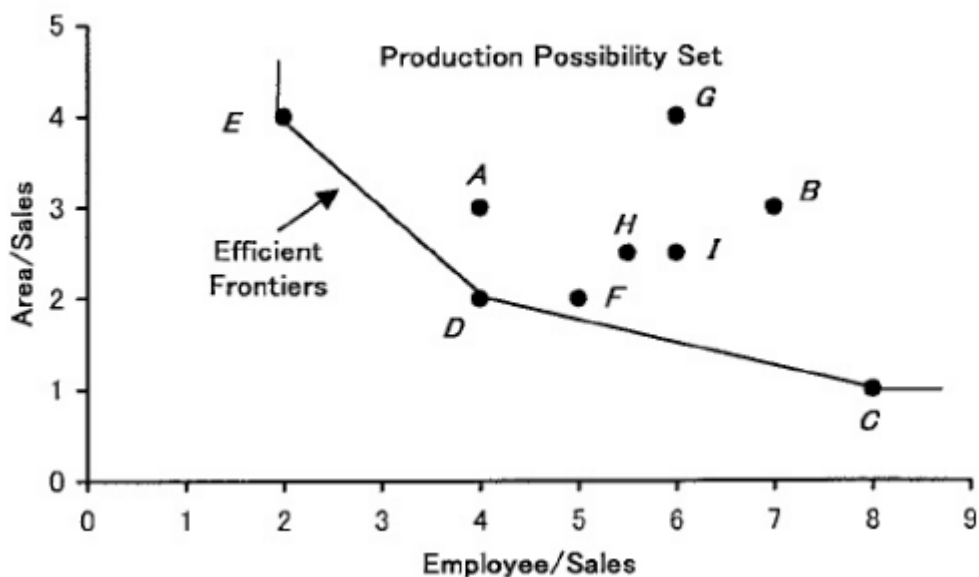
Zuckerman, Hadley, and Iezzoni (1994) use a frontier cost function to measure the efficiency of hospitals. They take into account an assessment of the relationship between profit and efficiency, as well as the relationship between quality and cost in the measurement of efficiency. Zuckerman et al. propose that there is a tradeoff between increasing production efficiency and reducing the quality of care. They define inefficiency as “using the minimum technically feasible total cost for each quantity and mix of total output and level of quality as a reference point”. Because there is no uniformity amongst the hospitals, variations of the mix and number of hospital outputs should be taken into account, as well as the severity of the patients’ illnesses, the quality of care, and the patient outcomes. The stochastic frontier estimation

technique used in this study allows for hospital-specific measures of efficiency. Through their study, Zuckerman et al. find that hospital occupancy rates are inversely related to inefficiency, that increasing the number of beds will generate a higher relative efficiency, having a higher average salary of employees at a hospital will increase inefficiency, that increasing the intensity of the use of inputs will also increase hospital inefficiency, and that competition between hospitals only represents a weak relationship to inefficiency. Therefore, Zuckerman et al. suggest that to increase savings, the hospital system should be restructured by shifting services from inefficient to efficient hospitals.

1.2.2 Data Envelopment Analysis and Allocation Model

Data Envelopment Analysis (DEA) was first developed by Charnes, Cooper, and Rhodes (1978). The objective that they proposed is to measure the efficiency of resource utilization of a decision making unit (DMU) relative to other similar DMUs within an organization that have multiple inputs and outputs. According to Charnes et al., efficiency is obtained by the maximum ratio of weighted outputs to weighted inputs subject to the condition that the similar ratios for every DMU be less than or equal to one. One advantage of DEA is that the units of the inputs and outputs do not need to be the same or of the same magnitude. Once relative efficiency values are obtained for each DMU, an efficient frontier is determined, which becomes important when making recommendations for the inefficient units to become efficient. The efficient frontier, according to Charnes et al., is represented by efficient units, and will envelop the inefficient units, thus giving DEA its name. All points along the efficient frontier represent a 100% relative efficiency. An example of an efficient frontier for a two inputs and one output model is shown in Figure 1-1. The DMUs C, D, and E are the efficient units, and create the efficient frontier, while

DMUs A, B, F, G, H, and I are the inefficient units. If the inefficient units move to any point along the efficient frontier, they will become efficient.



Source: Charnes et al. (1978)

Figure 1-1: Efficient Frontier for Model with Two Inputs and One Output

The efficient frontier also helps determine the reference set for the inefficient units, which represent the efficient DMUs to which the inefficient DMU most closely behaves, and will differ for each inefficient DMU. For example, in Figure 1-1 the reference set for DMU A consists of DMUs D and E, because they are the efficient DMUs which most closely resemble DMU A. Therefore, if DMU A were to operate completely like DMUs D or E, or any combination of these as represented by the line between them, then DMU A will become an efficient DMU. These are the types of recommendations that can be made to decision makers to help them improve the efficiency of their inefficient units.

An extension of DEA includes the family of Allocation Models, which include the cost, revenue, and profit allocation models, as detailed by Cooper, Seiford, and Tone (2006). The

objective of these models is to obtain a cost, revenue, and profit efficiency, respectively, where the inputs and outputs are all in dollar units. Suhaimi, Abdullah, Nee, and Ibrahim (2012), Brissimis, Delis, and Tsionas (2010), and Hartman, Storbeck, and Byrnes (2001) have all applied the allocation model to banking.

Suhaimi et al. (2012) specifically use profit efficiency frontier estimates for commercial banks in Malaysia. They measure efficiency by how close a bank comes to earning maximum profits given its output levels rather than its output prices, and find that the banks have lower profit efficiency as they expand in size.

Brissimis et al. (2010) break down cost efficiency into its technical and allocative efficiency components, where technical efficiency reflects the ability of a DMU to obtain maximal output from a given set of inputs, and allocative efficiency reflects the ability of a DMU to use the inputs in optimal proportions, given their respective prices. They have applied this to compare banks in European countries and find that allocative efficiency increases on average more than technical efficiency over time, and both contribute to the overall cost efficiency. Brissimis et al. propose that allocative efficiency should be modeled within a stochastic profit efficiency framework.

Hartman et al. (2001) apply and analyze technical and allocative efficiencies to bank branches in Sweden. They define relative efficiency as a branch being able to generate the same amount of revenue using fewer resources, and thus their objective is to minimize cost inputs. Hartman et al. propose that distinguishing between technical and allocative efficiencies can offer important guidelines in the redesign of the banking process, because the analysis focuses on the “proper mix of things” as well as “how well things are managed”.

1.2.3 Data Envelopment Analysis in Health Care

Data Envelopment Analysis (DEA) has been applied to health care systems in different settings with many advantages. Huang and McLaughlin (1989) find that DEA worked well for heterogeneous rural primary health care clinics. Another advantage they find is DEA's flexibility, especially with its multi-output model and use of results in further analyses.

Benneyan, Ceyhan, and Sunnetci (2007) applied DEA to analyze and compare the efficiencies of the health care systems for the countries of the World Health Organization (WHO). Of the 193 countries for which the WHO recorded data, 180 contained data for all the input and output fields. DEA was used to identify whether a country was efficient or not. If it was inefficient, the reference set was included, which is the set of efficient countries to which that country's performance most closely resembles. Benneyan et al. propose that DEA might be useful for policy making, benchmarking, and reform of a health care system.

Sheikhzadeh, Roudsari, Vahidi, Emrouznejad, and Dastgiri (2012) use DEA to measure allocative and cost efficiencies of public and private hospital services reform in Iran. Their objectives are to evaluate the efficiencies of the public and private hospitals, identify the highest and lowest efficiencies for benchmarking, and apply reforms to save money, time, and resources to increase a hospital's efficiency, and thus increase the efficiency of the health care system. Sheikhzadeh et al. evaluate technical efficiency, which ensures no resources are wasted, allocative efficiency, which ensures resources are used to produce outputs with the highest possible value, and cost efficiency, which is the technical efficiency value multiplied by the allocative efficiency value. Results find that public hospitals are more efficient than private ones, and they propose recommendations to increase the efficiency of the inefficient units, thus reforming and redesigning the health care system.

Athanassopoulos and Gounaris (2001) also employ technical and allocative efficiencies to analyze resource allocations of hospital operations in Greece. Technical efficiency's purpose is described as yielding information about the efficiency with which a unit converts its input resources into outputs, while allocative efficiency's purpose is to gauge efficiency improvements by means of resource allocation, looking specifically at how the uncertainty of input prices affects allocative efficiency. Athanassopoulos and Gounaris divide allocative efficiency into its macro and micro components that distinguish between the levels of decision making required for resource allocation. They describe macro-allocative efficiency as relating to the distribution and mix of resources within the health care industry as compared with other industries, while micro-allocative efficiency relates a hospital's resources to its ability to respond efficiently to the demand for services, which is where their research focuses. To account for inputs with unknown prices, the model output is divided into two different measures: their model gives estimates of resource levels for inputs with *known* prices, and overall cost levels for inputs with *unknown* prices. Athanassopoulos and Gounaris propose that inefficiencies must be addressed with structural changes within the operations of the health care organization.

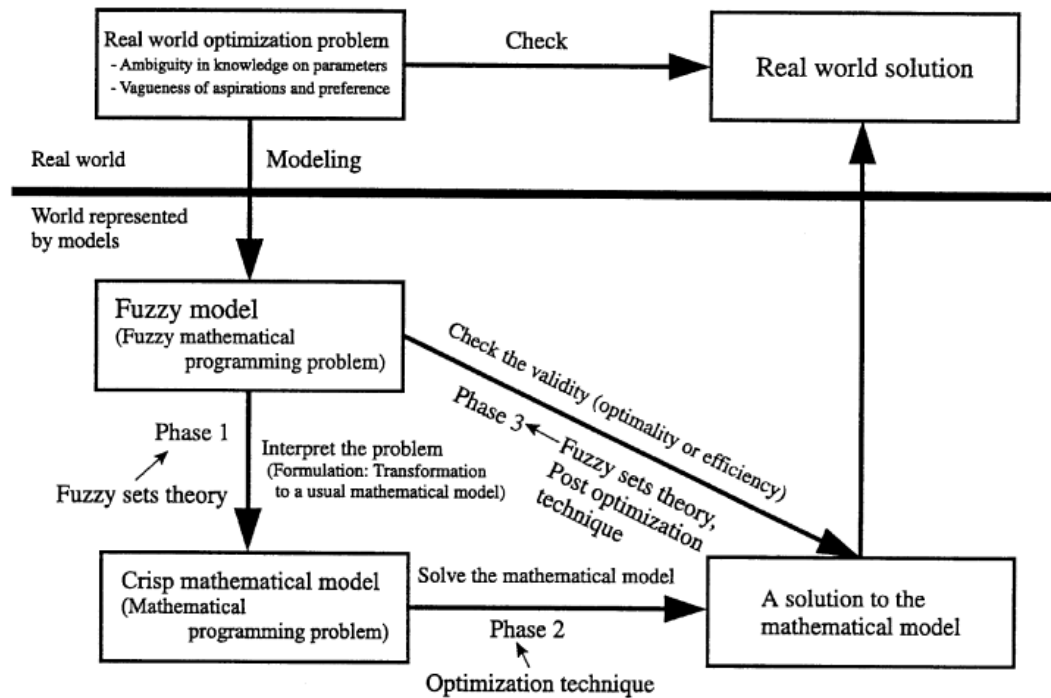
Al-Shayea (2011) applies Data Envelopment Analysis (DEA) to measuring hospital efficiencies in Saudi Arabia with the purpose of providing managers of health care centers a way to test the performance of their departments to meet the needs and quality of service of out-patients and in-patients. Health care managers also wish to know the performance of their health care organization as compared to their competitors. Al-Shayea believes that DEA is the best approach to comparative performance assessment for health care managers, and is a powerful and easily understandable tool that can be used to guide improvement measures. The author makes sure to point out that DEA produces relative efficiency scores, where a unit's performance is only compared to the other unit's in the analysis, and is thus the best tool for determining rankings of the units. Al-Shayea's analysis specifically looked at the efficiency of different departments

within the same hospital, looking at the efficiency per department per month over the course of 12 months, showing that three of the nine departments were 100% efficient every month. The results helped the hospital's manager to address those departments with low efficiencies.

Data Envelopment Analysis is used for multiple applications of deterministic data, including the health care industry. In order to be able to apply uncertainty to DEA, uncertainty in traditional linear programming is studied.

1.2.4 Linear Programming with Uncertainty

Methods have been studied to account for uncertainty in linear programming models, including fuzzy mathematical programming, possibilistic linear programming, and stochastic programming. Inuiguchi and Ramík (2000) look at all three of these methods from a practical point of view. They use a numerical example to show models of fuzzy linear programming, and then compare fuzzy mathematical programming with stochastic programming. Inuiguchi and Ramík point out that there are two types of uncertainties: ambiguity and vagueness, where ambiguity is the situation in which the choice between two or more alternatives is left unspecified, and vagueness is the difficulty of making precise distinctions or boundaries. Fuzzy mathematical programming is divided into three categories: one with vagueness, one with ambiguity, and one with vagueness and ambiguity. In the first, the fuzzy goals and constraints represent the flexibility of the target values of the objective functions and the elasticity of the constraints, respectively. In the second, ambiguity of the coefficients of the objective functions and constraints is treated, but not the fuzzy goals and constraints, and is therefore also known as possibilistic programming. In the third, both considerations from the previous two models are taken into consideration. This fuzzy programming approach and its comparison to reality are illustrated in Figure 1-2.



Source: Inuiguchi and Ramík (2000)

Figure 1-2: Fuzzy mathematical programming approach

Inuiguchi and Ramík also point out two differences between fuzzy programming and stochastic programming. First, stochastic programming is better used for a problem that follows a multivariate normal distribution, while fuzzy programming is better for a unimodal distribution. Second, a larger number of decision variables take on non-zero values in the optimal solution of a stochastic programming model than a fuzzy one.

Stanciulescu, Fortemps, Installé, and Wertz (2003) propose a multi-objective fuzzy linear programming problem specifically with fuzzy coefficients for the objectives and constraints, which supplies fuzzy solutions to the decision maker. They consider a special case where the decision variables sum up to a constant, which is especially applicable to problems dealing with the allocation of resources where there may be a limited amount of those resources. An

advantage of their model is that the “satisfactory region” of proposed fuzzy solutions provides easily understood views and options to the decision maker, where any option within this region is an appropriate choice.

An alternative method for dealing with uncertainty is proposed by Urli and Nadeau (2004). When there is incomplete information about the uncertain parameters of a problem, scenarios are developed, sometimes assumed to have known probabilities. Urli and Nadeau propose an interactive model where the probabilities of the scenarios are specified according to a ranking by the decision manager of the possibility of the scenarios occurring. Their model, named “PROMISE/scenarios”, first transforms the multi-objective stochastic program into a multi-objective deterministic program, taking into account the partially specified probabilities on scenarios from the decision maker to interactively work towards a best compromise solution. Urli and Nadeau find that their method is best suited for problems of small dimensions or problems with a small number of scenarios.

Another approach for undertaking uncertainty in linear programming models is interval programming, as presented by Oliveira and Henggeler Antunes (2007). Interval programming is interesting because it does not require the assumptions of probabilistic distributions as in stochastic programming or possibilistic distributions as in fuzzy programming, and assumes only that information about the range of variation of the parameters is available, specifying interval coefficients. Oliveira and Henggeler Antunes propose two different types of approaches: a satisficing approach and an optimizing approach. In the satisficing approach, each interval objective function is transformed into one or several objective functions, usually using the lower bound, upper bound, and central value of the intervals, to obtain a compromise solution. The optimizing approach extends the concept of efficiency to the interval objective function case, where two types of efficient solutions are presented, “necessarily efficient” and “possibly efficient”. These efficient solutions, first defined by Bitran (1980), are that a solution is

necessarily efficient if it is efficient for any given objective function coefficient within its range of variation, while a solution is possibly efficient if it is efficient for at least one of the given objective function coefficients in its range of variation. Oliveira and Henggeler Antunes present examples to show that interval programming is applicable to the uncertainty of real-world situations.

1.2.5 Data Envelopment Analysis with Uncertainty

Taking into account the different methods for incorporating uncertainty into linear programming problems, models are developed for uncertainty within Data Envelopment Analysis (DEA) problems, with applications to health care and other industries. Khaki, Sadjadi, Gharakhani, and Rashidi (2012) apply a robust DEA model to problems with uncertain output parameters to public health care centers in Iran. This is done by applying robust optimization techniques to DEA, which uses a control parameter that measures the price of robustness, assuming that the unknown distribution is symmetric. Khaki et al. have found that because it is still a linear model, incorporating the uncertainty does not deteriorate solvability of the model.

Zerafat Angiz, Emrouznejad, and Mustafa (2012) take another approach by developing a discrete fuzzy data envelopment analysis model. This takes into account the uncertainty of input and output variables, where the uncertainty is represented by a triangular membership function. While some fuzzy DEA methods result in an interval efficiency score for each DMU, this model results in a single fuzzy optimal solution, employing multi-objective programming and local α -level concepts. Zerafat Angiz et al. define local α -level as the set of elements that belong to a fuzzy set with degree of at least α . One advantage of this method is that the entire uncertainty is retained in the process of solving the problem. After presenting a numerical example to compare their method with others as well as using different α -levels, Zerafat Angiz et al. determine that

their approach gives a better estimation of efficiency scores than when the data are in interval form, without losing the uncertainty information.

Similar to Khaki et al., Shokouhi, Hatami-Marbini, Tavana, and Saati (2010) also develop a robust DEA optimization model. However, they propose that their model covers the interval approach results with less complexity than the fuzzy approach. Their model looks at uncertainty in both the input and output parameters, which are constrained within an uncertainty set. The model is run multiple times, obtaining efficiency values for different levels of robustness, analyzing an optimistic best case scenario and a pessimistic worst case scenario. This would create a feasible region for each decision making unit (DMU), identifying a range of robustness in which the rankings of the efficiencies of the DMUs occur with high probability.

Another approach taken to account for uncertainty in data envelopment analysis is the application of stochastic programming, as proposed by Retzlaff-Roberts and Morey (1993) and Li (1998). Retzlaff-Roberts and Morey apply goal programming to the allocative DEA model in order to develop a Stochastic Allocative DEA model. Unlike prior stochastic DEA models, this model allows for multiple outputs. Uncertainty is also defined as the amount by which a DMU deviates from the efficient frontier, allowing for all possible sources of uncertainty. The goal programming approach is able to handle this kind of uncertainty, which affects the location of the efficient frontier as well as the location of the DMUs. To demonstrate their model, Retzlaff-Roberts and Morey apply it to an empirical example for hospitals in California.

The stochastic DEA model presented by Li (1998) accounts for the possibility of random variations in the input-output structure. Li defines a stochastic efficiency measure, where a DMU is α -stochastically efficient if there is a $100(1-\alpha)$ confidence that it is efficient, where the probability that it is inefficient is less than α . The set of all α -stochastically efficient points represents the stochastically efficient production frontier. A critical assumption made is that the

random disturbances follow a multivariate symmetric distribution, allowing the efficient frontier to vary randomly as well.

1.3 Motivation

This research is motivated by the interest in being able to predict future performance and efficiency of an organization. While analyzing the past with deterministic historical data is very important, especially when trying to understand trends and outliers in performance and why they occurred, it is also important to prepare for the future. This is especially applied to the health care industry, where future performance is unknown, such as the number of patients that will be treated and the types of treatments they will need. A health care system is also restricted by budgeting resources, so knowing the predicted future performance will allow the managers to better allocate their limited resources within their organization. Therefore, it is important to consider questions such as what will be the future performance and efficiency level of an organization and its subsequent units, and how to increase the efficiency of inefficient units given their possible future performance.

1.4 Objectives

Research in the area of Data Envelopment Analysis (DEA) has been focused on analyzing the known past performance of organizations and decision making units (DMUs), focusing on the traditional DEA model rather than DEA Allocation Models. Therefore, the goal of this thesis research is to develop a model that will enable the prediction of future performance and efficiency levels of decision making units, specifically applied to a health care system, using DEA Allocation Models. The budget and resources of the system will be used as the inputs into

the model, and the types of services the clinic offers as the output that they produce. Because future input and output values are unknown, the uncertainty of the inputs and outputs will be taken into account using probability distributions. This will generate multiple scenarios, each with a probability of occurrence, for which the DMUs will be analyzed. Once the efficiencies are computed for each decision making unit for each scenario, recommendations will be made to the manager on how to improve the efficiency of inefficient units. The prediction of future performance will be pertinent to decision makers and managers, and will especially be used to better allocate their resources and budget among the clinics within their organization.

1.5 Thesis Organization

Chapter One of this thesis contains an introduction, which includes the problem statement, objectives for solving the problem, and a literature review of past research. Chapter Two presents the model formulated to solve the problem stated in Chapter One, including both discrete and continuous cases. Chapter Three shows a numerical example utilizing the model from Chapter Two. Chapter Four summarizes the thesis, presents conclusions, and provides suggestions for further research.

Chapter 2

Model Formulation

2.1 Introduction

Efficiency is defined as the ratio of the total output produced to the total amount of resources used, and is represented as a percentage. Specifically for a health care system, the resources include investments such as doctors, nurses, medical equipment, and facilities along with their associated costs, and the outputs are the types of services they can provide to their patients at a given price. The objective of a health care system, therefore, is to obtain an optimal efficiency level that utilizes their resources and investments fully, which reduces cost, to provide services to as many patients as possible, thus increasing their revenue.

Data Envelopment Analysis (DEA) is one method in which efficiencies are computed and analyzed for decision making units (DMUs) within an organization, given the inputs and outputs of each DMU. The Allocation Models, specifically, uses the unit cost and unit price of the inputs and outputs to obtain an allocative efficiency for each DMU, of which there are three types. The first is Cost Efficiency, which is calculated by dividing the target minimum cost by the current cost. This measures by how much a DMU falls short of operating at their minimum cost, given the input resources and unit cost per each input. The second is Revenue Efficiency, which is calculated by dividing the current revenue by the target maximum revenue. This measures how much a DMU falls short from obtaining the maximum revenue possible under their current mix of inputs and outputs. The final allocative efficiency measure is Profit Efficiency, where profit is defined as total revenue minus total cost. The Profit Efficiency is calculated by dividing the

current profit by the target maximum profit, which measures how much a DMU falls short from reaching optimal profit levels. Therefore, three models are presented that represent each of these efficiency measures.

While traditional DEA uses deterministic values for the inputs and outputs to measure the efficiency of past performance, this thesis uses uncertain inputs and outputs to predict the efficiency of future performance. This is done by allowing each input and output to realize several possible values, each with an associated probability that that value will occur. The distribution of each of these sets of values can be either discrete or continuous. However, this thesis will focus on the discrete case, with recommendations of how to proceed if the distribution is continuous. Possible scenarios are generated to take into consideration all possible combinations of input and output values. An efficiency score is then computed for each scenario for each DMU relative to the other DMUs, and recommendations will be made for improving the efficiency of inefficient DMUs.

2.2 Data Setup and Scenarios

Data collected for each organization will contain the types of inputs and outputs that will be used in the analysis, assuming that data for each input and output type must be available at each DMU. Then for each DMU, the associated costs and prices of each input and output, respectively, are collected. For each input and output, the possible values can be obtained from the expert opinion of the decision maker or manager, or from analysis of historical data. Each of these possible values will have an associated probability of occurrence, which can also be obtained from either the decision maker or historical data. For example, a manager at a health clinic thinks that there will be either 8 doctors or 10 doctors next year on staff, with probabilities of occurrence of 40% and 60%, respectively.

In order to develop the Allocative Models under uncertainty, notations that will be used in the model are defined below:

1. Number of Decision Making Units: k
2. DMU being analyzed: DMU_0
3. Number of inputs: m
4. Number of outputs: n
5. Total number of scenarios: S
6. Optimal value for DMU j for scenario s : $Z_{j,s}^*, j = 1, \dots, k; s = 1, \dots, S$
7. Probability of scenario s : $p_s^*, s = 1, \dots, S$
8. Number of possible values of input i for DMU j : $a_{i,j}, i = 1, \dots, m; j = 1, \dots, k$
9. Number of possible values of output r for DMU j : $b_{r,j}, r = 1, \dots, n; j = 1, \dots, k$
10. d^{th} Possible value of input i for DMU j : $x_{i,j,d}, i = 1, \dots, m; j = 1, \dots, k; d = 1, \dots, a_{i,j}$
11. f^{th} Possible value of output r for DMU j : $y_{r,j,f}, r = 1, \dots, n; j = 1, \dots, k; f = 1, \dots, b_{r,j}$
12. Value of input selected for scenario s : $x_{i,j,s}, i = 1, \dots, m; j = 1, \dots, k; s = 1, \dots, S$
13. Optimal value of input i : $x_i^*, i = 1, \dots, m$
14. Optimal value of output r : $y_r^*, r = 1, \dots, n$
15. Value of output selected for scenario s : $y_{r,j,s}, r = 1, \dots, n; j = 1, \dots, k; s = 1, \dots, S$
16. Probability of input $x_{i,j,d}$ occurring: $p_{i,j,d}, i = 1, \dots, m; j = 1, \dots, k; d = 1, \dots, a_{i,j}$
17. Probability of output $y_{r,j,f}$ occurring: $q_{r,j,f}, r = 1, \dots, n; j = 1, \dots, k; f = 1, \dots, b_{r,j}$
18. Probability of selected input $x_{i,j,s}$: $p_{i,j,s}, i = 1, \dots, m; j = 1, \dots, k; s = 1, \dots, S$
19. Probability of selected out put $y_{r,j,s}$: $q_{r,j,s}, r = 1, \dots, n; j = 1, \dots, k; s = 1, \dots, S$
20. Unit cost per input i for DMU j : $c_{i,j}, i = 1, \dots, m; j = 1, \dots, k$
21. Unit price per output r for DMU j : $g_{r,j}, r = 1, \dots, n; j = 1, \dots, k$

22. Unit cost per input i for DMU_0 : $c_{i,0}, i = 1, \dots, m$
23. Unit price per output r for DMU_0 : $g_{r,0}, r = 1, \dots, n$
24. Dual variable for DMU j : $\lambda_j, j = 1, \dots, k$
25. Input level for the DMU being analyzed: $x_{i,d,0}, i = 1, \dots, m; d = 1, \dots, a_{i,j}$
26. Output level for the DMU being analyzed: $y_{r,f,0}, r = 1, \dots, n; f = 1, \dots, b_{r,j}$

Also needed for model development is the generation method of the scenarios. A scenario is generated by selecting one possible value for each input and output for each DMU. Assuming independence, the probability of that scenario occurring will be the combined probability of each of the input and output values selected, calculated by multiplying the associated individual probabilities of those values. Each scenario is then run through the model, once for each DMU, in order to obtain the efficiency for each DMU under every possible scenario. Equation 2.1 shows how the total number of scenarios for each DMU is calculated, and Equation 2.2 shows how to calculate the total number of scenarios for the problem.

$$\text{Total Scenarios per DMU} = \prod_{j=1}^k a_{1,j} * a_{2,j} * \dots * a_{m,j} * b_{1,j} * b_{2,j} * \dots * b_{n,j} \quad (2.1)$$

$$\text{Total Number of Scenarios } S = \text{Total Scenarios per DMU} * k \quad (2.2)$$

For each of these scenarios, the probability of that scenario occurring, after the input and output values are selected, is also calculated as shown in Equation 2.3.

$$\text{Probability of a Scenario} = \prod_{j=1}^k p_{1,j,0} * p_{2,j,0} * \dots * p_{m,j,0} * q_{1,j,0} * q_{2,j,0} * \dots * q_{n,j,0} \quad (2.3)$$

Therefore, when an efficiency value is obtained when a scenario is optimized, it represents that the DMU is at that efficiency level with the probability of that scenario's occurrence. This procedure is completed for each of the Cost, Revenue, and Profit Allocation Models presented in this chapter.

2.3 Cost Allocation Model

The Cost Allocation Model computes the relative cost efficiency of each decision making unit (DMU), and compares it to that of all the other DMUs. This will be done for each of the scenarios for which it is being evaluated. The general steps of the model include formulating the model, optimizing each DMU for all of the scenarios, obtaining the cost efficiency value from the current and target costs, comparing the cost efficiency to other DMUs, and proposing recommendations to the decision maker on how to improve efficiency of the inefficient units.

2.3.1 Objective Function

The goal of the Cost Allocation Model is to minimize the total cost for DMU_0 for the scenario being evaluated. This will take into account the unit cost of each of the inputs for each DMU. The formulation will find the optimal levels for each input, as well as the dual variable values for each DMU, which will be used when determining the reference set of the DMU. The objective function used in each scenario is shown in Equation 2.4.

$$\text{Minimize } Z_{0,s} = \sum_{i=1}^m c_{i,0} * x_i^* \quad (2.4)$$

2.3.2 Constraints

The objective function in Equation 2.4 is subject to certain constraints for each input and output variable, based on the optimal input levels and the current output levels. The constraints also depend on the scenario chosen, at its respective input and output values for each DMU. These constraints are shown in Equations 2.5 and 2.6. The non-negativity constraint for all of the variables is shown in Equation 2.7.

For every input variable i , (2.5)

$$\sum_{j=1}^k \lambda_j * x_{i,j,s} \leq x_i^*$$

For every output variable r , (2.6)

$$\sum_{j=1}^k \lambda_j * y_{r,j,s} \geq y_{r,0}$$

Non – negativity Constraint: (2.7)

$$\lambda_j, x_i^* \geq 0 \text{ for } j = 1, \dots, k \text{ and } i = 1, \dots, m$$

2.3.3 Model Optimization and Results

The optimization model presented above is performed for each of the scenarios for each decision making unit. The output of each model will be a target cost, so the cost efficiency for each DMU for each scenario will need to be calculated according to Equation 2.8, where the current cost is calculated using the current input levels and their unit costs.

$$\text{Cost Efficiency} = \frac{\text{Target Cost}}{\text{Current Cost}} = \frac{\sum_{i=1}^m c_{i,0} * x_i^*}{\sum_{i=1}^m c_{i,0} * x_{i,0,s}} \quad (2.8)$$

Every DMU will have multiple relative cost efficiency values, one for each scenario, each with an associated probability of occurrence, denoted by $Z_{j,s}^*$ with probability p_s^* . An example output table of the results is shown in Table 2-1.

The optimization model result will also indicate the reference set of the DMU, according to the following conditions:

1. If DMU_0 has efficiency = 1, then its reference set is itself, and its associated dual variable will be greater than 0.
2. If DMU_0 has efficiency < 1, then its reference set is one or more of the efficient DMUs, and dual variables associated with those DMUs will be greater than 0.

Table 2-1: Example output table of results

Scenario	Prob	DMU A		DMU B		...	DMU k	
		Efficiency	Reference Set	Efficiency	Reference Set		Efficiency	Reference Set
1								
2								
3								
...								
S								

For each DMU, the efficiency value and probability for each scenario is recorded, along with its associated reference set and the lambda (dual) values of each of the reference units.

2.4 Revenue Allocation Model

The Revenue Allocation Model computes the relative revenue efficiency for each decision making unit for each of the scenarios. Similar to the Cost Allocation Model, it is formulated below.

2.4.1 Objective Function

The objective of the Revenue Allocation Model is to maximize the total revenue for DMU_0 for the scenario being evaluated. It will take into account the unit prices of each the outputs for each DMU. The model will find the optimal levels for each output as well as the dual variable values, and will be performed for each DMU for each scenario. The objective function for the Revenue Allocation Model for each scenario is shown in Equation 2.9.

$$\text{Maximize } Z_{0,s} = \sum_{r=1}^n g_{r,0} * y_r^* \quad (2.9)$$

2.4.2 Constraints

The objective function in Equation 2.9 is subject to certain constraints for each input and output variable, this time based on the optimal output levels and the current input levels. The constraints also depend on the scenario chosen, because it changes the input and output values. These constraints are shown below in Equations 2.10 and 2.11 for input and output, respectively, as well as the non-negativity constraints in Equation 2.12.

For every input variable i , (2.10)

$$\sum_{j=1}^k \lambda_j * x_{i,j,s} \leq x_{i,0,s}$$

For every output variable r , (2.11)

$$\sum_{j=1}^k \lambda_j * y_{r,j,s} \geq y_r^*$$

Non – negativity Constraint: (2.12)

$$\lambda_j, y_r^* \geq 0 \text{ for } j = 1, \dots, k \text{ and } r = 1, \dots, m$$

2.4.3 Model Optimization and Results

The optimization model presented above is performed for each of the scenarios for each decision making unit. The output of each model will be a target revenue, so the revenue efficiency for each DMU for each scenario will need to be calculated according to Equation 2.13, where the current revenue is calculated using the current output levels and their unit prices.

$$\text{Revenue Efficiency} = \frac{\text{Current Revenue}}{\text{Target Revenue}} = \frac{\sum_{r=1}^n g_{i,0} * y_{r,0,s}}{\sum_{r=1}^n g_{r,0} * y_r^*} \quad (2.13)$$

Every DMU will have multiple relative revenue efficiency values, one for each scenario, each with an associated probability of occurrence, denoted by $Z_{j,s}^*$ with probability p_s^* . A similar table to Table 2-1 above will be created to summarize the resulting outputs. Also similar to the

Cost Allocation Model is the indication of the reference set for each DMU, keeping in mind that the reference set for an efficient unit is itself.

For each DMU, the efficiency value and probability of each scenario are recorded, along with its reference set and associated lambda values.

2.5 Profit Allocation Model

The Profit Allocation Model is a combination of the Cost Allocation Model and the Revenue Allocation Model already presented, and computes the relative profit efficiency of each decision making unit (DMU), comparing it to the other DMUs. The formulation of this model is similar to that of the two previous models, optimizing each DMU for all of the possible scenarios.

2.5.1 Objective Function

The objective of the Profit Allocation Model is to maximize the total profit for DMU_0 for the scenario being evaluated. Combining the two previous models, it will take into account the unit cost of each of the inputs for each DMU as well as the unit price of each of the outputs for each DMU. The formulation will find the optimal profit levels, based on optimal levels for both the input and outputs values, as well as the dual variable values. The objective function that is used in each scenario is shown in Equation 2.14.

$$\text{Maximize } Z_{0,s} = \sum_{r=1}^n g_{r,0} * y_r^* - \sum_{i=1}^m c_{i,0} * x_i^* \quad (2.14)$$

2.5.2 Constraints

The constraints for the Profit Allocation Model combine the constraints from the two previous models. Therefore, for each input and each output there are two constraints, based on the optimal and current levels for inputs and outputs, depending on the scenario being evaluated. These constraints are shown below in Equations 2.15, 2.16, 2.17, and 2.18. The non-negativity constraint is also presented in Equation 2.19.

For every input variable i

$$\sum_{j=1}^k \lambda_j * x_{i,j,s} = x_i^* \quad (2.15)$$

$$\sum_{j=1}^k \lambda_j * x_{i,j,s} \leq x_{i,0,s} \quad (2.16)$$

For every output variable r ,

$$\sum_{j=1}^k \lambda_j * y_{r,j,s} = y_r^* \quad (2.17)$$

$$\sum_{j=1}^k \lambda_j * y_{r,j,s} \geq y_{r,0} \quad (2.18)$$

Non – negativity Constraint: (2.19)

$$\lambda_j, x_i^*, y_r^* \geq 0 \text{ for } j = 1, \dots, k; i = 1, \dots, m; \text{ and } r = 1, \dots, m$$

2.5.3 Model Optimization and Results

The Profit Allocation optimization model presented above is performed for each of the possible scenarios for each decision making unit. The output of the model will return a target profit level, so the profit efficiency for each DMU for each scenario will need to be calculated according to Equation 2.20. The current profit level is calculated using the current input and output levels and their unit costs and prices, respectively.

$$\text{Profit Efficiency} = \frac{\text{Current Profit}}{\text{Target Profit}} = \frac{\sum_{r=1}^n g_{i,0} * y_{r,0,s} - \sum_{i=1}^m c_{i,0} * x_{i,0,s}}{\sum_{r=1}^n g_{r,0} * y_r^* - \sum_{i=1}^m c_{i,0} * x_i^*} \quad (2.20)$$

Every DMU will have multiple relative profit efficiency values, one for each scenario, each with an associated probability of occurrence, denoted by $Z_{j,s}^*$ with probability p_s^* . A similar table to Table 2-1 above will be created to summarize the resulting outputs. Also similar to the Cost and Revenue Allocation Models is the indication of the reference set for each DMU, keeping in mind that the reference set for an efficient unit is itself.

For each DMU, the profit efficiency value and probability of each scenario is recorded, along with its reference set and associated lambda values.

2.5.4 Note on Negative Profit

The Profit Allocation Model presented above assumes that there is always positive profit, in both the current values and the target optimal values. If negative profit occurs, which is realistically very common, then the resulting efficiency values may be negative or greater than one. Therefore, a proposed method to handle negative profit is to utilize a profit ratio model. The objective function for this model is shown in Equation 2.21.

$$\text{Maximize } Z_{0,s} = \frac{\sum_{r=1}^n g_{r,0} * y_r^* - \sum_{i=1}^m c_{i,0} * x_i^*}{\sum_{i=1}^m c_{i,0} * x_i^*} \quad (2.21)$$

This model considers the ratio of total profit to total cost, and will ensure that the profit efficiency value will be between zero and one, and will not be negative.

2.6 Making Recommendations

Because of the probabilistic nature of the future performance and efficiencies, multiple methods are proposed when considering how to make recommendations for the inefficient units to become efficient. Ultimately, the method chosen will be based on the specific situation of the organization as well as the particular interest of the decision maker. All of these methods assume that the unit costs and prices of the inputs and outputs, respectively, for each decision making unit (DMU) cannot be changed, only the values of the inputs and outputs may be adjusted to increase efficiency.

2.6.1 Method 1

Once all of the efficiency values are recorded for each DMU for each scenario, along with their associated probability and reference set, the next step is to make recommendations to the decision maker on how to improve the efficiency of the inefficient units. This will be done through the following process:

1. For each DMU, indicate how often it is 100% efficient. This is done through noting the scenarios for which it is 100% efficient, and the probability of occurrence of

those scenarios. The percentage of time that the DMU is efficient will then be the sum of the probabilities of the scenarios for which it is efficient.

2. List the DMUs in order of decreasing percentage of time that it is efficient, according to the information obtained in step 1, with the DMU that is efficient most often listed first.
3. In order to create the efficiency frontier comprised of the efficient units, a benchmark performance must be set. This can be set by the decision maker or by historical information, if possible. Looking at the list created in step 2, a decision needs to be made on those that are efficient more often than others. For example, the decision maker may decide that the benchmark performance level is when a DMU is efficient greater than 50% of the time. Those above the benchmark level will be considered “efficient” units, while those below the benchmark will be considered “inefficient” units, and recommendations will be made for these “inefficient” units, as detailed in the following steps.
4. Next, record the scenarios in which the benchmark “efficient” DMUs are all 100% efficient.
5. The input and output values for the scenarios recorded in step 4 now need to be normalized based on the probability of that scenario’s occurrence. From these normalized values, an expected value for each input and output for each DMU is obtained.
6. For each of the inefficient DMUs, they will need to do one of the following to become efficient:
 - a. For the Cost Allocation Model: Decrease its input values for those with a higher unit cost, and increase its input values for those with a lower unit cost, to the optimal values obtained during the optimization process. Keep output

values the same. This will decrease the total cost of that DMU and will make it more cost efficient.

- b. For the Revenue Allocation Model: Increase its output values to those optimal values obtained during the optimization process. Keep input values the same. This will increase the total revenue of that DMU and will make it more revenue efficient.
- c. For the Profit Allocation Model: Perform a combination of parts (a) and (b). Decrease the input values of those with high unit costs, increase the input values for those with low unit costs, and increase the output values. This will increase the total profit for that DMU and will make it more profit efficient.

It is important to keep in mind that objective of the Cost, Revenue, and Profit models is to minimize cost, maximize revenue, and maximize profit, respectively. Because the unit costs and prices do not change, only the values of the inputs and outputs do, it is the combination of the values and their associated costs and prices that dictate the output of the model and whether or not the objective has been reached.

2.6.2 Method 2

The second proposed method takes into account the expected efficiency value of each DMU. This is done by taking a probabilistic expected value by multiplying the possible efficiency values obtained from the model output for each scenario by the probability of the associated scenario. When these values are summed, the expected efficiency value will be obtained. Similar to Step 2 from Method 1, the DMUs are then ranked based on their expected efficiency, with the highest efficiency listed first. To complete the recommendation process,

Steps 3 through 6 of Method 1 are followed, using the expected efficiency values of each DMU obtained from Method 2.

Note that the benchmark efficient DMUs in this method may be different than those of the first method. This is because the distribution of efficiency values is different for each DMU. For example, consider DMU A that is 100% efficient 50% of the time, and 30% efficient the rest of the time, versus DMU B that is 100% efficient 40% of the time, 90% efficient 50% of the time, and 30% efficient only 10% of the time. In this case, while DMU A is 100% more often that DMU B is, DMU B will have a higher expected efficiency (65% for DMU A versus 88% for DMU B).

2.6.3 Method 3

The third proposed method for making recommendations for inefficient units will look at which DMUs are efficient under the best case scenario and worst case scenario. The best case scenario is the one in which the inputs are the lowest and the outputs are the highest for each DMU. The worst case scenario is the opposite, where the input values are the highest possible and the output values are the lowest possible for each DMU. This is because the minimum amount of resources used to produce the maximum amount of output is wanted. Therefore, the two scenarios listed above are determined from the list of all scenarios, and their outputs for each DMU are recorded. To complete the recommendation process, there will be two sets of recommendations, one for each scenario. For each scenario, the method from Step 6 in Method 1 above is followed.

The meaning of the two sets of values obtained for each inefficient DMU is that the recommendations obtained from the best case scenario is the ultimate performance level that an inefficient DMU will want to achieve. The recommendation values obtained from the worst case

scenario represent the minimum performance level that the inefficient DMU will want to reach in order to become efficient.

2.6.4 Method 4

The fourth proposed method is similar to Method 3. This time, though, the best case scenario is considered for each DMU, given that the other DMUs follow their worst case scenario. This represents the scenario in which the lowest input values and highest output values for the DMU that is being optimized, and the highest input values and lowest output values for all other DMUs. Therefore, the total number of scenarios considered in this method will be equal to the number of DMUs.

For each scenario, the recommendations will be made for that DMU being analyzed if it is inefficient. This will be done by following Step 6 from Method 1. The recommendation values will then represent the minimum performance level that the DMU will need to achieve in order to be considered efficient, because the other DMUs are operating at their worst performance. Therefore, if a DMU is not efficient even under its best case while the other DMUs are performing at their worst, then that DMU is definitely not efficient.

2.7 Continuous Distribution Case

The model developed in the above sections is for when the set of possible input and output values for each DMU, as well as their associated probabilities, is discrete. When there is a case of a continuous distribution, the generation of scenarios will be different because there are no longer a finite number of scenarios. The methods for determining the cost, revenue, and profit efficiencies, however, will follow the same model as proposed above, as well as the methods for

making recommendations to the decision maker on how to increase the efficiency of inefficient units. This section will consider how to handle two different continuous distributions, the Normal Distribution and the Beta Distribution.

2.7.1 Normal Distribution

The Normal Distribution is defined as having the following probability density function, shown in Equation 2.22, where μ is the mean of the distribution and σ is the standard deviation.

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}, \text{ for } -\infty < x < \infty \quad (2.22)$$

Because there are an infinite number of values and probabilities, as well as no absolute minimum or maximum value, the following steps are proposed to determine the possible values and their associated probabilities to be used in the models.

1. Determine the mean, μ , standard deviation, σ , and the values for $\mu \pm 3\sigma$.
2. Next, the probability density function (pdf) will be divided into sections of equal width, where the total number of sections and width are determined by the decision maker, keeping in mind that the more sections there are, the more complex the models become because there will be more scenarios generated. One proposed method is to use the standard deviation as the width of the sections.
3. The midpoint of each of these sections will be considered as the values for use in the models. It is therefore important that the mean as well as the $\pm 3\sigma$ values are midpoints of their respective sections.

4. In order to obtain the probabilities of occurrence of these midpoint values, the pdf will be integrated for each section from its lower bound to its upper bound. The area under the curve obtained from this integration will be the probability associated with the midpoint value.
5. Now a set of values and their associated probabilities have been obtained, which will be used as the values for the scenarios and models. The sum of these probabilities will be approximately equal to one.

Once all of the possible values have been obtained along with their associated probabilities, the scenarios used in the models are generated in the same way they were for the discrete case, as detailed in Section 2.2. After the possible scenarios are generated, the Cost, Revenue, and Profit Allocation Models proposed in the above sections will also be utilized in the same way. Once the results of the models are obtained, the methods for making recommendations in the Normal Distribution case are the same as those for the discrete case.

2.7.2 Beta Distribution

The Beta Distribution is defined as the probability density function (pdf) shown in Equation 2.23:

$$f(x) = \frac{\left[\frac{x-a}{b-a}\right]^{\alpha-1} \left[1 - \frac{x-a}{b-a}\right]^{\beta-1}}{(b-a)B(\alpha, \beta)}, \text{ for } a \leq x \leq b \quad (2.23)$$

In the equation above, α and β represent the shape parameters, and the function $B(\alpha, \beta)$ is the Beta Function, which is to ensure that when the total probability density function is

integrated, it is equal to one. The Beta Function used in the distribution is shown in Equation 2.24 below.

$$B(\alpha, \beta) = \int_0^1 t^{\alpha-1}(1-t)^{\beta-1} dt \quad (2.24)$$

Unlike the Normal Distribution, the Beta Distribution has finite minimum and maximum values, as represented by “a” and “b”, respectively. The mean and variance for the Beta Distribution are defined as shown in Equations 2.25, and 2.26 respectively.

$$\text{Mean} = \frac{b\alpha + a\beta}{\alpha + \beta}, \text{ for } \alpha, \beta > 1 \quad (2.25)$$

$$\text{Variance} = \frac{(b-a)^2 \alpha \beta}{(\alpha + \beta + 1)(\alpha + \beta)^2}, \text{ for } \alpha, \beta > 1 \quad (2.26)$$

In order to generate the possible values that will be used in the models, and their associated probabilities, the steps will be similar to those presented in the Normal Distribution case, but with some modifications.

1. Determine the mean and variance of the distribution using Equations 2.25 and 2.26.
2. Using the maximum and minimum values, divide the probability density function into sections of equal width. The total number of sections is selected by the decision maker, and then the width of each section is determined by Equation 2.27 below.

The mean will fall within one of the sections. One proposed method for the number of sections is using the standard deviation of the distribution. Note that the more sections there are the more complex the model will become.

$$Width = \frac{b - a}{\# \text{ of sections}} \quad (2.27)$$

3. Similar to the Normal Distribution, the midpoints of these sections will represent the values, and the area under the curve, obtained from integrating the probability density function from the lower bound to the upper bound of the section, will be the associated probability. The areas can also be obtained from the common Beta Distribution Tables.
4. There is now a set of values and their associated probabilities, where the sum of all the probabilities will be equal to one.

From this set of values and probabilities, the scenarios that will be used in the models are generated according to the same steps described for the discrete case in Section 2.2. Once the scenarios are generated, the three allocation models will be run for each scenario, utilizing the same methods as proposed in the previous sections for the discrete case. The methods for making recommendations to the decision maker, in order for the inefficient units to become efficient, are also the same.

2.7.3 Other Continuous Distributions

This section proposes two types of possible continuous distributions, the Normal and Beta Distributions. Other continuous distributions may also be considered, following similar procedures as above, by looking at the possible maximum, minimum, mean, mode, and standard deviation values for the respective distribution. The probability density function is then divided

into appropriate sections of equal width, taking the midpoint as the possible value, and the area of the section as the probability of occurrence of that value. From there, the possible scenarios are generated according to the same method as for the discrete distribution. The Allocation Models presented will also be used similarly to optimize their respective efficiencies. The process for making recommendations to inefficient units also follows the same methods as in the discrete case.

Chapter 3

Numerical Example

3.1 Introduction

This chapter presents a numerical example of how to apply the models described in Chapter Two. In this example, the organization contains three decision making units (DMUs), each with two inputs and one output. The inputs and output each have two possible values with an associated probability of occurrence. The models are set up and the efficiency value for each DMU is computed for each possible scenario. After analyzing the efficiencies, recommendations are made to the decision maker on how to improve the efficiency of the inefficient DMUs.

3.2 Model Setup

The data for the possible input and output values and their associated probabilities that will be used in this example is in Table 3-1, where “Prob” stands for the probability of the value occurring.

Table 3-1: Data for Numerical Example

DMU	Input 1			Input 2			Output		
	Value	Prob	Cost	Value	Prob	Cost	Value	Prob	Price
DMU A	50	0.5	5	15	0.9	70	90	0.75	100
	75	0.5	5	25	0.1	70	100	0.25	100
DMU B	10	0.2	10	50	0.75	60	70	0.8	150
	20	0.8	10	60	0.25	60	80	0.2	150
DMU C	40	0.65	15	70	0.3	50	120	0.4	200
	60	0.35	15	80	0.7	50	150	0.6	200

The variables and notation specific to this example are:

1. Number of DMUs: $k = 3$
2. Number of inputs: $m = 2$
3. Number of outputs: $n = 1$
4. Number of possible values of input i for DMU j : $a_{i,j} = 2, i = 1, \dots, 2; j = 1, \dots, 3$
5. Number of possible values of output r for DMU j : $b_{r,j} = 2, r = 1; j = 1, \dots, 3$

Equations 3.1 and 3.2 show the calculations of the number of scenarios per DMU and the total number of scenarios for this example, using Equations 3.1 and 3.2, respectively.

$$\begin{aligned}
 & \textit{Total Scenarios per DMU} & (3.1) \\
 & = a_{1,1} * a_{2,1} * a_{1,2} * a_{2,2} * a_{1,3} * a_{2,3} * b_{1,1} * b_{1,2} * b_{1,3} \\
 & = 2 * 2 * \dots * 2 = 2^9 = 512
 \end{aligned}$$

$$\begin{aligned}
 S & = \textit{Total Scenarios per DMU} * 3 & (3.2) \\
 & = 512 * 3 = 1,536
 \end{aligned}$$

Once each of the scenarios is obtained from the possible combinations of input and output values for each DMU, the probability of each scenario is also computed, shown in Equation 3.3. An example showing how to compute the probability for Scenario 1 is demonstrated in Equation 3.4.

$$\begin{aligned}
 & \textit{Probability of a Scenario} & (3.3) \\
 & = p_{1,1,s} * p_{1,2,s} * p_{1,3,s} * p_{2,1,s} * p_{2,2,s} * p_{2,3,s} * q_{1,1,s} * q_{1,2,s} * q_{1,3,s}
 \end{aligned}$$

$$\textit{Probability of Scenario 1} \quad (3.4)$$

$$= 0.50 * 0.20 * 0.65 * 0.90 * 0.75 * 0.30 * 0.75 * 0.80 * 0.40 = 0.003159$$

Each of these 1,536 scenarios will be optimized for each of the Cost, Revenue, and Profit Allocation Models, totaling 4,608 models. Specific to this numerical example, the list of all 512 scenarios, their associated input and outputs values selected for each DMU, and the probability of occurrence of the scenarios are listed in Appendix A.

In order to evaluate all 1,536 scenarios, a developed Visual Basic program is used, which optimizes each of the Cost, Revenue, and Profit Allocation Models for each DMU for each of the scenarios using the Excel Solver function.

3.3 Cost Allocation Model

The formulation of the Cost Allocation Model for this numerical example is outlined below. There is the objective function, three constraints, and five decision variables. The objective function is shown in Equation 3.5 with an example for DMU A for Scenario 1 in Equation 3.6, where DMU_0 is DMU A.

$$\textit{Minimize } Z_{0,s} = \sum_{i=1}^2 c_{i,0} * x_i^* \quad (3.5)$$

$$\textit{Minimize } Z_{0,1} = 5 * x_1^* + 70 * x_2^* \quad (3.6)$$

Equations 3.7 through 3.10 show the constraints equations relative to this numerical problem, including a constraint for each input and output, as well as the non-negativity constraint.

For input variable 1, (3.7)

$$\sum_{j=1}^3 \lambda_j * x_{1,j,1} \leq x_1^*$$

For input variable 2, (3.8)

$$\sum_{j=1}^3 \lambda_j * x_{2,j,1} \leq x_2^*$$

For output variable, (3.9)

$$\sum_{j=1}^3 \lambda_j * y_{1,j,s} \geq y_{1,0}$$

Non – negativity Constraint: (3.10)

$$\lambda_j, x_i^* \geq 0 \text{ for } j = 1, 2, 3 \text{ and } i = 1, 2$$

Equations 3.11 through 3.14 continue the example of DMU A for Scenario 1, demonstrating its specific constraints, with the coefficients obtained from Table 3-1.

For input variable 1, (3.11)

$$50 * \lambda_1 + 10 * \lambda_2 + 40 * \lambda_3 \leq x_1^*$$

For input variable 2, (3.12)

$$15 * \lambda_1 + 50 * \lambda_2 + 70 * \lambda_3 \leq x_2^*$$

For output variable, (3.13)

$$90 * \lambda_1 + 70 * \lambda_2 + 120 * \lambda_3 \geq 90$$

Non – negativity Constraint: (3.14)

$$\lambda_1, \lambda_2, \lambda_3, x_1^*, x_2^* \geq 0$$

The model is completely set up in Excel in order to implement the Excel Solver function. Once the Cost Allocation Model is optimized, the resulting output is the optimal target cost. Therefore, Equation 3.15 shows how to calculate the cost efficiency based on the current cost and the optimal target cost. Equation 3.16 shows an example specifically for DMU A for Scenario 1.

$$\text{Cost Efficiency} = \frac{\text{Target Cost}}{\text{Current Cost}} = \frac{c_{1,0} * x_1^* + c_{2,0} * x_2^*}{c_{1,0} * x_{1,0,1} + c_{2,0} * x_{2,0,1}} \quad (3.15)$$

$$\text{Cost Efficiency} = \frac{\text{Target Cost}}{\text{Current Cost}} = \frac{5 * 50 + 70 * 15}{5 * 50 + 70 * 15} = 1 \quad (3.16)$$

Therefore, for Scenario 1, DMU A is 100% cost efficient. Each of the 1,536 scenarios is optimized, and the complete resulting output tables for each DMU are shown in Appendix B.

3.4 Revenue Allocation Model

The formulation of the Revenue Allocation Model for this numerical example is outlined below. There is the objective function, three constraints, and four decision variables. The objective function is shown in Equation 3.17 with an example for DMU A for Scenario 1 in Equation 3.18, where DMU_0 is DMU A.

$$\text{Maximize } Z_{0,s} = \sum_{r=1}^1 g_{r,0} * y_r^* \quad (3.17)$$

$$\text{Maximize } Z_{0,1} = 100 * y_1^* \quad (3.18)$$

Equations 3.19 through 3.22 show the constraints equations relative to this numerical problem for the revenue model, including a constraint for each input and output, as well as the non-negativity constraint.

$$\text{For input variable 1,} \quad (3.19)$$

$$\sum_{j=1}^3 \lambda_j * x_{1,j,1} \leq x_{1,0,1}$$

$$\text{For input variable 2,} \quad (3.20)$$

$$\sum_{j=1}^3 \lambda_j * x_{2,j,1} \leq x_{2,0,1}$$

For output variable, (3.21)

$$\sum_{j=1}^3 \lambda_j * y_{1,j,s} \geq y_1^*$$

Non – negativity Constraint: (3.22)

$$\lambda_j, y_1^* \geq 0 \text{ for } j = 1, 2, 3$$

Equations 3.23 through 3.26 continue the example of DMU A for Scenario 1, demonstrating its specific constraints for the revenue model, obtaining the coefficients from Table 3-1.

For input variable 1, (3.23)

$$50 * \lambda_1 + 10 * \lambda_2 + 40 * \lambda_3 \leq 50$$

For input variable 2, (3.24)

$$15 * \lambda_1 + 50 * \lambda_2 + 70 * \lambda_3 \leq 15$$

For output variable, (3.25)

$$90 * \lambda_1 + 70 * \lambda_2 + 120 * \lambda_3 \geq y_1^*$$

Non – negativity Constraint: (3.26)

$$\lambda_1, \lambda_2, \lambda_3, y_1^* \geq 0$$

The model is completely set up in Excel in order to implement the Excel Solver function. Once the Revenue Allocation Model is optimized, the resulting output is the optimal target revenue. Therefore, Equation 3.27 shows how to calculate the revenue efficiency based on the current revenue and the optimal target revenue. Equation 3.28 shows an example specifically for DMU A for Scenario 1.

$$\text{Revenue Efficiency} = \frac{\text{Current Revenue}}{\text{Target Revenue}} = \frac{g_{1,0} * y_{1,0,1}}{g_{1,0} * y_1^*} \quad (3.27)$$

$$\text{Revenue Efficiency} = \frac{\text{Current Revenue}}{\text{Target Revenue}} = \frac{100 * 90}{100 * 90} = 1 \quad (3.28)$$

Therefore, for Scenario 1, DMU A is 100% revenue efficient. Each of the 512 scenarios is optimized for each DMU, and the complete resulting output tables are shown in Appendix C.

3.5 Profit Allocation Model

The formulation of the Profit Allocation Model for this numerical example is outlined below. There is the objective function, six constraints, and six decision variables. The objective function is shown in Equation 3.29 with an example for DMU A for Scenario 1 in Equation 3.30, where DMU_0 is DMU A.

$$\text{Maximize } Z_{0,s} = \sum_{r=1}^1 g_{r,0} * y_r^* - \sum_{i=1}^2 c_{i,0} * x_i^* \quad (3.29)$$

$$\text{Maximize } Z_{0,1} = 100 * y_1^* - 5 * x_1^* - 70 * x_2^* \quad (3.30)$$

Equations 3.31 through 3.37 show the constraints equations relative to this numerical problem for the profit model, including two constraints for each input and output, as well as the non-negativity constraint.

For input variable 1

$$\sum_{j=1}^3 \lambda_j * x_{1,j,s} = x_1^* \quad (3.31)$$

$$\sum_{j=1}^3 \lambda_j * x_{1,j,s} \leq x_{1,0,s} \quad (3.32)$$

For input variable 2

$$\sum_{j=1}^3 \lambda_j * x_{2,j,s} = x_2^* \quad (3.33)$$

$$\sum_{j=1}^3 \lambda_j * x_{2,j,s} \leq x_{2,0,s} \quad (3.34)$$

For the output variable

$$\sum_{j=1}^3 \lambda_j * y_{1,j,s} = y_1^* \quad (3.35)$$

$$\sum_{j=1}^3 \lambda_j * y_{1,j,s} \geq y_{1,0} \quad (3.36)$$

Non – negativity Constraint: (3.37)

$$\lambda_j, x_i^*, y_1^* \geq 0 \text{ for } j = 1, \dots, 3; i = 1, \dots, 2$$

Equations 3.38 through 3.44 continue the example of DMU A for Scenario 1, demonstrating its specific constraints for the profit model, obtaining the coefficients from Table 3-1.

For input variable 1,

$$50 * \lambda_1 + 10 * \lambda_2 + 40 * \lambda_3 = x_1^* \quad (3.38)$$

$$50 * \lambda_1 + 10 * \lambda_2 + 40 * \lambda_3 \leq 50 \quad (3.39)$$

For input variable 2,

$$15 * \lambda_1 + 50 * \lambda_2 + 70 * \lambda_3 = x_2^* \quad (3.40)$$

$$15 * \lambda_1 + 50 * \lambda_2 + 70 * \lambda_3 \leq 15 \quad (3.41)$$

For the output variable,

$$90 * \lambda_1 + 70 * \lambda_2 + 120 * \lambda_3 = y_1^* \quad (3.42)$$

$$90 * \lambda_1 + 70 * \lambda_2 + 120 * \lambda_3 \geq 90 \quad (3.43)$$

Non – negativity Constraint: (3.44)

$$\lambda_1, \lambda_2, \lambda_3, y_1^*, x_1^*, x_2^* \geq 0$$

The model is completely set up in Excel in order to implement the Excel Solver function. Once the Profit Allocation Model is optimized, the resulting output is the optimal target profit for

that DMU. Therefore, Equation 3.45 shows how to calculate the profit efficiency based on the current profit and the optimal target profit. Equation 3.46 shows an example specifically for DMU A for Scenario 1.

$$\text{Profit Efficiency} = \frac{\text{Current Profit}}{\text{Target Profit}} = \frac{g_{1,0} * y_{1,0,1} - c_{1,0} * x_{1,0,1} - c_{2,0} * x_{2,0,1}}{g_{1,0} * y_1^* - c_{1,0} * x_1^* - c_{2,0} * x_2^*} \quad (3.45)$$

$$\text{Profit Efficiency} = \frac{\text{Current Profit}}{\text{Target Profit}} = \frac{100 * 90 - 5 * 50 - 70 * 15}{100 * 90 - 5 * 50 - 70 * 15} = 1 \quad (3.46)$$

Therefore, for Scenario 1, DMU A is 100% profit efficient. Each of the 512 scenarios is optimized for each DMU, and the complete resulting output tables are shown in Appendix D.

3.6 Results

Now that all 512 scenarios have been optimized for each DMU for each of the Cost, Revenue, and Profit Allocation Models, the results are summarized based on different ways for computing their efficiencies. This is important in order to be able to make recommendations for those units which are deemed “inefficient”. The inefficiency benchmark, however, is based on the decision maker.

The first method looks at the total amount of time that a DMU is efficient out of the 512 scenarios. The percentage is calculated by looking at the scenarios for which the DMU is efficient, and summing up the respective probabilities of those scenarios. These percentages are computed for each DMU for each of the three allocation models, and are summarized below in Table 3-2.

Table 3-2: Percentage of Time DMU is Efficient

DMU	Cost Eff	Revenue Eff	Profit Eff
DMU A	100%	100%	100%
DMU B	0%	75%	75%
DMU C	0%	62%	62%

From Table 3-2, it is seen that DMU A is efficient 100% of the time for each of the three allocation models. DMU A is also the only DMU that is ever efficient under the Cost Allocation Model. For the Revenue and Profit Allocation Models, DMUs B and C are occasionally efficient, at 75% and 62% of the time respectively. The scenarios for which they are efficient can be seen in Appendices A, B, and C for the Cost, Revenue, and Profit models respectively.

Another method for computing the efficiency values is to look at the expected efficiency of each of the DMUs. This is done by taking the expected value of the efficiency with respect to the probability of the scenarios. These results are computed for each DMU for each of the three models, and are summarized in Table 3-3.

Table 3-3: Expected Efficiency Value

DMU	Cost Eff	Revenue Eff	Profit Eff
DMU A	100%	100%	100%
DMU B	37%	98%	95%
DMU C	57%	95%	95%

From this table, it is concluded that DMU A is expected to be 100% efficiency for each of the models. For DMUs B and C, their expected efficiencies for the Cost Model are very low, while they are higher for the Revenue and Profit Models.

The next method of calculating the efficiency values is to look at how the DMUs perform under the worst case scenario. This scenario considers the worst values of each DMU with respect to the highest input values and the lowest output values. This way, it can be seen how the

DMUs each perform under the worst case scenario. For this example, the worst case scenario is scenario number 505, for which details can be seen in Appendix A. The efficiency scores for each of the DMUs for each of the three Allocation Models are recorded for scenario 505, and are summarized in Table 3-4.

Table 3-4: Worst Case Scenario: S505

DMU	Cost Eff	Revenue Eff	Profit Eff
DMU A	100%	100%	100%
DMU B	46%	100%	100%
DMU C	65%	97%	96%

From optimizing the worst case scenario, it is seen that DMU A is again 100% efficient for each of the models. DMU B is also 100% efficient for the Revenue and Profit Models. DMU C is not efficient for this scenario for any of the models, although it has a higher efficiency value for the Revenue and Profit Models than the Cost Model.

On the flip side, another method to look at is the best case scenario, to see how the DMUs perform relative to one another when they are all performing at their best. This is represented by their lowest input values and highest output values. The best case scenario in this example is scenario number 8. The efficiency values for each DMU for each of the models is recorded, and shown in Table 3-5.

Table 3-5: Best Case Scenario: S8

DMU	Cost Eff	Revenue Eff	Profit Eff
DMU A	100%	100%	100%
DMU B	36%	100%	100%
DMU C	55%	97%	97%

It is seen, again, that DMU A is 100% efficient for each of the three models. DMU B is also 100% efficient for the Revenue and Profit Models. DMU C is not efficient for any of the models. This means that even under the best scenario, DMU C is still not performing efficiently, although its efficiency values for the Revenue and Profit Models are much higher than for the Cost Model.

The last method considered for computing the efficiency values is to look at the scenarios in which one DMU is at its best performance while all of the other DMUs are at their worst performance. The scenario in this example in which DMU A is performing at its best, while DMUs B and C are performing at their worst is scenario number 221. Similarly for DMUs B and C, the scenarios represented are numbers 363 and 434, respectively. The efficiency values for each of these scenarios for each of the three allocation models is recorded and summarized in Table 3-6.

Table 3-6: Best Case for Each DMU

DMU	Scenario	Cost Eff	Revenue Eff	Profit Eff
DMU A	S221	100%	100%	100%
DMU B	S363	65%	100%	100%
DMU C	S434	97%	100%	100%

Under this method, all three DMUs are 100% efficient for both the Revenue and Profit Models. However, for the Cost Model, only DMU A is 100% efficient. DMUs B and C are 65% and 97% efficient, respectively. This shows especially poor performance for DMU B in the cost model because even when it is performing at its best, and the other DMUs are performing at their worst, DMU B is only able to be 65% efficient. Therefore, it will definitely need to improve its performance in order to become cost efficient. Recommendations for how to do so are discussed in Section 3.7 below.

3.7 Recommendations

For this numerical example, it is assumed that the decision maker would like to use Method 3 for the process of making recommendations for the inefficient units to become efficient under each of the three Allocation Models. In this method, the best case scenario (Scenario 8), and the worst case scenario (Scenario 505), will be examined to determine the efficient frontier. The best case scenario represents the ultimate cost, revenue, and profit levels that the DMUs would like to reach in order to become efficient. The worst case scenario represents the minimum level required in order for the DMUs to be efficient. Recommendations will be made for the inefficient units for each scenario for each model.

3.7.1 Best Case Scenario

From the results for Scenario 8, as seen in Table 3-5, it can be determined that for the Cost Model, the efficient frontier is DMU A, and for the Revenue and Profit Models, the efficient frontier is DMUs A and B. Therefore, recommendations will be made for DMUs B and C for the Cost Model, and DMU C for the Revenue and Profit Models, as detailed below.

DMU B is currently 36% efficient for the Cost Allocation Model. In order for DMU B to become efficient, it must decrease its total cost from \$3,100 to \$1,120 by increasing Input 1 from 10 to 40 units, and decreasing Input 2 from 50 to 20 units.

DMU C is currently 55% efficient for the Cost Allocation Model. In order for DMU C to become efficient, it must decrease its total cost from \$4,100 to \$2,250 by increasing Input 1 from 40 to 75 units, and decreasing Input 2 from 70 to 22.5 units.

DMU C is currently 97% efficient for the Revenue Allocation Model. However, recommendations will still be made because DMUs A and B are 100% efficient. Therefore, in

order for DMU C to become efficient, it must increase its total revenue from \$30,000 to \$30,808.51 by increasing its Output from 150 to 154.043 units.

DMU C is also currently 97% efficient for the Profit Allocation Model, however recommendations will still be made for this case as well. For DMU C to become efficient, it must increase its total profit from \$25,900 to \$26,709 by increasing Input 1 from 40 to 50 units, keeping Input 2 at 70 units, and increasing Output from 150 to 154.043 units.

If these recommendations are all followed, then DMUs A, B, and C will all be Cost, Revenue, and Profit Efficient for the best case scenario.

3.7.2 Worst Case Scenario

The results for the worst case scenario, Scenario 505, are outlined in Table 3-4. Similarly to the best case scenario, the efficient frontier for the Cost Model is DMU A, while the efficient frontier for the Revenue and Profit Models is DMUs A and B. Therefore, recommendations will be made for DMUs B and C to become efficient under the Cost Model, and for DMU C to become efficient under the Revenue and Profit Models.

DMU B is currently 46% cost-efficient. In order to become 100% efficient, DMU B must decrease its total cost from \$3,870 to \$1,750 by increasing Input 1 from 20 to 58.333 units and decreasing Input 2 from 60 to 19.444 units.

DMU C is currently 65% cost-efficient. In order to become 100% efficient, DMU C must decrease its total cost from \$4,900 to \$3166.67 by increasing Input 1 from 60 to 100 units and decreasing Input 2 from 80 to 33.33 units.

DMU C is also currently 97% revenue-efficient. However, recommendations will still be made for DMU C to become efficient, because DMUs A and B are both currently 100% efficient.

Therefore, DMU C should increase its total revenue from \$24,000 to \$24,750 by increasing its Output from 120 to 123.75 units.

DMU C is currently 96% profit-efficient. In order to become efficient, DMU C should increase its total profit from \$19,100 to \$19,850 by keeping Input 1 at 60 units, keeping Input 2 at 80 units, and increasing its Output from 120 to 123.75 units.

If these recommendations are all followed, then DMUs A, B, and C will all be 100% Cost, Revenue, and Profit-efficient under the worst case scenario.

Chapter 4

Summary, Conclusions, and Future Research

4.1 Summary and Conclusions

Managing and evaluating the efficiency of an organization is an important goal for its managers. Data Envelopment Analysis (DEA) is a useful technique for evaluating the efficient utilization of resources of a decision making unit (DMU) relative to the other DMUs within the organization. Advantages of DEA include being able to handle multiple inputs and outputs as well as inputs and outputs with different units and magnitudes. The DEA Allocation Models also look at multiple inputs and outputs, but where the units are all in dollars, to specifically evaluate a DMU's cost, revenue, and profit efficiencies. Traditionally, however, DEA is only evaluating past performance, where deterministic results are available. Future performance is also important to understand and evaluate, especially when a manager needs to allocate their resources appropriately to the units of their organization. However, future results are unknown at the present.

Three Allocative Data Envelopment Analysis Models were developed to incorporate the uncertainty of future performance. Focusing on discrete probability distributions, the values that each input and output could possibly be in the future are determined as well as their associated probability of occurrence. These values and probabilities will be obtained from either historical performance levels or from the expert knowledge of the managers and decision makers. For each DMU, the unit costs of each input and the unit prices of each output are also determined.

From these sets of values, all possible scenarios are generated from the combinations of possible input and output values for each DMU. The associated probability of occurrence for

each of these scenarios is also computed, based on the probabilities of each of the input and output values selected for use in that scenario. The three Allocative DEA Models developed are the Cost Model, Revenue Model, and Profit Model. Each DMU is evaluated for each of the possible scenarios for each of these three models, obtaining a possible efficiency value for each one.

The objective of the Cost Allocation Model is to minimize total cost of the DMU being analyzed, resulting in an optimal target cost. The cost efficiency value must then be obtained by dividing the optimal target cost received from the model output by the current cost, which is computed from the unit costs of the inputs and the input values. Similarly, the objective of the Revenue Allocation Model is to maximize total revenue for the DMU being analyzed, resulting in an optimal target revenue value. The revenue efficiency is then computed by dividing the current revenue by the optimal target revenue obtained from the model. The objective of the Profit Allocation Model is to maximize total profit for the DMU being analyzed. This model results in an optimal target profit, from which the profit efficiency is calculated by dividing the current profit by the optimal target profit. These efficiency values will be between zero and one, where a DMU is considered efficient if its efficiency value is equal to one and inefficient otherwise.

Once the efficiency values are obtained for each DMU for each scenario for each of the three models, four methods are proposed in order to make recommendations in order for the inefficient units to become efficient. The first method considers the percentage of time that each DMU is efficient, calculated by summing the probabilities of the scenarios for which the DMU is efficient. The second method takes into account the expected efficiency value of each DMU. The third evaluates the efficiency values of each DMU under the best case and worst case scenarios, while the fourth method evaluates the efficiency value for the scenario that is best for one DMU and worst for all of the others. Recommendations for the cost inefficient DMUs are to increase the inputs with the lower unit costs and decrease the inputs with the higher unit costs.

For the revenue inefficient DMUs, recommendations are to increase the output values. The recommendations for the profit inefficient DMUs are a combination of the recommendations for the cost and revenue models.

It is therefore important to be able to understand the possibilities of future results. Especially for managers of health care systems, they are able to better allocate their resources and budget amongst the units of their organization based on the prediction of future performance and the recommendations for inefficient units to become efficient.

4.2 Areas of Future Research

There are many areas in which future research can be applied to Allocative Data Envelopment Analysis with uncertainty. While one method for handling continuous distributions is proposed with respect to the Normal and Beta Distributions, further methods may be developed to better apply continuous distributions to the input and output values, especially to obtain their associated probabilities. Because each distribution has different properties, there may or may not be one method in which to handle all continuous distributions.

The models presented in this thesis assume that profit is non-negative, proposing a profit ratio method in consideration of negative values. Therefore, developing a model that is better able to optimize profit efficiency with negative values will be very valuable, especially because negative profit and debt are present in many applications.

This thesis also proposes four methods in which to make recommendations for the inefficient DMUs to become efficient. Because the method chosen is based on the preference of the decision maker, as well as their unique situation, further research may be done on other methods to better fit multiple types of applications and situations.

Future research could apply these models to data from a broader cross section of health care organizations. This would help to understand the nuances of different organizations along with enhancing the capabilities of the models to handle the nuances. All three of the Allocative DEA Models may also be applied to other industries in addition to the health care industry. The properties and advantages of the models presented in this thesis could assist other industries to better analyze their cost, revenue, and profit efficiencies to strengthen future performances.

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Appendix A

Table of Scenarios with Probabilities for Numerical Example

Table A-1: Table of Scenarios

Scenario	Input 1A	Input 1B	Input 1C	Input 2A	Input 2B	Input 2C	Output A	Output B	Output C	Prob
S1	50	10	40	15	50	70	90	70	120	0.00316
S2	50	10	40	15	50	70	90	70	150	0.00474
S3	50	10	40	15	50	70	90	80	120	0.00079
S4	50	10	40	15	50	70	90	80	150	0.00118
S5	50	10	40	15	50	70	100	70	120	0.00105
S6	50	10	40	15	50	70	100	70	150	0.00158
S7	50	10	40	15	50	70	100	80	120	0.00026
S8	50	10	40	15	50	70	100	80	150	0.00039
S9	50	10	40	15	50	80	90	70	120	0.00737
S10	50	10	40	15	50	80	90	70	150	0.01106
S11	50	10	40	15	50	80	90	80	120	0.00184
S12	50	10	40	15	50	80	90	80	150	0.00276
S13	50	10	40	15	50	80	100	70	120	0.00246
S14	50	10	40	15	50	80	100	70	150	0.00369
S15	50	10	40	15	50	80	100	80	120	0.00061
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S268	75	10	40	15	50	80	90	80	150	0.00276
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S281	75	10	40	15	60	80	90	70	120	0.00246
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S313	75	10	40	25	60	80	90	70	120	0.00027
S314	75	10	40	25	60	80	90	70	150	0.00041
S315	75	10	40	25	60	80	90	80	120	0.00007
S316	75	10	40	25	60	80	90	80	150	0.00010
S317	75	10	40	25	60	80	100	70	120	0.00009
S318	75	10	40	25	60	80	100	70	150	0.00014
S319	75	10	40	25	60	80	100	80	120	0.00002
S320	75	10	40	25	60	80	100	80	150	0.00003
S321	75	10	60	15	50	70	90	70	120	0.00170
S322	75	10	60	15	50	70	90	70	150	0.00255
S323	75	10	60	15	50	70	90	80	120	0.00043
S324	75	10	60	15	50	70	90	80	150	0.00064
S325	75	10	60	15	50	70	100	70	120	0.00057
S326	75	10	60	15	50	70	100	70	150	0.00085
S327	75	10	60	15	50	70	100	80	120	0.00014
S328	75	10	60	15	50	70	100	80	150	0.00021
S329	75	10	60	15	50	80	90	70	120	0.00397
S330	75	10	60	15	50	80	90	70	150	0.00595
S331	75	10	60	15	50	80	90	80	120	0.00099
S332	75	10	60	15	50	80	90	80	150	0.00149
S333	75	10	60	15	50	80	100	70	120	0.00132
S334	75	10	60	15	50	80	100	70	150	0.00198
S335	75	10	60	15	50	80	100	80	120	0.00033
S336	75	10	60	15	50	80	100	80	150	0.00050
S337	75	10	60	15	60	70	90	70	120	0.00057
S338	75	10	60	15	60	70	90	70	150	0.00085
S339	75	10	60	15	60	70	90	80	120	0.00014
S340	75	10	60	15	60	70	90	80	150	0.00021
S341	75	10	60	15	60	70	100	70	120	0.00019
S342	75	10	60	15	60	70	100	70	150	0.00028
S343	75	10	60	15	60	70	100	80	120	0.00005
S344	75	10	60	15	60	70	100	80	150	0.00007
S345	75	10	60	15	60	80	90	70	120	0.00132
S346	75	10	60	15	60	80	90	70	150	0.00198
S347	75	10	60	15	60	80	90	80	120	0.00033
S348	75	10	60	15	60	80	90	80	150	0.00050
S349	75	10	60	15	60	80	100	70	120	0.00044

S350	75	10	60	15	60	80	100	70	150	0.00066
S351	75	10	60	15	60	80	100	80	120	0.00011
S352	75	10	60	15	60	80	100	80	150	0.00017
S353	75	10	60	25	50	70	90	70	120	0.00019
S354	75	10	60	25	50	70	90	70	150	0.00028
S355	75	10	60	25	50	70	90	80	120	0.00005
S356	75	10	60	25	50	70	90	80	150	0.00007
S357	75	10	60	25	50	70	100	70	120	0.00006
S358	75	10	60	25	50	70	100	70	150	0.00009
S359	75	10	60	25	50	70	100	80	120	0.00002
S360	75	10	60	25	50	70	100	80	150	0.00002
S361	75	10	60	25	50	80	90	70	120	0.00044
S362	75	10	60	25	50	80	90	70	150	0.00066
S363	75	10	60	25	50	80	90	80	120	0.00011
S364	75	10	60	25	50	80	90	80	150	0.00017
S365	75	10	60	25	50	80	100	70	120	0.00015
S366	75	10	60	25	50	80	100	70	150	0.00022
S367	75	10	60	25	50	80	100	80	120	0.00004
S368	75	10	60	25	50	80	100	80	150	0.00006
S369	75	10	60	25	60	70	90	70	120	0.00006
S370	75	10	60	25	60	70	90	70	150	0.00009
S371	75	10	60	25	60	70	90	80	120	0.00002
S372	75	10	60	25	60	70	90	80	150	0.00002
S373	75	10	60	25	60	70	100	70	120	0.00002
S374	75	10	60	25	60	70	100	70	150	0.00003
S375	75	10	60	25	60	70	100	80	120	0.00001
S376	75	10	60	25	60	70	100	80	150	0.00001
S377	75	10	60	25	60	80	90	70	120	0.00015
S378	75	10	60	25	60	80	90	70	150	0.00022
S379	75	10	60	25	60	80	90	80	120	0.00004
S380	75	10	60	25	60	80	90	80	150	0.00006
S381	75	10	60	25	60	80	100	70	120	0.00005
S382	75	10	60	25	60	80	100	70	150	0.00007
S383	75	10	60	25	60	80	100	80	120	0.00001
S384	75	10	60	25	60	80	100	80	150	0.00002
S385	75	20	40	15	50	70	90	70	120	0.01264
S386	75	20	40	15	50	70	90	70	150	0.01895
S387	75	20	40	15	50	70	90	80	120	0.00316
S388	75	20	40	15	50	70	90	80	150	0.00474
S389	75	20	40	15	50	70	100	70	120	0.00421

S390	75	20	40	15	50	70	100	70	150	0.00632
S391	75	20	40	15	50	70	100	80	120	0.00105
S392	75	20	40	15	50	70	100	80	150	0.00158
S393	75	20	40	15	50	80	90	70	120	0.02948
S394	75	20	40	15	50	80	90	70	150	0.04423
S395	75	20	40	15	50	80	90	80	120	0.00737
S396	75	20	40	15	50	80	90	80	150	0.01106
S397	75	20	40	15	50	80	100	70	120	0.00983
S398	75	20	40	15	50	80	100	70	150	0.01474
S399	75	20	40	15	50	80	100	80	120	0.00246
S400	75	20	40	15	50	80	100	80	150	0.00369
S401	75	20	40	15	60	70	90	70	120	0.00421
S402	75	20	40	15	60	70	90	70	150	0.00632
S403	75	20	40	15	60	70	90	80	120	0.00105
S404	75	20	40	15	60	70	90	80	150	0.00158
S405	75	20	40	15	60	70	100	70	120	0.00140
S406	75	20	40	15	60	70	100	70	150	0.00211
S407	75	20	40	15	60	70	100	80	120	0.00035
S408	75	20	40	15	60	70	100	80	150	0.00053
S409	75	20	40	15	60	80	90	70	120	0.00983
S410	75	20	40	15	60	80	90	70	150	0.01474
S411	75	20	40	15	60	80	90	80	120	0.00246
S412	75	20	40	15	60	80	90	80	150	0.00369
S413	75	20	40	15	60	80	100	70	120	0.00328
S414	75	20	40	15	60	80	100	70	150	0.00491
S415	75	20	40	15	60	80	100	80	120	0.00082
S416	75	20	40	15	60	80	100	80	150	0.00123
S417	75	20	40	25	50	70	90	70	120	0.00140
S418	75	20	40	25	50	70	90	70	150	0.00211
S419	75	20	40	25	50	70	90	80	120	0.00035
S420	75	20	40	25	50	70	90	80	150	0.00053
S421	75	20	40	25	50	70	100	70	120	0.00047
S422	75	20	40	25	50	70	100	70	150	0.00070
S423	75	20	40	25	50	70	100	80	120	0.00012
S424	75	20	40	25	50	70	100	80	150	0.00018
S425	75	20	40	25	50	80	90	70	120	0.00328
S426	75	20	40	25	50	80	90	70	150	0.00491
S427	75	20	40	25	50	80	90	80	120	0.00082
S428	75	20	40	25	50	80	90	80	150	0.00123
S429	75	20	40	25	50	80	100	70	120	0.00109

S430	75	20	40	25	50	80	100	70	150	0.00164
S431	75	20	40	25	50	80	100	80	120	0.00027
S432	75	20	40	25	50	80	100	80	150	0.00041
S433	75	20	40	25	60	70	90	70	120	0.00047
S434	75	20	40	25	60	70	90	70	150	0.00070
S435	75	20	40	25	60	70	90	80	120	0.00012
S436	75	20	40	25	60	70	90	80	150	0.00018
S437	75	20	40	25	60	70	100	70	120	0.00016
S438	75	20	40	25	60	70	100	70	150	0.00023
S439	75	20	40	25	60	70	100	80	120	0.00004
S440	75	20	40	25	60	70	100	80	150	0.00006
S441	75	20	40	25	60	80	90	70	120	0.00109
S442	75	20	40	25	60	80	90	70	150	0.00164
S443	75	20	40	25	60	80	90	80	120	0.00027
S444	75	20	40	25	60	80	90	80	150	0.00041
S445	75	20	40	25	60	80	100	70	120	0.00036
S446	75	20	40	25	60	80	100	70	150	0.00055
S447	75	20	40	25	60	80	100	80	120	0.00009
S448	75	20	40	25	60	80	100	80	150	0.00014
S449	75	20	60	15	50	70	90	70	120	0.00680
S450	75	20	60	15	50	70	90	70	150	0.01021
S451	75	20	60	15	50	70	90	80	120	0.00170
S452	75	20	60	15	50	70	90	80	150	0.00255
S453	75	20	60	15	50	70	100	70	120	0.00227
S454	75	20	60	15	50	70	100	70	150	0.00340
S455	75	20	60	15	50	70	100	80	120	0.00057
S456	75	20	60	15	50	70	100	80	150	0.00085
S457	75	20	60	15	50	80	90	70	120	0.01588
S458	75	20	60	15	50	80	90	70	150	0.02381
S459	75	20	60	15	50	80	90	80	120	0.00397
S460	75	20	60	15	50	80	90	80	150	0.00595
S461	75	20	60	15	50	80	100	70	120	0.00529
S462	75	20	60	15	50	80	100	70	150	0.00794
S463	75	20	60	15	50	80	100	80	120	0.00132
S464	75	20	60	15	50	80	100	80	150	0.00198
S465	75	20	60	15	60	70	90	70	120	0.00227
S466	75	20	60	15	60	70	90	70	150	0.00340
S467	75	20	60	15	60	70	90	80	120	0.00057
S468	75	20	60	15	60	70	90	80	150	0.00085
S469	75	20	60	15	60	70	100	70	120	0.00076

S470	75	20	60	15	60	70	100	70	150	0.00113
S471	75	20	60	15	60	70	100	80	120	0.00019
S472	75	20	60	15	60	70	100	80	150	0.00028
S473	75	20	60	15	60	80	90	70	120	0.00529
S474	75	20	60	15	60	80	90	70	150	0.00794
S475	75	20	60	15	60	80	90	80	120	0.00132
S476	75	20	60	15	60	80	90	80	150	0.00198
S477	75	20	60	15	60	80	100	70	120	0.00176
S478	75	20	60	15	60	80	100	70	150	0.00265
S479	75	20	60	15	60	80	100	80	120	0.00044
S480	75	20	60	15	60	80	100	80	150	0.00066
S481	75	20	60	25	50	70	90	70	120	0.00076
S482	75	20	60	25	50	70	90	70	150	0.00113
S483	75	20	60	25	50	70	90	80	120	0.00019
S484	75	20	60	25	50	70	90	80	150	0.00028
S485	75	20	60	25	50	70	100	70	120	0.00025
S486	75	20	60	25	50	70	100	70	150	0.00038
S487	75	20	60	25	50	70	100	80	120	0.00006
S488	75	20	60	25	50	70	100	80	150	0.00009
S489	75	20	60	25	50	80	90	70	120	0.00176
S490	75	20	60	25	50	80	90	70	150	0.00265
S491	75	20	60	25	50	80	90	80	120	0.00044
S492	75	20	60	25	50	80	90	80	150	0.00066
S493	75	20	60	25	50	80	100	70	120	0.00059
S494	75	20	60	25	50	80	100	70	150	0.00088
S495	75	20	60	25	50	80	100	80	120	0.00015
S496	75	20	60	25	50	80	100	80	150	0.00022
S497	75	20	60	25	60	70	90	70	120	0.00025
S498	75	20	60	25	60	70	90	70	150	0.00038
S499	75	20	60	25	60	70	90	80	120	0.00006
S500	75	20	60	25	60	70	90	80	150	0.00009
S501	75	20	60	25	60	70	100	70	120	0.00008
S502	75	20	60	25	60	70	100	70	150	0.00013
S503	75	20	60	25	60	70	100	80	120	0.00002
S504	75	20	60	25	60	70	100	80	150	0.00003
S505	75	20	60	25	60	80	90	70	120	0.00059
S506	75	20	60	25	60	80	90	70	150	0.00088
S507	75	20	60	25	60	80	90	80	120	0.00015
S508	75	20	60	25	60	80	90	80	150	0.00022
S509	75	20	60	25	60	80	100	70	120	0.00020

S510	75	20	60	25	60	80	100	70	150	0.00029
S511	75	20	60	25	60	80	100	80	120	0.00005
S512	75	20	60	25	60	80	100	80	150	0.00007

Appendix B

Cost Allocation Model Results for Numerical Example

Table B-1: Cost Model Output for DMU A

Scenario	DMUA						O.F.	Current	Eff
	x1*	x2*	lambdaA	lambdaB	lambdaC				
S1	50	15	1	0	0	1300	1300	1	
S2	50	15	1	0	0	1300	1300	1	
S3	50	15	1	0	0	1300	1300	1	
S4	50	15	1	0	0	1300	1300	1	
S5	50	15	1	0	0	1300	1300	1	
S6	50	15	1	0	0	1300	1300	1	
S7	50	15	1	0	0	1300	1300	1	
S8	50	15	1	0	0	1300	1300	1	
S9	50	15	1	0	0	1300	1300	1	
S10	50	15	1	0	0	1300	1300	1	
S11	50	15	1	0	0	1300	1300	1	
S12	50	15	1	0	0	1300	1300	1	
S13	50	15	1	0	0	1300	1300	1	
S14	50	15	1	0	0	1300	1300	1	
S15	50	15	1	0	0	1300	1300	1	
S16	50	15	1	0	0	1300	1300	1	
S17	50	15	1	0	0	1300	1300	1	
S18	50	15	1	0	0	1300	1300	1	
S19	50	15	1	0	0	1300	1300	1	
S20	50	15	1	0	0	1300	1300	1	
S21	50	15	1	0	0	1300	1300	1	
S22	50	15	1	0	0	1300	1300	1	
S23	50	15	1	0	0	1300	1300	1	
S24	50	15	1	0	0	1300	1300	1	
S25	50	15	1	0	0	1300	1300	1	
S26	50	15	1	0	0	1300	1300	1	
S27	50	15	1	0	0	1300	1300	1	
S28	50	15	1	0	0	1300	1300	1	
S29	50	15	1	0	0	1300	1300	1	
S30	50	15	1	0	0	1300	1300	1	

S31	50	15	1	0	0	1300	1300	1
S32	50	15	1	0	0	1300	1300	1
S33	50	25	1	0	0	2000	2000	1
S34	50	25	1	0	0	2000	2000	1
S35	50	25	1	0	0	2000	2000	1
S36	50	25	1	0	0	2000	2000	1
S37	50	25	1	0	0	2000	2000	1
S38	50	25	1	0	0	2000	2000	1
S39	50	25	1	0	0	2000	2000	1
S40	50	25	1	0	0	2000	2000	1
S41	50	25	1	0	0	2000	2000	1
S42	50	25	1	0	0	2000	2000	1
S43	50	25	1	0	0	2000	2000	1
S44	50	25	1	0	0	2000	2000	1
S45	50	25	1	0	0	2000	2000	1
S46	50	25	1	0	0	2000	2000	1
S47	50	25	1	0	0	2000	2000	1
S48	50	25	1	0	0	2000	2000	1
S49	50	25	1	0	0	2000	2000	1
S50	50	25	1	0	0	2000	2000	1
S51	50	25	1	0	0	2000	2000	1
S52	50	25	1	0	0	2000	2000	1
S53	50	25	1	0	0	2000	2000	1
S54	50	25	1	0	0	2000	2000	1
S55	50	25	1	0	0	2000	2000	1
S56	50	25	1	0	0	2000	2000	1
S57	50	25	1	0	0	2000	2000	1
S58	50	25	1	0	0	2000	2000	1
S59	50	25	1	0	0	2000	2000	1
S60	50	25	1	0	0	2000	2000	1
S61	50	25	1	0	0	2000	2000	1
S62	50	25	1	0	0	2000	2000	1
S63	50	25	1	0	0	2000	2000	1
S64	50	25	1	0	0	2000	2000	1
S65	50	15	1	0	0	1300	1300	1
S66	50	15	1	0	0	1300	1300	1
S67	50	15	1	0	0	1300	1300	1
S68	50	15	1	0	0	1300	1300	1
S69	50	15	1	0	0	1300	1300	1
S70	50	15	1	0	0	1300	1300	1
S71	50	15	1	0	0	1300	1300	1

S72	50	15	1	0	0	1300	1300	1
S73	50	15	1	0	0	1300	1300	1
S74	50	15	1	0	0	1300	1300	1
S75	50	15	1	0	0	1300	1300	1
S76	50	15	1	0	0	1300	1300	1
S77	50	15	1	0	0	1300	1300	1
S78	50	15	1	0	0	1300	1300	1
S79	50	15	1	0	0	1300	1300	1
S80	50	15	1	0	0	1300	1300	1
S81	50	15	1	0	0	1300	1300	1
S82	50	15	1	0	0	1300	1300	1
S83	50	15	1	0	0	1300	1300	1
S84	50	15	1	0	0	1300	1300	1
S85	50	15	1	0	0	1300	1300	1
S86	50	15	1	0	0	1300	1300	1
S87	50	15	1	0	0	1300	1300	1
S88	50	15	1	0	0	1300	1300	1
S89	50	15	1	0	0	1300	1300	1
S90	50	15	1	0	0	1300	1300	1
S91	50	15	1	0	0	1300	1300	1
S92	50	15	1	0	0	1300	1300	1
S93	50	15	1	0	0	1300	1300	1
S94	50	15	1	0	0	1300	1300	1
S95	50	15	1	0	0	1300	1300	1
S96	50	15	1	0	0	1300	1300	1
S97	50	25	1	0	0	2000	2000	1
S98	50	25	1	0	0	2000	2000	1
S99	50	25	1	0	0	2000	2000	1
S100	50	25	1	0	0	2000	2000	1
S101	50	25	1	0	0	2000	2000	1
S102	50	25	1	0	0	2000	2000	1
S103	50	25	1	0	0	2000	2000	1
S104	50	25	1	0	0	2000	2000	1
S105	50	25	1	0	0	2000	2000	1
S106	50	25	1	0	0	2000	2000	1
S107	50	25	1	0	0	2000	2000	1
S108	50	25	1	0	0	2000	2000	1
S109	50	25	1	0	0	2000	2000	1
S110	50	25	1	0	0	2000	2000	1
S111	50	25	1	0	0	2000	2000	1
S112	50	25	1	0	0	2000	2000	1

S113	50	25	1	0	0	2000	2000	1
S114	50	25	1	0	0	2000	2000	1
S115	50	25	1	0	0	2000	2000	1
S116	50	25	1	0	0	2000	2000	1
S117	50	25	1	0	0	2000	2000	1
S118	50	25	1	0	0	2000	2000	1
S119	50	25	1	0	0	2000	2000	1
S120	50	25	1	0	0	2000	2000	1
S121	50	25	1	0	0	2000	2000	1
S122	50	25	1	0	0	2000	2000	1
S123	50	25	1	0	0	2000	2000	1
S124	50	25	1	0	0	2000	2000	1
S125	50	25	1	0	0	2000	2000	1
S126	50	25	1	0	0	2000	2000	1
S127	50	25	1	0	0	2000	2000	1
S128	50	25	1	0	0	2000	2000	1
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S503	75	25	1	0	0	2125	2125	1
S504	75	25	1	0	0	2125	2125	1
S505	75	25	1	0	0	2125	2125	1
S506	75	25	1	0	0	2125	2125	1
S507	75	25	1	0	0	2125	2125	1
S508	75	25	1	0	0	2125	2125	1
S509	75	25	1	0	0	2125	2125	1
S510	75	25	1	0	0	2125	2125	1
S511	75	25	1	0	0	2125	2125	1
S512	75	25	1	0	0	2125	2125	1

Table B-2: Cost Model Output for DMU B

Scenario	DMUB					O.F.	Current	Eff
	x1*	x2*	lambdaA	lambdaB	lambdaC			
S1	38.889	11.667	0.778	0	0	1088.89	3100	0.3513
S2	38.889	11.667	0.778	0	0	1088.89	3100	0.3513
S3	44.444	13.333	0.889	0	0	1244.44	3100	0.4014
S4	44.444	13.333	0.889	0	0	1244.44	3100	0.4014
S5	35.000	10.500	0.700	0	0	980.00	3100	0.3161

S6	35.000	10.500	0.700	0	0	980.00	3100	0.3161
S7	40.000	12.000	0.800	0	0	1120.00	3100	0.3613
S8	40.000	12.000	0.800	0	0	1120.00	3100	0.3613
S9	38.889	11.667	0.778	0	0	1088.89	3100	0.3513
S10	38.889	11.667	0.778	0	0	1088.89	3100	0.3513
S11	44.444	13.333	0.889	0	0	1244.44	3100	0.4014
S12	44.444	13.333	0.889	0	0	1244.44	3100	0.4014
S13	35.000	10.500	0.700	0	0	980.00	3100	0.3161
S14	35.000	10.500	0.700	0	0	980.00	3100	0.3161
S15	40.000	12.000	0.800	0	0	1120.00	3100	0.3613
S16	40.000	12.000	0.800	0	0	1120.00	3100	0.3613
S17	38.889	11.667	0.778	0	0	1088.89	3700	0.2943
S18	38.889	11.667	0.778	0	0	1088.89	3700	0.2943
S19	44.444	13.333	0.889	0	0	1244.44	3700	0.3363
S20	44.444	13.333	0.889	0	0	1244.44	3700	0.3363
S21	35.000	10.500	0.700	0	0	980.00	3700	0.2649
S22	35.000	10.500	0.700	0	0	980.00	3700	0.2649
S23	40.000	12.000	0.800	0	0	1120.00	3700	0.3027
S24	40.000	12.000	0.800	0	0	1120.00	3700	0.3027
S25	38.889	11.667	0.778	0	0	1088.89	3700	0.2943
S26	38.889	11.667	0.778	0	0	1088.89	3700	0.2943
S27	44.444	13.333	0.889	0	0	1244.44	3700	0.3363
S28	44.444	13.333	0.889	0	0	1244.44	3700	0.3363
S29	35.000	10.500	0.700	0	0	980.00	3700	0.2649
S30	35.000	10.500	0.700	0	0	980.00	3700	0.2649
S31	40.000	12.000	0.800	0	0	1120.00	3700	0.3027
S32	40.000	12.000	0.800	0	0	1120.00	3700	0.3027
S33	38.889	19.444	0.778	0	0	1555.56	3100	0.5018
S34	38.889	19.444	0.778	0	0	1555.56	3100	0.5018
S35	44.444	22.222	0.889	0	0	1777.78	3100	0.5735
S36	44.444	22.222	0.889	0	0	1777.78	3100	0.5735
S37	35.000	17.500	0.700	0	0	1400.00	3100	0.4516
S38	35.000	17.500	0.700	0	0	1400.00	3100	0.4516
S39	40.000	20.000	0.800	0	0	1600.00	3100	0.5161
S40	40.000	20.000	0.800	0	0	1600.00	3100	0.5161
S41	38.889	19.444	0.778	0	0	1555.56	3100	0.5018
S42	38.889	19.444	0.778	0	0	1555.56	3100	0.5018
S43	44.444	22.222	0.889	0	0	1777.78	3100	0.5735
S44	44.444	22.222	0.889	0	0	1777.78	3100	0.5735
S45	35.000	17.500	0.700	0	0	1400.00	3100	0.4516
S46	35.000	17.500	0.700	0	0	1400.00	3100	0.4516

S47	40.000	20.000	0.800	0	0	1600.00	3100	0.5161
S48	40.000	20.000	0.800	0	0	1600.00	3100	0.5161
S49	38.889	19.444	0.778	0	0	1555.56	3700	0.4204
S50	38.889	19.444	0.778	0	0	1555.56	3700	0.4204
S51	44.444	22.222	0.889	0	0	1777.78	3700	0.4805
S52	44.444	22.222	0.889	0	0	1777.78	3700	0.4805
S53	35.000	17.500	0.700	0	0	1400.00	3700	0.3784
S54	35.000	17.500	0.700	0	0	1400.00	3700	0.3784
S55	40.000	20.000	0.800	0	0	1600.00	3700	0.4324
S56	40.000	20.000	0.800	0	0	1600.00	3700	0.4324
S57	38.889	19.444	0.778	0	0	1555.56	3700	0.4204
S58	38.889	19.444	0.778	0	0	1555.56	3700	0.4204
S59	44.444	22.222	0.889	0	0	1777.78	3700	0.4805
S60	44.444	22.222	0.889	0	0	1777.78	3700	0.4805
S61	35.000	17.500	0.700	0	0	1400.00	3700	0.3784
S62	35.000	17.500	0.700	0	0	1400.00	3700	0.3784
S63	40.000	20.000	0.800	0	0	1600.00	3700	0.4324
S64	40.000	20.000	0.800	0	0	1600.00	3700	0.4324
S65	38.889	11.667	0.778	0	0	1088.89	3100	0.3513
S66	38.889	11.667	0.778	0	0	1088.89	3100	0.3513
S67	44.444	13.333	0.889	0	0	1244.44	3100	0.4014
S68	44.444	13.333	0.889	0	0	1244.44	3100	0.4014
S69	35.000	10.500	0.700	0	0	980.00	3100	0.3161
S70	35.000	10.500	0.700	0	0	980.00	3100	0.3161
S71	40.000	12.000	0.800	0	0	1120.00	3100	0.3613
S72	40.000	12.000	0.800	0	0	1120.00	3100	0.3613
S73	38.889	11.667	0.778	0	0	1088.89	3100	0.3513
S74	38.889	11.667	0.778	0	0	1088.89	3100	0.3513
S75	44.444	13.333	0.889	0	0	1244.44	3100	0.4014
S76	44.444	13.333	0.889	0	0	1244.44	3100	0.4014
S77	35.000	10.500	0.700	0	0	980.00	3100	0.3161
S78	35.000	10.500	0.700	0	0	980.00	3100	0.3161
S79	40.000	12.000	0.800	0	0	1120.00	3100	0.3613
S80	40.000	12.000	0.800	0	0	1120.00	3100	0.3613
S81	38.889	11.667	0.778	0	0	1088.89	3700	0.2943
S82	38.889	11.667	0.778	0	0	1088.89	3700	0.2943
S83	44.444	13.333	0.889	0	0	1244.44	3700	0.3363
S84	44.444	13.333	0.889	0	0	1244.44	3700	0.3363
S85	35.000	10.500	0.700	0	0	980.00	3700	0.2649
S86	35.000	10.500	0.700	0	0	980.00	3700	0.2649
S87	40.000	12.000	0.800	0	0	1120.00	3700	0.3027

S88	40.000	12.000	0.800	0	0	1120.00	3700	0.3027
S89	38.889	11.667	0.778	0	0	1088.89	3700	0.2943
S90	38.889	11.667	0.778	0	0	1088.89	3700	0.2943
S91	44.444	13.333	0.889	0	0	1244.44	3700	0.3363
S92	44.444	13.333	0.889	0	0	1244.44	3700	0.3363
S93	35.000	10.500	0.700	0	0	980.00	3700	0.2649
S94	35.000	10.500	0.700	0	0	980.00	3700	0.2649
S95	40.000	12.000	0.800	0	0	1120.00	3700	0.3027
S96	40.000	12.000	0.800	0	0	1120.00	3700	0.3027
S97	38.889	19.444	0.778	0	0	1555.56	3100	0.5018
S98	38.889	19.444	0.778	0	0	1555.56	3100	0.5018
S99	44.444	22.222	0.889	0	0	1777.78	3100	0.5735
S100	44.444	22.222	0.889	0	0	1777.78	3100	0.5735
S101	35.000	17.500	0.700	0	0	1400.00	3100	0.4516
S102	35.000	17.500	0.700	0	0	1400.00	3100	0.4516
S103	40.000	20.000	0.800	0	0	1600.00	3100	0.5161
S104	40.000	20.000	0.800	0	0	1600.00	3100	0.5161
S105	38.889	19.444	0.778	0	0	1555.56	3100	0.5018
S106	38.889	19.444	0.778	0	0	1555.56	3100	0.5018
S107	44.444	22.222	0.889	0	0	1777.78	3100	0.5735
S108	44.444	22.222	0.889	0	0	1777.78	3100	0.5735
S109	35.000	17.500	0.700	0	0	1400.00	3100	0.4516
S110	35.000	17.500	0.700	0	0	1400.00	3100	0.4516
S111	40.000	20.000	0.800	0	0	1600.00	3100	0.5161
S112	40.000	20.000	0.800	0	0	1600.00	3100	0.5161
S113	38.889	19.444	0.778	0	0	1555.56	3700	0.4204
S114	38.889	19.444	0.778	0	0	1555.56	3700	0.4204
S115	44.444	22.222	0.889	0	0	1777.78	3700	0.4805
S116	44.444	22.222	0.889	0	0	1777.78	3700	0.4805
S117	35.000	17.500	0.700	0	0	1400.00	3700	0.3784
S118	35.000	17.500	0.700	0	0	1400.00	3700	0.3784
S119	40.000	20.000	0.800	0	0	1600.00	3700	0.4324
S120	40.000	20.000	0.800	0	0	1600.00	3700	0.4324
S121	38.889	19.444	0.778	0	0	1555.56	3700	0.4204
S122	38.889	19.444	0.778	0	0	1555.56	3700	0.4204
S123	44.444	22.222	0.889	0	0	1777.78	3700	0.4805
S124	44.444	22.222	0.889	0	0	1777.78	3700	0.4805
S125	35.000	17.500	0.700	0	0	1400.00	3700	0.3784
S126	35.000	17.500	0.700	0	0	1400.00	3700	0.3784
S127	40.000	20.000	0.800	0	0	1600.00	3700	0.4324
S128	40.000	20.000	0.800	0	0	1600.00	3700	0.4324

S129	38.889	11.667	0.778	0	0	1088.89	3200	0.3403
S130	38.889	11.667	0.778	0	0	1088.89	3200	0.3403
S131	44.444	13.333	0.889	0	0	1244.44	3200	0.3889
S132	44.444	13.333	0.889	0	0	1244.44	3200	0.3889
S133	35.000	10.500	0.700	0	0	980.00	3200	0.3063
S134	35.000	10.500	0.700	0	0	980.00	3200	0.3063
S135	40.000	12.000	0.800	0	0	1120.00	3200	0.3500
S136	40.000	12.000	0.800	0	0	1120.00	3200	0.3500
S137	38.889	11.667	0.778	0	0	1088.89	3200	0.3403
S138	38.889	11.667	0.778	0	0	1088.89	3200	0.3403
S139	44.444	13.333	0.889	0	0	1244.44	3200	0.3889
S140	44.444	13.333	0.889	0	0	1244.44	3200	0.3889
S141	35.000	10.500	0.700	0	0	980.00	3200	0.3063
S142	35.000	10.500	0.700	0	0	980.00	3200	0.3063
S143	40.000	12.000	0.800	0	0	1120.00	3200	0.3500
S144	40.000	12.000	0.800	0	0	1120.00	3200	0.3500
S145	38.889	11.667	0.778	0	0	1088.89	3800	0.2865
S146	38.889	11.667	0.778	0	0	1088.89	3800	0.2865
S147	44.444	13.333	0.889	0	0	1244.44	3800	0.3275
S148	44.444	13.333	0.889	0	0	1244.44	3800	0.3275
S149	35.000	10.500	0.700	0	0	980.00	3800	0.2579
S150	35.000	10.500	0.700	0	0	980.00	3800	0.2579
S151	40.000	12.000	0.800	0	0	1120.00	3800	0.2947
S152	40.000	12.000	0.800	0	0	1120.00	3800	0.2947
S153	38.889	11.667	0.778	0	0	1088.89	3800	0.2865
S154	38.889	11.667	0.778	0	0	1088.89	3800	0.2865
S155	44.444	13.333	0.889	0	0	1244.44	3800	0.3275
S156	44.444	13.333	0.889	0	0	1244.44	3800	0.3275
S157	35.000	10.500	0.700	0	0	980.00	3800	0.2579
S158	35.000	10.500	0.700	0	0	980.00	3800	0.2579
S159	40.000	12.000	0.800	0	0	1120.00	3800	0.2947
S160	40.000	12.000	0.800	0	0	1120.00	3800	0.2947
S161	38.889	19.444	0.778	0	0	1555.56	3200	0.4861
S162	38.889	19.444	0.778	0	0	1555.56	3200	0.4861
S163	44.444	22.222	0.889	0	0	1777.78	3200	0.5556
S164	44.444	22.222	0.889	0	0	1777.78	3200	0.5556
S165	35.000	17.500	0.700	0	0	1400.00	3200	0.4375
S166	35.000	17.500	0.700	0	0	1400.00	3200	0.4375
S167	40.000	20.000	0.800	0	0	1600.00	3200	0.5000
S168	40.000	20.000	0.800	0	0	1600.00	3200	0.5000
S169	38.889	19.444	0.778	0	0	1555.56	3200	0.4861

S170	38.889	19.444	0.778	0	0	1555.56	3200	0.4861
S171	44.444	22.222	0.889	0	0	1777.78	3200	0.5556
S172	44.444	22.222	0.889	0	0	1777.78	3200	0.5556
S173	35.000	17.500	0.700	0	0	1400.00	3200	0.4375
S174	35.000	17.500	0.700	0	0	1400.00	3200	0.4375
S175	40.000	20.000	0.800	0	0	1600.00	3200	0.5000
S176	40.000	20.000	0.800	0	0	1600.00	3200	0.5000
S177	38.889	19.444	0.778	0	0	1555.56	3800	0.4094
S178	38.889	19.444	0.778	0	0	1555.56	3800	0.4094
S179	44.444	22.222	0.889	0	0	1777.78	3800	0.4678
S180	44.444	22.222	0.889	0	0	1777.78	3800	0.4678
S181	35.000	17.500	0.700	0	0	1400.00	3800	0.3684
S182	35.000	17.500	0.700	0	0	1400.00	3800	0.3684
S183	40.000	20.000	0.800	0	0	1600.00	3800	0.4211
S184	40.000	20.000	0.800	0	0	1600.00	3800	0.4211
S185	38.889	19.444	0.778	0	0	1555.56	3800	0.4094
S186	38.889	19.444	0.778	0	0	1555.56	3800	0.4094
S187	44.444	22.222	0.889	0	0	1777.78	3800	0.4678
S188	44.444	22.222	0.889	0	0	1777.78	3800	0.4678
S189	35.000	17.500	0.700	0	0	1400.00	3800	0.3684
S190	35.000	17.500	0.700	0	0	1400.00	3800	0.3684
S191	40.000	20.000	0.800	0	0	1600.00	3800	0.4211
S192	40.000	20.000	0.800	0	0	1600.00	3800	0.4211
S193	38.889	11.667	0.778	0	0	1088.89	3200	0.3403
S194	38.889	11.667	0.778	0	0	1088.89	3200	0.3403
S195	44.444	13.333	0.889	0	0	1244.44	3200	0.3889
S196	44.444	13.333	0.889	0	0	1244.44	3200	0.3889
S197	35.000	10.500	0.700	0	0	980.00	3200	0.3063
S198	35.000	10.500	0.700	0	0	980.00	3200	0.3063
S199	40.000	12.000	0.800	0	0	1120.00	3200	0.3500
S200	40.000	12.000	0.800	0	0	1120.00	3200	0.3500
S201	38.889	11.667	0.778	0	0	1088.89	3200	0.3403
S202	38.889	11.667	0.778	0	0	1088.89	3200	0.3403
S203	44.444	13.333	0.889	0	0	1244.44	3200	0.3889
S204	44.444	13.333	0.889	0	0	1244.44	3200	0.3889
S205	35.000	10.500	0.700	0	0	980.00	3200	0.3063
S206	35.000	10.500	0.700	0	0	980.00	3200	0.3063
S207	40.000	12.000	0.800	0	0	1120.00	3200	0.3500
S208	40.000	12.000	0.800	0	0	1120.00	3200	0.3500
S209	38.889	11.667	0.778	0	0	1088.89	3800	0.2865
S210	38.889	11.667	0.778	0	0	1088.89	3800	0.2865

S211	44.444	13.333	0.889	0	0	1244.44	3800	0.3275
S212	44.444	13.333	0.889	0	0	1244.44	3800	0.3275
S213	35.000	10.500	0.700	0	0	980.00	3800	0.2579
S214	35.000	10.500	0.700	0	0	980.00	3800	0.2579
S215	40.000	12.000	0.800	0	0	1120.00	3800	0.2947
S216	40.000	12.000	0.800	0	0	1120.00	3800	0.2947
S217	38.889	11.667	0.778	0	0	1088.89	3800	0.2865
S218	38.889	11.667	0.778	0	0	1088.89	3800	0.2865
S219	44.444	13.333	0.889	0	0	1244.44	3800	0.3275
S220	44.444	13.333	0.889	0	0	1244.44	3800	0.3275
S221	35.000	10.500	0.700	0	0	980.00	3800	0.2579
S222	35.000	10.500	0.700	0	0	980.00	3800	0.2579
S223	40.000	12.000	0.800	0	0	1120.00	3800	0.2947
S224	40.000	12.000	0.800	0	0	1120.00	3800	0.2947
S225	38.889	19.444	0.778	0	0	1555.56	3200	0.4861
S226	38.889	19.444	0.778	0	0	1555.56	3200	0.4861
S227	44.444	22.222	0.889	0	0	1777.78	3200	0.5556
S228	44.444	22.222	0.889	0	0	1777.78	3200	0.5556
S229	35.000	17.500	0.700	0	0	1400.00	3200	0.4375
S230	35.000	17.500	0.700	0	0	1400.00	3200	0.4375
S231	40.000	20.000	0.800	0	0	1600.00	3200	0.5000
S232	40.000	20.000	0.800	0	0	1600.00	3200	0.5000
S233	38.889	19.444	0.778	0	0	1555.56	3200	0.4861
S234	38.889	19.444	0.778	0	0	1555.56	3200	0.4861
S235	44.444	22.222	0.889	0	0	1777.78	3200	0.5556
S236	44.444	22.222	0.889	0	0	1777.78	3200	0.5556
S237	35.000	17.500	0.700	0	0	1400.00	3200	0.4375
S238	35.000	17.500	0.700	0	0	1400.00	3200	0.4375
S239	40.000	20.000	0.800	0	0	1600.00	3200	0.5000
S240	40.000	20.000	0.800	0	0	1600.00	3200	0.5000
S241	38.889	19.444	0.778	0	0	1555.56	3800	0.4094
S242	38.889	19.444	0.778	0	0	1555.56	3800	0.4094
S243	44.444	22.222	0.889	0	0	1777.78	3800	0.4678
S244	44.444	22.222	0.889	0	0	1777.78	3800	0.4678
S245	35.000	17.500	0.700	0	0	1400.00	3800	0.3684
S246	35.000	17.500	0.700	0	0	1400.00	3800	0.3684
S247	40.000	20.000	0.800	0	0	1600.00	3800	0.4211
S248	40.000	20.000	0.800	0	0	1600.00	3800	0.4211
S249	38.889	19.444	0.778	0	0	1555.56	3800	0.4094
S250	38.889	19.444	0.778	0	0	1555.56	3800	0.4094
S251	44.444	22.222	0.889	0	0	1777.78	3800	0.4678

S252	44.444	22.222	0.889	0	0	1777.78	3800	0.4678
S253	35.000	17.500	0.700	0	0	1400.00	3800	0.3684
S254	35.000	17.500	0.700	0	0	1400.00	3800	0.3684
S255	40.000	20.000	0.800	0	0	1600.00	3800	0.4211
S256	40.000	20.000	0.800	0	0	1600.00	3800	0.4211
S257	58.333	11.667	0.778	0	0	1283.33	3100	0.4140
S258	58.333	11.667	0.778	0	0	1283.33	3100	0.4140
S259	66.667	13.333	0.889	0	0	1466.67	3100	0.4731
S260	66.667	13.333	0.889	0	0	1466.67	3100	0.4731
S261	52.500	10.500	0.700	0	0	1155.00	3100	0.3726
S262	52.500	10.500	0.700	0	0	1155.00	3100	0.3726
S263	60.000	12.000	0.800	0	0	1320.00	3100	0.4258
S264	60.000	12.000	0.800	0	0	1320.00	3100	0.4258
S265	58.333	11.667	0.778	0	0	1283.33	3100	0.4140
S266	58.333	11.667	0.778	0	0	1283.33	3100	0.4140
S267	66.667	13.333	0.889	0	0	1466.67	3100	0.4731
S268	66.667	13.333	0.889	0	0	1466.67	3100	0.4731
S269	52.500	10.500	0.700	0	0	1155.00	3100	0.3726
S270	52.500	10.500	0.700	0	0	1155.00	3100	0.3726
S271	60.000	12.000	0.800	0	0	1320.00	3100	0.4258
S272	60.000	12.000	0.800	0	0	1320.00	3100	0.4258
S273	58.333	11.667	0.778	0	0	1283.33	3700	0.3468
S274	58.333	11.667	0.778	0	0	1283.33	3700	0.3468
S275	66.667	13.333	0.889	0	0	1466.67	3700	0.3964
S276	66.667	13.333	0.889	0	0	1466.67	3700	0.3964
S277	52.500	10.500	0.700	0	0	1155.00	3700	0.3122
S278	52.500	10.500	0.700	0	0	1155.00	3700	0.3122
S279	60.000	12.000	0.800	0	0	1320.00	3700	0.3568
S280	60.000	12.000	0.800	0	0	1320.00	3700	0.3568
S281	58.333	11.667	0.778	0	0	1283.33	3700	0.3468
S282	58.333	11.667	0.778	0	0	1283.33	3700	0.3468
S283	66.667	13.333	0.889	0	0	1466.67	3700	0.3964
S284	66.667	13.333	0.889	0	0	1466.67	3700	0.3964
S285	52.500	10.500	0.700	0	0	1155.00	3700	0.3122
S286	52.500	10.500	0.700	0	0	1155.00	3700	0.3122
S287	60.000	12.000	0.800	0	0	1320.00	3700	0.3568
S288	60.000	12.000	0.800	0	0	1320.00	3700	0.3568
S289	58.333	19.444	0.778	0	0	1750.00	3100	0.5645
S290	58.333	19.444	0.778	0	0	1750.00	3100	0.5645
S291	66.667	22.222	0.889	0	0	2000.00	3100	0.6452
S292	66.667	22.222	0.889	0	0	2000.00	3100	0.6452

S293	52.500	17.500	0.700	0	0	1575.00	3100	0.5081
S294	52.500	17.500	0.700	0	0	1575.00	3100	0.5081
S295	60.000	20.000	0.800	0	0	1800.00	3100	0.5806
S296	60.000	20.000	0.800	0	0	1800.00	3100	0.5806
S297	58.333	19.444	0.778	0	0	1750.00	3100	0.5645
S298	58.333	19.444	0.778	0	0	1750.00	3100	0.5645
S299	66.667	22.222	0.889	0	0	2000.00	3100	0.6452
S300	66.667	22.222	0.889	0	0	2000.00	3100	0.6452
S301	52.500	17.500	0.700	0	0	1575.00	3100	0.5081
S302	52.500	17.500	0.700	0	0	1575.00	3100	0.5081
S303	60.000	20.000	0.800	0	0	1800.00	3100	0.5806
S304	60.000	20.000	0.800	0	0	1800.00	3100	0.5806
S305	58.333	19.444	0.778	0	0	1750.00	3700	0.4730
S306	58.333	19.444	0.778	0	0	1750.00	3700	0.4730
S307	66.667	22.222	0.889	0	0	2000.00	3700	0.5405
S308	66.667	22.222	0.889	0	0	2000.00	3700	0.5405
S309	52.500	17.500	0.700	0	0	1575.00	3700	0.4257
S310	52.500	17.500	0.700	0	0	1575.00	3700	0.4257
S311	60.000	20.000	0.800	0	0	1800.00	3700	0.4865
S312	60.000	20.000	0.800	0	0	1800.00	3700	0.4865
S313	58.333	19.444	0.778	0	0	1750.00	3700	0.4730
S314	58.333	19.444	0.778	0	0	1750.00	3700	0.4730
S315	66.667	22.222	0.889	0	0	2000.00	3700	0.5405
S316	66.667	22.222	0.889	0	0	2000.00	3700	0.5405
S317	52.500	17.500	0.700	0	0	1575.00	3700	0.4257
S318	52.500	17.500	0.700	0	0	1575.00	3700	0.4257
S319	60.000	20.000	0.800	0	0	1800.00	3700	0.4865
S320	60.000	20.000	0.800	0	0	1800.00	3700	0.4865
S321	58.333	11.667	0.778	0	0	1283.33	3100	0.4140
S322	58.333	11.667	0.778	0	0	1283.33	3100	0.4140
S323	66.667	13.333	0.889	0	0	1466.67	3100	0.4731
S324	66.667	13.333	0.889	0	0	1466.67	3100	0.4731
S325	52.500	10.500	0.700	0	0	1155.00	3100	0.3726
S326	52.500	10.500	0.700	0	0	1155.00	3100	0.3726
S327	60.000	12.000	0.800	0	0	1320.00	3100	0.4258
S328	60.000	12.000	0.800	0	0	1320.00	3100	0.4258
S329	58.333	11.667	0.778	0	0	1283.33	3100	0.4140
S330	58.333	11.667	0.778	0	0	1283.33	3100	0.4140
S331	66.667	13.333	0.889	0	0	1466.67	3100	0.4731
S332	66.667	13.333	0.889	0	0	1466.67	3100	0.4731
S333	52.500	10.500	0.700	0	0	1155.00	3100	0.3726

S334	52.500	10.500	0.700	0	0	1155.00	3100	0.3726
S335	60.000	12.000	0.800	0	0	1320.00	3100	0.4258
S336	60.000	12.000	0.800	0	0	1320.00	3100	0.4258
S337	58.333	11.667	0.778	0	0	1283.33	3700	0.3468
S338	58.333	11.667	0.778	0	0	1283.33	3700	0.3468
S339	66.667	13.333	0.889	0	0	1466.67	3700	0.3964
S340	66.667	13.333	0.889	0	0	1466.67	3700	0.3964
S341	52.500	10.500	0.700	0	0	1155.00	3700	0.3122
S342	52.500	10.500	0.700	0	0	1155.00	3700	0.3122
S343	60.000	12.000	0.800	0	0	1320.00	3700	0.3568
S344	60.000	12.000	0.800	0	0	1320.00	3700	0.3568
S345	58.333	11.667	0.778	0	0	1283.33	3700	0.3468
S346	58.333	11.667	0.778	0	0	1283.33	3700	0.3468
S347	66.667	13.333	0.889	0	0	1466.67	3700	0.3964
S348	66.667	13.333	0.889	0	0	1466.67	3700	0.3964
S349	52.500	10.500	0.700	0	0	1155.00	3700	0.3122
S350	52.500	10.500	0.700	0	0	1155.00	3700	0.3122
S351	60.000	12.000	0.800	0	0	1320.00	3700	0.3568
S352	60.000	12.000	0.800	0	0	1320.00	3700	0.3568
S353	58.333	19.444	0.778	0	0	1750.00	3100	0.5645
S354	58.333	19.444	0.778	0	0	1750.00	3100	0.5645
S355	66.667	22.222	0.889	0	0	2000.00	3100	0.6452
S356	66.667	22.222	0.889	0	0	2000.00	3100	0.6452
S357	52.500	17.500	0.700	0	0	1575.00	3100	0.5081
S358	52.500	17.500	0.700	0	0	1575.00	3100	0.5081
S359	60.000	20.000	0.800	0	0	1800.00	3100	0.5806
S360	60.000	20.000	0.800	0	0	1800.00	3100	0.5806
S361	58.333	19.444	0.778	0	0	1750.00	3100	0.5645
S362	58.333	19.444	0.778	0	0	1750.00	3100	0.5645
S363	66.667	22.222	0.889	0	0	2000.00	3100	0.6452
S364	66.667	22.222	0.889	0	0	2000.00	3100	0.6452
S365	52.500	17.500	0.700	0	0	1575.00	3100	0.5081
S366	52.500	17.500	0.700	0	0	1575.00	3100	0.5081
S367	60.000	20.000	0.800	0	0	1800.00	3100	0.5806
S368	60.000	20.000	0.800	0	0	1800.00	3100	0.5806
S369	58.333	19.444	0.778	0	0	1750.00	3700	0.4730
S370	58.333	19.444	0.778	0	0	1750.00	3700	0.4730
S371	66.667	22.222	0.889	0	0	2000.00	3700	0.5405
S372	66.667	22.222	0.889	0	0	2000.00	3700	0.5405
S373	52.500	17.500	0.700	0	0	1575.00	3700	0.4257
S374	52.500	17.500	0.700	0	0	1575.00	3700	0.4257

S375	60.000	20.000	0.800	0	0	1800.00	3700	0.4865
S376	60.000	20.000	0.800	0	0	1800.00	3700	0.4865
S377	58.333	19.444	0.778	0	0	1750.00	3700	0.4730
S378	58.333	19.444	0.778	0	0	1750.00	3700	0.4730
S379	66.667	22.222	0.889	0	0	2000.00	3700	0.5405
S380	66.667	22.222	0.889	0	0	2000.00	3700	0.5405
S381	52.500	17.500	0.700	0	0	1575.00	3700	0.4257
S382	52.500	17.500	0.700	0	0	1575.00	3700	0.4257
S383	60.000	20.000	0.800	0	0	1800.00	3700	0.4865
S384	60.000	20.000	0.800	0	0	1800.00	3700	0.4865
S385	58.333	11.667	0.778	0	0	1283.33	3200	0.4010
S386	58.333	11.667	0.778	0	0	1283.33	3200	0.4010
S387	66.667	13.333	0.889	0	0	1466.67	3200	0.4583
S388	66.667	13.333	0.889	0	0	1466.67	3200	0.4583
S389	52.500	10.500	0.700	0	0	1155.00	3200	0.3609
S390	52.500	10.500	0.700	0	0	1155.00	3200	0.3609
S391	60.000	12.000	0.800	0	0	1320.00	3200	0.4125
S392	60.000	12.000	0.800	0	0	1320.00	3200	0.4125
S393	58.333	11.667	0.778	0	0	1283.33	3200	0.4010
S394	58.333	11.667	0.778	0	0	1283.33	3200	0.4010
S395	66.667	13.333	0.889	0	0	1466.67	3200	0.4583
S396	66.667	13.333	0.889	0	0	1466.67	3200	0.4583
S397	52.500	10.500	0.700	0	0	1155.00	3200	0.3609
S398	52.500	10.500	0.700	0	0	1155.00	3200	0.3609
S399	60.000	12.000	0.800	0	0	1320.00	3200	0.4125
S400	60.000	12.000	0.800	0	0	1320.00	3200	0.4125
S401	58.333	11.667	0.778	0	0	1283.33	3800	0.3377
S402	58.333	11.667	0.778	0	0	1283.33	3800	0.3377
S403	66.667	13.333	0.889	0	0	1466.67	3800	0.3860
S404	66.667	13.333	0.889	0	0	1466.67	3800	0.3860
S405	52.500	10.500	0.700	0	0	1155.00	3800	0.3039
S406	52.500	10.500	0.700	0	0	1155.00	3800	0.3039
S407	60.000	12.000	0.800	0	0	1320.00	3800	0.3474
S408	60.000	12.000	0.800	0	0	1320.00	3800	0.3474
S409	58.333	11.667	0.778	0	0	1283.33	3800	0.3377
S410	58.333	11.667	0.778	0	0	1283.33	3800	0.3377
S411	66.667	13.333	0.889	0	0	1466.67	3800	0.3860
S412	66.667	13.333	0.889	0	0	1466.67	3800	0.3860
S413	52.500	10.500	0.700	0	0	1155.00	3800	0.3039
S414	52.500	10.500	0.700	0	0	1155.00	3800	0.3039
S415	60.000	12.000	0.800	0	0	1320.00	3800	0.3474

S416	60.000	12.000	0.800	0	0	1320.00	3800	0.3474
S417	58.333	19.444	0.778	0	0	1750.00	3200	0.5469
S418	58.333	19.444	0.778	0	0	1750.00	3200	0.5469
S419	66.667	22.222	0.889	0	0	2000.00	3200	0.6250
S420	66.667	22.222	0.889	0	0	2000.00	3200	0.6250
S421	52.500	17.500	0.700	0	0	1575.00	3200	0.4922
S422	52.500	17.500	0.700	0	0	1575.00	3200	0.4922
S423	60.000	20.000	0.800	0	0	1800.00	3200	0.5625
S424	60.000	20.000	0.800	0	0	1800.00	3200	0.5625
S425	58.333	19.444	0.778	0	0	1750.00	3200	0.5469
S426	58.333	19.444	0.778	0	0	1750.00	3200	0.5469
S427	66.667	22.222	0.889	0	0	2000.00	3200	0.6250
S428	66.667	22.222	0.889	0	0	2000.00	3200	0.6250
S429	52.500	17.500	0.700	0	0	1575.00	3200	0.4922
S430	52.500	17.500	0.700	0	0	1575.00	3200	0.4922
S431	60.000	20.000	0.800	0	0	1800.00	3200	0.5625
S432	60.000	20.000	0.800	0	0	1800.00	3200	0.5625
S433	58.333	19.444	0.778	0	0	1750.00	3800	0.4605
S434	58.333	19.444	0.778	0	0	1750.00	3800	0.4605
S435	66.667	22.222	0.889	0	0	2000.00	3800	0.5263
S436	66.667	22.222	0.889	0	0	2000.00	3800	0.5263
S437	52.500	17.500	0.700	0	0	1575.00	3800	0.4145
S438	52.500	17.500	0.700	0	0	1575.00	3800	0.4145
S439	60.000	20.000	0.800	0	0	1800.00	3800	0.4737
S440	60.000	20.000	0.800	0	0	1800.00	3800	0.4737
S441	58.333	19.444	0.778	0	0	1750.00	3800	0.4605
S442	58.333	19.444	0.778	0	0	1750.00	3800	0.4605
S443	66.667	22.222	0.889	0	0	2000.00	3800	0.5263
S444	66.667	22.222	0.889	0	0	2000.00	3800	0.5263
S445	52.500	17.500	0.700	0	0	1575.00	3800	0.4145
S446	52.500	17.500	0.700	0	0	1575.00	3800	0.4145
S447	60.000	20.000	0.800	0	0	1800.00	3800	0.4737
S448	60.000	20.000	0.800	0	0	1800.00	3800	0.4737
S449	58.333	11.667	0.778	0	0	1283.33	3200	0.4010
S450	58.333	11.667	0.778	0	0	1283.33	3200	0.4010
S451	66.667	13.333	0.889	0	0	1466.67	3200	0.4583
S452	66.667	13.333	0.889	0	0	1466.67	3200	0.4583
S453	52.500	10.500	0.700	0	0	1155.00	3200	0.3609
S454	52.500	10.500	0.700	0	0	1155.00	3200	0.3609
S455	60.000	12.000	0.800	0	0	1320.00	3200	0.4125
S456	60.000	12.000	0.800	0	0	1320.00	3200	0.4125

S457	58.333	11.667	0.778	0	0	1283.33	3200	0.4010
S458	58.333	11.667	0.778	0	0	1283.33	3200	0.4010
S459	66.667	13.333	0.889	0	0	1466.67	3200	0.4583
S460	66.667	13.333	0.889	0	0	1466.67	3200	0.4583
S461	52.500	10.500	0.700	0	0	1155.00	3200	0.3609
S462	52.500	10.500	0.700	0	0	1155.00	3200	0.3609
S463	60.000	12.000	0.800	0	0	1320.00	3200	0.4125
S464	60.000	12.000	0.800	0	0	1320.00	3200	0.4125
S465	58.333	11.667	0.778	0	0	1283.33	3800	0.3377
S466	58.333	11.667	0.778	0	0	1283.33	3800	0.3377
S467	66.667	13.333	0.889	0	0	1466.67	3800	0.3860
S468	66.667	13.333	0.889	0	0	1466.67	3800	0.3860
S469	52.500	10.500	0.700	0	0	1155.00	3800	0.3039
S470	52.500	10.500	0.700	0	0	1155.00	3800	0.3039
S471	60.000	12.000	0.800	0	0	1320.00	3800	0.3474
S472	60.000	12.000	0.800	0	0	1320.00	3800	0.3474
S473	58.333	11.667	0.778	0	0	1283.33	3800	0.3377
S474	58.333	11.667	0.778	0	0	1283.33	3800	0.3377
S475	66.667	13.333	0.889	0	0	1466.67	3800	0.3860
S476	66.667	13.333	0.889	0	0	1466.67	3800	0.3860
S477	52.500	10.500	0.700	0	0	1155.00	3800	0.3039
S478	52.500	10.500	0.700	0	0	1155.00	3800	0.3039
S479	60.000	12.000	0.800	0	0	1320.00	3800	0.3474
S480	60.000	12.000	0.800	0	0	1320.00	3800	0.3474
S481	58.333	19.444	0.778	0	0	1750.00	3200	0.5469
S482	58.333	19.444	0.778	0	0	1750.00	3200	0.5469
S483	66.667	22.222	0.889	0	0	2000.00	3200	0.6250
S484	66.667	22.222	0.889	0	0	2000.00	3200	0.6250
S485	52.500	17.500	0.700	0	0	1575.00	3200	0.4922
S486	52.500	17.500	0.700	0	0	1575.00	3200	0.4922
S487	60.000	20.000	0.800	0	0	1800.00	3200	0.5625
S488	60.000	20.000	0.800	0	0	1800.00	3200	0.5625
S489	58.333	19.444	0.778	0	0	1750.00	3200	0.5469
S490	58.333	19.444	0.778	0	0	1750.00	3200	0.5469
S491	66.667	22.222	0.889	0	0	2000.00	3200	0.6250
S492	66.667	22.222	0.889	0	0	2000.00	3200	0.6250
S493	52.500	17.500	0.700	0	0	1575.00	3200	0.4922
S494	52.500	17.500	0.700	0	0	1575.00	3200	0.4922
S495	60.000	20.000	0.800	0	0	1800.00	3200	0.5625
S496	60.000	20.000	0.800	0	0	1800.00	3200	0.5625
S497	58.333	19.444	0.778	0	0	1750.00	3800	0.4605

S498	58.333	19.444	0.778	0	0	1750.00	3800	0.4605
S499	66.667	22.222	0.889	0	0	2000.00	3800	0.5263
S500	66.667	22.222	0.889	0	0	2000.00	3800	0.5263
S501	52.500	17.500	0.700	0	0	1575.00	3800	0.4145
S502	52.500	17.500	0.700	0	0	1575.00	3800	0.4145
S503	60.000	20.000	0.800	0	0	1800.00	3800	0.4737
S504	60.000	20.000	0.800	0	0	1800.00	3800	0.4737
S505	58.333	19.444	0.778	0	0	1750.00	3800	0.4605
S506	58.333	19.444	0.778	0	0	1750.00	3800	0.4605
S507	66.667	22.222	0.889	0	0	2000.00	3800	0.5263
S508	66.667	22.222	0.889	0	0	2000.00	3800	0.5263
S509	52.500	17.500	0.700	0	0	1575.00	3800	0.4145
S510	52.500	17.500	0.700	0	0	1575.00	3800	0.4145
S511	60.000	20.000	0.800	0	0	1800.00	3800	0.4737
S512	60.000	20.000	0.800	0	0	1800.00	3800	0.4737

Table B-3: Cost Model Output for DMU C

Scenario	DMUC					O.F.	Current	Eff
	x1*	x2*	lambdaA	lambdaB	lambdaC			
S1	66.667	20.000	1.33	0	0	2000.00	4100	0.4878
S2	83.333	25.000	1.67	0	0	2500.00	4100	0.6098
S3	66.667	20.000	1.33	0	0	2000.00	4100	0.4878
S4	83.333	25.000	1.67	0	0	2500.00	4100	0.6098
S5	60.000	18.000	1.20	0	0	1800.00	4100	0.4390
S6	75.000	22.500	1.50	0	0	2250.00	4100	0.5488
S7	60.000	18.000	1.20	0	0	1800.00	4100	0.4390
S8	75.000	22.500	1.50	0	0	2250.00	4100	0.5488
S9	66.667	20.000	1.33	0	0	2000.00	4600	0.4348
S10	83.333	25.000	1.67	0	0	2500.00	4600	0.5435
S11	66.667	20.000	1.33	0	0	2000.00	4600	0.4348
S12	83.333	25.000	1.67	0	0	2500.00	4600	0.5435
S13	60.000	18.000	1.20	0	0	1800.00	4600	0.3913
S14	75.000	22.500	1.50	0	0	2250.00	4600	0.4891
S15	60.000	18.000	1.20	0	0	1800.00	4600	0.3913
S16	75.000	22.500	1.50	0	0	2250.00	4600	0.4891
S17	66.667	20.000	1.33	0	0	2000.00	4100	0.4878
S18	83.333	25.000	1.67	0	0	2500.00	4100	0.6098
S19	66.667	20.000	1.33	0	0	2000.00	4100	0.4878
S20	83.333	25.000	1.67	0	0	2500.00	4100	0.6098
S21	60.000	18.000	1.20	0	0	1800.00	4100	0.4390

S22	75.000	22.500	1.50	0	0	2250.00	4100	0.5488
S23	60.000	18.000	1.20	0	0	1800.00	4100	0.4390
S24	75.000	22.500	1.50	0	0	2250.00	4100	0.5488
S25	66.667	20.000	1.33	0	0	2000.00	4600	0.4348
S26	83.333	25.000	1.67	0	0	2500.00	4600	0.5435
S27	66.667	20.000	1.33	0	0	2000.00	4600	0.4348
S28	83.333	25.000	1.67	0	0	2500.00	4600	0.5435
S29	60.000	18.000	1.20	0	0	1800.00	4600	0.3913
S30	75.000	22.500	1.50	0	0	2250.00	4600	0.4891
S31	60.000	18.000	1.20	0	0	1800.00	4600	0.3913
S32	75.000	22.500	1.50	0	0	2250.00	4600	0.4891
S33	66.667	33.333	1.33	0	0	2666.67	4100	0.6504
S34	83.333	41.667	1.67	0	0	3333.33	4100	0.8130
S35	66.667	33.333	1.33	0	0	2666.67	4100	0.6504
S36	83.333	41.667	1.67	0	0	3333.33	4100	0.8130
S37	60.000	30.000	1.20	0	0	2400.00	4100	0.5854
S38	75.000	37.500	1.50	0	0	3000.00	4100	0.7317
S39	60.000	30.000	1.20	0	0	2400.00	4100	0.5854
S40	75.000	37.500	1.50	0	0	3000.00	4100	0.7317
S41	66.667	33.333	1.33	0	0	2666.67	4600	0.5797
S42	83.333	41.667	1.67	0	0	3333.33	4600	0.7246
S43	66.667	33.333	1.33	0	0	2666.67	4600	0.5797
S44	83.333	41.667	1.67	0	0	3333.33	4600	0.7246
S45	60.000	30.000	1.20	0	0	2400.00	4600	0.5217
S46	75.000	37.500	1.50	0	0	3000.00	4600	0.6522
S47	60.000	30.000	1.20	0	0	2400.00	4600	0.5217
S48	75.000	37.500	1.50	0	0	3000.00	4600	0.6522
S49	66.667	33.333	1.33	0	0	2666.67	4100	0.6504
S50	83.333	41.667	1.67	0	0	3333.33	4100	0.8130
S51	66.667	33.333	1.33	0	0	2666.67	4100	0.6504
S52	83.333	41.667	1.67	0	0	3333.33	4100	0.8130
S53	60.000	30.000	1.20	0	0	2400.00	4100	0.5854
S54	75.000	37.500	1.50	0	0	3000.00	4100	0.7317
S55	60.000	30.000	1.20	0	0	2400.00	4100	0.5854
S56	75.000	37.500	1.50	0	0	3000.00	4100	0.7317
S57	66.667	33.333	1.33	0	0	2666.67	4600	0.5797
S58	83.333	41.667	1.67	0	0	3333.33	4600	0.7246
S59	66.667	33.333	1.33	0	0	2666.67	4600	0.5797
S60	83.333	41.667	1.67	0	0	3333.33	4600	0.7246
S61	60.000	30.000	1.20	0	0	2400.00	4600	0.5217
S62	75.000	37.500	1.50	0	0	3000.00	4600	0.6522

S63	60.000	30.000	1.20	0	0	2400.00	4600	0.5217
S64	75.000	37.500	1.50	0	0	3000.00	4600	0.6522
S65	66.667	20.000	1.33	0	0	2000.00	4400	0.4545
S66	83.333	25.000	1.67	0	0	2500.00	4400	0.5682
S67	66.667	20.000	1.33	0	0	2000.00	4400	0.4545
S68	83.333	25.000	1.67	0	0	2500.00	4400	0.5682
S69	60.000	18.000	1.20	0	0	1800.00	4400	0.4091
S70	75.000	22.500	1.50	0	0	2250.00	4400	0.5114
S71	60.000	18.000	1.20	0	0	1800.00	4400	0.4091
S72	75.000	22.500	1.50	0	0	2250.00	4400	0.5114
S73	66.667	20.000	1.33	0	0	2000.00	4900	0.4082
S74	83.333	25.000	1.67	0	0	2500.00	4900	0.5102
S75	66.667	20.000	1.33	0	0	2000.00	4900	0.4082
S76	83.333	25.000	1.67	0	0	2500.00	4900	0.5102
S77	60.000	18.000	1.20	0	0	1800.00	4900	0.3673
S78	75.000	22.500	1.50	0	0	2250.00	4900	0.4592
S79	60.000	18.000	1.20	0	0	1800.00	4900	0.3673
S80	75.000	22.500	1.50	0	0	2250.00	4900	0.4592
S81	66.667	20.000	1.33	0	0	2000.00	4400	0.4545
S82	83.333	25.000	1.67	0	0	2500.00	4400	0.5682
S83	66.667	20.000	1.33	0	0	2000.00	4400	0.4545
S84	83.333	25.000	1.67	0	0	2500.00	4400	0.5682
S85	60.000	18.000	1.20	0	0	1800.00	4400	0.4091
S86	75.000	22.500	1.50	0	0	2250.00	4400	0.5114
S87	60.000	18.000	1.20	0	0	1800.00	4400	0.4091
S88	75.000	22.500	1.50	0	0	2250.00	4400	0.5114
S89	66.667	20.000	1.33	0	0	2000.00	4900	0.4082
S90	83.333	25.000	1.67	0	0	2500.00	4900	0.5102
S91	66.667	20.000	1.33	0	0	2000.00	4900	0.4082
S92	83.333	25.000	1.67	0	0	2500.00	4900	0.5102
S93	60.000	18.000	1.20	0	0	1800.00	4900	0.3673
S94	75.000	22.500	1.50	0	0	2250.00	4900	0.4592
S95	60.000	18.000	1.20	0	0	1800.00	4900	0.3673
S96	75.000	22.500	1.50	0	0	2250.00	4900	0.4592
S97	66.667	33.333	1.33	0	0	2666.67	4400	0.6061
S98	83.333	41.667	1.67	0	0	3333.33	4400	0.7576
S99	66.667	33.333	1.33	0	0	2666.67	4400	0.6061
S100	83.333	41.667	1.67	0	0	3333.33	4400	0.7576
S101	60.000	30.000	1.20	0	0	2400.00	4400	0.5455
S102	75.000	37.500	1.50	0	0	3000.00	4400	0.6818
S103	60.000	30.000	1.20	0	0	2400.00	4400	0.5455

S104	75.000	37.500	1.50	0	0	3000.00	4400	0.6818
S105	66.667	33.333	1.33	0	0	2666.67	4900	0.5442
S106	83.333	41.667	1.67	0	0	3333.33	4900	0.6803
S107	66.667	33.333	1.33	0	0	2666.67	4900	0.5442
S108	83.333	41.667	1.67	0	0	3333.33	4900	0.6803
S109	60.000	30.000	1.20	0	0	2400.00	4900	0.4898
S110	75.000	37.500	1.50	0	0	3000.00	4900	0.6122
S111	60.000	30.000	1.20	0	0	2400.00	4900	0.4898
S112	75.000	37.500	1.50	0	0	3000.00	4900	0.6122
S113	66.667	33.333	1.33	0	0	2666.67	4400	0.6061
S114	83.333	41.667	1.67	0	0	3333.33	4400	0.7576
S115	66.667	33.333	1.33	0	0	2666.67	4400	0.6061
S116	83.333	41.667	1.67	0	0	3333.33	4400	0.7576
S117	60.000	30.000	1.20	0	0	2400.00	4400	0.5455
S118	75.000	37.500	1.50	0	0	3000.00	4400	0.6818
S119	60.000	30.000	1.20	0	0	2400.00	4400	0.5455
S120	75.000	37.500	1.50	0	0	3000.00	4400	0.6818
S121	66.667	33.333	1.33	0	0	2666.67	4900	0.5442
S122	83.333	41.667	1.67	0	0	3333.33	4900	0.6803
S123	66.667	33.333	1.33	0	0	2666.67	4900	0.5442
S124	83.333	41.667	1.67	0	0	3333.33	4900	0.6803
S125	60.000	30.000	1.20	0	0	2400.00	4900	0.4898
S126	75.000	37.500	1.50	0	0	3000.00	4900	0.6122
S127	60.000	30.000	1.20	0	0	2400.00	4900	0.4898
S128	75.000	37.500	1.50	0	0	3000.00	4900	0.6122
S129	66.667	20.000	1.33	0	0	2000.00	4100	0.4878
S130	83.333	25.000	1.67	0	0	2500.00	4100	0.6098
S131	66.667	20.000	1.33	0	0	2000.00	4100	0.4878
S132	83.333	25.000	1.67	0	0	2500.00	4100	0.6098
S133	60.000	18.000	1.20	0	0	1800.00	4100	0.4390
S134	75.000	22.500	1.50	0	0	2250.00	4100	0.5488
S135	60.000	18.000	1.20	0	0	1800.00	4100	0.4390
S136	75.000	22.500	1.50	0	0	2250.00	4100	0.5488
S137	66.667	20.000	1.33	0	0	2000.00	4600	0.4348
S138	83.333	25.000	1.67	0	0	2500.00	4600	0.5435
S139	66.667	20.000	1.33	0	0	2000.00	4600	0.4348
S140	83.333	25.000	1.67	0	0	2500.00	4600	0.5435
S141	60.000	18.000	1.20	0	0	1800.00	4600	0.3913
S142	75.000	22.500	1.50	0	0	2250.00	4600	0.4891
S143	60.000	18.000	1.20	0	0	1800.00	4600	0.3913
S144	75.000	22.500	1.50	0	0	2250.00	4600	0.4891

S145	66.667	20.000	1.33	0	0	2000.00	4100	0.4878
S146	83.333	25.000	1.67	0	0	2500.00	4100	0.6098
S147	66.667	20.000	1.33	0	0	2000.00	4100	0.4878
S148	83.333	25.000	1.67	0	0	2500.00	4100	0.6098
S149	60.000	18.000	1.20	0	0	1800.00	4100	0.4390
S150	75.000	22.500	1.50	0	0	2250.00	4100	0.5488
S151	60.000	18.000	1.20	0	0	1800.00	4100	0.4390
S152	75.000	22.500	1.50	0	0	2250.00	4100	0.5488
S153	66.667	20.000	1.33	0	0	2000.00	4600	0.4348
S154	83.333	25.000	1.67	0	0	2500.00	4600	0.5435
S155	66.667	20.000	1.33	0	0	2000.00	4600	0.4348
S156	83.333	25.000	1.67	0	0	2500.00	4600	0.5435
S157	60.000	18.000	1.20	0	0	1800.00	4600	0.3913
S158	75.000	22.500	1.50	0	0	2250.00	4600	0.4891
S159	60.000	18.000	1.20	0	0	1800.00	4600	0.3913
S160	75.000	22.500	1.50	0	0	2250.00	4600	0.4891
S161	66.667	33.333	1.33	0	0	2666.67	4100	0.6504
S162	83.333	41.667	1.67	0	0	3333.33	4100	0.8130
S163	66.667	33.333	1.33	0	0	2666.67	4100	0.6504
S164	83.333	41.667	1.67	0	0	3333.33	4100	0.8130
S165	60.000	30.000	1.20	0	0	2400.00	4100	0.5854
S166	75.000	37.500	1.50	0	0	3000.00	4100	0.7317
S167	60.000	30.000	1.20	0	0	2400.00	4100	0.5854
S168	75.000	37.500	1.50	0	0	3000.00	4100	0.7317
S169	66.667	33.333	1.33	0	0	2666.67	4600	0.5797
S170	83.333	41.667	1.67	0	0	3333.33	4600	0.7246
S171	66.667	33.333	1.33	0	0	2666.67	4600	0.5797
S172	83.333	41.667	1.67	0	0	3333.33	4600	0.7246
S173	60.000	30.000	1.20	0	0	2400.00	4600	0.5217
S174	75.000	37.500	1.50	0	0	3000.00	4600	0.6522
S175	60.000	30.000	1.20	0	0	2400.00	4600	0.5217
S176	75.000	37.500	1.50	0	0	3000.00	4600	0.6522
S177	66.667	33.333	1.33	0	0	2666.67	4100	0.6504
S178	83.333	41.667	1.67	0	0	3333.33	4100	0.8130
S179	66.667	33.333	1.33	0	0	2666.67	4100	0.6504
S180	83.333	41.667	1.67	0	0	3333.33	4100	0.8130
S181	60.000	30.000	1.20	0	0	2400.00	4100	0.5854
S182	75.000	37.500	1.50	0	0	3000.00	4100	0.7317
S183	60.000	30.000	1.20	0	0	2400.00	4100	0.5854
S184	75.000	37.500	1.50	0	0	3000.00	4100	0.7317
S185	66.667	33.333	1.33	0	0	2666.67	4600	0.5797

S186	83.333	41.667	1.67	0	0	3333.33	4600	0.7246
S187	66.667	33.333	1.33	0	0	2666.67	4600	0.5797
S188	83.333	41.667	1.67	0	0	3333.33	4600	0.7246
S189	60.000	30.000	1.20	0	0	2400.00	4600	0.5217
S190	75.000	37.500	1.50	0	0	3000.00	4600	0.6522
S191	60.000	30.000	1.20	0	0	2400.00	4600	0.5217
S192	75.000	37.500	1.50	0	0	3000.00	4600	0.6522
S193	66.667	20.000	1.33	0	0	2000.00	4400	0.4545
S194	83.333	25.000	1.67	0	0	2500.00	4400	0.5682
S195	66.667	20.000	1.33	0	0	2000.00	4400	0.4545
S196	83.333	25.000	1.67	0	0	2500.00	4400	0.5682
S197	60.000	18.000	1.20	0	0	1800.00	4400	0.4091
S198	75.000	22.500	1.50	0	0	2250.00	4400	0.5114
S199	60.000	18.000	1.20	0	0	1800.00	4400	0.4091
S200	75.000	22.500	1.50	0	0	2250.00	4400	0.5114
S201	66.667	20.000	1.33	0	0	2000.00	4900	0.4082
S202	83.333	25.000	1.67	0	0	2500.00	4900	0.5102
S203	66.667	20.000	1.33	0	0	2000.00	4900	0.4082
S204	83.333	25.000	1.67	0	0	2500.00	4900	0.5102
S205	60.000	18.000	1.20	0	0	1800.00	4900	0.3673
S206	75.000	22.500	1.50	0	0	2250.00	4900	0.4592
S207	60.000	18.000	1.20	0	0	1800.00	4900	0.3673
S208	75.000	22.500	1.50	0	0	2250.00	4900	0.4592
S209	66.667	20.000	1.33	0	0	2000.00	4400	0.4545
S210	83.333	25.000	1.67	0	0	2500.00	4400	0.5682
S211	66.667	20.000	1.33	0	0	2000.00	4400	0.4545
S212	83.333	25.000	1.67	0	0	2500.00	4400	0.5682
S213	60.000	18.000	1.20	0	0	1800.00	4400	0.4091
S214	75.000	22.500	1.50	0	0	2250.00	4400	0.5114
S215	60.000	18.000	1.20	0	0	1800.00	4400	0.4091
S216	75.000	22.500	1.50	0	0	2250.00	4400	0.5114
S217	66.667	20.000	1.33	0	0	2000.00	4900	0.4082
S218	83.333	25.000	1.67	0	0	2500.00	4900	0.5102
S219	66.667	20.000	1.33	0	0	2000.00	4900	0.4082
S220	83.333	25.000	1.67	0	0	2500.00	4900	0.5102
S221	60.000	18.000	1.20	0	0	1800.00	4900	0.3673
S222	75.000	22.500	1.50	0	0	2250.00	4900	0.4592
S223	60.000	18.000	1.20	0	0	1800.00	4900	0.3673
S224	75.000	22.500	1.50	0	0	2250.00	4900	0.4592
S225	66.667	33.333	1.33	0	0	2666.67	4400	0.6061
S226	83.333	41.667	1.67	0	0	3333.33	4400	0.7576

S227	66.667	33.333	1.33	0	0	2666.67	4400	0.6061
S228	83.333	41.667	1.67	0	0	3333.33	4400	0.7576
S229	60.000	30.000	1.20	0	0	2400.00	4400	0.5455
S230	75.000	37.500	1.50	0	0	3000.00	4400	0.6818
S231	60.000	30.000	1.20	0	0	2400.00	4400	0.5455
S232	75.000	37.500	1.50	0	0	3000.00	4400	0.6818
S233	66.667	33.333	1.33	0	0	2666.67	4900	0.5442
S234	83.333	41.667	1.67	0	0	3333.33	4900	0.6803
S235	66.667	33.333	1.33	0	0	2666.67	4900	0.5442
S236	83.333	41.667	1.67	0	0	3333.33	4900	0.6803
S237	60.000	30.000	1.20	0	0	2400.00	4900	0.4898
S238	75.000	37.500	1.50	0	0	3000.00	4900	0.6122
S239	60.000	30.000	1.20	0	0	2400.00	4900	0.4898
S240	75.000	37.500	1.50	0	0	3000.00	4900	0.6122
S241	66.667	33.333	1.33	0	0	2666.67	4400	0.6061
S242	83.333	41.667	1.67	0	0	3333.33	4400	0.7576
S243	66.667	33.333	1.33	0	0	2666.67	4400	0.6061
S244	83.333	41.667	1.67	0	0	3333.33	4400	0.7576
S245	60.000	30.000	1.20	0	0	2400.00	4400	0.5455
S246	75.000	37.500	1.50	0	0	3000.00	4400	0.6818
S247	60.000	30.000	1.20	0	0	2400.00	4400	0.5455
S248	75.000	37.500	1.50	0	0	3000.00	4400	0.6818
S249	66.667	33.333	1.33	0	0	2666.67	4900	0.5442
S250	83.333	41.667	1.67	0	0	3333.33	4900	0.6803
S251	66.667	33.333	1.33	0	0	2666.67	4900	0.5442
S252	83.333	41.667	1.67	0	0	3333.33	4900	0.6803
S253	60.000	30.000	1.20	0	0	2400.00	4900	0.4898
S254	75.000	37.500	1.50	0	0	3000.00	4900	0.6122
S255	60.000	30.000	1.20	0	0	2400.00	4900	0.4898
S256	75.000	37.500	1.50	0	0	3000.00	4900	0.6122
S257	100.000	20.000	1.33	0	0	2500.00	4100	0.6098
S258	125.000	25.000	1.67	0	0	3125.00	4100	0.7622
S259	100.000	20.000	1.33	0	0	2500.00	4100	0.6098
S260	125.000	25.000	1.67	0	0	3125.00	4100	0.7622
S261	90.000	18.000	1.20	0	0	2250.00	4100	0.5488
S262	112.500	22.500	1.50	0	0	2812.50	4100	0.6860
S263	90.000	18.000	1.20	0	0	2250.00	4100	0.5488
S264	112.500	22.500	1.50	0	0	2812.50	4100	0.6860
S265	100.000	20.000	1.33	0	0	2500.00	4600	0.5435
S266	125.000	25.000	1.67	0	0	3125.00	4600	0.6793
S267	100.000	20.000	1.33	0	0	2500.00	4600	0.5435

S268	125.000	25.000	1.67	0	0	3125.00	4600	0.6793
S269	90.000	18.000	1.20	0	0	2250.00	4600	0.4891
S270	112.500	22.500	1.50	0	0	2812.50	4600	0.6114
S271	90.000	18.000	1.20	0	0	2250.00	4600	0.4891
S272	112.500	22.500	1.50	0	0	2812.50	4600	0.6114
S273	100.000	20.000	1.33	0	0	2500.00	4100	0.6098
S274	125.000	25.000	1.67	0	0	3125.00	4100	0.7622
S275	100.000	20.000	1.33	0	0	2500.00	4100	0.6098
S276	125.000	25.000	1.67	0	0	3125.00	4100	0.7622
S277	90.000	18.000	1.20	0	0	2250.00	4100	0.5488
S278	112.500	22.500	1.50	0	0	2812.50	4100	0.6860
S279	90.000	18.000	1.20	0	0	2250.00	4100	0.5488
S280	112.500	22.500	1.50	0	0	2812.50	4100	0.6860
S281	100.000	20.000	1.33	0	0	2500.00	4600	0.5435
S282	125.000	25.000	1.67	0	0	3125.00	4600	0.6793
S283	100.000	20.000	1.33	0	0	2500.00	4600	0.5435
S284	125.000	25.000	1.67	0	0	3125.00	4600	0.6793
S285	90.000	18.000	1.20	0	0	2250.00	4600	0.4891
S286	112.500	22.500	1.50	0	0	2812.50	4600	0.6114
S287	90.000	18.000	1.20	0	0	2250.00	4600	0.4891
S288	112.500	22.500	1.50	0	0	2812.50	4600	0.6114
S289	100.000	33.333	1.33	0	0	3166.67	4100	0.7724
S290	125.000	41.667	1.67	0	0	3958.33	4100	0.9654
S291	100.000	33.333	1.33	0	0	3166.67	4100	0.7724
S292	125.000	41.667	1.67	0	0	3958.33	4100	0.9654
S293	90.000	30.000	1.20	0	0	2850.00	4100	0.6951
S294	112.500	37.500	1.50	0	0	3562.50	4100	0.8689
S295	90.000	30.000	1.20	0	0	2850.00	4100	0.6951
S296	112.500	37.500	1.50	0	0	3562.50	4100	0.8689
S297	100.000	33.333	1.33	0	0	3166.67	4600	0.6884
S298	125.000	41.667	1.67	0	0	3958.33	4600	0.8605
S299	100.000	33.333	1.33	0	0	3166.67	4600	0.6884
S300	125.000	41.667	1.67	0	0	3958.33	4600	0.8605
S301	90.000	30.000	1.20	0	0	2850.00	4600	0.6196
S302	112.500	37.500	1.50	0	0	3562.50	4600	0.7745
S303	90.000	30.000	1.20	0	0	2850.00	4600	0.6196
S304	112.500	37.500	1.50	0	0	3562.50	4600	0.7745
S305	100.000	33.333	1.33	0	0	3166.67	4100	0.7724
S306	125.000	41.667	1.67	0	0	3958.33	4100	0.9654
S307	100.000	33.333	1.33	0	0	3166.67	4100	0.7724
S308	125.000	41.667	1.67	0	0	3958.33	4100	0.9654

S309	90.000	30.000	1.20	0	0	2850.00	4100	0.6951
S310	112.500	37.500	1.50	0	0	3562.50	4100	0.8689
S311	90.000	30.000	1.20	0	0	2850.00	4100	0.6951
S312	112.500	37.500	1.50	0	0	3562.50	4100	0.8689
S313	100.000	33.333	1.33	0	0	3166.67	4600	0.6884
S314	125.000	41.667	1.67	0	0	3958.33	4600	0.8605
S315	100.000	33.333	1.33	0	0	3166.67	4600	0.6884
S316	125.000	41.667	1.67	0	0	3958.33	4600	0.8605
S317	90.000	30.000	1.20	0	0	2850.00	4600	0.6196
S318	112.500	37.500	1.50	0	0	3562.50	4600	0.7745
S319	90.000	30.000	1.20	0	0	2850.00	4600	0.6196
S320	112.500	37.500	1.50	0	0	3562.50	4600	0.7745
S321	100.000	20.000	1.33	0	0	2500.00	4400	0.5682
S322	125.000	25.000	1.67	0	0	3125.00	4400	0.7102
S323	100.000	20.000	1.33	0	0	2500.00	4400	0.5682
S324	125.000	25.000	1.67	0	0	3125.00	4400	0.7102
S325	90.000	18.000	1.20	0	0	2250.00	4400	0.5114
S326	112.500	22.500	1.50	0	0	2812.50	4400	0.6392
S327	90.000	18.000	1.20	0	0	2250.00	4400	0.5114
S328	112.500	22.500	1.50	0	0	2812.50	4400	0.6392
S329	100.000	20.000	1.33	0	0	2500.00	4900	0.5102
S330	125.000	25.000	1.67	0	0	3125.00	4900	0.6378
S331	100.000	20.000	1.33	0	0	2500.00	4900	0.5102
S332	125.000	25.000	1.67	0	0	3125.00	4900	0.6378
S333	90.000	18.000	1.20	0	0	2250.00	4900	0.4592
S334	112.500	22.500	1.50	0	0	2812.50	4900	0.5740
S335	90.000	18.000	1.20	0	0	2250.00	4900	0.4592
S336	112.500	22.500	1.50	0	0	2812.50	4900	0.5740
S337	100.000	20.000	1.33	0	0	2500.00	4400	0.5682
S338	125.000	25.000	1.67	0	0	3125.00	4400	0.7102
S339	100.000	20.000	1.33	0	0	2500.00	4400	0.5682
S340	125.000	25.000	1.67	0	0	3125.00	4400	0.7102
S341	90.000	18.000	1.20	0	0	2250.00	4400	0.5114
S342	112.500	22.500	1.50	0	0	2812.50	4400	0.6392
S343	90.000	18.000	1.20	0	0	2250.00	4400	0.5114
S344	112.500	22.500	1.50	0	0	2812.50	4400	0.6392
S345	100.000	20.000	1.33	0	0	2500.00	4900	0.5102
S346	125.000	25.000	1.67	0	0	3125.00	4900	0.6378
S347	100.000	20.000	1.33	0	0	2500.00	4900	0.5102
S348	125.000	25.000	1.67	0	0	3125.00	4900	0.6378
S349	90.000	18.000	1.20	0	0	2250.00	4900	0.4592

S350	112.500	22.500	1.50	0	0	2812.50	4900	0.5740
S351	90.000	18.000	1.20	0	0	2250.00	4900	0.4592
S352	112.500	22.500	1.50	0	0	2812.50	4900	0.5740
S353	100.000	33.333	1.33	0	0	3166.67	4400	0.7197
S354	125.000	41.667	1.67	0	0	3958.33	4400	0.8996
S355	100.000	33.333	1.33	0	0	3166.67	4400	0.7197
S356	125.000	41.667	1.67	0	0	3958.33	4400	0.8996
S357	90.000	30.000	1.20	0	0	2850.00	4400	0.6477
S358	112.500	37.500	1.50	0	0	3562.50	4400	0.8097
S359	90.000	30.000	1.20	0	0	2850.00	4400	0.6477
S360	112.500	37.500	1.50	0	0	3562.50	4400	0.8097
S361	100.000	33.333	1.33	0	0	3166.67	4900	0.6463
S362	125.000	41.667	1.67	0	0	3958.33	4900	0.8078
S363	100.000	33.333	1.33	0	0	3166.67	4900	0.6463
S364	125.000	41.667	1.67	0	0	3958.33	4900	0.8078
S365	90.000	30.000	1.20	0	0	2850.00	4900	0.5816
S366	112.500	37.500	1.50	0	0	3562.50	4900	0.7270
S367	90.000	30.000	1.20	0	0	2850.00	4900	0.5816
S368	112.500	37.500	1.50	0	0	3562.50	4900	0.7270
S369	100.000	33.333	1.33	0	0	3166.67	4400	0.7197
S370	125.000	41.667	1.67	0	0	3958.33	4400	0.8996
S371	100.000	33.333	1.33	0	0	3166.67	4400	0.7197
S372	125.000	41.667	1.67	0	0	3958.33	4400	0.8996
S373	90.000	30.000	1.20	0	0	2850.00	4400	0.6477
S374	112.500	37.500	1.50	0	0	3562.50	4400	0.8097
S375	90.000	30.000	1.20	0	0	2850.00	4400	0.6477
S376	112.500	37.500	1.50	0	0	3562.50	4400	0.8097
S377	100.000	33.333	1.33	0	0	3166.67	4900	0.6463
S378	125.000	41.667	1.67	0	0	3958.33	4900	0.8078
S379	100.000	33.333	1.33	0	0	3166.67	4900	0.6463
S380	125.000	41.667	1.67	0	0	3958.33	4900	0.8078
S381	90.000	30.000	1.20	0	0	2850.00	4900	0.5816
S382	112.500	37.500	1.50	0	0	3562.50	4900	0.7270
S383	90.000	30.000	1.20	0	0	2850.00	4900	0.5816
S384	112.500	37.500	1.50	0	0	3562.50	4900	0.7270
S385	100.000	20.000	1.33	0	0	2500.00	4100	0.6098
S386	125.000	25.000	1.67	0	0	3125.00	4100	0.7622
S387	100.000	20.000	1.33	0	0	2500.00	4100	0.6098
S388	125.000	25.000	1.67	0	0	3125.00	4100	0.7622
S389	90.000	18.000	1.20	0	0	2250.00	4100	0.5488
S390	112.500	22.500	1.50	0	0	2812.50	4100	0.6860

S391	90.000	18.000	1.20	0	0	2250.00	4100	0.5488
S392	112.500	22.500	1.50	0	0	2812.50	4100	0.6860
S393	100.000	20.000	1.33	0	0	2500.00	4600	0.5435
S394	125.000	25.000	1.67	0	0	3125.00	4600	0.6793
S395	100.000	20.000	1.33	0	0	2500.00	4600	0.5435
S396	125.000	25.000	1.67	0	0	3125.00	4600	0.6793
S397	90.000	18.000	1.20	0	0	2250.00	4600	0.4891
S398	112.500	22.500	1.50	0	0	2812.50	4600	0.6114
S399	90.000	18.000	1.20	0	0	2250.00	4600	0.4891
S400	112.500	22.500	1.50	0	0	2812.50	4600	0.6114
S401	100.000	20.000	1.33	0	0	2500.00	4100	0.6098
S402	125.000	25.000	1.67	0	0	3125.00	4100	0.7622
S403	100.000	20.000	1.33	0	0	2500.00	4100	0.6098
S404	125.000	25.000	1.67	0	0	3125.00	4100	0.7622
S405	90.000	18.000	1.20	0	0	2250.00	4100	0.5488
S406	112.500	22.500	1.50	0	0	2812.50	4100	0.6860
S407	90.000	18.000	1.20	0	0	2250.00	4100	0.5488
S408	112.500	22.500	1.50	0	0	2812.50	4100	0.6860
S409	100.000	20.000	1.33	0	0	2500.00	4600	0.5435
S410	125.000	25.000	1.67	0	0	3125.00	4600	0.6793
S411	100.000	20.000	1.33	0	0	2500.00	4600	0.5435
S412	125.000	25.000	1.67	0	0	3125.00	4600	0.6793
S413	90.000	18.000	1.20	0	0	2250.00	4600	0.4891
S414	112.500	22.500	1.50	0	0	2812.50	4600	0.6114
S415	90.000	18.000	1.20	0	0	2250.00	4600	0.4891
S416	112.500	22.500	1.50	0	0	2812.50	4600	0.6114
S417	100.000	33.333	1.33	0	0	3166.67	4100	0.7724
S418	125.000	41.667	1.67	0	0	3958.33	4100	0.9654
S419	100.000	33.333	1.33	0	0	3166.67	4100	0.7724
S420	125.000	41.667	1.67	0	0	3958.33	4100	0.9654
S421	90.000	30.000	1.20	0	0	2850.00	4100	0.6951
S422	112.500	37.500	1.50	0	0	3562.50	4100	0.8689
S423	90.000	30.000	1.20	0	0	2850.00	4100	0.6951
S424	112.500	37.500	1.50	0	0	3562.50	4100	0.8689
S425	100.000	33.333	1.33	0	0	3166.67	4600	0.6884
S426	125.000	41.667	1.67	0	0	3958.33	4600	0.8605
S427	100.000	33.333	1.33	0	0	3166.67	4600	0.6884
S428	125.000	41.667	1.67	0	0	3958.33	4600	0.8605
S429	90.000	30.000	1.20	0	0	2850.00	4600	0.6196
S430	112.500	37.500	1.50	0	0	3562.50	4600	0.7745
S431	90.000	30.000	1.20	0	0	2850.00	4600	0.6196

S432	112.500	37.500	1.50	0	0	3562.50	4600	0.7745
S433	100.000	33.333	1.33	0	0	3166.67	4100	0.7724
S434	125.000	41.667	1.67	0	0	3958.33	4100	0.9654
S435	100.000	33.333	1.33	0	0	3166.67	4100	0.7724
S436	125.000	41.667	1.67	0	0	3958.33	4100	0.9654
S437	90.000	30.000	1.20	0	0	2850.00	4100	0.6951
S438	112.500	37.500	1.50	0	0	3562.50	4100	0.8689
S439	90.000	30.000	1.20	0	0	2850.00	4100	0.6951
S440	112.500	37.500	1.50	0	0	3562.50	4100	0.8689
S441	100.000	33.333	1.33	0	0	3166.67	4600	0.6884
S442	125.000	41.667	1.67	0	0	3958.33	4600	0.8605
S443	100.000	33.333	1.33	0	0	3166.67	4600	0.6884
S444	125.000	41.667	1.67	0	0	3958.33	4600	0.8605
S445	90.000	30.000	1.20	0	0	2850.00	4600	0.6196
S446	112.500	37.500	1.50	0	0	3562.50	4600	0.7745
S447	90.000	30.000	1.20	0	0	2850.00	4600	0.6196
S448	112.500	37.500	1.50	0	0	3562.50	4600	0.7745
S449	100.000	20.000	1.33	0	0	2500.00	4400	0.5682
S450	125.000	25.000	1.67	0	0	3125.00	4400	0.7102
S451	100.000	20.000	1.33	0	0	2500.00	4400	0.5682
S452	125.000	25.000	1.67	0	0	3125.00	4400	0.7102
S453	90.000	18.000	1.20	0	0	2250.00	4400	0.5114
S454	112.500	22.500	1.50	0	0	2812.50	4400	0.6392
S455	90.000	18.000	1.20	0	0	2250.00	4400	0.5114
S456	112.500	22.500	1.50	0	0	2812.50	4400	0.6392
S457	100.000	20.000	1.33	0	0	2500.00	4900	0.5102
S458	125.000	25.000	1.67	0	0	3125.00	4900	0.6378
S459	100.000	20.000	1.33	0	0	2500.00	4900	0.5102
S460	125.000	25.000	1.67	0	0	3125.00	4900	0.6378
S461	90.000	18.000	1.20	0	0	2250.00	4900	0.4592
S462	112.500	22.500	1.50	0	0	2812.50	4900	0.5740
S463	90.000	18.000	1.20	0	0	2250.00	4900	0.4592
S464	112.500	22.500	1.50	0	0	2812.50	4900	0.5740
S465	100.000	20.000	1.33	0	0	2500.00	4400	0.5682
S466	125.000	25.000	1.67	0	0	3125.00	4400	0.7102
S467	100.000	20.000	1.33	0	0	2500.00	4400	0.5682
S468	125.000	25.000	1.67	0	0	3125.00	4400	0.7102
S469	90.000	18.000	1.20	0	0	2250.00	4400	0.5114
S470	112.500	22.500	1.50	0	0	2812.50	4400	0.6392
S471	90.000	18.000	1.20	0	0	2250.00	4400	0.5114
S472	112.500	22.500	1.50	0	0	2812.50	4400	0.6392

S473	100.000	20.000	1.33	0	0	2500.00	4900	0.5102
S474	125.000	25.000	1.67	0	0	3125.00	4900	0.6378
S475	100.000	20.000	1.33	0	0	2500.00	4900	0.5102
S476	125.000	25.000	1.67	0	0	3125.00	4900	0.6378
S477	90.000	18.000	1.20	0	0	2250.00	4900	0.4592
S478	112.500	22.500	1.50	0	0	2812.50	4900	0.5740
S479	90.000	18.000	1.20	0	0	2250.00	4900	0.4592
S480	112.500	22.500	1.50	0	0	2812.50	4900	0.5740
S481	100.000	33.333	1.33	0	0	3166.67	4400	0.7197
S482	125.000	41.667	1.67	0	0	3958.33	4400	0.8996
S483	100.000	33.333	1.33	0	0	3166.67	4400	0.7197
S484	125.000	41.667	1.67	0	0	3958.33	4400	0.8996
S485	90.000	30.000	1.20	0	0	2850.00	4400	0.6477
S486	112.500	37.500	1.50	0	0	3562.50	4400	0.8097
S487	90.000	30.000	1.20	0	0	2850.00	4400	0.6477
S488	112.500	37.500	1.50	0	0	3562.50	4400	0.8097
S489	100.000	33.333	1.33	0	0	3166.67	4900	0.6463
S490	125.000	41.667	1.67	0	0	3958.33	4900	0.8078
S491	100.000	33.333	1.33	0	0	3166.67	4900	0.6463
S492	125.000	41.667	1.67	0	0	3958.33	4900	0.8078
S493	90.000	30.000	1.20	0	0	2850.00	4900	0.5816
S494	112.500	37.500	1.50	0	0	3562.50	4900	0.7270
S495	90.000	30.000	1.20	0	0	2850.00	4900	0.5816
S496	112.500	37.500	1.50	0	0	3562.50	4900	0.7270
S497	100.000	33.333	1.33	0	0	3166.67	4400	0.7197
S498	125.000	41.667	1.67	0	0	3958.33	4400	0.8996
S499	100.000	33.333	1.33	0	0	3166.67	4400	0.7197
S500	125.000	41.667	1.67	0	0	3958.33	4400	0.8996
S501	90.000	30.000	1.20	0	0	2850.00	4400	0.6477
S502	112.500	37.500	1.50	0	0	3562.50	4400	0.8097
S503	90.000	30.000	1.20	0	0	2850.00	4400	0.6477
S504	112.500	37.500	1.50	0	0	3562.50	4400	0.8097
S505	100.000	33.333	1.33	0	0	3166.67	4900	0.6463
S506	125.000	41.667	1.67	0	0	3958.33	4900	0.8078
S507	100.000	33.333	1.33	0	0	3166.67	4900	0.6463
S508	125.000	41.667	1.67	0	0	3958.33	4900	0.8078
S509	90.000	30.000	1.20	0	0	2850.00	4900	0.5816
S510	112.500	37.500	1.50	0	0	3562.50	4900	0.7270
S511	90.000	30.000	1.20	0	0	2850.00	4900	0.5816
S512	112.500	37.500	1.50	0	0	3562.50	4900	0.7270

Appendix C

Revenue Allocation Model Results for Numerical Example

Table C-1: Revenue Model Results for DMU A

Scenario	DMUA						Eff
	y*	lambdaA	lambdaB	lambdaC	O.F.	Current	
S1	90	1	0	0	9000	9000	1
S2	90	1	0	0	9000	9000	1
S3	90	1	0	0	9000	9000	1
S4	90	1	0	0	9000	9000	1
S5	100	1	0	0	10000	10000	1
S6	100	1	0	0	10000	10000	1
S7	100	1	0	0	10000	10000	1
S8	100	1	0	0	10000	10000	1
S9	90	1	0	0	9000	9000	1
S10	90	1	0	0	9000	9000	1
S11	90	1	0	0	9000	9000	1
S12	90	1	0	0	9000	9000	1
S13	100	1	0	0	10000	10000	1
S14	100	1	0	0	10000	10000	1
S15	100	1	0	0	10000	10000	1
S16	100	1	0	0	10000	10000	1
S17	90	1	0	0	9000	9000	1
S18	90	1	0	0	9000	9000	1
S19	90	1	0	0	9000	9000	1
S20	90	1	0	0	9000	9000	1
S21	100	1	0	0	10000	10000	1
S22	100	1	0	0	10000	10000	1
S23	100	1	0	0	10000	10000	1
S24	100	1	0	0	10000	10000	1
S25	90	1	0	0	9000	9000	1
S26	90	1	0	0	9000	9000	1
S27	90	1	0	0	9000	9000	1
S28	90	1	0	0	9000	9000	1
S29	100	1	0	0	10000	10000	1
S30	100	1	0	0	10000	10000	1

S31	100	1	0	0	10000	10000	1
S32	100	1	0	0	10000	10000	1
S33	90	1	0	0	9000	9000	1
S34	90	1	0	0	9000	9000	1
S35	90	1	0	0	9000	9000	1
S36	90	1	0	0	9000	9000	1
S37	100	1	0	0	10000	10000	1
S38	100	1	0	0	10000	10000	1
S39	100	1	0	0	10000	10000	1
S40	100	1	0	0	10000	10000	1
S41	90	1	0	0	9000	9000	1
S42	90	1	0	0	9000	9000	1
S43	90	1	0	0	9000	9000	1
S44	90	1	0	0	9000	9000	1
S45	100	1	0	0	10000	10000	1
S46	100	1	0	0	10000	10000	1
S47	100	1	0	0	10000	10000	1
S48	100	1	0	0	10000	10000	1
S49	90	1	0	0	9000	9000	1
S50	90	1	0	0	9000	9000	1
S51	90	1	0	0	9000	9000	1
S52	90	1	0	0	9000	9000	1
S53	100	1	0	0	10000	10000	1
S54	100	1	0	0	10000	10000	1
S55	100	1	0	0	10000	10000	1
S56	100	1	0	0	10000	10000	1
S57	90	1	0	0	9000	9000	1
S58	90	1	0	0	9000	9000	1
S59	90	1	0	0	9000	9000	1
S60	90	1	0	0	9000	9000	1
S61	100	1	0	0	10000	10000	1
S62	100	1	0	0	10000	10000	1
S63	100	1	0	0	10000	10000	1
S64	100	1	0	0	10000	10000	1
S65	90	1	0	0	9000	9000	1
S66	90	1	0	0	9000	9000	1
S67	90	1	0	0	9000	9000	1
S68	90	1	0	0	9000	9000	1
S69	100	1	0	0	10000	10000	1
S70	100	1	0	0	10000	10000	1
S71	100	1	0	0	10000	10000	1

S72	100	1	0	0	10000	10000	1
S73	90	1	0	0	9000	9000	1
S74	90	1	0	0	9000	9000	1
S75	90	1	0	0	9000	9000	1
S76	90	1	0	0	9000	9000	1
S77	100	1	0	0	10000	10000	1
S78	100	1	0	0	10000	10000	1
S79	100	1	0	0	10000	10000	1
S80	100	1	0	0	10000	10000	1
S81	90	1	0	0	9000	9000	1
S82	90	1	0	0	9000	9000	1
S83	90	1	0	0	9000	9000	1
S84	90	1	0	0	9000	9000	1
S85	100	1	0	0	10000	10000	1
S86	100	1	0	0	10000	10000	1
S87	100	1	0	0	10000	10000	1
S88	100	1	0	0	10000	10000	1
S89	90	1	0	0	9000	9000	1
S90	90	1	0	0	9000	9000	1
S91	90	1	0	0	9000	9000	1
S92	90	1	0	0	9000	9000	1
S93	100	1	0	0	10000	10000	1
S94	100	1	0	0	10000	10000	1
S95	100	1	0	0	10000	10000	1
S96	100	1	0	0	10000	10000	1
S97	90	1	0	0	9000	9000	1
S98	90	1	0	0	9000	9000	1
S99	90	1	0	0	9000	9000	1
S100	90	1	0	0	9000	9000	1
S101	100	1	0	0	10000	10000	1
S102	100	1	0	0	10000	10000	1
S103	100	1	0	0	10000	10000	1
S104	100	1	0	0	10000	10000	1
S105	90	1	0	0	9000	9000	1
S106	90	1	0	0	9000	9000	1
S107	90	1	0	0	9000	9000	1
S108	90	1	0	0	9000	9000	1
S109	100	1	0	0	10000	10000	1
S110	100	1	0	0	10000	10000	1
S111	100	1	0	0	10000	10000	1
S112	100	1	0	0	10000	10000	1

S113	90	1	0	0	9000	9000	1
S114	90	1	0	0	9000	9000	1
S115	90	1	0	0	9000	9000	1
S116	90	1	0	0	9000	9000	1
S117	100	1	0	0	10000	10000	1
S118	100	1	0	0	10000	10000	1
S119	100	1	0	0	10000	10000	1
S120	100	1	0	0	10000	10000	1
S121	90	1	0	0	9000	9000	1
S122	90	1	0	0	9000	9000	1
S123	90	1	0	0	9000	9000	1
S124	90	1	0	0	9000	9000	1
S125	100	1	0	0	10000	10000	1
S126	100	1	0	0	10000	10000	1
S127	100	1	0	0	10000	10000	1
S128	100	1	0	0	10000	10000	1
S129	90	1	0	0	9000	9000	1
S130	90	1	0	0	9000	9000	1
S131	90	1	0	0	9000	9000	1
S132	90	1	0	0	9000	9000	1
S133	100	1	0	0	10000	10000	1
S134	100	1	0	0	10000	10000	1
S135	100	1	0	0	10000	10000	1
S136	100	1	0	0	10000	10000	1
S137	90	1	0	0	9000	9000	1
S138	90	1	0	0	9000	9000	1
S139	90	1	0	0	9000	9000	1
S140	90	1	0	0	9000	9000	1
S141	100	1	0	0	10000	10000	1
S142	100	1	0	0	10000	10000	1
S143	100	1	0	0	10000	10000	1
S144	100	1	0	0	10000	10000	1
S145	90	1	0	0	9000	9000	1
S146	90	1	0	0	9000	9000	1
S147	90	1	0	0	9000	9000	1
S148	90	1	0	0	9000	9000	1
S149	100	1	0	0	10000	10000	1
S150	100	1	0	0	10000	10000	1
S151	100	1	0	0	10000	10000	1
S152	100	1	0	0	10000	10000	1
S153	90	1	0	0	9000	9000	1

S154	90	1	0	0	9000	9000	1
S155	90	1	0	0	9000	9000	1
S156	90	1	0	0	9000	9000	1
S157	100	1	0	0	10000	10000	1
S158	100	1	0	0	10000	10000	1
S159	100	1	0	0	10000	10000	1
S160	100	1	0	0	10000	10000	1
S161	90	1	0	0	9000	9000	1
S162	90	1	0	0	9000	9000	1
S163	90	1	0	0	9000	9000	1
S164	90	1	0	0	9000	9000	1
S165	100	1	0	0	10000	10000	1
S166	100	1	0	0	10000	10000	1
S167	100	1	0	0	10000	10000	1
S168	100	1	0	0	10000	10000	1
S169	90	1	0	0	9000	9000	1
S170	90	1	0	0	9000	9000	1
S171	90	1	0	0	9000	9000	1
S172	90	1	0	0	9000	9000	1
S173	100	1	0	0	10000	10000	1
S174	100	1	0	0	10000	10000	1
S175	100	1	0	0	10000	10000	1
S176	100	1	0	0	10000	10000	1
S177	90	1	0	0	9000	9000	1
S178	90	1	0	0	9000	9000	1
S179	90	1	0	0	9000	9000	1
S180	90	1	0	0	9000	9000	1
S181	100	1	0	0	10000	10000	1
S182	100	1	0	0	10000	10000	1
S183	100	1	0	0	10000	10000	1
S184	100	1	0	0	10000	10000	1
S185	90	1	0	0	9000	9000	1
S186	90	1	0	0	9000	9000	1
S187	90	1	0	0	9000	9000	1
S188	90	1	0	0	9000	9000	1
S189	100	1	0	0	10000	10000	1
S190	100	1	0	0	10000	10000	1
S191	100	1	0	0	10000	10000	1
S192	100	1	0	0	10000	10000	1
S193	90	1	0	0	9000	9000	1
S194	90	1	0	0	9000	9000	1

S195	90	1	0	0	9000	9000	1
S196	90	1	0	0	9000	9000	1
S197	100	1	0	0	10000	10000	1
S198	100	1	0	0	10000	10000	1
S199	100	1	0	0	10000	10000	1
S200	100	1	0	0	10000	10000	1
S201	90	1	0	0	9000	9000	1
S202	90	1	0	0	9000	9000	1
S203	90	1	0	0	9000	9000	1
S204	90	1	0	0	9000	9000	1
S205	100	1	0	0	10000	10000	1
S206	100	1	0	0	10000	10000	1
S207	100	1	0	0	10000	10000	1
S208	100	1	0	0	10000	10000	1
S209	90	1	0	0	9000	9000	1
S210	90	1	0	0	9000	9000	1
S211	90	1	0	0	9000	9000	1
S212	90	1	0	0	9000	9000	1
S213	100	1	0	0	10000	10000	1
S214	100	1	0	0	10000	10000	1
S215	100	1	0	0	10000	10000	1
S216	100	1	0	0	10000	10000	1
S217	90	1	0	0	9000	9000	1
S218	90	1	0	0	9000	9000	1
S219	90	1	0	0	9000	9000	1
S220	90	1	0	0	9000	9000	1
S221	100	1	0	0	10000	10000	1
S222	100	1	0	0	10000	10000	1
S223	100	1	0	0	10000	10000	1
S224	100	1	0	0	10000	10000	1
S225	90	1	0	0	9000	9000	1
S226	90	1	0	0	9000	9000	1
S227	90	1	0	0	9000	9000	1
S228	90	1	0	0	9000	9000	1
S229	100	1	0	0	10000	10000	1
S230	100	1	0	0	10000	10000	1
S231	100	1	0	0	10000	10000	1
S232	100	1	0	0	10000	10000	1
S233	90	1	0	0	9000	9000	1
S234	90	1	0	0	9000	9000	1
S235	90	1	0	0	9000	9000	1

S236	90	1	0	0	9000	9000	1
S237	100	1	0	0	10000	10000	1
S238	100	1	0	0	10000	10000	1
S239	100	1	0	0	10000	10000	1
S240	100	1	0	0	10000	10000	1
S241	90	1	0	0	9000	9000	1
S242	90	1	0	0	9000	9000	1
S243	90	1	0	0	9000	9000	1
S244	90	1	0	0	9000	9000	1
S245	100	1	0	0	10000	10000	1
S246	100	1	0	0	10000	10000	1
S247	100	1	0	0	10000	10000	1
S248	100	1	0	0	10000	10000	1
S249	90	1	0	0	9000	9000	1
S250	90	1	0	0	9000	9000	1
S251	90	1	0	0	9000	9000	1
S252	90	1	0	0	9000	9000	1
S253	100	1	0	0	10000	10000	1
S254	100	1	0	0	10000	10000	1
S255	100	1	0	0	10000	10000	1
S256	100	1	0	0	10000	10000	1
S257	90	1	0	0	9000	9000	1
S258	90	1	0	0	9000	9000	1
S259	90	1	0	0	9000	9000	1
S260	90	1	0	0	9000	9000	1
S261	100	1	0	0	10000	10000	1
S262	100	1	0	0	10000	10000	1
S263	100	1	0	0	10000	10000	1
S264	100	1	0	0	10000	10000	1
S265	90	1	0	0	9000	9000	1
S266	90	1	0	0	9000	9000	1
S267	90	1	0	0	9000	9000	1
S268	90	1	0	0	9000	9000	1
S269	100	1	0	0	10000	10000	1
S270	100	1	0	0	10000	10000	1
S271	100	1	0	0	10000	10000	1
S272	100	1	0	0	10000	10000	1
S273	90	1	0	0	9000	9000	1
S274	90	1	0	0	9000	9000	1
S275	90	1	0	0	9000	9000	1
S276	90	1	0	0	9000	9000	1

S277	100	1	0	0	10000	10000	1
S278	100	1	0	0	10000	10000	1
S279	100	1	0	0	10000	10000	1
S280	100	1	0	0	10000	10000	1
S281	90	1	0	0	9000	9000	1
S282	90	1	0	0	9000	9000	1
S283	90	1	0	0	9000	9000	1
S284	90	1	0	0	9000	9000	1
S285	100	1	0	0	10000	10000	1
S286	100	1	0	0	10000	10000	1
S287	100	1	0	0	10000	10000	1
S288	100	1	0	0	10000	10000	1
S289	90	1	0	0	9000	9000	1
S290	90	1	0	0	9000	9000	1
S291	90	1	0	0	9000	9000	1
S292	90	1	0	0	9000	9000	1
S293	100	1	0	0	10000	10000	1
S294	100	1	0	0	10000	10000	1
S295	100	1	0	0	10000	10000	1
S296	100	1	0	0	10000	10000	1
S297	90	1	0	0	9000	9000	1
S298	90	1	0	0	9000	9000	1
S299	90	1	0	0	9000	9000	1
S300	90	1	0	0	9000	9000	1
S301	100	1	0	0	10000	10000	1
S302	100	1	0	0	10000	10000	1
S303	100	1	0	0	10000	10000	1
S304	100	1	0	0	10000	10000	1
S305	90	1	0	0	9000	9000	1
S306	90	1	0	0	9000	9000	1
S307	90	1	0	0	9000	9000	1
S308	90	1	0	0	9000	9000	1
S309	100	1	0	0	10000	10000	1
S310	100	1	0	0	10000	10000	1
S311	100	1	0	0	10000	10000	1
S312	100	1	0	0	10000	10000	1
S313	90	1	0	0	9000	9000	1
S314	90	1	0	0	9000	9000	1
S315	90	1	0	0	9000	9000	1
S316	90	1	0	0	9000	9000	1
S317	100	1	0	0	10000	10000	1

S318	100	1	0	0	10000	10000	1
S319	100	1	0	0	10000	10000	1
S320	100	1	0	0	10000	10000	1
S321	90	1	0	0	9000	9000	1
S322	90	1	0	0	9000	9000	1
S323	90	1	0	0	9000	9000	1
S324	90	1	0	0	9000	9000	1
S325	100	1	0	0	10000	10000	1
S326	100	1	0	0	10000	10000	1
S327	100	1	0	0	10000	10000	1
S328	100	1	0	0	10000	10000	1
S329	90	1	0	0	9000	9000	1
S330	90	1	0	0	9000	9000	1
S331	90	1	0	0	9000	9000	1
S332	90	1	0	0	9000	9000	1
S333	100	1	0	0	10000	10000	1
S334	100	1	0	0	10000	10000	1
S335	100	1	0	0	10000	10000	1
S336	100	1	0	0	10000	10000	1
S337	90	1	0	0	9000	9000	1
S338	90	1	0	0	9000	9000	1
S339	90	1	0	0	9000	9000	1
S340	90	1	0	0	9000	9000	1
S341	100	1	0	0	10000	10000	1
S342	100	1	0	0	10000	10000	1
S343	100	1	0	0	10000	10000	1
S344	100	1	0	0	10000	10000	1
S345	90	1	0	0	9000	9000	1
S346	90	1	0	0	9000	9000	1
S347	90	1	0	0	9000	9000	1
S348	90	1	0	0	9000	9000	1
S349	100	1	0	0	10000	10000	1
S350	100	1	0	0	10000	10000	1
S351	100	1	0	0	10000	10000	1
S352	100	1	0	0	10000	10000	1
S353	90	1	0	0	9000	9000	1
S354	90	1	0	0	9000	9000	1
S355	90	1	0	0	9000	9000	1
S356	90	1	0	0	9000	9000	1
S357	100	1	0	0	10000	10000	1
S358	100	1	0	0	10000	10000	1

S359	100	1	0	0	10000	10000	1
S360	100	1	0	0	10000	10000	1
S361	90	1	0	0	9000	9000	1
S362	90	1	0	0	9000	9000	1
S363	90	1	0	0	9000	9000	1
S364	90	1	0	0	9000	9000	1
S365	100	1	0	0	10000	10000	1
S366	100	1	0	0	10000	10000	1
S367	100	1	0	0	10000	10000	1
S368	100	1	0	0	10000	10000	1
S369	90	1	0	0	9000	9000	1
S370	90	1	0	0	9000	9000	1
S371	90	1	0	0	9000	9000	1
S372	90	1	0	0	9000	9000	1
S373	100	1	0	0	10000	10000	1
S374	100	1	0	0	10000	10000	1
S375	100	1	0	0	10000	10000	1
S376	100	1	0	0	10000	10000	1
S377	90	1	0	0	9000	9000	1
S378	90	1	0	0	9000	9000	1
S379	90	1	0	0	9000	9000	1
S380	90	1	0	0	9000	9000	1
S381	100	1	0	0	10000	10000	1
S382	100	1	0	0	10000	10000	1
S383	100	1	0	0	10000	10000	1
S384	100	1	0	0	10000	10000	1
S385	90	1	0	0	9000	9000	1
S386	90	1	0	0	9000	9000	1
S387	90	1	0	0	9000	9000	1
S388	90	1	0	0	9000	9000	1
S389	100	1	0	0	10000	10000	1
S390	100	1	0	0	10000	10000	1
S391	100	1	0	0	10000	10000	1
S392	100	1	0	0	10000	10000	1
S393	90	1	0	0	9000	9000	1
S394	90	1	0	0	9000	9000	1
S395	90	1	0	0	9000	9000	1
S396	90	1	0	0	9000	9000	1
S397	100	1	0	0	10000	10000	1
S398	100	1	0	0	10000	10000	1
S399	100	1	0	0	10000	10000	1

S400	100	1	0	0	10000	10000	1
S401	90	1	0	0	9000	9000	1
S402	90	1	0	0	9000	9000	1
S403	90	1	0	0	9000	9000	1
S404	90	1	0	0	9000	9000	1
S405	100	1	0	0	10000	10000	1
S406	100	1	0	0	10000	10000	1
S407	100	1	0	0	10000	10000	1
S408	100	1	0	0	10000	10000	1
S409	90	1	0	0	9000	9000	1
S410	90	1	0	0	9000	9000	1
S411	90	1	0	0	9000	9000	1
S412	90	1	0	0	9000	9000	1
S413	100	1	0	0	10000	10000	1
S414	100	1	0	0	10000	10000	1
S415	100	1	0	0	10000	10000	1
S416	100	1	0	0	10000	10000	1
S417	90	1	0	0	9000	9000	1
S418	90	1	0	0	9000	9000	1
S419	90	1	0	0	9000	9000	1
S420	90	1	0	0	9000	9000	1
S421	100	1	0	0	10000	10000	1
S422	100	1	0	0	10000	10000	1
S423	100	1	0	0	10000	10000	1
S424	100	1	0	0	10000	10000	1
S425	90	1	0	0	9000	9000	1
S426	90	1	0	0	9000	9000	1
S427	90	1	0	0	9000	9000	1
S428	90	1	0	0	9000	9000	1
S429	100	1	0	0	10000	10000	1
S430	100	1	0	0	10000	10000	1
S431	100	1	0	0	10000	10000	1
S432	100	1	0	0	10000	10000	1
S433	90	1	0	0	9000	9000	1
S434	90	1	0	0	9000	9000	1
S435	90	1	0	0	9000	9000	1
S436	90	1	0	0	9000	9000	1
S437	100	1	0	0	10000	10000	1
S438	100	1	0	0	10000	10000	1
S439	100	1	0	0	10000	10000	1
S440	100	1	0	0	10000	10000	1

S441	90	1	0	0	9000	9000	1
S442	90	1	0	0	9000	9000	1
S443	90	1	0	0	9000	9000	1
S444	90	1	0	0	9000	9000	1
S445	100	1	0	0	10000	10000	1
S446	100	1	0	0	10000	10000	1
S447	100	1	0	0	10000	10000	1
S448	100	1	0	0	10000	10000	1
S449	90	1	0	0	9000	9000	1
S450	90	1	0	0	9000	9000	1
S451	90	1	0	0	9000	9000	1
S452	90	1	0	0	9000	9000	1
S453	100	1	0	0	10000	10000	1
S454	100	1	0	0	10000	10000	1
S455	100	1	0	0	10000	10000	1
S456	100	1	0	0	10000	10000	1
S457	90	1	0	0	9000	9000	1
S458	90	1	0	0	9000	9000	1
S459	90	1	0	0	9000	9000	1
S460	90	1	0	0	9000	9000	1
S461	100	1	0	0	10000	10000	1
S462	100	1	0	0	10000	10000	1
S463	100	1	0	0	10000	10000	1
S464	100	1	0	0	10000	10000	1
S465	90	1	0	0	9000	9000	1
S466	90	1	0	0	9000	9000	1
S467	90	1	0	0	9000	9000	1
S468	90	1	0	0	9000	9000	1
S469	100	1	0	0	10000	10000	1
S470	100	1	0	0	10000	10000	1
S471	100	1	0	0	10000	10000	1
S472	100	1	0	0	10000	10000	1
S473	90	1	0	0	9000	9000	1
S474	90	1	0	0	9000	9000	1
S475	90	1	0	0	9000	9000	1
S476	90	1	0	0	9000	9000	1
S477	100	1	0	0	10000	10000	1
S478	100	1	0	0	10000	10000	1
S479	100	1	0	0	10000	10000	1
S480	100	1	0	0	10000	10000	1
S481	90	1	0	0	9000	9000	1

S482	90	1	0	0	9000	9000	1
S483	90	1	0	0	9000	9000	1
S484	90	1	0	0	9000	9000	1
S485	100	1	0	0	10000	10000	1
S486	100	1	0	0	10000	10000	1
S487	100	1	0	0	10000	10000	1
S488	100	1	0	0	10000	10000	1
S489	90	1	0	0	9000	9000	1
S490	90	1	0	0	9000	9000	1
S491	90	1	0	0	9000	9000	1
S492	90	1	0	0	9000	9000	1
S493	100	1	0	0	10000	10000	1
S494	100	1	0	0	10000	10000	1
S495	100	1	0	0	10000	10000	1
S496	100	1	0	0	10000	10000	1
S497	90	1	0	0	9000	9000	1
S498	90	1	0	0	9000	9000	1
S499	90	1	0	0	9000	9000	1
S500	90	1	0	0	9000	9000	1
S501	100	1	0	0	10000	10000	1
S502	100	1	0	0	10000	10000	1
S503	100	1	0	0	10000	10000	1
S504	100	1	0	0	10000	10000	1
S505	90	1	0	0	9000	9000	1
S506	90	1	0	0	9000	9000	1
S507	90	1	0	0	9000	9000	1
S508	90	1	0	0	9000	9000	1
S509	100	1	0	0	10000	10000	1
S510	100	1	0	0	10000	10000	1
S511	100	1	0	0	10000	10000	1
S512	100	1	0	0	10000	10000	1

Table C-2: Revenue Model Results for DMU B

Scenario	y*	lambdaA	lambdaB	DMUB			Eff
				lambdaC	O.F.	Current	
S1	70	0	1	0	10500	10500	1
S2	70	0	1	0	10500	10500	1
S3	80	0	1	0	12000	12000	1
S4	80	0	1	0	12000	12000	1
S5	70	0	1	0	10500	10500	1

S6	70	0	1	0	10500	10500	1
S7	80	0	1	0	12000	12000	1
S8	80	0	1	0	12000	12000	1
S9	70	0	1	0	10500	10500	1
S10	70	0	1	0	10500	10500	1
S11	80	0	1	0	12000	12000	1
S12	80	0	1	0	12000	12000	1
S13	70	0	1	0	10500	10500	1
S14	70	0	1	0	10500	10500	1
S15	80	0	1	0	12000	12000	1
S16	80	0	1	0	12000	12000	1
S17	70	0	1	0	10500	10500	1
S18	70	0	1	0	10500	10500	1
S19	80	0	1	0	12000	12000	1
S20	80	0	1	0	12000	12000	1
S21	70	0	1	0	10500	10500	1
S22	70	0	1	0	10500	10500	1
S23	80	0	1	0	12000	12000	1
S24	80	0	1	0	12000	12000	1
S25	70	0	1	0	10500	10500	1
S26	70	0	1	0	10500	10500	1
S27	80	0	1	0	12000	12000	1
S28	80	0	1	0	12000	12000	1
S29	70	0	1	0	10500	10500	1
S30	70	0	1	0	10500	10500	1
S31	80	0	1	0	12000	12000	1
S32	80	0	1	0	12000	12000	1
S33	70	0	1	0	10500	10500	1
S34	70	0	1	0	10500	10500	1
S35	80	0	1	0	12000	12000	1
S36	80	0	1	0	12000	12000	1
S37	70	0	1	0	10500	10500	1
S38	70	0	1	0	10500	10500	1
S39	80	0	1	0	12000	12000	1
S40	80	0	1	0	12000	12000	1
S41	70	0	1	0	10500	10500	1
S42	70	0	1	0	10500	10500	1
S43	80	0	1	0	12000	12000	1
S44	80	0	1	0	12000	12000	1
S45	70	0	1	0	10500	10500	1
S46	70	0	1	0	10500	10500	1

S47	80	0	1	0	12000	12000	1
S48	80	0	1	0	12000	12000	1
S49	70	0	1	0	10500	10500	1
S50	70	0	1	0	10500	10500	1
S51	80	0	1	0	12000	12000	1
S52	80	0	1	0	12000	12000	1
S53	70	0	1	0	10500	10500	1
S54	70	0	1	0	10500	10500	1
S55	80	0	1	0	12000	12000	1
S56	80	0	1	0	12000	12000	1
S57	70	0	1	0	10500	10500	1
S58	70	0	1	0	10500	10500	1
S59	80	0	1	0	12000	12000	1
S60	80	0	1	0	12000	12000	1
S61	70	0	1	0	10500	10500	1
S62	70	0	1	0	10500	10500	1
S63	80	0	1	0	12000	12000	1
S64	80	0	1	0	12000	12000	1
S65	70	0	1	0	10500	10500	1
S66	70	0	1	0	10500	10500	1
S67	80	0	1	0	12000	12000	1
S68	80	0	1	0	12000	12000	1
S69	70	0	1	0	10500	10500	1
S70	70	0	1	0	10500	10500	1
S71	80	0	1	0	12000	12000	1
S72	80	0	1	0	12000	12000	1
S73	70	0	1	0	10500	10500	1
S74	70	0	1	0	10500	10500	1
S75	80	0	1	0	12000	12000	1
S76	80	0	1	0	12000	12000	1
S77	70	0	1	0	10500	10500	1
S78	70	0	1	0	10500	10500	1
S79	80	0	1	0	12000	12000	1
S80	80	0	1	0	12000	12000	1
S81	70	0	1	0	10500	10500	1
S82	70	0	1	0	10500	10500	1
S83	80	0	1	0	12000	12000	1
S84	80	0	1	0	12000	12000	1
S85	70	0	1	0	10500	10500	1
S86	70	0	1	0	10500	10500	1
S87	80	0	1	0	12000	12000	1

S88	80	0	1	0	12000	12000	1
S89	70	0	1	0	10500	10500	1
S90	70	0	1	0	10500	10500	1
S91	80	0	1	0	12000	12000	1
S92	80	0	1	0	12000	12000	1
S93	70	0	1	0	10500	10500	1
S94	70	0	1	0	10500	10500	1
S95	80	0	1	0	12000	12000	1
S96	80	0	1	0	12000	12000	1
S97	70	0	1	0	10500	10500	1
S98	70	0	1	0	10500	10500	1
S99	80	0	1	0	12000	12000	1
S100	80	0	1	0	12000	12000	1
S101	70	0	1	0	10500	10500	1
S102	70	0	1	0	10500	10500	1
S103	80	0	1	0	12000	12000	1
S104	80	0	1	0	12000	12000	1
S105	70	0	1	0	10500	10500	1
S106	70	0	1	0	10500	10500	1
S107	80	0	1	0	12000	12000	1
S108	80	0	1	0	12000	12000	1
S109	70	0	1	0	10500	10500	1
S110	70	0	1	0	10500	10500	1
S111	80	0	1	0	12000	12000	1
S112	80	0	1	0	12000	12000	1
S113	70	0	1	0	10500	10500	1
S114	70	0	1	0	10500	10500	1
S115	80	0	1	0	12000	12000	1
S116	80	0	1	0	12000	12000	1
S117	70	0	1	0	10500	10500	1
S118	70	0	1	0	10500	10500	1
S119	80	0	1	0	12000	12000	1
S120	80	0	1	0	12000	12000	1
S121	70	0	1	0	10500	10500	1
S122	70	0	1	0	10500	10500	1
S123	80	0	1	0	12000	12000	1
S124	80	0	1	0	12000	12000	1
S125	70	0	1	0	10500	10500	1
S126	70	0	1	0	10500	10500	1
S127	80	0	1	0	12000	12000	1
S128	80	0	1	0	12000	12000	1

S129	70	0	1	0	10500	10500	1
S130	75	0	0	1	11250	10500	0.933333
S131	80	0	1	0	12000	12000	1
S132	80	0	1	0	12000	12000	1
S133	70	0	1	0	10500	10500	1
S134	75	0	0	1	11250	10500	0.933333
S135	80	0	1	0	12000	12000	1
S136	80	0	1	0	12000	12000	1
S137	70	0	1	0	10500	10500	1
S138	75	0	0	1	11250	10500	0.933333
S139	80	0	1	0	12000	12000	1
S140	80	0	1	0	12000	12000	1
S141	70	0	1	0	10500	10500	1
S142	75	0	0	1	11250	10500	0.933333
S143	80	0	1	0	12000	12000	1
S144	80	0	1	0	12000	12000	1
S145	70	0	1	0	10500	10500	1
S146	75	0	0	1	11250	10500	0.933333
S147	80	0	1	0	12000	12000	1
S148	80	0	1	0	12000	12000	1
S149	70	0	1	0	10500	10500	1
S150	75	0	0	1	11250	10500	0.933333
S151	80	0	1	0	12000	12000	1
S152	80	0	1	0	12000	12000	1
S153	70	0	1	0	10500	10500	1
S154	75	0	0	1	11250	10500	0.933333
S155	80	0	1	0	12000	12000	1
S156	80	0	1	0	12000	12000	1
S157	70	0	1	0	10500	10500	1
S158	75	0	0	1	11250	10500	0.933333
S159	80	0	1	0	12000	12000	1
S160	80	0	1	0	12000	12000	1
S161	70	0	1	0	10500	10500	1
S162	75	0	0	1	11250	10500	0.933333
S163	80	0	1	0	12000	12000	1
S164	80	0	1	0	12000	12000	1
S165	70	0	1	0	10500	10500	1
S166	75	0	0	1	11250	10500	0.933333
S167	80	0	1	0	12000	12000	1
S168	80	0	1	0	12000	12000	1
S169	70	0	1	0	10500	10500	1

S170	75	0	0	1	11250	10500	0.933333
S171	80	0	1	0	12000	12000	1
S172	80	0	1	0	12000	12000	1
S173	70	0	1	0	10500	10500	1
S174	75	0	0	1	11250	10500	0.933333
S175	80	0	1	0	12000	12000	1
S176	80	0	1	0	12000	12000	1
S177	70	0	1	0	10500	10500	1
S178	75	0	0	1	11250	10500	0.933333
S179	80	0	1	0	12000	12000	1
S180	80	0	1	0	12000	12000	1
S181	70	0	1	0	10500	10500	1
S182	75	0	0	1	11250	10500	0.933333
S183	80	0	1	0	12000	12000	1
S184	80	0	1	0	12000	12000	1
S185	70	0	1	0	10500	10500	1
S186	75	0	0	1	11250	10500	0.933333
S187	80	0	1	0	12000	12000	1
S188	80	0	1	0	12000	12000	1
S189	70	0	1	0	10500	10500	1
S190	75	0	0	1	11250	10500	0.933333
S191	80	0	1	0	12000	12000	1
S192	80	0	1	0	12000	12000	1
S193	70	0	1	0	10500	10500	1
S194	70	0	1	0	10500	10500	1
S195	80	0	1	0	12000	12000	1
S196	80	0	1	0	12000	12000	1
S197	70	0	1	0	10500	10500	1
S198	70	0	1	0	10500	10500	1
S199	80	0	1	0	12000	12000	1
S200	80	0	1	0	12000	12000	1
S201	70	0	1	0	10500	10500	1
S202	70	0	1	0	10500	10500	1
S203	80	0	1	0	12000	12000	1
S204	80	0	1	0	12000	12000	1
S205	70	0	1	0	10500	10500	1
S206	70	0	1	0	10500	10500	1
S207	80	0	1	0	12000	12000	1
S208	80	0	1	0	12000	12000	1
S209	70	0	1	0	10500	10500	1
S210	70	0	1	0	10500	10500	1

S211	80	0	1	0	12000	12000	1
S212	80	0	1	0	12000	12000	1
S213	70	0	1	0	10500	10500	1
S214	70	0	1	0	10500	10500	1
S215	80	0	1	0	12000	12000	1
S216	80	0	1	0	12000	12000	1
S217	70	0	1	0	10500	10500	1
S218	70	0	1	0	10500	10500	1
S219	80	0	1	0	12000	12000	1
S220	80	0	1	0	12000	12000	1
S221	70	0	1	0	10500	10500	1
S222	70	0	1	0	10500	10500	1
S223	80	0	1	0	12000	12000	1
S224	80	0	1	0	12000	12000	1
S225	70	0	1	0	10500	10500	1
S226	70	0	1	0	10500	10500	1
S227	80	0	1	0	12000	12000	1
S228	80	0	1	0	12000	12000	1
S229	70	0	1	0	10500	10500	1
S230	70	0	1	0	10500	10500	1
S231	80	0	1	0	12000	12000	1
S232	80	0	1	0	12000	12000	1
S233	70	0	1	0	10500	10500	1
S234	70	0	1	0	10500	10500	1
S235	80	0	1	0	12000	12000	1
S236	80	0	1	0	12000	12000	1
S237	70	0	1	0	10500	10500	1
S238	70	0	1	0	10500	10500	1
S239	80	0	1	0	12000	12000	1
S240	80	0	1	0	12000	12000	1
S241	70	0	1	0	10500	10500	1
S242	70	0	1	0	10500	10500	1
S243	80	0	1	0	12000	12000	1
S244	80	0	1	0	12000	12000	1
S245	70	0	1	0	10500	10500	1
S246	70	0	1	0	10500	10500	1
S247	80	0	1	0	12000	12000	1
S248	80	0	1	0	12000	12000	1
S249	70	0	1	0	10500	10500	1
S250	70	0	1	0	10500	10500	1
S251	80	0	1	0	12000	12000	1

S252	80	0	1	0	12000	12000	1
S253	70	0	1	0	10500	10500	1
S254	70	0	1	0	10500	10500	1
S255	80	0	1	0	12000	12000	1
S256	80	0	1	0	12000	12000	1
S257	70	0	1	0	10500	10500	1
S258	70	0	1	0	10500	10500	1
S259	80	0	1	0	12000	12000	1
S260	80	0	1	0	12000	12000	1
S261	70	0	1	0	10500	10500	1
S262	70	0	1	0	10500	10500	1
S263	80	0	1	0	12000	12000	1
S264	80	0	1	0	12000	12000	1
S265	70	0	1	0	10500	10500	1
S266	70	0	1	0	10500	10500	1
S267	80	0	1	0	12000	12000	1
S268	80	0	1	0	12000	12000	1
S269	70	0	1	0	10500	10500	1
S270	70	0	1	0	10500	10500	1
S271	80	0	1	0	12000	12000	1
S272	80	0	1	0	12000	12000	1
S273	70	0	1	0	10500	10500	1
S274	70	0	1	0	10500	10500	1
S275	80	0	1	0	12000	12000	1
S276	80	0	1	0	12000	12000	1
S277	70	0	1	0	10500	10500	1
S278	70	0	1	0	10500	10500	1
S279	80	0	1	0	12000	12000	1
S280	80	0	1	0	12000	12000	1
S281	70	0	1	0	10500	10500	1
S282	70	0	1	0	10500	10500	1
S283	80	0	1	0	12000	12000	1
S284	80	0	1	0	12000	12000	1
S285	70	0	1	0	10500	10500	1
S286	70	0	1	0	10500	10500	1
S287	80	0	1	0	12000	12000	1
S288	80	0	1	0	12000	12000	1
S289	70	0	1	0	10500	10500	1
S290	70	0	1	0	10500	10500	1
S291	80	0	1	0	12000	12000	1
S292	80	0	1	0	12000	12000	1

S293	70	0	1	0	10500	10500	1
S294	70	0	1	0	10500	10500	1
S295	80	0	1	0	12000	12000	1
S296	80	0	1	0	12000	12000	1
S297	70	0	1	0	10500	10500	1
S298	70	0	1	0	10500	10500	1
S299	80	0	1	0	12000	12000	1
S300	80	0	1	0	12000	12000	1
S301	70	0	1	0	10500	10500	1
S302	70	0	1	0	10500	10500	1
S303	80	0	1	0	12000	12000	1
S304	80	0	1	0	12000	12000	1
S305	70	0	1	0	10500	10500	1
S306	70	0	1	0	10500	10500	1
S307	80	0	1	0	12000	12000	1
S308	80	0	1	0	12000	12000	1
S309	70	0	1	0	10500	10500	1
S310	70	0	1	0	10500	10500	1
S311	80	0	1	0	12000	12000	1
S312	80	0	1	0	12000	12000	1
S313	70	0	1	0	10500	10500	1
S314	70	0	1	0	10500	10500	1
S315	80	0	1	0	12000	12000	1
S316	80	0	1	0	12000	12000	1
S317	70	0	1	0	10500	10500	1
S318	70	0	1	0	10500	10500	1
S319	80	0	1	0	12000	12000	1
S320	80	0	1	0	12000	12000	1
S321	70	0	1	0	10500	10500	1
S322	70	0	1	0	10500	10500	1
S323	80	0	1	0	12000	12000	1
S324	80	0	1	0	12000	12000	1
S325	70	0	1	0	10500	10500	1
S326	70	0	1	0	10500	10500	1
S327	80	0	1	0	12000	12000	1
S328	80	0	1	0	12000	12000	1
S329	70	0	1	0	10500	10500	1
S330	70	0	1	0	10500	10500	1
S331	80	0	1	0	12000	12000	1
S332	80	0	1	0	12000	12000	1
S333	70	0	1	0	10500	10500	1

S334	70	0	1	0	10500	10500	1
S335	80	0	1	0	12000	12000	1
S336	80	0	1	0	12000	12000	1
S337	70	0	1	0	10500	10500	1
S338	70	0	1	0	10500	10500	1
S339	80	0	1	0	12000	12000	1
S340	80	0	1	0	12000	12000	1
S341	70	0	1	0	10500	10500	1
S342	70	0	1	0	10500	10500	1
S343	80	0	1	0	12000	12000	1
S344	80	0	1	0	12000	12000	1
S345	70	0	1	0	10500	10500	1
S346	70	0	1	0	10500	10500	1
S347	80	0	1	0	12000	12000	1
S348	80	0	1	0	12000	12000	1
S349	70	0	1	0	10500	10500	1
S350	70	0	1	0	10500	10500	1
S351	80	0	1	0	12000	12000	1
S352	80	0	1	0	12000	12000	1
S353	70	0	1	0	10500	10500	1
S354	70	0	1	0	10500	10500	1
S355	80	0	1	0	12000	12000	1
S356	80	0	1	0	12000	12000	1
S357	70	0	1	0	10500	10500	1
S358	70	0	1	0	10500	10500	1
S359	80	0	1	0	12000	12000	1
S360	80	0	1	0	12000	12000	1
S361	70	0	1	0	10500	10500	1
S362	70	0	1	0	10500	10500	1
S363	80	0	1	0	12000	12000	1
S364	80	0	1	0	12000	12000	1
S365	70	0	1	0	10500	10500	1
S366	70	0	1	0	10500	10500	1
S367	80	0	1	0	12000	12000	1
S368	80	0	1	0	12000	12000	1
S369	70	0	1	0	10500	10500	1
S370	70	0	1	0	10500	10500	1
S371	80	0	1	0	12000	12000	1
S372	80	0	1	0	12000	12000	1
S373	70	0	1	0	10500	10500	1
S374	70	0	1	0	10500	10500	1

S375	80	0	1	0	12000	12000	1
S376	80	0	1	0	12000	12000	1
S377	70	0	1	0	10500	10500	1
S378	70	0	1	0	10500	10500	1
S379	80	0	1	0	12000	12000	1
S380	80	0	1	0	12000	12000	1
S381	70	0	1	0	10500	10500	1
S382	70	0	1	0	10500	10500	1
S383	80	0	1	0	12000	12000	1
S384	80	0	1	0	12000	12000	1
S385	70	0	1	0	10500	10500	1
S386	75	0	0	1	11250	10500	0.933333
S387	80	0	1	0	12000	12000	1
S388	80	0	1	0	12000	12000	1
S389	70	0	1	0	10500	10500	1
S390	75	0	0	1	11250	10500	0.933333
S391	80	0	1	0	12000	12000	1
S392	80	0	1	0	12000	12000	1
S393	70	0	1	0	10500	10500	1
S394	75	0	0	1	11250	10500	0.933333
S395	80	0	1	0	12000	12000	1
S396	80	0	1	0	12000	12000	1
S397	70	0	1	0	10500	10500	1
S398	75	0	0	1	11250	10500	0.933333
S399	80	0	1	0	12000	12000	1
S400	80	0	1	0	12000	12000	1
S401	70	0	1	0	10500	10500	1
S402	75	0	0	1	11250	10500	0.933333
S403	80	0	1	0	12000	12000	1
S404	80	0	1	0	12000	12000	1
S405	70	0	1	0	10500	10500	1
S406	75	0	0	1	11250	10500	0.933333
S407	80	0	1	0	12000	12000	1
S408	80	0	1	0	12000	12000	1
S409	70	0	1	0	10500	10500	1
S410	75	0	0	1	11250	10500	0.933333
S411	80	0	1	0	12000	12000	1
S412	80	0	1	0	12000	12000	1
S413	70	0	1	0	10500	10500	1
S414	75	0	0	1	11250	10500	0.933333
S415	80	0	1	0	12000	12000	1

S416	80	0	1	0	12000	12000	1
S417	70	0	1	0	10500	10500	1
S418	75	0	0	1	11250	10500	0.933333
S419	80	0	1	0	12000	12000	1
S420	80	0	1	0	12000	12000	1
S421	70	0	1	0	10500	10500	1
S422	75	0	0	1	11250	10500	0.933333
S423	80	0	1	0	12000	12000	1
S424	80	0	1	0	12000	12000	1
S425	70	0	1	0	10500	10500	1
S426	75	0	0	1	11250	10500	0.933333
S427	80	0	1	0	12000	12000	1
S428	80	0	1	0	12000	12000	1
S429	70	0	1	0	10500	10500	1
S430	75	0	0	1	11250	10500	0.933333
S431	80	0	1	0	12000	12000	1
S432	80	0	1	0	12000	12000	1
S433	70	0	1	0	10500	10500	1
S434	75	0	0	1	11250	10500	0.933333
S435	80	0	1	0	12000	12000	1
S436	80	0	1	0	12000	12000	1
S437	70	0	1	0	10500	10500	1
S438	75	0	0	1	11250	10500	0.933333
S439	80	0	1	0	12000	12000	1
S440	80	0	1	0	12000	12000	1
S441	70	0	1	0	10500	10500	1
S442	75	0	0	1	11250	10500	0.933333
S443	80	0	1	0	12000	12000	1
S444	80	0	1	0	12000	12000	1
S445	70	0	1	0	10500	10500	1
S446	75	0	0	1	11250	10500	0.933333
S447	80	0	1	0	12000	12000	1
S448	80	0	1	0	12000	12000	1
S449	70	0	1	0	10500	10500	1
S450	70	0	1	0	10500	10500	1
S451	80	0	1	0	12000	12000	1
S452	80	0	1	0	12000	12000	1
S453	70	0	1	0	10500	10500	1
S454	70	0	1	0	10500	10500	1
S455	80	0	1	0	12000	12000	1
S456	80	0	1	0	12000	12000	1

S457	70	0	1	0	10500	10500	1
S458	70	0	1	0	10500	10500	1
S459	80	0	1	0	12000	12000	1
S460	80	0	1	0	12000	12000	1
S461	70	0	1	0	10500	10500	1
S462	70	0	1	0	10500	10500	1
S463	80	0	1	0	12000	12000	1
S464	80	0	1	0	12000	12000	1
S465	70	0	1	0	10500	10500	1
S466	70	0	1	0	10500	10500	1
S467	80	0	1	0	12000	12000	1
S468	80	0	1	0	12000	12000	1
S469	70	0	1	0	10500	10500	1
S470	70	0	1	0	10500	10500	1
S471	80	0	1	0	12000	12000	1
S472	80	0	1	0	12000	12000	1
S473	70	0	1	0	10500	10500	1
S474	70	0	1	0	10500	10500	1
S475	80	0	1	0	12000	12000	1
S476	80	0	1	0	12000	12000	1
S477	70	0	1	0	10500	10500	1
S478	70	0	1	0	10500	10500	1
S479	80	0	1	0	12000	12000	1
S480	80	0	1	0	12000	12000	1
S481	70	0	1	0	10500	10500	1
S482	70	0	1	0	10500	10500	1
S483	80	0	1	0	12000	12000	1
S484	80	0	1	0	12000	12000	1
S485	70	0	1	0	10500	10500	1
S486	70	0	1	0	10500	10500	1
S487	80	0	1	0	12000	12000	1
S488	80	0	1	0	12000	12000	1
S489	70	0	1	0	10500	10500	1
S490	70	0	1	0	10500	10500	1
S491	80	0	1	0	12000	12000	1
S492	80	0	1	0	12000	12000	1
S493	70	0	1	0	10500	10500	1
S494	70	0	1	0	10500	10500	1
S495	80	0	1	0	12000	12000	1
S496	80	0	1	0	12000	12000	1
S497	70	0	1	0	10500	10500	1

S498	70	0	1	0	10500	10500	1
S499	80	0	1	0	12000	12000	1
S500	80	0	1	0	12000	12000	1
S501	70	0	1	0	10500	10500	1
S502	70	0	1	0	10500	10500	1
S503	80	0	1	0	12000	12000	1
S504	80	0	1	0	12000	12000	1
S505	70	0	1	0	10500	10500	1
S506	70	0	1	0	10500	10500	1
S507	80	0	1	0	12000	12000	1
S508	80	0	1	0	12000	12000	1
S509	70	0	1	0	10500	10500	1
S510	70	0	1	0	10500	10500	1
S511	80	0	1	0	12000	12000	1
S512	80	0	1	0	12000	12000	1

Table C-3: Revenue Model Results for DMU C

Scenario	y*	DMUC			O.F.	Current	Eff
		lambdaA	lambdaB	lambdaC			
S1	136.1702	0.5532	1.2340	0	27234.04	24000	0.88125
S2	150	0.0000	0.0000	1	30000	30000	1
S3	148.5106	0.5532	1.2340	0	29702.13	24000	0.808023
S4	150	0.0000	0.0000	1	30000	30000	1
S5	141.7021	0.5532	1.2340	0	28340.43	24000	0.846847
S6	150	0.0000	0.0000	1	30000	30000	1
S7	154.0426	0.5532	1.2340	0	30808.51	24000	0.779006
S8	154.0426	0.5532	1.2340	0	30808.51	30000	0.973757
S9	147.234	0.5106	1.4468	0	29446.81	24000	0.815029
S10	150	0.0000	0.0000	1	30000	30000	1
S11	161.7021	0.5106	1.4468	0	32340.43	24000	0.742105
S12	161.7021	0.5106	1.4468	0	32340.43	30000	0.927632
S13	152.3404	0.5106	1.4468	0	30468.09	24000	0.787709
S14	152.3404	0.5106	1.4468	0	30468.09	30000	0.984637
S15	166.8085	0.5106	1.4468	0	33361.7	24000	0.719388
S16	166.8085	0.5106	1.4468	0	33361.7	30000	0.899235
S17	124.9123	0.5965	1.0175	0	24982.46	24000	0.960674
S18	150	0.0000	0.0000	1	30000	30000	1
S19	135.0877	0.5965	1.0175	0	27017.54	24000	0.888312
S20	150	0.0000	0.0000	1	30000	30000	1
S21	130.8772	0.5965	1.0175	0	26175.44	24000	0.91689

S22	150	0.0000	0.0000	1	30000	30000	1
S23	141.0526	0.5965	1.0175	0	28210.53	24000	0.850746
S24	150	0.0000	0.0000	1	30000	30000	1
S25	134.0351	0.5614	1.1930	0	26807.02	24000	0.895288
S26	150	0.0000	0.0000	1	30000	30000	1
S27	145.9649	0.5614	1.1930	0	29192.98	24000	0.822115
S28	150	0.0000	0.0000	1	30000	30000	1
S29	139.6491	0.5614	1.1930	0	27929.82	24000	0.859296
S30	150	0.0000	0.0000	1	30000	30000	1
S31	151.5789	0.5614	1.1930	0	30315.79	24000	0.791667
S32	151.5789	0.5614	1.1930	0	30315.79	30000	0.989583
S33	129.7778	0.5778	1.1111	0	25955.56	24000	0.924658
S34	150	0.0000	0.0000	1	30000	30000	1
S35	140.8889	0.5778	1.1111	0	28177.78	24000	0.851735
S36	150	0.0000	0.0000	1	30000	30000	1
S37	135.5556	0.5778	1.1111	0	27111.11	24000	0.885246
S38	150	0.0000	0.0000	1	30000	30000	1
S39	146.6667	0.5778	1.1111	0	29333.33	24000	0.818182
S40	150	0.0000	0.0000	1	30000	30000	1
S41	141.3333	0.5333	1.3333	0	28266.67	24000	0.849057
S42	150	0.0000	0.0000	1	30000	30000	1
S43	154.6667	0.5333	1.3333	0	30933.33	24000	0.775862
S44	154.6667	0.5333	1.3333	0	30933.33	30000	0.969828
S45	146.6667	0.5333	1.3333	0	29333.33	24000	0.818182
S46	150	0.0000	0.0000	1	30000	30000	1
S47	160	0.5333	1.3333	0	32000	24000	0.75
S48	160	0.5333	1.3333	0	32000	30000	0.9375
S49	120	0.0000	0.0000	1	24000	24000	1
S50	150	0.0000	0.0000	1	30000	30000	1
S51	128.3636	0.6182	0.9091	0	25672.73	24000	0.934844
S52	150	0.0000	0.0000	1	30000	30000	1
S53	125.4545	0.6182	0.9091	0	25090.91	24000	0.956522
S54	150	0.0000	0.0000	1	30000	30000	1
S55	134.5455	0.6182	0.9091	0	26909.09	24000	0.891892
S56	150	0.0000	0.0000	1	30000	30000	1
S57	128.7273	0.5818	1.0909	0	25745.45	24000	0.932203
S58	150	0.0000	0.0000	1	30000	30000	1
S59	139.6364	0.5818	1.0909	0	27927.27	24000	0.859375
S60	150	0.0000	0.0000	1	30000	30000	1
S61	134.5455	0.5818	1.0909	0	26909.09	24000	0.891892
S62	150	0.0000	0.0000	1	30000	30000	1

S63	145.4545	0.5818	1.0909	0	29090.91	24000	0.825
S64	150	0.0000	0.0000	1	30000	30000	1
S65	165.5319	0.9787	1.1064	0	33106.38	24000	0.724936
S66	165.5319	0.9787	1.1064	0	33106.38	30000	0.90617
S67	176.5957	0.9787	1.1064	0	35319.15	24000	0.679518
S68	176.5957	0.9787	1.1064	0	35319.15	30000	0.849398
S69	175.3191	0.9787	1.1064	0	35063.83	24000	0.684466
S70	175.3191	0.9787	1.1064	0	35063.83	30000	0.855583
S71	186.383	0.9787	1.1064	0	37276.6	24000	0.643836
S72	186.383	0.9787	1.1064	0	37276.6	30000	0.804795
S73	176.5957	0.9362	1.3191	0	35319.15	24000	0.679518
S74	176.5957	0.9362	1.3191	0	35319.15	30000	0.849398
S75	189.7872	0.9362	1.3191	0	37957.45	24000	0.632287
S76	189.7872	0.9362	1.3191	0	37957.45	30000	0.790359
S77	185.9574	0.9362	1.3191	0	37191.49	24000	0.645309
S78	185.9574	0.9362	1.3191	0	37191.49	30000	0.806636
S79	199.1489	0.9362	1.3191	0	39829.79	24000	0.602564
S80	199.1489	0.9362	1.3191	0	39829.79	30000	0.753205
S81	155.4386	1.0175	0.9123	0	31087.72	24000	0.772009
S82	155.4386	1.0175	0.9123	0	31087.72	30000	0.965011
S83	164.5614	1.0175	0.9123	0	32912.28	24000	0.729211
S84	164.5614	1.0175	0.9123	0	32912.28	30000	0.911514
S85	165.614	1.0175	0.9123	0	33122.81	24000	0.724576
S86	165.614	1.0175	0.9123	0	33122.81	30000	0.90572
S87	174.7368	1.0175	0.9123	0	34947.37	24000	0.686747
S88	174.7368	1.0175	0.9123	0	34947.37	30000	0.858434
S89	164.5614	0.9825	1.0877	0	32912.28	24000	0.729211
S90	164.5614	0.9825	1.0877	0	32912.28	30000	0.911514
S91	175.4386	0.9825	1.0877	0	35087.72	24000	0.684
S92	175.4386	0.9825	1.0877	0	35087.72	30000	0.855
S93	174.386	0.9825	1.0877	0	34877.19	24000	0.688129
S94	174.386	0.9825	1.0877	0	34877.19	30000	0.860161
S95	185.2632	0.9825	1.0877	0	37052.63	24000	0.647727
S96	185.2632	0.9825	1.0877	0	37052.63	30000	0.809659
S97	154.2222	1.0222	0.8889	0	30844.44	24000	0.778098
S98	154.2222	1.0222	0.8889	0	30844.44	30000	0.972622
S99	163.1111	1.0222	0.8889	0	32622.22	24000	0.735695
S100	163.1111	1.0222	0.8889	0	32622.22	30000	0.919619
S101	164.4444	1.0222	0.8889	0	32888.89	24000	0.72973
S102	164.4444	1.0222	0.8889	0	32888.89	30000	0.912162
S103	173.3333	1.0222	0.8889	0	34666.67	24000	0.692308

S104	173.3333	1.0222	0.8889	0	34666.67	30000	0.865385
S105	165.7778	0.9778	1.1111	0	33155.56	24000	0.723861
S106	165.7778	0.9778	1.1111	0	33155.56	30000	0.904826
S107	176.8889	0.9778	1.1111	0	35377.78	24000	0.678392
S108	176.8889	0.9778	1.1111	0	35377.78	30000	0.84799
S109	175.5556	0.9778	1.1111	0	35111.11	24000	0.683544
S110	175.5556	0.9778	1.1111	0	35111.11	30000	0.85443
S111	186.6667	0.9778	1.1111	0	37333.33	24000	0.642857
S112	186.6667	0.9778	1.1111	0	37333.33	30000	0.803571
S113	145.8182	1.0545	0.7273	0	29163.64	24000	0.822943
S114	150	0.0000	0.0000	1	30000	30000	1
S115	153.0909	1.0545	0.7273	0	30618.18	24000	0.783848
S116	153.0909	1.0545	0.7273	0	30618.18	30000	0.97981
S117	156.3636	1.0545	0.7273	0	31272.73	24000	0.767442
S118	156.3636	1.0545	0.7273	0	31272.73	30000	0.959302
S119	163.6364	1.0545	0.7273	0	32727.27	24000	0.733333
S120	163.6364	1.0545	0.7273	0	32727.27	30000	0.916667
S121	155.2727	1.0182	0.9091	0	31054.55	24000	0.772834
S122	155.2727	1.0182	0.9091	0	31054.55	30000	0.966042
S123	164.3636	1.0182	0.9091	0	32872.73	24000	0.730088
S124	164.3636	1.0182	0.9091	0	32872.73	30000	0.912611
S125	165.4545	1.0182	0.9091	0	33090.91	24000	0.725275
S126	165.4545	1.0182	0.9091	0	33090.91	30000	0.906593
S127	174.5455	1.0182	0.9091	0	34909.09	24000	0.6875
S128	174.5455	1.0182	0.9091	0	34909.09	30000	0.859375
S129	120	0.0000	0.0000	1	24000	24000	1
S130	150	0.0000	0.0000	1	30000	30000	1
S131	130	0.2727	1.3182	0	26000	24000	0.923077
S132	150	0.0000	0.0000	1	30000	30000	1
S133	120	0.0000	0.0000	1	24000	24000	1
S134	150	0.0000	0.0000	1	30000	30000	1
S135	132.7273	0.2727	1.3182	0	26545.45	24000	0.90411
S136	150	0.0000	0.0000	1	30000	30000	1
S137	124.5455	0.1818	1.5455	0	24909.09	24000	0.963504
S138	150	0.0000	0.0000	1	30000	30000	1
S139	140	0.1818	1.5455	0	28000	24000	0.857143
S140	150	0.0000	0.0000	1	30000	30000	1
S141	126.3636	0.1818	1.5455	0	25272.73	24000	0.94964
S142	150	0.0000	0.0000	1	30000	30000	1
S143	141.8182	0.1818	1.5455	0	28363.64	24000	0.846154
S144	150	0.0000	0.0000	1	30000	30000	1

S145	120	0.0000	0.0000	1	24000	24000	1
S146	150	0.0000	0.0000	1	30000	30000	1
S147	120	0.0000	0.0000	1	24000	24000	1
S148	150	0.0000	0.0000	1	30000	30000	1
S149	120	0.0000	0.0000	1	24000	24000	1
S150	150	0.0000	0.0000	1	30000	30000	1
S151	122.963	0.3704	1.0741	0	24592.59	24000	0.975904
S152	150	0.0000	0.0000	1	30000	30000	1
S153	120	0.0000	0.0000	1	24000	24000	1
S154	150	0.0000	0.0000	1	30000	30000	1
S155	127.4074	0.2963	1.2593	0	25481.48	24000	0.94186
S156	150	0.0000	0.0000	1	30000	30000	1
S157	120	0.0000	0.0000	1	24000	24000	1
S158	150	0.0000	0.0000	1	30000	30000	1
S159	130.3704	0.2963	1.2593	0	26074.07	24000	0.920455
S160	150	0.0000	0.0000	1	30000	30000	1
S161	120	0.0000	0.0000	1	24000	24000	1
S162	150	0.0000	0.0000	1	30000	30000	1
S163	127	0.3000	1.2500	0	25400	24000	0.944882
S164	150	0.0000	0.0000	1	30000	30000	1
S165	120	0.0000	0.0000	1	24000	24000	1
S166	150	0.0000	0.0000	1	30000	30000	1
S167	130	0.3000	1.2500	0	26000	24000	0.923077
S168	150	0.0000	0.0000	1	30000	30000	1
S169	123	0.2000	1.5000	0	24600	24000	0.97561
S170	150	0.0000	0.0000	1	30000	30000	1
S171	138	0.2000	1.5000	0	27600	24000	0.869565
S172	150	0.0000	0.0000	1	30000	30000	1
S173	125	0.2000	1.5000	0	25000	24000	0.96
S174	150	0.0000	0.0000	1	30000	30000	1
S175	140	0.2000	1.5000	0	28000	24000	0.857143
S176	150	0.0000	0.0000	1	30000	30000	1
S177	120	0.0000	0.0000	1	24000	24000	1
S178	150	0.0000	0.0000	1	30000	30000	1
S179	120	0.0000	0.0000	1	24000	24000	1
S180	150	0.0000	0.0000	1	30000	30000	1
S181	120	0.0000	0.0000	1	24000	24000	1
S182	150	0.0000	0.0000	1	30000	30000	1
S183	120	0.4000	1.0000	0	24000	24000	1
S184	150	0.0000	0.0000	1	30000	30000	1
S185	120	0.0000	0.0000	1	24000	24000	1

S186	150	0.0000	0.0000	1	30000	30000	1
S187	124.8	0.3200	1.2000	0	24960	24000	0.961538
S188	150	0.0000	0.0000	1	30000	30000	1
S189	120	0.0000	0.0000	1	24000	24000	1
S190	150	0.0000	0.0000	1	30000	30000	1
S191	128	0.3200	1.2000	0	25600	24000	0.9375
S192	150	0.0000	0.0000	1	30000	30000	1
S193	148.1818	0.7273	1.1818	0	29636.36	24000	0.809816
S194	150	0.0000	0.0000	1	30000	30000	1
S195	160	0.7273	1.1818	0	32000	24000	0.75
S196	160	0.7273	1.1818	0	32000	30000	0.9375
S197	155.4545	0.7273	1.1818	0	31090.91	24000	0.77193
S198	155.4545	0.7273	1.1818	0	31090.91	30000	0.964912
S199	167.2727	0.7273	1.1818	0	33454.55	24000	0.717391
S200	167.2727	0.7273	1.1818	0	33454.55	30000	0.896739
S201	155.9091	0.6364	1.4091	0	31181.82	24000	0.769679
S202	155.9091	0.6364	1.4091	0	31181.82	30000	0.962099
S203	170	0.6364	1.4091	0	34000	24000	0.705882
S204	170	0.6364	1.4091	0	34000	30000	0.882353
S205	162.2727	0.6364	1.4091	0	32454.55	24000	0.739496
S206	162.2727	0.6364	1.4091	0	32454.55	30000	0.92437
S207	176.3636	0.6364	1.4091	0	35272.73	24000	0.680412
S208	176.3636	0.6364	1.4091	0	35272.73	30000	0.850515
S209	140.7407	0.8148	0.9630	0	28148.15	24000	0.852632
S210	150	0.0000	0.0000	1	30000	30000	1
S211	150.3704	0.8148	0.9630	0	30074.07	24000	0.79803
S212	150.3704	0.8148	0.9630	0	30074.07	30000	0.997537
S213	148.8889	0.8148	0.9630	0	29777.78	24000	0.80597
S214	150	0.0000	0.0000	1	30000	30000	1
S215	158.5185	0.8148	0.9630	0	31703.7	24000	0.757009
S216	158.5185	0.8148	0.9630	0	31703.7	30000	0.946262
S217	147.037	0.7407	1.1481	0	29407.41	24000	0.816121
S218	150	0.0000	0.0000	1	30000	30000	1
S219	158.5185	0.7407	1.1481	0	31703.7	24000	0.757009
S220	158.5185	0.7407	1.1481	0	31703.7	30000	0.946262
S221	154.4444	0.7407	1.1481	0	30888.89	24000	0.776978
S222	154.4444	0.7407	1.1481	0	30888.89	30000	0.971223
S223	165.9259	0.7407	1.1481	0	33185.19	24000	0.723214
S224	165.9259	0.7407	1.1481	0	33185.19	30000	0.904018
S225	142	0.8000	1.0000	0	28400	24000	0.84507
S226	150	0.0000	0.0000	1	30000	30000	1

S227	152	0.8000	1.0000	0	30400	24000	0.789474
S228	152	0.8000	1.0000	0	30400	30000	0.986842
S229	150	0.8000	1.0000	0	30000	24000	0.8
S230	150	0.8000	1.0000	0	30000	30000	1
S231	160	0.8000	1.0000	0	32000	24000	0.75
S232	160	0.8000	1.0000	0	32000	30000	0.9375
S233	150.5	0.7000	1.2500	0	30100	24000	0.797342
S234	150.5	0.7000	1.2500	0	30100	30000	0.996678
S235	163	0.7000	1.2500	0	32600	24000	0.736196
S236	163	0.7000	1.2500	0	32600	30000	0.920245
S237	157.5	0.7000	1.2500	0	31500	24000	0.761905
S238	157.5	0.7000	1.2500	0	31500	30000	0.952381
S239	170	0.7000	1.2500	0	34000	24000	0.705882
S240	170	0.7000	1.2500	0	34000	30000	0.882353
S241	135.2	0.8800	0.8000	0	27040	24000	0.887574
S242	150	0.0000	0.0000	1	30000	30000	1
S243	143.2	0.8800	0.8000	0	28640	24000	0.837989
S244	150	0.0000	0.0000	1	30000	30000	1
S245	144	0.8800	0.8000	0	28800	24000	0.833333
S246	150	0.0000	0.0000	1	30000	30000	1
S247	152	0.8800	0.8000	0	30400	24000	0.789474
S248	152	0.8800	0.8000	0	30400	30000	0.986842
S249	142	0.8000	1.0000	0	28400	24000	0.84507
S250	150	0.0000	0.0000	1	30000	30000	1
S251	152	0.8000	1.0000	0	30400	24000	0.789474
S252	152	0.8000	1.0000	0	30400	30000	0.986842
S253	150	0.8000	1.0000	0	30000	24000	0.8
S254	150	0.8000	1.0000	0	30000	30000	1
S255	160	0.8000	1.0000	0	32000	24000	0.75
S256	160	0.8000	1.0000	0	32000	30000	0.9375
S257	122.9167	0.3611	1.2917	0	24583.33	24000	0.976271
S258	150	0.0000	0.0000	1	30000	30000	1
S259	135.8333	0.3611	1.2917	0	27166.67	24000	0.883436
S260	150	0.0000	0.0000	1	30000	30000	1
S261	126.5278	0.3611	1.2917	0	25305.56	24000	0.948408
S262	150	0.0000	0.0000	1	30000	30000	1
S263	139.4444	0.3611	1.2917	0	27888.89	24000	0.860558
S264	150	0.0000	0.0000	1	30000	30000	1
S265	135	0.3333	1.5000	0	27000	24000	0.888889
S266	150	0.0000	0.0000	1	30000	30000	1
S267	150	0.3333	1.5000	0	30000	24000	0.8

S268	150	0.3333	1.5000	0	30000	30000	1
S269	138.3333	0.3333	1.5000	0	27666.67	24000	0.86747
S270	150	0.0000	0.0000	1	30000	30000	1
S271	153.3333	0.3333	1.5000	0	30666.67	24000	0.782609
S272	153.3333	0.3333	1.5000	0	30666.67	30000	0.978261
S273	120	0.0000	0.0000	1	24000	24000	1
S274	150	0.0000	0.0000	1	30000	30000	1
S275	120.6897	0.3908	1.0690	0	24137.93	24000	0.994286
S276	150	0.0000	0.0000	1	30000	30000	1
S277	120	0.0000	0.0000	1	24000	24000	1
S278	150	0.0000	0.0000	1	30000	30000	1
S279	124.5977	0.3908	1.0690	0	24919.54	24000	0.9631
S280	150	0.0000	0.0000	1	30000	30000	1
S281	120	0.3678	1.2414	0	24000	24000	1
S282	150	0.0000	0.0000	1	30000	30000	1
S283	132.4138	0.3678	1.2414	0	26482.76	24000	0.90625
S284	150	0.0000	0.0000	1	30000	30000	1
S285	123.6782	0.3678	1.2414	0	24735.63	24000	0.97026
S286	150	0.0000	0.0000	1	30000	30000	1
S287	136.092	0.3678	1.2414	0	27218.39	24000	0.881757
S288	150	0.0000	0.0000	1	30000	30000	1
S289	120	0.0000	0.0000	1	24000	24000	1
S290	150	0.0000	0.0000	1	30000	30000	1
S291	130.5714	0.3714	1.2143	0	26114.29	24000	0.919037
S292	150	0.0000	0.0000	1	30000	30000	1
S293	122.1429	0.3714	1.2143	0	24428.57	24000	0.982456
S294	150	0.0000	0.0000	1	30000	30000	1
S295	134.2857	0.3714	1.2143	0	26857.14	24000	0.893617
S296	150	0.0000	0.0000	1	30000	30000	1
S297	130.8571	0.3429	1.4286	0	26171.43	24000	0.917031
S298	150	0.0000	0.0000	1	30000	30000	1
S299	145.1429	0.3429	1.4286	0	29028.57	24000	0.826772
S300	150	0.0000	0.0000	1	30000	30000	1
S301	134.2857	0.3429	1.4286	0	26857.14	24000	0.893617
S302	150	0.0000	0.0000	1	30000	30000	1
S303	148.5714	0.3429	1.4286	0	29714.29	24000	0.807692
S304	150	0.0000	0.0000	1	30000	30000	1
S305	120	0.0000	0.0000	1	24000	24000	1
S306	150	0.0000	0.0000	1	30000	30000	1
S307	120	0.0000	0.0000	1	24000	24000	1
S308	150	0.0000	0.0000	1	30000	30000	1

S309	120	0.0000	0.0000	1	24000	24000	1
S310	150	0.0000	0.0000	1	30000	30000	1
S311	120	0.4000	1.0000	0	24000	24000	1
S312	150	0.0000	0.0000	1	30000	30000	1
S313	120	0.0000	0.0000	1	24000	24000	1
S314	150	0.0000	0.0000	1	30000	30000	1
S315	128	0.3765	1.1765	0	25600	24000	0.9375
S316	150	0.0000	0.0000	1	30000	30000	1
S317	120	0.3765	1.1765	0	24000	24000	1
S318	150	0.0000	0.0000	1	30000	30000	1
S319	131.7647	0.3765	1.1765	0	26352.94	24000	0.910714
S320	150	0.0000	0.0000	1	30000	30000	1
S321	142.0833	0.6389	1.2083	0	28416.67	24000	0.844575
S322	150	0.0000	0.0000	1	30000	30000	1
S323	154.1667	0.6389	1.2083	0	30833.33	24000	0.778378
S324	154.1667	0.6389	1.2083	0	30833.33	30000	0.972973
S325	148.4722	0.6389	1.2083	0	29694.44	24000	0.808232
S326	150	0.0000	0.0000	1	30000	30000	1
S327	160.5556	0.6389	1.2083	0	32111.11	24000	0.747405
S328	160.5556	0.6389	1.2083	0	32111.11	30000	0.934256
S329	154.1667	0.6111	1.4167	0	30833.33	24000	0.778378
S330	154.1667	0.6111	1.4167	0	30833.33	30000	0.972973
S331	168.3333	0.6111	1.4167	0	33666.67	24000	0.712871
S332	168.3333	0.6111	1.4167	0	33666.67	30000	0.891089
S333	160.2778	0.6111	1.4167	0	32055.56	24000	0.7487
S334	160.2778	0.6111	1.4167	0	32055.56	30000	0.935875
S335	174.4444	0.6111	1.4167	0	34888.89	24000	0.687898
S336	174.4444	0.6111	1.4167	0	34888.89	30000	0.859873
S337	130	0.6667	1.0000	0	26000	24000	0.923077
S338	150	0.0000	0.0000	1	30000	30000	1
S339	140	0.6667	1.0000	0	28000	24000	0.857143
S340	150	0.0000	0.0000	1	30000	30000	1
S341	136.6667	0.6667	1.0000	0	27333.33	24000	0.878049
S342	150	0.0000	0.0000	1	30000	30000	1
S343	146.6667	0.6667	1.0000	0	29333.33	24000	0.818182
S344	150	0.0000	0.0000	1	30000	30000	1
S345	140	0.6437	1.1724	0	28000	24000	0.857143
S346	150	0.0000	0.0000	1	30000	30000	1
S347	151.7241	0.6437	1.1724	0	30344.83	24000	0.790909
S348	151.7241	0.6437	1.1724	0	30344.83	30000	0.988636
S349	146.4368	0.6437	1.1724	0	29287.36	24000	0.819466

S350	150	0.0000	0.0000	1	30000	30000	1
S351	158.1609	0.6437	1.1724	0	31632.18	24000	0.758721
S352	158.1609	0.6437	1.1724	0	31632.18	30000	0.948401
S353	134.1429	0.6571	1.0714	0	26828.57	24000	0.894569
S354	150	0.0000	0.0000	1	30000	30000	1
S355	144.8571	0.6571	1.0714	0	28971.43	24000	0.828402
S356	150	0.0000	0.0000	1	30000	30000	1
S357	140.7143	0.6571	1.0714	0	28142.86	24000	0.852792
S358	150	0.0000	0.0000	1	30000	30000	1
S359	151.4286	0.6571	1.0714	0	30285.71	24000	0.792453
S360	151.4286	0.6571	1.0714	0	30285.71	30000	0.990566
S361	146.5714	0.6286	1.2857	0	29314.29	24000	0.818713
S362	150	0.0000	0.0000	1	30000	30000	1
S363	159.4286	0.6286	1.2857	0	31885.71	24000	0.752688
S364	159.4286	0.6286	1.2857	0	31885.71	30000	0.94086
S365	152.8571	0.6286	1.2857	0	30571.43	24000	0.785047
S366	152.8571	0.6286	1.2857	0	30571.43	30000	0.981308
S367	165.7143	0.6286	1.2857	0	33142.86	24000	0.724138
S368	165.7143	0.6286	1.2857	0	33142.86	30000	0.905172
S369	123.1765	0.6824	0.8824	0	24635.29	24000	0.974212
S370	150	0.0000	0.0000	1	30000	30000	1
S371	132	0.6824	0.8824	0	26400	24000	0.909091
S372	150	0.0000	0.0000	1	30000	30000	1
S373	130	0.6824	0.8824	0	26000	24000	0.923077
S374	150	0.0000	0.0000	1	30000	30000	1
S375	138.8235	0.6824	0.8824	0	27764.71	24000	0.864407
S376	150	0.0000	0.0000	1	30000	30000	1
S377	133.4118	0.6588	1.0588	0	26682.35	24000	0.899471
S378	150	0.0000	0.0000	1	30000	30000	1
S379	144	0.6588	1.0588	0	28800	24000	0.833333
S380	150	0.0000	0.0000	1	30000	30000	1
S381	140	0.6588	1.0588	0	28000	24000	0.857143
S382	150	0.0000	0.0000	1	30000	30000	1
S383	150.5882	0.6588	1.0588	0	30117.65	24000	0.796875
S384	150.5882	0.6588	1.0588	0	30117.65	30000	0.996094
S385	120	0.0000	0.0000	1	24000	24000	1
S386	150	0.0000	0.0000	1	30000	30000	1
S387	123.4783	0.1739	1.3478	0	24695.65	24000	0.971831
S388	150	0.0000	0.0000	1	30000	30000	1
S389	120	0.0000	0.0000	1	24000	24000	1
S390	150	0.0000	0.0000	1	30000	30000	1

S391	125.2174	0.1739	1.3478	0	25043.48	24000	0.958333
S392	150	0.0000	0.0000	1	30000	30000	1
S393	120	0.0000	0.0000	1	24000	24000	1
S394	150	0.0000	0.0000	1	30000	30000	1
S395	135.6522	0.1159	1.5652	0	27130.43	24000	0.884615
S396	150	0.0000	0.0000	1	30000	30000	1
S397	121.1594	0.1159	1.5652	0	24231.88	24000	0.990431
S398	150	0.0000	0.0000	1	30000	30000	1
S399	136.8116	0.1159	1.5652	0	27362.32	24000	0.877119
S400	150	0.0000	0.0000	1	30000	30000	1
S401	120	0.0000	0.0000	1	24000	24000	1
S402	150	0.0000	0.0000	1	30000	30000	1
S403	120	0.0000	0.0000	1	24000	24000	1
S404	150	0.0000	0.0000	1	30000	30000	1
S405	120	0.0000	0.0000	1	24000	24000	1
S406	150	0.0000	0.0000	1	30000	30000	1
S407	120	0.0000	0.0000	1	24000	24000	1
S408	150	0.0000	0.0000	1	30000	30000	1
S409	120	0.0000	0.0000	1	24000	24000	1
S410	150	0.0000	0.0000	1	30000	30000	1
S411	120	0.0000	0.0000	1	24000	24000	1
S412	150	0.0000	0.0000	1	30000	30000	1
S413	120	0.0000	0.0000	1	24000	24000	1
S414	150	0.0000	0.0000	1	30000	30000	1
S415	121.9048	0.1905	1.2857	0	24380.95	24000	0.984375
S416	150	0.0000	0.0000	1	30000	30000	1
S417	120	0.0000	0.0000	1	24000	24000	1
S418	150	0.0000	0.0000	1	30000	30000	1
S419	121.2308	0.1846	1.3077	0	24246.15	24000	0.989848
S420	150	0.0000	0.0000	1	30000	30000	1
S421	120	0.0000	0.0000	1	24000	24000	1
S422	150	0.0000	0.0000	1	30000	30000	1
S423	123.0769	0.1846	1.3077	0	24615.38	24000	0.975
S424	150	0.0000	0.0000	1	30000	30000	1
S425	120	0.0000	0.0000	1	24000	24000	1
S426	150	0.0000	0.0000	1	30000	30000	1
S427	134.1538	0.1231	1.5385	0	26830.77	24000	0.894495
S428	150	0.0000	0.0000	1	30000	30000	1
S429	120	0.0000	0.0000	1	24000	24000	1
S430	150	0.0000	0.0000	1	30000	30000	1
S431	135.3846	0.1231	1.5385	0	27076.92	24000	0.886364

S432	150	0.0000	0.0000	1	30000	30000	1
S433	120	0.0000	0.0000	1	24000	24000	1
S434	150	0.0000	0.0000	1	30000	30000	1
S435	120	0.0000	0.0000	1	24000	24000	1
S436	150	0.0000	0.0000	1	30000	30000	1
S437	120	0.0000	0.0000	1	24000	24000	1
S438	150	0.0000	0.0000	1	30000	30000	1
S439	120	0.0000	0.0000	1	24000	24000	1
S440	150	0.0000	0.0000	1	30000	30000	1
S441	120	0.0000	0.0000	1	24000	24000	1
S442	150	0.0000	0.0000	1	30000	30000	1
S443	120	0.0000	0.0000	1	24000	24000	1
S444	150	0.0000	0.0000	1	30000	30000	1
S445	120	0.0000	0.0000	1	24000	24000	1
S446	150	0.0000	0.0000	1	30000	30000	1
S447	120	0.0000	0.0000	1	24000	24000	1
S448	150	0.0000	0.0000	1	30000	30000	1
S449	130	0.4638	1.2609	0	26000	24000	0.923077
S450	150	0.0000	0.0000	1	30000	30000	1
S451	142.6087	0.4638	1.2609	0	28521.74	24000	0.841463
S452	150	0.0000	0.0000	1	30000	30000	1
S453	134.6377	0.4638	1.2609	0	26927.54	24000	0.891281
S454	150	0.0000	0.0000	1	30000	30000	1
S455	147.2464	0.4638	1.2609	0	29449.28	24000	0.814961
S456	150	0.0000	0.0000	1	30000	30000	1
S457	140	0.4058	1.4783	0	28000	24000	0.857143
S458	150	0.0000	0.0000	1	30000	30000	1
S459	154.7826	0.4058	1.4783	0	30956.52	24000	0.775281
S460	154.7826	0.4058	1.4783	0	30956.52	30000	0.969101
S461	144.058	0.4058	1.4783	0	28811.59	24000	0.832998
S462	150	0.0000	0.0000	1	30000	30000	1
S463	158.8406	0.4058	1.4783	0	31768.12	24000	0.755474
S464	158.8406	0.4058	1.4783	0	31768.12	30000	0.944343
S465	120	0.0000	0.0000	1	24000	24000	1
S466	150	0.0000	0.0000	1	30000	30000	1
S467	130	0.5238	1.0357	0	26000	24000	0.923077
S468	150	0.0000	0.0000	1	30000	30000	1
S469	124.881	0.5238	1.0357	0	24976.19	24000	0.960915
S470	150	0.0000	0.0000	1	30000	30000	1
S471	135.2381	0.5238	1.0357	0	27047.62	24000	0.887324
S472	150	0.0000	0.0000	1	30000	30000	1

S473	127.8571	0.4762	1.2143	0	25571.43	24000	0.938547
S474	150	0.0000	0.0000	1	30000	30000	1
S475	140	0.4762	1.2143	0	28000	24000	0.857143
S476	150	0.0000	0.0000	1	30000	30000	1
S477	132.619	0.4762	1.2143	0	26523.81	24000	0.904847
S478	150	0.0000	0.0000	1	30000	30000	1
S479	144.7619	0.4762	1.2143	0	28952.38	24000	0.828947
S480	150	0.0000	0.0000	1	30000	30000	1
S481	125.0769	0.4923	1.1538	0	25015.38	24000	0.95941
S482	150	0.0000	0.0000	1	30000	30000	1
S483	136.6154	0.4923	1.1538	0	27323.08	24000	0.878378
S484	150	0.0000	0.0000	1	30000	30000	1
S485	130	0.4923	1.1538	0	26000	24000	0.923077
S486	150	0.0000	0.0000	1	30000	30000	1
S487	141.5385	0.4923	1.1538	0	28307.69	24000	0.847826
S488	150	0.0000	0.0000	1	30000	30000	1
S489	135.6923	0.4308	1.3846	0	27138.46	24000	0.884354
S490	150	0.0000	0.0000	1	30000	30000	1
S491	149.5385	0.4308	1.3846	0	29907.69	24000	0.802469
S492	150	0.0000	0.0000	1	30000	30000	1
S493	140	0.4308	1.3846	0	28000	24000	0.857143
S494	150	0.0000	0.0000	1	30000	30000	1
S495	153.8462	0.4308	1.3846	0	30769.23	24000	0.78
S496	153.8462	0.4308	1.3846	0	30769.23	30000	0.975
S497	120	0.0000	0.0000	1	24000	24000	1
S498	150	0.0000	0.0000	1	30000	30000	1
S499	124.5	0.5500	0.9375	0	24900	24000	0.963855
S500	150	0.0000	0.0000	1	30000	30000	1
S501	120.625	0.5500	0.9375	0	24125	24000	0.994819
S502	150	0.0000	0.0000	1	30000	30000	1
S503	130	0.5500	0.9375	0	26000	24000	0.923077
S504	150	0.0000	0.0000	1	30000	30000	1
S505	123.75	0.5000	1.1250	0	24750	24000	0.969697
S506	150	0.0000	0.0000	1	30000	30000	1
S507	135	0.5000	1.1250	0	27000	24000	0.888889
S508	150	0.0000	0.0000	1	30000	30000	1
S509	128.75	0.5000	1.1250	0	25750	24000	0.932039
S510	150	0.0000	0.0000	1	30000	30000	1
S511	140	0.5000	1.1250	0	28000	24000	0.857143
S512	150	0.0000	0.0000	1	30000	30000	1

Appendix D

Profit Allocation Model Results for Numerical Example

Table D-1: Profit Model Results for DMU A

Scenario	DMUA							O.F.	Current	Eff
	x1*	x2*	y*	lambdaA	lambdaB	lambdaC				
S1	50	15	90	1	0	0	7700	7700	1	
S2	50	15	90	1	0	0	7700	7700	1	
S3	50	15	90	1	0	0	7700	7700	1	
S4	50	15	90	1	0	0	7700	7700	1	
S5	50	15	100	1	0	0	8700	8700	1	
S6	50	15	100	1	0	0	8700	8700	1	
S7	50	15	100	1	0	0	8700	8700	1	
S8	50	15	100	1	0	0	8700	8700	1	
S9	50	15	90	1	0	0	7700	7700	1	
S10	50	15	90	1	0	0	7700	7700	1	
S11	50	15	90	1	0	0	7700	7700	1	
S12	50	15	90	1	0	0	7700	7700	1	
S13	50	15	100	1	0	0	8700	8700	1	
S14	50	15	100	1	0	0	8700	8700	1	
S15	50	15	100	1	0	0	8700	8700	1	
S16	50	15	100	1	0	0	8700	8700	1	
S17	50	15	90	1	0	0	7700	7700	1	
S18	50	15	90	1	0	0	7700	7700	1	
S19	50	15	90	1	0	0	7700	7700	1	
S20	50	15	90	1	0	0	7700	7700	1	
S21	50	15	100	1	0	0	8700	8700	1	
S22	50	15	100	1	0	0	8700	8700	1	
S23	50	15	100	1	0	0	8700	8700	1	
S24	50	15	100	1	0	0	8700	8700	1	
S25	50	15	90	1	0	0	7700	7700	1	
S26	50	15	90	1	0	0	7700	7700	1	
S27	50	15	90	1	0	0	7700	7700	1	
S28	50	15	90	1	0	0	7700	7700	1	
S29	50	15	100	1	0	0	8700	8700	1	
S30	50	15	100	1	0	0	8700	8700	1	

S31	50	15	100	1	0	0	8700	8700	1
S32	50	15	100	1	0	0	8700	8700	1
S33	50	25	90	1	0	0	7000	7000	1
S34	50	25	90	1	0	0	7000	7000	1
S35	50	25	90	1	0	0	7000	7000	1
S36	50	25	90	1	0	0	7000	7000	1
S37	50	25	100	1	0	0	8000	8000	1
S38	50	25	100	1	0	0	8000	8000	1
S39	50	25	100	1	0	0	8000	8000	1
S40	50	25	100	1	0	0	8000	8000	1
S41	50	25	90	1	0	0	7000	7000	1
S42	50	25	90	1	0	0	7000	7000	1
S43	50	25	90	1	0	0	7000	7000	1
S44	50	25	90	1	0	0	7000	7000	1
S45	50	25	100	1	0	0	8000	8000	1
S46	50	25	100	1	0	0	8000	8000	1
S47	50	25	100	1	0	0	8000	8000	1
S48	50	25	100	1	0	0	8000	8000	1
S49	50	25	90	1	0	0	7000	7000	1
S50	50	25	90	1	0	0	7000	7000	1
S51	50	25	90	1	0	0	7000	7000	1
S52	50	25	90	1	0	0	7000	7000	1
S53	50	25	100	1	0	0	8000	8000	1
S54	50	25	100	1	0	0	8000	8000	1
S55	50	25	100	1	0	0	8000	8000	1
S56	50	25	100	1	0	0	8000	8000	1
S57	50	25	90	1	0	0	7000	7000	1
S58	50	25	90	1	0	0	7000	7000	1
S59	50	25	90	1	0	0	7000	7000	1
S60	50	25	90	1	0	0	7000	7000	1
S61	50	25	100	1	0	0	8000	8000	1
S62	50	25	100	1	0	0	8000	8000	1
S63	50	25	100	1	0	0	8000	8000	1
S64	50	25	100	1	0	0	8000	8000	1
S65	50	15	90	1	0	0	7700	7700	1
S66	50	15	90	1	0	0	7700	7700	1
S67	50	15	90	1	0	0	7700	7700	1
S68	50	15	90	1	0	0	7700	7700	1
S69	50	15	100	1	0	0	8700	8700	1
S70	50	15	100	1	0	0	8700	8700	1
S71	50	15	100	1	0	0	8700	8700	1

S72	50	15	100	1	0	0	8700	8700	1
S73	50	15	90	1	0	0	7700	7700	1
S74	50	15	90	1	0	0	7700	7700	1
S75	50	15	90	1	0	0	7700	7700	1
S76	50	15	90	1	0	0	7700	7700	1
S77	50	15	100	1	0	0	8700	8700	1
S78	50	15	100	1	0	0	8700	8700	1
S79	50	15	100	1	0	0	8700	8700	1
S80	50	15	100	1	0	0	8700	8700	1
S81	50	15	90	1	0	0	7700	7700	1
S82	50	15	90	1	0	0	7700	7700	1
S83	50	15	90	1	0	0	7700	7700	1
S84	50	15	90	1	0	0	7700	7700	1
S85	50	15	100	1	0	0	8700	8700	1
S86	50	15	100	1	0	0	8700	8700	1
S87	50	15	100	1	0	0	8700	8700	1
S88	50	15	100	1	0	0	8700	8700	1
S89	50	15	90	1	0	0	7700	7700	1
S90	50	15	90	1	0	0	7700	7700	1
S91	50	15	90	1	0	0	7700	7700	1
S92	50	15	90	1	0	0	7700	7700	1
S93	50	15	100	1	0	0	8700	8700	1
S94	50	15	100	1	0	0	8700	8700	1
S95	50	15	100	1	0	0	8700	8700	1
S96	50	15	100	1	0	0	8700	8700	1
S97	50	25	90	1	0	0	7000	7000	1
S98	50	25	90	1	0	0	7000	7000	1
S99	50	25	90	1	0	0	7000	7000	1
S100	50	25	90	1	0	0	7000	7000	1
S101	50	25	100	1	0	0	8000	8000	1
S102	50	25	100	1	0	0	8000	8000	1
S103	50	25	100	1	0	0	8000	8000	1
S104	50	25	100	1	0	0	8000	8000	1
S105	50	25	90	1	0	0	7000	7000	1
S106	50	25	90	1	0	0	7000	7000	1
S107	50	25	90	1	0	0	7000	7000	1
S108	50	25	90	1	0	0	7000	7000	1
S109	50	25	100	1	0	0	8000	8000	1
S110	50	25	100	1	0	0	8000	8000	1
S111	50	25	100	1	0	0	8000	8000	1
S112	50	25	100	1	0	0	8000	8000	1

S113	50	25	90	1	0	0	7000	7000	1
S114	50	25	90	1	0	0	7000	7000	1
S115	50	25	90	1	0	0	7000	7000	1
S116	50	25	90	1	0	0	7000	7000	1
S117	50	25	100	1	0	0	8000	8000	1
S118	50	25	100	1	0	0	8000	8000	1
S119	50	25	100	1	0	0	8000	8000	1
S120	50	25	100	1	0	0	8000	8000	1
S121	50	25	90	1	0	0	7000	7000	1
S122	50	25	90	1	0	0	7000	7000	1
S123	50	25	90	1	0	0	7000	7000	1
S124	50	25	90	1	0	0	7000	7000	1
S125	50	25	100	1	0	0	8000	8000	1
S126	50	25	100	1	0	0	8000	8000	1
S127	50	25	100	1	0	0	8000	8000	1
S128	50	25	100	1	0	0	8000	8000	1
S129	50	15	90	1	0	0	7700	7700	1
S130	50	15	90	1	0	0	7700	7700	1
S131	50	15	90	1	0	0	7700	7700	1
S132	50	15	90	1	0	0	7700	7700	1
S133	50	15	100	1	0	0	8700	8700	1
S134	50	15	100	1	0	0	8700	8700	1
S135	50	15	100	1	0	0	8700	8700	1
S136	50	15	100	1	0	0	8700	8700	1
S137	50	15	90	1	0	0	7700	7700	1
S138	50	15	90	1	0	0	7700	7700	1
S139	50	15	90	1	0	0	7700	7700	1
S140	50	15	90	1	0	0	7700	7700	1
S141	50	15	100	1	0	0	8700	8700	1
S142	50	15	100	1	0	0	8700	8700	1
S143	50	15	100	1	0	0	8700	8700	1
S144	50	15	100	1	0	0	8700	8700	1
S145	50	15	90	1	0	0	7700	7700	1
S146	50	15	90	1	0	0	7700	7700	1
S147	50	15	90	1	0	0	7700	7700	1
S148	50	15	90	1	0	0	7700	7700	1
S149	50	15	100	1	0	0	8700	8700	1
S150	50	15	100	1	0	0	8700	8700	1
S151	50	15	100	1	0	0	8700	8700	1
S152	50	15	100	1	0	0	8700	8700	1
S153	50	15	90	1	0	0	7700	7700	1

S154	50	15	90	1	0	0	7700	7700	1
S155	50	15	90	1	0	0	7700	7700	1
S156	50	15	90	1	0	0	7700	7700	1
S157	50	15	100	1	0	0	8700	8700	1
S158	50	15	100	1	0	0	8700	8700	1
S159	50	15	100	1	0	0	8700	8700	1
S160	50	15	100	1	0	0	8700	8700	1
S161	50	25	90	1	0	0	7000	7000	1
S162	50	25	90	1	0	0	7000	7000	1
S163	50	25	90	1	0	0	7000	7000	1
S164	50	25	90	1	0	0	7000	7000	1
S165	50	25	100	1	0	0	8000	8000	1
S166	50	25	100	1	0	0	8000	8000	1
S167	50	25	100	1	0	0	8000	8000	1
S168	50	25	100	1	0	0	8000	8000	1
S169	50	25	90	1	0	0	7000	7000	1
S170	50	25	90	1	0	0	7000	7000	1
S171	50	25	90	1	0	0	7000	7000	1
S172	50	25	90	1	0	0	7000	7000	1
S173	50	25	100	1	0	0	8000	8000	1
S174	50	25	100	1	0	0	8000	8000	1
S175	50	25	100	1	0	0	8000	8000	1
S176	50	25	100	1	0	0	8000	8000	1
S177	50	25	90	1	0	0	7000	7000	1
S178	50	25	90	1	0	0	7000	7000	1
S179	50	25	90	1	0	0	7000	7000	1
S180	50	25	90	1	0	0	7000	7000	1
S181	50	25	100	1	0	0	8000	8000	1
S182	50	25	100	1	0	0	8000	8000	1
S183	50	25	100	1	0	0	8000	8000	1
S184	50	25	100	1	0	0	8000	8000	1
S185	50	25	90	1	0	0	7000	7000	1
S186	50	25	90	1	0	0	7000	7000	1
S187	50	25	90	1	0	0	7000	7000	1
S188	50	25	90	1	0	0	7000	7000	1
S189	50	25	100	1	0	0	8000	8000	1
S190	50	25	100	1	0	0	8000	8000	1
S191	50	25	100	1	0	0	8000	8000	1
S192	50	25	100	1	0	0	8000	8000	1
S193	50	15	90	1	0	0	7700	7700	1
S194	50	15	90	1	0	0	7700	7700	1

S195	50	15	90	1	0	0	7700	7700	1
S196	50	15	90	1	0	0	7700	7700	1
S197	50	15	100	1	0	0	8700	8700	1
S198	50	15	100	1	0	0	8700	8700	1
S199	50	15	100	1	0	0	8700	8700	1
S200	50	15	100	1	0	0	8700	8700	1
S201	50	15	90	1	0	0	7700	7700	1
S202	50	15	90	1	0	0	7700	7700	1
S203	50	15	90	1	0	0	7700	7700	1
S204	50	15	90	1	0	0	7700	7700	1
S205	50	15	100	1	0	0	8700	8700	1
S206	50	15	100	1	0	0	8700	8700	1
S207	50	15	100	1	0	0	8700	8700	1
S208	50	15	100	1	0	0	8700	8700	1
S209	50	15	90	1	0	0	7700	7700	1
S210	50	15	90	1	0	0	7700	7700	1
S211	50	15	90	1	0	0	7700	7700	1
S212	50	15	90	1	0	0	7700	7700	1
S213	50	15	100	1	0	0	8700	8700	1
S214	50	15	100	1	0	0	8700	8700	1
S215	50	15	100	1	0	0	8700	8700	1
S216	50	15	100	1	0	0	8700	8700	1
S217	50	15	90	1	0	0	7700	7700	1
S218	50	15	90	1	0	0	7700	7700	1
S219	50	15	90	1	0	0	7700	7700	1
S220	50	15	90	1	0	0	7700	7700	1
S221	50	15	100	1	0	0	8700	8700	1
S222	50	15	100	1	0	0	8700	8700	1
S223	50	15	100	1	0	0	8700	8700	1
S224	50	15	100	1	0	0	8700	8700	1
S225	50	25	90	1	0	0	7000	7000	1
S226	50	25	90	1	0	0	7000	7000	1
S227	50	25	90	1	0	0	7000	7000	1
S228	50	25	90	1	0	0	7000	7000	1
S229	50	25	100	1	0	0	8000	8000	1
S230	50	25	100	1	0	0	8000	8000	1
S231	50	25	100	1	0	0	8000	8000	1
S232	50	25	100	1	0	0	8000	8000	1
S233	50	25	90	1	0	0	7000	7000	1
S234	50	25	90	1	0	0	7000	7000	1
S235	50	25	90	1	0	0	7000	7000	1

S236	50	25	90	1	0	0	7000	7000	1
S237	50	25	100	1	0	0	8000	8000	1
S238	50	25	100	1	0	0	8000	8000	1
S239	50	25	100	1	0	0	8000	8000	1
S240	50	25	100	1	0	0	8000	8000	1
S241	50	25	90	1	0	0	7000	7000	1
S242	50	25	90	1	0	0	7000	7000	1
S243	50	25	90	1	0	0	7000	7000	1
S244	50	25	90	1	0	0	7000	7000	1
S245	50	25	100	1	0	0	8000	8000	1
S246	50	25	100	1	0	0	8000	8000	1
S247	50	25	100	1	0	0	8000	8000	1
S248	50	25	100	1	0	0	8000	8000	1
S249	50	25	90	1	0	0	7000	7000	1
S250	50	25	90	1	0	0	7000	7000	1
S251	50	25	90	1	0	0	7000	7000	1
S252	50	25	90	1	0	0	7000	7000	1
S253	50	25	100	1	0	0	8000	8000	1
S254	50	25	100	1	0	0	8000	8000	1
S255	50	25	100	1	0	0	8000	8000	1
S256	50	25	100	1	0	0	8000	8000	1
S257	75	15	90	1	0	0	7575	7575	1
S258	75	15	90	1	0	0	7575	7575	1
S259	75	15	90	1	0	0	7575	7575	1
S260	75	15	90	1	0	0	7575	7575	1
S261	75	15	100	1	0	0	8575	8575	1
S262	75	15	100	1	0	0	8575	8575	1
S263	75	15	100	1	0	0	8575	8575	1
S264	75	15	100	1	0	0	8575	8575	1
S265	75	15	90	1	0	0	7575	7575	1
S266	75	15	90	1	0	0	7575	7575	1
S267	75	15	90	1	0	0	7575	7575	1
S268	75	15	90	1	0	0	7575	7575	1
S269	75	15	100	1	0	0	8575	8575	1
S270	75	15	100	1	0	0	8575	8575	1
S271	75	15	100	1	0	0	8575	8575	1
S272	75	15	100	1	0	0	8575	8575	1
S273	75	15	90	1	0	0	7575	7575	1
S274	75	15	90	1	0	0	7575	7575	1
S275	75	15	90	1	0	0	7575	7575	1
S276	75	15	90	1	0	0	7575	7575	1

S277	75	15	100	1	0	0	8575	8575	1
S278	75	15	100	1	0	0	8575	8575	1
S279	75	15	100	1	0	0	8575	8575	1
S280	75	15	100	1	0	0	8575	8575	1
S281	75	15	90	1	0	0	7575	7575	1
S282	75	15	90	1	0	0	7575	7575	1
S283	75	15	90	1	0	0	7575	7575	1
S284	75	15	90	1	0	0	7575	7575	1
S285	75	15	100	1	0	0	8575	8575	1
S286	75	15	100	1	0	0	8575	8575	1
S287	75	15	100	1	0	0	8575	8575	1
S288	75	15	100	1	0	0	8575	8575	1
S289	75	25	90	1	0	0	6875	6875	1
S290	75	25	90	1	0	0	6875	6875	1
S291	75	25	90	1	0	0	6875	6875	1
S292	75	25	90	1	0	0	6875	6875	1
S293	75	25	100	1	0	0	7875	7875	1
S294	75	25	100	1	0	0	7875	7875	1
S295	75	25	100	1	0	0	7875	7875	1
S296	75	25	100	1	0	0	7875	7875	1
S297	75	25	90	1	0	0	6875	6875	1
S298	75	25	90	1	0	0	6875	6875	1
S299	75	25	90	1	0	0	6875	6875	1
S300	75	25	90	1	0	0	6875	6875	1
S301	75	25	100	1	0	0	7875	7875	1
S302	75	25	100	1	0	0	7875	7875	1
S303	75	25	100	1	0	0	7875	7875	1
S304	75	25	100	1	0	0	7875	7875	1
S305	75	25	90	1	0	0	6875	6875	1
S306	75	25	90	1	0	0	6875	6875	1
S307	75	25	90	1	0	0	6875	6875	1
S308	75	25	90	1	0	0	6875	6875	1
S309	75	25	100	1	0	0	7875	7875	1
S310	75	25	100	1	0	0	7875	7875	1
S311	75	25	100	1	0	0	7875	7875	1
S312	75	25	100	1	0	0	7875	7875	1
S313	75	25	90	1	0	0	6875	6875	1
S314	75	25	90	1	0	0	6875	6875	1
S315	75	25	90	1	0	0	6875	6875	1
S316	75	25	90	1	0	0	6875	6875	1
S317	75	25	100	1	0	0	7875	7875	1

S318	75	25	100	1	0	0	7875	7875	1
S319	75	25	100	1	0	0	7875	7875	1
S320	75	25	100	1	0	0	7875	7875	1
S321	75	15	90	1	0	0	7575	7575	1
S322	75	15	90	1	0	0	7575	7575	1
S323	75	15	90	1	0	0	7575	7575	1
S324	75	15	90	1	0	0	7575	7575	1
S325	75	15	100	1	0	0	8575	8575	1
S326	75	15	100	1	0	0	8575	8575	1
S327	75	15	100	1	0	0	8575	8575	1
S328	75	15	100	1	0	0	8575	8575	1
S329	75	15	90	1	0	0	7575	7575	1
S330	75	15	90	1	0	0	7575	7575	1
S331	75	15	90	1	0	0	7575	7575	1
S332	75	15	90	1	0	0	7575	7575	1
S333	75	15	100	1	0	0	8575	8575	1
S334	75	15	100	1	0	0	8575	8575	1
S335	75	15	100	1	0	0	8575	8575	1
S336	75	15	100	1	0	0	8575	8575	1
S337	75	15	90	1	0	0	7575	7575	1
S338	75	15	90	1	0	0	7575	7575	1
S339	75	15	90	1	0	0	7575	7575	1
S340	75	15	90	1	0	0	7575	7575	1
S341	75	15	100	1	0	0	8575	8575	1
S342	75	15	100	1	0	0	8575	8575	1
S343	75	15	100	1	0	0	8575	8575	1
S344	75	15	100	1	0	0	8575	8575	1
S345	75	15	90	1	0	0	7575	7575	1
S346	75	15	90	1	0	0	7575	7575	1
S347	75	15	90	1	0	0	7575	7575	1
S348	75	15	90	1	0	0	7575	7575	1
S349	75	15	100	1	0	0	8575	8575	1
S350	75	15	100	1	0	0	8575	8575	1
S351	75	15	100	1	0	0	8575	8575	1
S352	75	15	100	1	0	0	8575	8575	1
S353	75	25	90	1	0	0	6875	6875	1
S354	75	25	90	1	0	0	6875	6875	1
S355	75	25	90	1	0	0	6875	6875	1
S356	75	25	90	1	0	0	6875	6875	1
S357	75	25	100	1	0	0	7875	7875	1
S358	75	25	100	1	0	0	7875	7875	1

S359	75	25	100	1	0	0	7875	7875	1
S360	75	25	100	1	0	0	7875	7875	1
S361	75	25	90	1	0	0	6875	6875	1
S362	75	25	90	1	0	0	6875	6875	1
S363	75	25	90	1	0	0	6875	6875	1
S364	75	25	90	1	0	0	6875	6875	1
S365	75	25	100	1	0	0	7875	7875	1
S366	75	25	100	1	0	0	7875	7875	1
S367	75	25	100	1	0	0	7875	7875	1
S368	75	25	100	1	0	0	7875	7875	1
S369	75	25	90	1	0	0	6875	6875	1
S370	75	25	90	1	0	0	6875	6875	1
S371	75	25	90	1	0	0	6875	6875	1
S372	75	25	90	1	0	0	6875	6875	1
S373	75	25	100	1	0	0	7875	7875	1
S374	75	25	100	1	0	0	7875	7875	1
S375	75	25	100	1	0	0	7875	7875	1
S376	75	25	100	1	0	0	7875	7875	1
S377	75	25	90	1	0	0	6875	6875	1
S378	75	25	90	1	0	0	6875	6875	1
S379	75	25	90	1	0	0	6875	6875	1
S380	75	25	90	1	0	0	6875	6875	1
S381	75	25	100	1	0	0	7875	7875	1
S382	75	25	100	1	0	0	7875	7875	1
S383	75	25	100	1	0	0	7875	7875	1
S384	75	25	100	1	0	0	7875	7875	1
S385	75	15	90	1	0	0	7575	7575	1
S386	75	15	90	1	0	0	7575	7575	1
S387	75	15	90	1	0	0	7575	7575	1
S388	75	15	90	1	0	0	7575	7575	1
S389	75	15	100	1	0	0	8575	8575	1
S390	75	15	100	1	0	0	8575	8575	1
S391	75	15	100	1	0	0	8575	8575	1
S392	75	15	100	1	0	0	8575	8575	1
S393	75	15	90	1	0	0	7575	7575	1
S394	75	15	90	1	0	0	7575	7575	1
S395	75	15	90	1	0	0	7575	7575	1
S396	75	15	90	1	0	0	7575	7575	1
S397	75	15	100	1	0	0	8575	8575	1
S398	75	15	100	1	0	0	8575	8575	1
S399	75	15	100	1	0	0	8575	8575	1

S400	75	15	100	1	0	0	8575	8575	1
S401	75	15	90	1	0	0	7575	7575	1
S402	75	15	90	1	0	0	7575	7575	1
S403	75	15	90	1	0	0	7575	7575	1
S404	75	15	90	1	0	0	7575	7575	1
S405	75	15	100	1	0	0	8575	8575	1
S406	75	15	100	1	0	0	8575	8575	1
S407	75	15	100	1	0	0	8575	8575	1
S408	75	15	100	1	0	0	8575	8575	1
S409	75	15	90	1	0	0	7575	7575	1
S410	75	15	90	1	0	0	7575	7575	1
S411	75	15	90	1	0	0	7575	7575	1
S412	75	15	90	1	0	0	7575	7575	1
S413	75	15	100	1	0	0	8575	8575	1
S414	75	15	100	1	0	0	8575	8575	1
S415	75	15	100	1	0	0	8575	8575	1
S416	75	15	100	1	0	0	8575	8575	1
S417	75	25	90	1	0	0	6875	6875	1
S418	75	25	90	1	0	0	6875	6875	1
S419	75	25	90	1	0	0	6875	6875	1
S420	75	25	90	1	0	0	6875	6875	1
S421	75	25	100	1	0	0	7875	7875	1
S422	75	25	100	1	0	0	7875	7875	1
S423	75	25	100	1	0	0	7875	7875	1
S424	75	25	100	1	0	0	7875	7875	1
S425	75	25	90	1	0	0	6875	6875	1
S426	75	25	90	1	0	0	6875	6875	1
S427	75	25	90	1	0	0	6875	6875	1
S428	75	25	90	1	0	0	6875	6875	1
S429	75	25	100	1	0	0	7875	7875	1
S430	75	25	100	1	0	0	7875	7875	1
S431	75	25	100	1	0	0	7875	7875	1
S432	75	25	100	1	0	0	7875	7875	1
S433	75	25	90	1	0	0	6875	6875	1
S434	75	25	90	1	0	0	6875	6875	1
S435	75	25	90	1	0	0	6875	6875	1
S436	75	25	90	1	0	0	6875	6875	1
S437	75	25	100	1	0	0	7875	7875	1
S438	75	25	100	1	0	0	7875	7875	1
S439	75	25	100	1	0	0	7875	7875	1
S440	75	25	100	1	0	0	7875	7875	1

S441	75	25	90	1	0	0	6875	6875	1
S442	75	25	90	1	0	0	6875	6875	1
S443	75	25	90	1	0	0	6875	6875	1
S444	75	25	90	1	0	0	6875	6875	1
S445	75	25	100	1	0	0	7875	7875	1
S446	75	25	100	1	0	0	7875	7875	1
S447	75	25	100	1	0	0	7875	7875	1
S448	75	25	100	1	0	0	7875	7875	1
S449	75	15	90	1	0	0	7575	7575	1
S450	75	15	90	1	0	0	7575	7575	1
S451	75	15	90	1	0	0	7575	7575	1
S452	75	15	90	1	0	0	7575	7575	1
S453	75	15	100	1	0	0	8575	8575	1
S454	75	15	100	1	0	0	8575	8575	1
S455	75	15	100	1	0	0	8575	8575	1
S456	75	15	100	1	0	0	8575	8575	1
S457	75	15	90	1	0	0	7575	7575	1
S458	75	15	90	1	0	0	7575	7575	1
S459	75	15	90	1	0	0	7575	7575	1
S460	75	15	90	1	0	0	7575	7575	1
S461	75	15	100	1	0	0	8575	8575	1
S462	75	15	100	1	0	0	8575	8575	1
S463	75	15	100	1	0	0	8575	8575	1
S464	75	15	100	1	0	0	8575	8575	1
S465	75	15	90	1	0	0	7575	7575	1
S466	75	15	90	1	0	0	7575	7575	1
S467	75	15	90	1	0	0	7575	7575	1
S468	75	15	90	1	0	0	7575	7575	1
S469	75	15	100	1	0	0	8575	8575	1
S470	75	15	100	1	0	0	8575	8575	1
S471	75	15	100	1	0	0	8575	8575	1
S472	75	15	100	1	0	0	8575	8575	1
S473	75	15	90	1	0	0	7575	7575	1
S474	75	15	90	1	0	0	7575	7575	1
S475	75	15	90	1	0	0	7575	7575	1
S476	75	15	90	1	0	0	7575	7575	1
S477	75	15	100	1	0	0	8575	8575	1
S478	75	15	100	1	0	0	8575	8575	1
S479	75	15	100	1	0	0	8575	8575	1
S480	75	15	100	1	0	0	8575	8575	1
S481	75	25	90	1	0	0	6875	6875	1

S482	75	25	90	1	0	0	6875	6875	1
S483	75	25	90	1	0	0	6875	6875	1
S484	75	25	90	1	0	0	6875	6875	1
S485	75	25	100	1	0	0	7875	7875	1
S486	75	25	100	1	0	0	7875	7875	1
S487	75	25	100	1	0	0	7875	7875	1
S488	75	25	100	1	0	0	7875	7875	1
S489	75	25	90	1	0	0	6875	6875	1
S490	75	25	90	1	0	0	6875	6875	1
S491	75	25	90	1	0	0	6875	6875	1
S492	75	25	90	1	0	0	6875	6875	1
S493	75	25	100	1	0	0	7875	7875	1
S494	75	25	100	1	0	0	7875	7875	1
S495	75	25	100	1	0	0	7875	7875	1
S496	75	25	100	1	0	0	7875	7875	1
S497	75	25	90	1	0	0	6875	6875	1
S498	75	25	90	1	0	0	6875	6875	1
S499	75	25	90	1	0	0	6875	6875	1
S500	75	25	90	1	0	0	6875	6875	1
S501	75	25	100	1	0	0	7875	7875	1
S502	75	25	100	1	0	0	7875	7875	1
S503	75	25	100	1	0	0	7875	7875	1
S504	75	25	100	1	0	0	7875	7875	1
S505	75	25	90	1	0	0	6875	6875	1
S506	75	25	90	1	0	0	6875	6875	1
S507	75	25	90	1	0	0	6875	6875	1
S508	75	25	90	1	0	0	6875	6875	1
S509	75	25	100	1	0	0	7875	7875	1
S510	75	25	100	1	0	0	7875	7875	1
S511	75	25	100	1	0	0	7875	7875	1
S512	75	25	100	1	0	0	7875	7875	1

Table D-2: Profit Model Results for DMU B

Scenario	DMUB						O.F.	Current	Eff
	x1*	x2*	y*	lambdaA	lambdaB	lambdaC			
S1	10	50	70	0	1	0.0	7400	7400	1
S2	10	50	70	0	1	0.0	7400	7400	1
S3	10	50	80	0	1	0.0	8900	8900	1
S4	10	50	80	0	1	0.0	8900	8900	1
S5	10	50	70	0	1	0.0	7400	7400	1

S6	10	50	70	0	1	0.0	7400	7400	1
S7	10	50	80	0	1	0.0	8900	8900	1
S8	10	50	80	0	1	0.0	8900	8900	1
S9	10	50	70	0	1	0.0	7400	7400	1
S10	10	50	70	0	1	0.0	7400	7400	1
S11	10	50	80	0	1	0.0	8900	8900	1
S12	10	50	80	0	1	0.0	8900	8900	1
S13	10	50	70	0	1	0.0	7400	7400	1
S14	10	50	70	0	1	0.0	7400	7400	1
S15	10	50	80	0	1	0.0	8900	8900	1
S16	10	50	80	0	1	0.0	8900	8900	1
S17	10	60	70	0	1	0.0	6800	6800	1
S18	10	60	70	0	1	0.0	6800	6800	1
S19	10	60	80	0	1	0.0	8300	8300	1
S20	10	60	80	0	1	0.0	8300	8300	1
S21	10	60	70	0	1	0.0	6800	6800	1
S22	10	60	70	0	1	0.0	6800	6800	1
S23	10	60	80	0	1	0.0	8300	8300	1
S24	10	60	80	0	1	0.0	8300	8300	1
S25	10	60	70	0	1	0.0	6800	6800	1
S26	10	60	70	0	1	0.0	6800	6800	1
S27	10	60	80	0	1	0.0	8300	8300	1
S28	10	60	80	0	1	0.0	8300	8300	1
S29	10	60	70	0	1	0.0	6800	6800	1
S30	10	60	70	0	1	0.0	6800	6800	1
S31	10	60	80	0	1	0.0	8300	8300	1
S32	10	60	80	0	1	0.0	8300	8300	1
S33	10	50	70	0	1	0.0	7400	7400	1
S34	10	50	70	0	1	0.0	7400	7400	1
S35	10	50	80	0	1	0.0	8900	8900	1
S36	10	50	80	0	1	0.0	8900	8900	1
S37	10	50	70	0	1	0.0	7400	7400	1
S38	10	50	70	0	1	0.0	7400	7400	1
S39	10	50	80	0	1	0.0	8900	8900	1
S40	10	50	80	0	1	0.0	8900	8900	1
S41	10	50	70	0	1	0.0	7400	7400	1
S42	10	50	70	0	1	0.0	7400	7400	1
S43	10	50	80	0	1	0.0	8900	8900	1
S44	10	50	80	0	1	0.0	8900	8900	1
S45	10	50	70	0	1	0.0	7400	7400	1
S46	10	50	70	0	1	0.0	7400	7400	1

S47	10	50	80	0	1	0.0	8900	8900	1
S48	10	50	80	0	1	0.0	8900	8900	1
S49	10	60	70	0	1	0.0	6800	6800	1
S50	10	60	70	0	1	0.0	6800	6800	1
S51	10	60	80	0	1	0.0	8300	8300	1
S52	10	60	80	0	1	0.0	8300	8300	1
S53	10	60	70	0	1	0.0	6800	6800	1
S54	10	60	70	0	1	0.0	6800	6800	1
S55	10	60	80	0	1	0.0	8300	8300	1
S56	10	60	80	0	1	0.0	8300	8300	1
S57	10	60	70	0	1	0.0	6800	6800	1
S58	10	60	70	0	1	0.0	6800	6800	1
S59	10	60	80	0	1	0.0	8300	8300	1
S60	10	60	80	0	1	0.0	8300	8300	1
S61	10	60	70	0	1	0.0	6800	6800	1
S62	10	60	70	0	1	0.0	6800	6800	1
S63	10	60	80	0	1	0.0	8300	8300	1
S64	10	60	80	0	1	0.0	8300	8300	1
S65	10	50	70	0	1	0.0	7400	7400	1
S66	10	50	70	0	1	0.0	7400	7400	1
S67	10	50	80	0	1	0.0	8900	8900	1
S68	10	50	80	0	1	0.0	8900	8900	1
S69	10	50	70	0	1	0.0	7400	7400	1
S70	10	50	70	0	1	0.0	7400	7400	1
S71	10	50	80	0	1	0.0	8900	8900	1
S72	10	50	80	0	1	0.0	8900	8900	1
S73	10	50	70	0	1	0.0	7400	7400	1
S74	10	50	70	0	1	0.0	7400	7400	1
S75	10	50	80	0	1	0.0	8900	8900	1
S76	10	50	80	0	1	0.0	8900	8900	1
S77	10	50	70	0	1	0.0	7400	7400	1
S78	10	50	70	0	1	0.0	7400	7400	1
S79	10	50	80	0	1	0.0	8900	8900	1
S80	10	50	80	0	1	0.0	8900	8900	1
S81	10	60	70	0	1	0.0	6800	6800	1
S82	10	60	70	0	1	0.0	6800	6800	1
S83	10	60	80	0	1	0.0	8300	8300	1
S84	10	60	80	0	1	0.0	8300	8300	1
S85	10	60	70	0	1	0.0	6800	6800	1
S86	10	60	70	0	1	0.0	6800	6800	1
S87	10	60	80	0	1	0.0	8300	8300	1

S88	10	60	80	0	1	0.0	8300	8300	1
S89	10	60	70	0	1	0.0	6800	6800	1
S90	10	60	70	0	1	0.0	6800	6800	1
S91	10	60	80	0	1	0.0	8300	8300	1
S92	10	60	80	0	1	0.0	8300	8300	1
S93	10	60	70	0	1	0.0	6800	6800	1
S94	10	60	70	0	1	0.0	6800	6800	1
S95	10	60	80	0	1	0.0	8300	8300	1
S96	10	60	80	0	1	0.0	8300	8300	1
S97	10	50	70	0	1	0.0	7400	7400	1
S98	10	50	70	0	1	0.0	7400	7400	1
S99	10	50	80	0	1	0.0	8900	8900	1
S100	10	50	80	0	1	0.0	8900	8900	1
S101	10	50	70	0	1	0.0	7400	7400	1
S102	10	50	70	0	1	0.0	7400	7400	1
S103	10	50	80	0	1	0.0	8900	8900	1
S104	10	50	80	0	1	0.0	8900	8900	1
S105	10	50	70	0	1	0.0	7400	7400	1
S106	10	50	70	0	1	0.0	7400	7400	1
S107	10	50	80	0	1	0.0	8900	8900	1
S108	10	50	80	0	1	0.0	8900	8900	1
S109	10	50	70	0	1	0.0	7400	7400	1
S110	10	50	70	0	1	0.0	7400	7400	1
S111	10	50	80	0	1	0.0	8900	8900	1
S112	10	50	80	0	1	0.0	8900	8900	1
S113	10	60	70	0	1	0.0	6800	6800	1
S114	10	60	70	0	1	0.0	6800	6800	1
S115	10	60	80	0	1	0.0	8300	8300	1
S116	10	60	80	0	1	0.0	8300	8300	1
S117	10	60	70	0	1	0.0	6800	6800	1
S118	10	60	70	0	1	0.0	6800	6800	1
S119	10	60	80	0	1	0.0	8300	8300	1
S120	10	60	80	0	1	0.0	8300	8300	1
S121	10	60	70	0	1	0.0	6800	6800	1
S122	10	60	70	0	1	0.0	6800	6800	1
S123	10	60	80	0	1	0.0	8300	8300	1
S124	10	60	80	0	1	0.0	8300	8300	1
S125	10	60	70	0	1	0.0	6800	6800	1
S126	10	60	70	0	1	0.0	6800	6800	1
S127	10	60	80	0	1	0.0	8300	8300	1
S128	10	60	80	0	1	0.0	8300	8300	1

S129	20	50	70	0	1	0.0	7300	7300	1
S130	20	35	75	0	0	0.5	8950	7300	0.815642
S131	20	50	80	0	1	0.0	8800	8800	1
S132	20	50	80	0	1	0.0	8800	8800	1
S133	20	50	70	0	1	0.0	7300	7300	1
S134	20	35	75	0	0	0.5	8950	7300	0.815642
S135	20	50	80	0	1	0.0	8800	8800	1
S136	20	50	80	0	1	0.0	8800	8800	1
S137	20	50	70	0	1	0.0	7300	7300	1
S138	20	40	75	0	0	0.5	8650	7300	0.843931
S139	20	50	80	0	1	0.0	8800	8800	1
S140	20	50	80	0	1	0.0	8800	8800	1
S141	20	50	70	0	1	0.0	7300	7300	1
S142	20	40	75	0	0	0.5	8650	7300	0.843931
S143	20	50	80	0	1	0.0	8800	8800	1
S144	20	50	80	0	1	0.0	8800	8800	1
S145	20	60	70	0	1	0.0	6700	6700	1
S146	20	35	75	0	0	0.5	8950	6700	0.748603
S147	20	60	80	0	1	0.0	8200	8200	1
S148	20	60	80	0	1	0.0	8200	8200	1
S149	20	60	70	0	1	0.0	6700	6700	1
S150	20	35	75	0	0	0.5	8950	6700	0.748603
S151	20	60	80	0	1	0.0	8200	8200	1
S152	20	60	80	0	1	0.0	8200	8200	1
S153	20	60	70	0	1	0.0	6700	6700	1
S154	20	40	75	0	0	0.5	8650	6700	0.774566
S155	20	60	80	0	1	0.0	8200	8200	1
S156	20	60	80	0	1	0.0	8200	8200	1
S157	20	60	70	0	1	0.0	6700	6700	1
S158	20	40	75	0	0	0.5	8650	6700	0.774566
S159	20	60	80	0	1	0.0	8200	8200	1
S160	20	60	80	0	1	0.0	8200	8200	1
S161	20	50	70	0	1	0.0	7300	7300	1
S162	20	35	75	0	0	0.5	8950	7300	0.815642
S163	20	50	80	0	1	0.0	8800	8800	1
S164	20	50	80	0	1	0.0	8800	8800	1
S165	20	50	70	0	1	0.0	7300	7300	1
S166	20	35	75	0	0	0.5	8950	7300	0.815642
S167	20	50	80	0	1	0.0	8800	8800	1
S168	20	50	80	0	1	0.0	8800	8800	1
S169	20	50	70	0	1	0.0	7300	7300	1

S170	20	40	75	0	0	0.5	8650	7300	0.843931
S171	20	50	80	0	1	0.0	8800	8800	1
S172	20	50	80	0	1	0.0	8800	8800	1
S173	20	50	70	0	1	0.0	7300	7300	1
S174	20	40	75	0	0	0.5	8650	7300	0.843931
S175	20	50	80	0	1	0.0	8800	8800	1
S176	20	50	80	0	1	0.0	8800	8800	1
S177	20	60	70	0	1	0.0	6700	6700	1
S178	20	35	75	0	0	0.5	8950	6700	0.748603
S179	20	60	80	0	1	0.0	8200	8200	1
S180	20	60	80	0	1	0.0	8200	8200	1
S181	20	60	70	0	1	0.0	6700	6700	1
S182	20	35	75	0	0	0.5	8950	6700	0.748603
S183	20	60	80	0	1	0.0	8200	8200	1
S184	20	60	80	0	1	0.0	8200	8200	1
S185	20	60	70	0	1	0.0	6700	6700	1
S186	20	40	75	0	0	0.5	8650	6700	0.774566
S187	20	60	80	0	1	0.0	8200	8200	1
S188	20	60	80	0	1	0.0	8200	8200	1
S189	20	60	70	0	1	0.0	6700	6700	1
S190	20	40	75	0	0	0.5	8650	6700	0.774566
S191	20	60	80	0	1	0.0	8200	8200	1
S192	20	60	80	0	1	0.0	8200	8200	1
S193	20	50	70	0	1	0.0	7300	7300	1
S194	20	50	70	0	1	0.0	7300	7300	1
S195	20	50	80	0	1	0.0	8800	8800	1
S196	20	50	80	0	1	0.0	8800	8800	1
S197	20	50	70	0	1	0.0	7300	7300	1
S198	20	50	70	0	1	0.0	7300	7300	1
S199	20	50	80	0	1	0.0	8800	8800	1
S200	20	50	80	0	1	0.0	8800	8800	1
S201	20	50	70	0	1	0.0	7300	7300	1
S202	20	50	70	0	1	0.0	7300	7300	1
S203	20	50	80	0	1	0.0	8800	8800	1
S204	20	50	80	0	1	0.0	8800	8800	1
S205	20	50	70	0	1	0.0	7300	7300	1
S206	20	50	70	0	1	0.0	7300	7300	1
S207	20	50	80	0	1	0.0	8800	8800	1
S208	20	50	80	0	1	0.0	8800	8800	1
S209	20	60	70	0	1	0.0	6700	6700	1
S210	20	60	70	0	1	0.0	6700	6700	1

S211	20	60	80	0	1	0.0	8200	8200	1
S212	20	60	80	0	1	0.0	8200	8200	1
S213	20	60	70	0	1	0.0	6700	6700	1
S214	20	60	70	0	1	0.0	6700	6700	1
S215	20	60	80	0	1	0.0	8200	8200	1
S216	20	60	80	0	1	0.0	8200	8200	1
S217	20	60	70	0	1	0.0	6700	6700	1
S218	20	60	70	0	1	0.0	6700	6700	1
S219	20	60	80	0	1	0.0	8200	8200	1
S220	20	60	80	0	1	0.0	8200	8200	1
S221	20	60	70	0	1	0.0	6700	6700	1
S222	20	60	70	0	1	0.0	6700	6700	1
S223	20	60	80	0	1	0.0	8200	8200	1
S224	20	60	80	0	1	0.0	8200	8200	1
S225	20	50	70	0	1	0.0	7300	7300	1
S226	20	50	70	0	1	0.0	7300	7300	1
S227	20	50	80	0	1	0.0	8800	8800	1
S228	20	50	80	0	1	0.0	8800	8800	1
S229	20	50	70	0	1	0.0	7300	7300	1
S230	20	50	70	0	1	0.0	7300	7300	1
S231	20	50	80	0	1	0.0	8800	8800	1
S232	20	50	80	0	1	0.0	8800	8800	1
S233	20	50	70	0	1	0.0	7300	7300	1
S234	20	50	70	0	1	0.0	7300	7300	1
S235	20	50	80	0	1	0.0	8800	8800	1
S236	20	50	80	0	1	0.0	8800	8800	1
S237	20	50	70	0	1	0.0	7300	7300	1
S238	20	50	70	0	1	0.0	7300	7300	1
S239	20	50	80	0	1	0.0	8800	8800	1
S240	20	50	80	0	1	0.0	8800	8800	1
S241	20	60	70	0	1	0.0	6700	6700	1
S242	20	60	70	0	1	0.0	6700	6700	1
S243	20	60	80	0	1	0.0	8200	8200	1
S244	20	60	80	0	1	0.0	8200	8200	1
S245	20	60	70	0	1	0.0	6700	6700	1
S246	20	60	70	0	1	0.0	6700	6700	1
S247	20	60	80	0	1	0.0	8200	8200	1
S248	20	60	80	0	1	0.0	8200	8200	1
S249	20	60	70	0	1	0.0	6700	6700	1
S250	20	60	70	0	1	0.0	6700	6700	1
S251	20	60	80	0	1	0.0	8200	8200	1

S252	20	60	80	0	1	0.0	8200	8200	1
S253	20	60	70	0	1	0.0	6700	6700	1
S254	20	60	70	0	1	0.0	6700	6700	1
S255	20	60	80	0	1	0.0	8200	8200	1
S256	20	60	80	0	1	0.0	8200	8200	1
S257	10	50	70	0	1	0.0	7400	7400	1
S258	10	50	70	0	1	0.0	7400	7400	1
S259	10	50	80	0	1	0.0	8900	8900	1
S260	10	50	80	0	1	0.0	8900	8900	1
S261	10	50	70	0	1	0.0	7400	7400	1
S262	10	50	70	0	1	0.0	7400	7400	1
S263	10	50	80	0	1	0.0	8900	8900	1
S264	10	50	80	0	1	0.0	8900	8900	1
S265	10	50	70	0	1	0.0	7400	7400	1
S266	10	50	70	0	1	0.0	7400	7400	1
S267	10	50	80	0	1	0.0	8900	8900	1
S268	10	50	80	0	1	0.0	8900	8900	1
S269	10	50	70	0	1	0.0	7400	7400	1
S270	10	50	70	0	1	0.0	7400	7400	1
S271	10	50	80	0	1	0.0	8900	8900	1
S272	10	50	80	0	1	0.0	8900	8900	1
S273	10	60	70	0	1	0.0	6800	6800	1
S274	10	60	70	0	1	0.0	6800	6800	1
S275	10	60	80	0	1	0.0	8300	8300	1
S276	10	60	80	0	1	0.0	8300	8300	1
S277	10	60	70	0	1	0.0	6800	6800	1
S278	10	60	70	0	1	0.0	6800	6800	1
S279	10	60	80	0	1	0.0	8300	8300	1
S280	10	60	80	0	1	0.0	8300	8300	1
S281	10	60	70	0	1	0.0	6800	6800	1
S282	10	60	70	0	1	0.0	6800	6800	1
S283	10	60	80	0	1	0.0	8300	8300	1
S284	10	60	80	0	1	0.0	8300	8300	1
S285	10	60	70	0	1	0.0	6800	6800	1
S286	10	60	70	0	1	0.0	6800	6800	1
S287	10	60	80	0	1	0.0	8300	8300	1
S288	10	60	80	0	1	0.0	8300	8300	1
S289	10	50	70	0	1	0.0	7400	7400	1
S290	10	50	70	0	1	0.0	7400	7400	1
S291	10	50	80	0	1	0.0	8900	8900	1
S292	10	50	80	0	1	0.0	8900	8900	1

S293	10	50	70	0	1	0.0	7400	7400	1
S294	10	50	70	0	1	0.0	7400	7400	1
S295	10	50	80	0	1	0.0	8900	8900	1
S296	10	50	80	0	1	0.0	8900	8900	1
S297	10	50	70	0	1	0.0	7400	7400	1
S298	10	50	70	0	1	0.0	7400	7400	1
S299	10	50	80	0	1	0.0	8900	8900	1
S300	10	50	80	0	1	0.0	8900	8900	1
S301	10	50	70	0	1	0.0	7400	7400	1
S302	10	50	70	0	1	0.0	7400	7400	1
S303	10	50	80	0	1	0.0	8900	8900	1
S304	10	50	80	0	1	0.0	8900	8900	1
S305	10	60	70	0	1	0.0	6800	6800	1
S306	10	60	70	0	1	0.0	6800	6800	1
S307	10	60	80	0	1	0.0	8300	8300	1
S308	10	60	80	0	1	0.0	8300	8300	1
S309	10	60	70	0	1	0.0	6800	6800	1
S310	10	60	70	0	1	0.0	6800	6800	1
S311	10	60	80	0	1	0.0	8300	8300	1
S312	10	60	80	0	1	0.0	8300	8300	1
S313	10	60	70	0	1	0.0	6800	6800	1
S314	10	60	70	0	1	0.0	6800	6800	1
S315	10	60	80	0	1	0.0	8300	8300	1
S316	10	60	80	0	1	0.0	8300	8300	1
S317	10	60	70	0	1	0.0	6800	6800	1
S318	10	60	70	0	1	0.0	6800	6800	1
S319	10	60	80	0	1	0.0	8300	8300	1
S320	10	60	80	0	1	0.0	8300	8300	1
S321	10	50	70	0	1	0.0	7400	7400	1
S322	10	50	70	0	1	0.0	7400	7400	1
S323	10	50	80	0	1	0.0	8900	8900	1
S324	10	50	80	0	1	0.0	8900	8900	1
S325	10	50	70	0	1	0.0	7400	7400	1
S326	10	50	70	0	1	0.0	7400	7400	1
S327	10	50	80	0	1	0.0	8900	8900	1
S328	10	50	80	0	1	0.0	8900	8900	1
S329	10	50	70	0	1	0.0	7400	7400	1
S330	10	50	70	0	1	0.0	7400	7400	1
S331	10	50	80	0	1	0.0	8900	8900	1
S332	10	50	80	0	1	0.0	8900	8900	1
S333	10	50	70	0	1	0.0	7400	7400	1

S334	10	50	70	0	1	0.0	7400	7400	1
S335	10	50	80	0	1	0.0	8900	8900	1
S336	10	50	80	0	1	0.0	8900	8900	1
S337	10	60	70	0	1	0.0	6800	6800	1
S338	10	60	70	0	1	0.0	6800	6800	1
S339	10	60	80	0	1	0.0	8300	8300	1
S340	10	60	80	0	1	0.0	8300	8300	1
S341	10	60	70	0	1	0.0	6800	6800	1
S342	10	60	70	0	1	0.0	6800	6800	1
S343	10	60	80	0	1	0.0	8300	8300	1
S344	10	60	80	0	1	0.0	8300	8300	1
S345	10	60	70	0	1	0.0	6800	6800	1
S346	10	60	70	0	1	0.0	6800	6800	1
S347	10	60	80	0	1	0.0	8300	8300	1
S348	10	60	80	0	1	0.0	8300	8300	1
S349	10	60	70	0	1	0.0	6800	6800	1
S350	10	60	70	0	1	0.0	6800	6800	1
S351	10	60	80	0	1	0.0	8300	8300	1
S352	10	60	80	0	1	0.0	8300	8300	1
S353	10	50	70	0	1	0.0	7400	7400	1
S354	10	50	70	0	1	0.0	7400	7400	1
S355	10	50	80	0	1	0.0	8900	8900	1
S356	10	50	80	0	1	0.0	8900	8900	1
S357	10	50	70	0	1	0.0	7400	7400	1
S358	10	50	70	0	1	0.0	7400	7400	1
S359	10	50	80	0	1	0.0	8900	8900	1
S360	10	50	80	0	1	0.0	8900	8900	1
S361	10	50	70	0	1	0.0	7400	7400	1
S362	10	50	70	0	1	0.0	7400	7400	1
S363	10	50	80	0	1	0.0	8900	8900	1
S364	10	50	80	0	1	0.0	8900	8900	1
S365	10	50	70	0	1	0.0	7400	7400	1
S366	10	50	70	0	1	0.0	7400	7400	1
S367	10	50	80	0	1	0.0	8900	8900	1
S368	10	50	80	0	1	0.0	8900	8900	1
S369	10	60	70	0	1	0.0	6800	6800	1
S370	10	60	70	0	1	0.0	6800	6800	1
S371	10	60	80	0	1	0.0	8300	8300	1
S372	10	60	80	0	1	0.0	8300	8300	1
S373	10	60	70	0	1	0.0	6800	6800	1
S374	10	60	70	0	1	0.0	6800	6800	1

S375	10	60	80	0	1	0.0	8300	8300	1
S376	10	60	80	0	1	0.0	8300	8300	1
S377	10	60	70	0	1	0.0	6800	6800	1
S378	10	60	70	0	1	0.0	6800	6800	1
S379	10	60	80	0	1	0.0	8300	8300	1
S380	10	60	80	0	1	0.0	8300	8300	1
S381	10	60	70	0	1	0.0	6800	6800	1
S382	10	60	70	0	1	0.0	6800	6800	1
S383	10	60	80	0	1	0.0	8300	8300	1
S384	10	60	80	0	1	0.0	8300	8300	1
S385	20	50	70	0	1	0.0	7300	7300	1
S386	20	35	75	0	0	0.5	8950	7300	0.815642
S387	20	50	80	0	1	0.0	8800	8800	1
S388	20	50	80	0	1	0.0	8800	8800	1
S389	20	50	70	0	1	0.0	7300	7300	1
S390	20	35	75	0	0	0.5	8950	7300	0.815642
S391	20	50	80	0	1	0.0	8800	8800	1
S392	20	50	80	0	1	0.0	8800	8800	1
S393	20	50	70	0	1	0.0	7300	7300	1
S394	20	40	75	0	0	0.5	8650	7300	0.843931
S395	20	50	80	0	1	0.0	8800	8800	1
S396	20	50	80	0	1	0.0	8800	8800	1
S397	20	50	70	0	1	0.0	7300	7300	1
S398	20	40	75	0	0	0.5	8650	7300	0.843931
S399	20	50	80	0	1	0.0	8800	8800	1
S400	20	50	80	0	1	0.0	8800	8800	1
S401	20	60	70	0	1	0.0	6700	6700	1
S402	20	35	75	0	0	0.5	8950	6700	0.748603
S403	20	60	80	0	1	0.0	8200	8200	1
S404	20	60	80	0	1	0.0	8200	8200	1
S405	20	60	70	0	1	0.0	6700	6700	1
S406	20	35	75	0	0	0.5	8950	6700	0.748603
S407	20	60	80	0	1	0.0	8200	8200	1
S408	20	60	80	0	1	0.0	8200	8200	1
S409	20	60	70	0	1	0.0	6700	6700	1
S410	20	40	75	0	0	0.5	8650	6700	0.774566
S411	20	60	80	0	1	0.0	8200	8200	1
S412	20	60	80	0	1	0.0	8200	8200	1
S413	20	60	70	0	1	0.0	6700	6700	1
S414	20	40	75	0	0	0.5	8650	6700	0.774566
S415	20	60	80	0	1	0.0	8200	8200	1

S416	20	60	80	0	1	0.0	8200	8200	1
S417	20	50	70	0	1	0.0	7300	7300	1
S418	20	35	75	0	0	0.5	8950	7300	0.815642
S419	20	50	80	0	1	0.0	8800	8800	1
S420	20	50	80	0	1	0.0	8800	8800	1
S421	20	50	70	0	1	0.0	7300	7300	1
S422	20	35	75	0	0	0.5	8950	7300	0.815642
S423	20	50	80	0	1	0.0	8800	8800	1
S424	20	50	80	0	1	0.0	8800	8800	1
S425	20	50	70	0	1	0.0	7300	7300	1
S426	20	40	75	0	0	0.5	8650	7300	0.843931
S427	20	50	80	0	1	0.0	8800	8800	1
S428	20	50	80	0	1	0.0	8800	8800	1
S429	20	50	70	0	1	0.0	7300	7300	1
S430	20	40	75	0	0	0.5	8650	7300	0.843931
S431	20	50	80	0	1	0.0	8800	8800	1
S432	20	50	80	0	1	0.0	8800	8800	1
S433	20	60	70	0	1	0.0	6700	6700	1
S434	20	35	75	0	0	0.5	8950	6700	0.748603
S435	20	60	80	0	1	0.0	8200	8200	1
S436	20	60	80	0	1	0.0	8200	8200	1
S437	20	60	70	0	1	0.0	6700	6700	1
S438	20	35	75	0	0	0.5	8950	6700	0.748603
S439	20	60	80	0	1	0.0	8200	8200	1
S440	20	60	80	0	1	0.0	8200	8200	1
S441	20	60	70	0	1	0.0	6700	6700	1
S442	20	40	75	0	0	0.5	8650	6700	0.774566
S443	20	60	80	0	1	0.0	8200	8200	1
S444	20	60	80	0	1	0.0	8200	8200	1
S445	20	60	70	0	1	0.0	6700	6700	1
S446	20	40	75	0	0	0.5	8650	6700	0.774566
S447	20	60	80	0	1	0.0	8200	8200	1
S448	20	60	80	0	1	0.0	8200	8200	1
S449	20	50	70	0	1	0.0	7300	7300	1
S450	20	50	70	0	1	0.0	7300	7300	1
S451	20	50	80	0	1	0.0	8800	8800	1
S452	20	50	80	0	1	0.0	8800	8800	1
S453	20	50	70	0	1	0.0	7300	7300	1
S454	20	50	70	0	1	0.0	7300	7300	1
S455	20	50	80	0	1	0.0	8800	8800	1
S456	20	50	80	0	1	0.0	8800	8800	1

S457	20	50	70	0	1	0.0	7300	7300	1
S458	20	50	70	0	1	0.0	7300	7300	1
S459	20	50	80	0	1	0.0	8800	8800	1
S460	20	50	80	0	1	0.0	8800	8800	1
S461	20	50	70	0	1	0.0	7300	7300	1
S462	20	50	70	0	1	0.0	7300	7300	1
S463	20	50	80	0	1	0.0	8800	8800	1
S464	20	50	80	0	1	0.0	8800	8800	1
S465	20	60	70	0	1	0.0	6700	6700	1
S466	20	60	70	0	1	0.0	6700	6700	1
S467	20	60	80	0	1	0.0	8200	8200	1
S468	20	60	80	0	1	0.0	8200	8200	1
S469	20	60	70	0	1	0.0	6700	6700	1
S470	20	60	70	0	1	0.0	6700	6700	1
S471	20	60	80	0	1	0.0	8200	8200	1
S472	20	60	80	0	1	0.0	8200	8200	1
S473	20	60	70	0	1	0.0	6700	6700	1
S474	20	60	70	0	1	0.0	6700	6700	1
S475	20	60	80	0	1	0.0	8200	8200	1
S476	20	60	80	0	1	0.0	8200	8200	1
S477	20	60	70	0	1	0.0	6700	6700	1
S478	20	60	70	0	1	0.0	6700	6700	1
S479	20	60	80	0	1	0.0	8200	8200	1
S480	20	60	80	0	1	0.0	8200	8200	1
S481	20	50	70	0	1	0.0	7300	7300	1
S482	20	50	70	0	1	0.0	7300	7300	1
S483	20	50	80	0	1	0.0	8800	8800	1
S484	20	50	80	0	1	0.0	8800	8800	1
S485	20	50	70	0	1	0.0	7300	7300	1
S486	20	50	70	0	1	0.0	7300	7300	1
S487	20	50	80	0	1	0.0	8800	8800	1
S488	20	50	80	0	1	0.0	8800	8800	1
S489	20	50	70	0	1	0.0	7300	7300	1
S490	20	50	70	0	1	0.0	7300	7300	1
S491	20	50	80	0	1	0.0	8800	8800	1
S492	20	50	80	0	1	0.0	8800	8800	1
S493	20	50	70	0	1	0.0	7300	7300	1
S494	20	50	70	0	1	0.0	7300	7300	1
S495	20	50	80	0	1	0.0	8800	8800	1
S496	20	50	80	0	1	0.0	8800	8800	1
S497	20	60	70	0	1	0.0	6700	6700	1

S498	20	60	70	0	1	0.0	6700	6700	1
S499	20	60	80	0	1	0.0	8200	8200	1
S500	20	60	80	0	1	0.0	8200	8200	1
S501	20	60	70	0	1	0.0	6700	6700	1
S502	20	60	70	0	1	0.0	6700	6700	1
S503	20	60	80	0	1	0.0	8200	8200	1
S504	20	60	80	0	1	0.0	8200	8200	1
S505	20	60	70	0	1	0.0	6700	6700	1
S506	20	60	70	0	1	0.0	6700	6700	1
S507	20	60	80	0	1	0.0	8200	8200	1
S508	20	60	80	0	1	0.0	8200	8200	1
S509	20	60	70	0	1	0.0	6700	6700	1
S510	20	60	70	0	1	0.0	6700	6700	1
S511	20	60	80	0	1	0.0	8200	8200	1
S512	20	60	80	0	1	0.0	8200	8200	1

Table D-3: Profit Model Results for DMU C

Scenario	DMUC						O.F.	Current	Eff
	x1*	x2*	y*	lambdaA	lambdaB	lambdaC			
S1	40	70	136.17	0.553	1.234	0	23134	19900	0.860204
S2	40	70	150.00	0.000	0.000	1	25900	25900	1
S3	40	70	148.51	0.553	1.234	0	25602	19900	0.777279
S4	40	70	150.00	0.000	0.000	1	25900	25900	1
S5	40	70	141.70	0.553	1.234	0	24240	19900	0.820943
S6	40	70	150.00	0.000	0.000	1	25900	25900	1
S7	40	70	154.04	0.553	1.234	0	26709	19900	0.745081
S8	40	70	154.04	0.553	1.234	0	26709	25900	0.969728
S9	40	80	147.23	0.511	1.447	0	24847	19400	0.780784
S10	40	80	150.00	0.000	0.000	1	25400	25400	1
S11	40	80	161.70	0.511	1.447	0	27740	19400	0.69934
S12	40	80	161.70	0.511	1.447	0	27740	25400	0.915631
S13	40	80	152.34	0.511	1.447	0	25868	19400	0.749959
S14	40	80	152.34	0.511	1.447	0	25868	25400	0.981905
S15	40	80	166.81	0.511	1.447	0	28762	19400	0.674508
S16	40	80	166.81	0.511	1.447	0	28762	25400	0.883119
S17	40	70	124.91	0.596	1.018	0	20882	19900	0.952953
S18	40	70	150.00	0.000	0.000	1	25900	25900	1
S19	40	70	135.09	0.596	1.018	0	22918	19900	0.86833
S20	40	70	150.00	0.000	0.000	1	25900	25900	1
S21	40	70	130.88	0.596	1.018	0	22075	19900	0.901454

S22	40	70	150.00	0.000	0.000	1	25900	25900	1
S23	40	70	141.05	0.596	1.018	0	24111	19900	0.825366
S24	40	70	150.00	0.000	0.000	1	25900	25900	1
S25	40	80	134.04	0.561	1.193	0	22207	19400	0.873598
S26	40	80	150.00	0.000	0.000	1	25400	25400	1
S27	40	80	145.96	0.561	1.193	0	24593	19400	0.788843
S28	40	80	150.00	0.000	0.000	1	25400	25400	1
S29	40	80	139.65	0.561	1.193	0	23330	19400	0.831554
S30	40	80	150.00	0.000	0.000	1	25400	25400	1
S31	40	80	151.58	0.561	1.193	0	25716	19400	0.7544
S32	40	80	151.58	0.561	1.193	0	25716	25400	0.98772
S33	40	70	129.78	0.578	1.111	0	21856	19900	0.910524
S34	40	70	150.00	0.000	0.000	1	25900	25900	1
S35	40	70	140.89	0.578	1.111	0	24078	19900	0.826488
S36	40	70	150.00	0.000	0.000	1	25900	25900	1
S37	40	70	135.56	0.578	1.111	0	23011	19900	0.8648
S38	40	70	150.00	0.000	0.000	1	25900	25900	1
S39	40	70	146.67	0.578	1.111	0	25233	19900	0.788639
S40	40	70	150.00	0.000	0.000	1	25900	25900	1
S41	40	80	141.33	0.533	1.333	0	23667	19400	0.819718
S42	40	80	150.00	0.000	0.000	1	25400	25400	1
S43	40	80	154.67	0.533	1.333	0	26333	19400	0.736709
S44	40	80	154.67	0.533	1.333	0	26333	25400	0.964557
S45	40	80	146.67	0.533	1.333	0	24733	19400	0.784367
S46	40	80	150.00	0.000	0.000	1	25400	25400	1
S47	40	80	160.00	0.533	1.333	0	27400	19400	0.708029
S48	40	80	160.00	0.533	1.333	0	27400	25400	0.927007
S49	40	70	120.00	0.000	0.000	1	19900	19900	1
S50	40	70	150.00	0.000	0.000	1	25900	25900	1
S51	40	70	128.36	0.618	0.909	0	21573	19900	0.922461
S52	40	70	150.00	0.000	0.000	1	25900	25900	1
S53	40	70	125.45	0.618	0.909	0	20991	19900	0.948029
S54	40	70	150.00	0.000	0.000	1	25900	25900	1
S55	40	70	134.55	0.618	0.909	0	22809	19900	0.872459
S56	40	70	150.00	0.000	0.000	1	25900	25900	1
S57	40	80	128.73	0.582	1.091	0	21145	19400	0.917455
S58	40	80	150.00	0.000	0.000	1	25400	25400	1
S59	40	80	139.64	0.582	1.091	0	23327	19400	0.831645
S60	40	80	150.00	0.000	0.000	1	25400	25400	1
S61	40	80	134.55	0.582	1.091	0	22309	19400	0.869601
S62	40	80	150.00	0.000	0.000	1	25400	25400	1

S63	40	80	145.45	0.582	1.091	0	24491	19400	0.792131
S64	40	80	150.00	0.000	0.000	1	25400	25400	1
S65	60	70	165.53	0.979	1.106	0	28706	19600	0.682775
S66	60	70	165.53	0.979	1.106	0	28706	25600	0.891788
S67	60	70	176.60	0.979	1.106	0	30919	19600	0.633911
S68	60	70	176.60	0.979	1.106	0	30919	25600	0.827966
S69	60	70	175.32	0.979	1.106	0	30664	19600	0.63919
S70	60	70	175.32	0.979	1.106	0	30664	25600	0.83486
S71	60	70	186.38	0.979	1.106	0	32877	19600	0.596169
S72	60	70	186.38	0.979	1.106	0	32877	25600	0.778669
S73	60	80	176.60	0.936	1.319	0	30419	19100	0.627894
S74	60	80	176.60	0.936	1.319	0	30419	25100	0.825138
S75	60	80	189.79	0.936	1.319	0	33057	19100	0.577782
S76	60	80	189.79	0.936	1.319	0	33057	25100	0.759284
S77	60	80	185.96	0.936	1.319	0	32291	19100	0.591487
S78	60	80	185.96	0.936	1.319	0	32291	25100	0.777295
S79	60	80	199.15	0.936	1.319	0	34930	19100	0.546811
S80	60	80	199.15	0.936	1.319	0	34930	25100	0.718584
S81	60	70	155.44	1.018	0.912	0	26688	19600	0.73442
S82	60	70	155.44	1.018	0.912	0	26688	25600	0.959243
S83	60	70	164.56	1.018	0.912	0	28512	19600	0.687423
S84	60	70	164.56	1.018	0.912	0	28512	25600	0.897859
S85	60	70	165.61	1.018	0.912	0	28723	19600	0.682385
S86	60	70	165.61	1.018	0.912	0	28723	25600	0.891278
S87	60	70	174.74	1.018	0.912	0	30547	19600	0.641626
S88	60	70	174.74	1.018	0.912	0	30547	25600	0.838043
S89	60	80	164.56	0.982	1.088	0	28012	19100	0.681844
S90	60	80	164.56	0.982	1.088	0	28012	25100	0.896036
S91	60	80	175.44	0.982	1.088	0	30188	19100	0.632708
S92	60	80	175.44	0.982	1.088	0	30188	25100	0.831464
S93	60	80	174.39	0.982	1.088	0	29977	19100	0.637151
S94	60	80	174.39	0.982	1.088	0	29977	25100	0.837303
S95	60	80	185.26	0.982	1.088	0	32153	19100	0.594042
S96	60	80	185.26	0.982	1.088	0	32153	25100	0.780651
S97	60	70	154.22	1.022	0.889	0	26444	19600	0.741176
S98	60	70	154.22	1.022	0.889	0	26444	25600	0.968067
S99	60	70	163.11	1.022	0.889	0	28222	19600	0.694488
S100	60	70	163.11	1.022	0.889	0	28222	25600	0.907087
S101	60	70	164.44	1.022	0.889	0	28489	19600	0.687988
S102	60	70	164.44	1.022	0.889	0	28489	25600	0.898596
S103	60	70	173.33	1.022	0.889	0	30267	19600	0.647577

S104	60	70	173.33	1.022	0.889	0	30267	25600	0.845815
S105	60	80	165.78	0.978	1.111	0	28256	19100	0.675973
S106	60	80	165.78	0.978	1.111	0	28256	25100	0.888321
S107	60	80	176.89	0.978	1.111	0	30478	19100	0.626686
S108	60	80	176.89	0.978	1.111	0	30478	25100	0.823551
S109	60	80	175.56	0.978	1.111	0	30211	19100	0.632218
S110	60	80	175.56	0.978	1.111	0	30211	25100	0.83082
S111	60	80	186.67	0.978	1.111	0	32433	19100	0.5889
S112	60	80	186.67	0.978	1.111	0	32433	25100	0.773895
S113	60	70	145.82	1.055	0.727	0	24764	19600	0.791483
S114	60	70	150.00	0.000	0.000	1	25600	25600	1
S115	60	70	153.09	1.055	0.727	0	26218	19600	0.747573
S116	60	70	153.09	1.055	0.727	0	26218	25600	0.976422
S117	60	70	156.36	1.055	0.727	0	26873	19600	0.729364
S118	60	70	156.36	1.055	0.727	0	26873	25600	0.952639
S119	60	70	163.64	1.055	0.727	0	28327	19600	0.691913
S120	60	70	163.64	1.055	0.727	0	28327	25600	0.903723
S121	60	80	155.27	1.018	0.909	0	26155	19100	0.730275
S122	60	80	155.27	1.018	0.909	0	26155	25100	0.95968
S123	60	80	164.36	1.018	0.909	0	27973	19100	0.682808
S124	60	80	164.36	1.018	0.909	0	27973	25100	0.897303
S125	60	80	165.45	1.018	0.909	0	28191	19100	0.677523
S126	60	80	165.45	1.018	0.909	0	28191	25100	0.890358
S127	60	80	174.55	1.018	0.909	0	30009	19100	0.636474
S128	60	80	174.55	1.018	0.909	0	30009	25100	0.836413
S129	40	70	120.00	0.000	0.000	1	19900	19900	1
S130	40	70	150.00	0.000	0.000	1	25900	25900	1
S131	40	70	130.00	0.273	1.318	0	21900	19900	0.908676
S132	40	70	150.00	0.000	0.000	1	25900	25900	1
S133	40	70	120.00	0.000	0.000	1	19900	19900	1
S134	40	70	150.00	0.000	0.000	1	25900	25900	1
S135	40	70	132.73	0.273	1.318	0	22445	19900	0.886594
S136	40	70	150.00	0.000	0.000	1	25900	25900	1
S137	40	80	124.55	0.182	1.545	0	20309	19400	0.955237
S138	40	80	150.00	0.000	0.000	1	25400	25400	1
S139	40	80	140.00	0.182	1.545	0	23400	19400	0.82906
S140	40	80	150.00	0.000	0.000	1	25400	25400	1
S141	40	80	126.36	0.182	1.545	0	20673	19400	0.938434
S142	40	80	150.00	0.000	0.000	1	25400	25400	1
S143	40	80	141.82	0.182	1.545	0	23764	19400	0.816373
S144	40	80	150.00	0.000	0.000	1	25400	25400	1

S145	40	70	120.00	0.000	0.000	1	19900	19900	1
S146	40	70	150.00	0.000	0.000	1	25900	25900	1
S147	40	70	120.00	0.000	0.000	1	19900	19900	1
S148	40	70	150.00	0.000	0.000	1	25900	25900	1
S149	40	70	120.00	0.000	0.000	1	19900	19900	1
S150	40	70	150.00	0.000	0.000	1	25900	25900	1
S151	40	70	122.96	0.370	1.074	0	20493	19900	0.971083
S152	40	70	150.00	0.000	0.000	1	25900	25900	1
S153	40	80	120.00	0.000	0.000	1	19400	19400	1
S154	40	80	150.00	0.000	0.000	1	25400	25400	1
S155	40	80	127.41	0.296	1.259	0	20881	19400	0.929053
S156	40	80	150.00	0.000	0.000	1	25400	25400	1
S157	40	80	120.00	0.000	0.000	1	19400	19400	1
S158	40	80	150.00	0.000	0.000	1	25400	25400	1
S159	40	80	130.37	0.296	1.259	0	21474	19400	0.903415
S160	40	80	150.00	0.000	0.000	1	25400	25400	1
S161	40	70	120.00	0.000	0.000	1	19900	19900	1
S162	40	70	150.00	0.000	0.000	1	25900	25900	1
S163	40	70	127.00	0.300	1.250	0	21300	19900	0.934272
S164	40	70	150.00	0.000	0.000	1	25900	25900	1
S165	40	70	120.00	0.000	0.000	1	19900	19900	1
S166	40	70	150.00	0.000	0.000	1	25900	25900	1
S167	40	70	130.00	0.300	1.250	0	21900	19900	0.908676
S168	40	70	150.00	0.000	0.000	1	25900	25900	1
S169	40	80	123.00	0.200	1.500	0	20000	19400	0.97
S170	40	80	150.00	0.000	0.000	1	25400	25400	1
S171	40	80	138.00	0.200	1.500	0	23000	19400	0.843478
S172	40	80	150.00	0.000	0.000	1	25400	25400	1
S173	40	80	125.00	0.200	1.500	0	20400	19400	0.95098
S174	40	80	150.00	0.000	0.000	1	25400	25400	1
S175	40	80	140.00	0.200	1.500	0	23400	19400	0.82906
S176	40	80	150.00	0.000	0.000	1	25400	25400	1
S177	40	70	120.00	0.000	0.000	1	19900	19900	1
S178	40	70	150.00	0.000	0.000	1	25900	25900	1
S179	40	70	120.00	0.000	0.000	1	19900	19900	1
S180	40	70	150.00	0.000	0.000	1	25900	25900	1
S181	40	70	120.00	0.000	0.000	1	19900	19900	1
S182	40	70	150.00	0.000	0.000	1	25900	25900	1
S183	40	70	120.00	0.000	0.000	1	19900	19900	1
S184	40	70	150.00	0.000	0.000	1	25900	25900	1
S185	40	80	120.00	0.000	0.000	1	19400	19400	1

S186	40	80	150.00	0.000	0.000	1	25400	25400	1
S187	40	80	124.80	0.320	1.200	0	20360	19400	0.952849
S188	40	80	150.00	0.000	0.000	1	25400	25400	1
S189	40	80	120.00	0.000	0.000	1	19400	19400	1
S190	40	80	150.00	0.000	0.000	1	25400	25400	1
S191	40	80	128.00	0.320	1.200	0	21000	19400	0.92381
S192	40	80	150.00	0.000	0.000	1	25400	25400	1
S193	60	70	148.18	0.727	1.182	0	25236	19600	0.776657
S194	60	70	150.00	0.000	0.000	1	25600	25600	1
S195	60	70	160.00	0.727	1.182	0	27600	19600	0.710145
S196	60	70	160.00	0.727	1.182	0	27600	25600	0.927536
S197	60	70	155.45	0.727	1.182	0	26691	19600	0.734332
S198	60	70	155.45	0.727	1.182	0	26691	25600	0.959128
S199	60	70	167.27	0.727	1.182	0	29055	19600	0.674593
S200	60	70	167.27	0.727	1.182	0	29055	25600	0.881101
S201	60	80	155.91	0.636	1.409	0	26282	19100	0.726738
S202	60	80	155.91	0.636	1.409	0	26282	25100	0.955033
S203	60	80	170.00	0.636	1.409	0	29100	19100	0.656357
S204	60	80	170.00	0.636	1.409	0	29100	25100	0.862543
S205	60	80	162.27	0.636	1.409	0	27555	19100	0.693171
S206	60	80	162.27	0.636	1.409	0	27555	25100	0.91092
S207	60	80	176.36	0.636	1.409	0	30373	19100	0.628854
S208	60	80	176.36	0.636	1.409	0	30373	25100	0.826399
S209	60	70	140.74	0.815	0.963	0	23748	19600	0.825328
S210	60	70	150.00	0.000	0.000	1	25600	25600	1
S211	60	70	150.37	0.815	0.963	0	25674	19600	0.763416
S212	60	70	150.37	0.815	0.963	0	25674	25600	0.997115
S213	60	70	148.89	0.815	0.963	0	25378	19600	0.772329
S214	60	70	150.00	0.000	0.000	1	25600	25600	1
S215	60	70	158.52	0.815	0.963	0	27304	19600	0.717851
S216	60	70	158.52	0.815	0.963	0	27304	25600	0.937602
S217	60	80	147.04	0.741	1.148	0	24507	19100	0.779356
S218	60	80	150.00	0.000	0.000	1	25100	25100	1
S219	60	80	158.52	0.741	1.148	0	26804	19100	0.712588
S220	60	80	158.52	0.741	1.148	0	26804	25100	0.936438
S221	60	80	154.44	0.741	1.148	0	25989	19100	0.734929
S222	60	80	154.44	0.741	1.148	0	25989	25100	0.965797
S223	60	80	165.93	0.741	1.148	0	28285	19100	0.675265
S224	60	80	165.93	0.741	1.148	0	28285	25100	0.88739
S225	60	70	142.00	0.800	1.000	0	24000	19600	0.816667
S226	60	70	150.00	0.000	0.000	1	25600	25600	1

S227	60	70	152.00	0.800	1.000	0	26000	19600	0.753846
S228	60	70	152.00	0.800	1.000	0	26000	25600	0.984615
S229	60	70	150.00	0.800	1.000	0	25600	19600	0.765625
S230	60	70	150.00	0.800	1.000	0	25600	25600	1
S231	60	70	160.00	0.800	1.000	0	27600	19600	0.710145
S232	60	70	160.00	0.800	1.000	0	27600	25600	0.927536
S233	60	80	150.50	0.700	1.250	0	25200	19100	0.757937
S234	60	80	150.50	0.700	1.250	0	25200	25100	0.996032
S235	60	80	163.00	0.700	1.250	0	27700	19100	0.689531
S236	60	80	163.00	0.700	1.250	0	27700	25100	0.906137
S237	60	80	157.50	0.700	1.250	0	26600	19100	0.718045
S238	60	80	157.50	0.700	1.250	0	26600	25100	0.943609
S239	60	80	170.00	0.700	1.250	0	29100	19100	0.656357
S240	60	80	170.00	0.700	1.250	0	29100	25100	0.862543
S241	60	70	135.20	0.880	0.800	0	22640	19600	0.865724
S242	60	70	150.00	0.000	0.000	1	25600	25600	1
S243	60	70	143.20	0.880	0.800	0	24240	19600	0.808581
S244	60	70	150.00	0.000	0.000	1	25600	25600	1
S245	60	70	144.00	0.880	0.800	0	24400	19600	0.803279
S246	60	70	150.00	0.000	0.000	1	25600	25600	1
S247	60	70	152.00	0.880	0.800	0	26000	19600	0.753846
S248	60	70	152.00	0.880	0.800	0	26000	25600	0.984615
S249	60	80	142.00	0.800	1.000	0	23500	19100	0.812766
S250	60	80	150.00	0.000	0.000	1	25100	25100	1
S251	60	80	152.00	0.800	1.000	0	25500	19100	0.74902
S252	60	80	152.00	0.800	1.000	0	25500	25100	0.984314
S253	60	80	150.00	0.800	1.000	0	25100	19100	0.760956
S254	60	80	150.00	0.800	1.000	0	25100	25100	1
S255	60	80	160.00	0.800	1.000	0	27100	19100	0.704797
S256	60	80	160.00	0.800	1.000	0	27100	25100	0.926199
S257	40	70	122.92	0.361	1.292	0	20483	19900	0.971522
S258	40	70	150.00	0.000	0.000	1	25900	25900	1
S259	40	70	135.83	0.361	1.292	0	23067	19900	0.862717
S260	40	70	150.00	0.000	0.000	1	25900	25900	1
S261	40	70	126.53	0.361	1.292	0	21206	19900	0.938433
S262	40	70	150.00	0.000	0.000	1	25900	25900	1
S263	40	70	139.44	0.361	1.292	0	23789	19900	0.836525
S264	40	70	150.00	0.000	0.000	1	25900	25900	1
S265	40	80	135.00	0.333	1.500	0	22400	19400	0.866071
S266	40	80	150.00	0.000	0.000	1	25400	25400	1
S267	40	80	150.00	0.333	1.500	0	25400	19400	0.76378

S268	40	80	150.00	0.333	1.500	0	25400	25400	1
S269	40	80	138.33	0.333	1.500	0	23067	19400	0.84104
S270	40	80	150.00	0.000	0.000	1	25400	25400	1
S271	40	80	153.33	0.333	1.500	0	26067	19400	0.744246
S272	40	80	153.33	0.333	1.500	0	26067	25400	0.974425
S273	40	70	120.00	0.000	0.000	1	19900	19900	1
S274	40	70	150.00	0.000	0.000	1	25900	25900	1
S275	40	70	120.69	0.391	1.069	0	20038	19900	0.993117
S276	40	70	150.00	0.000	0.000	1	25900	25900	1
S277	40	70	120.00	0.000	0.000	1	19900	19900	1
S278	40	70	150.00	0.000	0.000	1	25900	25900	1
S279	40	70	124.60	0.391	1.069	0	20820	19900	0.955833
S280	40	70	150.00	0.000	0.000	1	25900	25900	1
S281	40	80	120.00	0.000	0.000	1	19400	19400	1
S282	40	80	150.00	0.000	0.000	1	25400	25400	1
S283	40	80	132.41	0.368	1.241	0	21883	19400	0.886543
S284	40	80	150.00	0.000	0.000	1	25400	25400	1
S285	40	80	123.68	0.368	1.241	0	20136	19400	0.963466
S286	40	80	150.00	0.000	0.000	1	25400	25400	1
S287	40	80	136.09	0.368	1.241	0	22618	19400	0.857709
S288	40	80	150.00	0.000	0.000	1	25400	25400	1
S289	40	70	120.00	0.000	0.000	1	19900	19900	1
S290	40	70	150.00	0.000	0.000	1	25900	25900	1
S291	40	70	130.57	0.371	1.214	0	22014	19900	0.903958
S292	40	70	150.00	0.000	0.000	1	25900	25900	1
S293	40	70	122.14	0.371	1.214	0	20329	19900	0.978918
S294	40	70	150.00	0.000	0.000	1	25900	25900	1
S295	40	70	134.29	0.371	1.214	0	22757	19900	0.874451
S296	40	70	150.00	0.000	0.000	1	25900	25900	1
S297	40	80	130.86	0.343	1.429	0	21571	19400	0.899338
S298	40	80	150.00	0.000	0.000	1	25400	25400	1
S299	40	80	145.14	0.343	1.429	0	24429	19400	0.794152
S300	40	80	150.00	0.000	0.000	1	25400	25400	1
S301	40	80	134.29	0.343	1.429	0	22257	19400	0.87163
S302	40	80	150.00	0.000	0.000	1	25400	25400	1
S303	40	80	148.57	0.343	1.429	0	25114	19400	0.772469
S304	40	80	150.00	0.000	0.000	1	25400	25400	1
S305	40	70	120.00	0.000	0.000	1	19900	19900	1
S306	40	70	150.00	0.000	0.000	1	25900	25900	1
S307	40	70	120.00	0.000	0.000	1	19900	19900	1
S308	40	70	150.00	0.000	0.000	1	25900	25900	1

S309	40	70	120.00	0.000	0.000	1	19900	19900	1
S310	40	70	150.00	0.000	0.000	1	25900	25900	1
S311	40	70	120.00	0.000	0.000	1	19900	19900	1
S312	40	70	150.00	0.000	0.000	1	25900	25900	1
S313	40	80	120.00	0.000	0.000	1	19400	19400	1
S314	40	80	150.00	0.000	0.000	1	25400	25400	1
S315	40	80	128.00	0.376	1.176	0	21000	19400	0.92381
S316	40	80	150.00	0.000	0.000	1	25400	25400	1
S317	40	80	120.00	0.000	0.000	1	19400	19400	1
S318	40	80	150.00	0.000	0.000	1	25400	25400	1
S319	40	80	131.76	0.376	1.176	0	21753	19400	0.891833
S320	40	80	150.00	0.000	0.000	1	25400	25400	1
S321	60	70	142.08	0.639	1.208	0	24017	19600	0.8161
S322	60	70	150.00	0.000	0.000	1	25600	25600	1
S323	60	70	154.17	0.639	1.208	0	26433	19600	0.741488
S324	60	70	154.17	0.639	1.208	0	26433	25600	0.968474
S325	60	70	148.47	0.639	1.208	0	25294	19600	0.774874
S326	60	70	150.00	0.000	0.000	1	25600	25600	1
S327	60	70	160.56	0.639	1.208	0	27711	19600	0.707298
S328	60	70	160.56	0.639	1.208	0	27711	25600	0.923817
S329	60	80	154.17	0.611	1.417	0	25933	19100	0.736504
S330	60	80	154.17	0.611	1.417	0	25933	25100	0.967866
S331	60	80	168.33	0.611	1.417	0	28767	19100	0.663963
S332	60	80	168.33	0.611	1.417	0	28767	25100	0.872538
S333	60	80	160.28	0.611	1.417	0	27156	19100	0.703355
S334	60	80	160.28	0.611	1.417	0	27156	25100	0.924304
S335	60	80	174.44	0.611	1.417	0	29989	19100	0.636903
S336	60	80	174.44	0.611	1.417	0	29989	25100	0.836977
S337	60	70	130.00	0.667	1.000	0	21600	19600	0.907407
S338	60	70	150.00	0.000	0.000	1	25600	25600	1
S339	60	70	140.00	0.667	1.000	0	23600	19600	0.830508
S340	60	70	150.00	0.000	0.000	1	25600	25600	1
S341	60	70	136.67	0.667	1.000	0	22933	19600	0.854651
S342	60	70	150.00	0.000	0.000	1	25600	25600	1
S343	60	70	146.67	0.667	1.000	0	24933	19600	0.786096
S344	60	70	150.00	0.000	0.000	1	25600	25600	1
S345	60	80	140.00	0.644	1.172	0	23100	19100	0.82684
S346	60	80	150.00	0.000	0.000	1	25100	25100	1
S347	60	80	151.72	0.644	1.172	0	25445	19100	0.750644
S348	60	80	151.72	0.644	1.172	0	25445	25100	0.986448
S349	60	80	146.44	0.644	1.172	0	24387	19100	0.783193

S350	60	80	150.00	0.000	0.000	1	25100	25100	1
S351	60	80	158.16	0.644	1.172	0	26732	19100	0.714495
S352	60	80	158.16	0.644	1.172	0	26732	25100	0.938943
S353	60	70	134.14	0.657	1.071	0	22429	19600	0.873885
S354	60	70	150.00	0.000	0.000	1	25600	25600	1
S355	60	70	144.86	0.657	1.071	0	24571	19600	0.797674
S356	60	70	150.00	0.000	0.000	1	25600	25600	1
S357	60	70	140.71	0.657	1.071	0	23743	19600	0.825511
S358	60	70	150.00	0.000	0.000	1	25600	25600	1
S359	60	70	151.43	0.657	1.071	0	25886	19600	0.757174
S360	60	70	151.43	0.657	1.071	0	25886	25600	0.988962
S361	60	80	146.57	0.629	1.286	0	24414	19100	0.782329
S362	60	80	150.00	0.000	0.000	1	25100	25100	1
S363	60	80	159.43	0.629	1.286	0	26986	19100	0.707782
S364	60	80	159.43	0.629	1.286	0	26986	25100	0.930122
S365	60	80	152.86	0.629	1.286	0	25671	19100	0.744018
S366	60	80	152.86	0.629	1.286	0	25671	25100	0.977741
S367	60	80	165.71	0.629	1.286	0	28243	19100	0.676277
S368	60	80	165.71	0.629	1.286	0	28243	25100	0.88872
S369	60	70	123.18	0.682	0.882	0	20235	19600	0.968605
S370	60	70	150.00	0.000	0.000	1	25600	25600	1
S371	60	70	132.00	0.682	0.882	0	22000	19600	0.890909
S372	60	70	150.00	0.000	0.000	1	25600	25600	1
S373	60	70	130.00	0.682	0.882	0	21600	19600	0.907407
S374	60	70	150.00	0.000	0.000	1	25600	25600	1
S375	60	70	138.82	0.682	0.882	0	23365	19600	0.838872
S376	60	70	150.00	0.000	0.000	1	25600	25600	1
S377	60	80	133.41	0.659	1.059	0	21782	19100	0.876857
S378	60	80	150.00	0.000	0.000	1	25100	25100	1
S379	60	80	144.00	0.659	1.059	0	23900	19100	0.799163
S380	60	80	150.00	0.000	0.000	1	25100	25100	1
S381	60	80	140.00	0.659	1.059	0	23100	19100	0.82684
S382	60	80	150.00	0.000	0.000	1	25100	25100	1
S383	60	80	150.59	0.659	1.059	0	25218	19100	0.757406
S384	60	80	150.59	0.659	1.059	0	25218	25100	0.995335
S385	40	70	120.00	0.000	0.000	1	19900	19900	1
S386	40	70	150.00	0.000	0.000	1	25900	25900	1
S387	40	70	123.48	0.174	1.348	0	20596	19900	0.966223
S388	40	70	150.00	0.000	0.000	1	25900	25900	1
S389	40	70	120.00	0.000	0.000	1	19900	19900	1
S390	40	70	150.00	0.000	0.000	1	25900	25900	1

S391	40	70	125.22	0.174	1.348	0	20943	19900	0.950176
S392	40	70	150.00	0.000	0.000	1	25900	25900	1
S393	40	80	120.00	0.000	0.000	1	19400	19400	1
S394	40	80	150.00	0.000	0.000	1	25400	25400	1
S395	40	80	135.65	0.116	1.565	0	22530	19400	0.861058
S396	40	80	150.00	0.000	0.000	1	25400	25400	1
S397	40	80	121.16	0.116	1.565	0	19632	19400	0.988188
S398	40	80	150.00	0.000	0.000	1	25400	25400	1
S399	40	80	136.81	0.116	1.565	0	22762	19400	0.852286
S400	40	80	150.00	0.000	0.000	1	25400	25400	1
S401	40	70	120.00	0.000	0.000	1	19900	19900	1
S402	40	70	150.00	0.000	0.000	1	25900	25900	1
S403	40	70	120.00	0.000	0.000	1	19900	19900	1
S404	40	70	150.00	0.000	0.000	1	25900	25900	1
S405	40	70	120.00	0.000	0.000	1	19900	19900	1
S406	40	70	150.00	0.000	0.000	1	25900	25900	1
S407	40	70	120.00	0.000	0.000	1	19900	19900	1
S408	40	70	150.00	0.000	0.000	1	25900	25900	1
S409	40	80	120.00	0.000	0.000	1	19400	19400	1
S410	40	80	150.00	0.000	0.000	1	25400	25400	1
S411	40	80	120.00	0.000	0.000	1	19400	19400	1
S412	40	80	150.00	0.000	0.000	1	25400	25400	1
S413	40	80	120.00	0.000	0.000	1	19400	19400	1
S414	40	80	150.00	0.000	0.000	1	25400	25400	1
S415	40	80	121.90	0.190	1.286	0	19781	19400	0.980741
S416	40	80	150.00	0.000	0.000	1	25400	25400	1
S417	40	70	120.00	0.000	0.000	1	19900	19900	1
S418	40	70	150.00	0.000	0.000	1	25900	25900	1
S419	40	70	121.23	0.185	1.308	0	20146	19900	0.987782
S420	40	70	150.00	0.000	0.000	1	25900	25900	1
S421	40	70	120.00	0.000	0.000	1	19900	19900	1
S422	40	70	150.00	0.000	0.000	1	25900	25900	1
S423	40	70	123.08	0.185	1.308	0	20515	19900	0.970004
S424	40	70	150.00	0.000	0.000	1	25900	25900	1
S425	40	80	120.00	0.000	0.000	1	19400	19400	1
S426	40	80	150.00	0.000	0.000	1	25400	25400	1
S427	40	80	134.15	0.123	1.538	0	22231	19400	0.872664
S428	40	80	150.00	0.000	0.000	1	25400	25400	1
S429	40	80	120.00	0.000	0.000	1	19400	19400	1
S430	40	80	150.00	0.000	0.000	1	25400	25400	1
S431	40	80	135.38	0.123	1.538	0	22477	19400	0.863107

S432	40	80	150.00	0.000	0.000	1	25400	25400	1
S433	40	70	120.00	0.000	0.000	1	19900	19900	1
S434	40	70	150.00	0.000	0.000	1	25900	25900	1
S435	40	70	120.00	0.000	0.000	1	19900	19900	1
S436	40	70	150.00	0.000	0.000	1	25900	25900	1
S437	40	70	120.00	0.000	0.000	1	19900	19900	1
S438	40	70	150.00	0.000	0.000	1	25900	25900	1
S439	40	70	120.00	0.000	0.000	1	19900	19900	1
S440	40	70	150.00	0.000	0.000	1	25900	25900	1
S441	40	80	120.00	0.000	0.000	1	19400	19400	1
S442	40	80	150.00	0.000	0.000	1	25400	25400	1
S443	40	80	120.00	0.000	0.000	1	19400	19400	1
S444	40	80	150.00	0.000	0.000	1	25400	25400	1
S445	40	80	120.00	0.000	0.000	1	19400	19400	1
S446	40	80	150.00	0.000	0.000	1	25400	25400	1
S447	40	80	120.00	0.000	0.000	1	19400	19400	1
S448	40	80	150.00	0.000	0.000	1	25400	25400	1
S449	60	70	130.00	0.464	1.261	0	21600	19600	0.907407
S450	60	70	150.00	0.000	0.000	1	25600	25600	1
S451	60	70	142.61	0.464	1.261	0	24122	19600	0.812545
S452	60	70	150.00	0.000	0.000	1	25600	25600	1
S453	60	70	134.64	0.464	1.261	0	22528	19600	0.870046
S454	60	70	150.00	0.000	0.000	1	25600	25600	1
S455	60	70	147.25	0.464	1.261	0	25049	19600	0.782458
S456	60	70	150.00	0.000	0.000	1	25600	25600	1
S457	60	80	140.00	0.406	1.478	0	23100	19100	0.82684
S458	60	80	150.00	0.000	0.000	1	25100	25100	1
S459	60	80	154.78	0.406	1.478	0	26057	19100	0.733022
S460	60	80	154.78	0.406	1.478	0	26057	25100	0.963291
S461	60	80	144.06	0.406	1.478	0	23912	19100	0.798776
S462	60	80	150.00	0.000	0.000	1	25100	25100	1
S463	60	80	158.84	0.406	1.478	0	26868	19100	0.71088
S464	60	80	158.84	0.406	1.478	0	26868	25100	0.934193
S465	60	70	120.00	0.000	0.000	1	19600	19600	1
S466	60	70	150.00	0.000	0.000	1	25600	25600	1
S467	60	70	130.00	0.524	1.036	0	21600	19600	0.907407
S468	60	70	150.00	0.000	0.000	1	25600	25600	1
S469	60	70	124.88	0.524	1.036	0	20576	19600	0.952557
S470	60	70	150.00	0.000	0.000	1	25600	25600	1
S471	60	70	135.24	0.524	1.036	0	22648	19600	0.865433
S472	60	70	150.00	0.000	0.000	1	25600	25600	1

S473	60	80	127.86	0.476	1.214	0	20671	19100	0.923981
S474	60	80	150.00	0.000	0.000	1	25100	25100	1
S475	60	80	140.00	0.476	1.214	0	23100	19100	0.82684
S476	60	80	150.00	0.000	0.000	1	25100	25100	1
S477	60	80	132.62	0.476	1.214	0	21624	19100	0.883286
S478	60	80	150.00	0.000	0.000	1	25100	25100	1
S479	60	80	144.76	0.476	1.214	0	24052	19100	0.7941
S480	60	80	150.00	0.000	0.000	1	25100	25100	1
S481	60	70	125.08	0.492	1.154	0	20615	19600	0.950746
S482	60	70	150.00	0.000	0.000	1	25600	25600	1
S483	60	70	136.62	0.492	1.154	0	22923	19600	0.855034
S484	60	70	150.00	0.000	0.000	1	25600	25600	1
S485	60	70	130.00	0.492	1.154	0	21600	19600	0.907407
S486	60	70	150.00	0.000	0.000	1	25600	25600	1
S487	60	70	141.54	0.492	1.154	0	23908	19600	0.81982
S488	60	70	150.00	0.000	0.000	1	25600	25600	1
S489	60	80	135.69	0.431	1.385	0	22238	19100	0.858872
S490	60	80	150.00	0.000	0.000	1	25100	25100	1
S491	60	80	149.54	0.431	1.385	0	25008	19100	0.763765
S492	60	80	150.00	0.000	0.000	1	25100	25100	1
S493	60	80	140.00	0.431	1.385	0	23100	19100	0.82684
S494	60	80	150.00	0.000	0.000	1	25100	25100	1
S495	60	80	153.85	0.431	1.385	0	25869	19100	0.738329
S496	60	80	153.85	0.431	1.385	0	25869	25100	0.970265
S497	60	70	120.00	0.000	0.000	1	19600	19600	1
S498	60	70	150.00	0.000	0.000	1	25600	25600	1
S499	60	70	124.50	0.550	0.938	0	20500	19600	0.956098
S500	60	70	150.00	0.000	0.000	1	25600	25600	1
S501	60	70	120.63	0.550	0.938	0	19725	19600	0.993663
S502	60	70	150.00	0.000	0.000	1	25600	25600	1
S503	60	70	130.00	0.550	0.938	0	21600	19600	0.907407
S504	60	70	150.00	0.000	0.000	1	25600	25600	1
S505	60	80	123.75	0.500	1.125	0	19850	19100	0.962217
S506	60	80	150.00	0.000	0.000	1	25100	25100	1
S507	60	80	135.00	0.500	1.125	0	22100	19100	0.864253
S508	60	80	150.00	0.000	0.000	1	25100	25100	1
S509	60	80	128.75	0.500	1.125	0	20850	19100	0.916067
S510	60	80	150.00	0.000	0.000	1	25100	25100	1
S511	60	80	140.00	0.500	1.125	0	23100	19100	0.82684
S512	60	80	150.00	0.000	0.000	1	25100	25100	1