An Empirical Study on Measuring Operating Efficiency and Revenue of Real Estate Assets in the UAE Using Data Envelopment Analysis

دراسة تطبيقية حول قياس الكفاءة التشغيلية وإيرادات الأصول العقارية في دولة الإمارات العربية المتحدة باستخدام التحليل التطويقي للبيانات

by

ABDULRAHMAN ALAFEEFI

A thesis submitted in fulfilment

of the requirements for the degree of

DOCTOR OF PHILOSOPHY IN PROJECT MANAGEMENT

at

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Thesis Supervisor
Professor Halim Boussabaine

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ABSTRACT IN ENGLISH

The main focus of this thesis is building assets in the United Arab Emirates as a representative of emerging real estate markets. Research conducted in this thesis tackles the issue of efficiency in building assets. There is an extreme lack of studies investigating the performance of building assets in emerging markets in the Middle East. In the last couple of decades, the United Arab Emirates has witnessed an accelerated growth in all economic aspects. The population exploded from barely 3 million to almost 10 million. This growth of population forced the real estate industry to grow as well. As a result, investment in real estate became one of the main norms. Nevertheless, comparing the performance of real estate building assets is not an easy task due to the lack of necessary studies.

This thesis tries to fill this gap by investigating efficiency in real estate. Data envelopment analysis was used as the main methodology in this research. In addition, data collection of 57 building assets was conducted. Results showed that most of the building assets in this investigation can be considered moderate with regard to efficiency in terms of Capital Expenditures metrics. On the other hand, Operational Expenditures metrics experience a wider range of efficiency values, indicating that the building assets require improvement. Finally, this thesis contributed to expanding the definition of real estate performance outside financial performance and investigating the uniqueness of the efficiency of building assets in emerging economies by utilising local data only.

ABSTRACT IN ARABIC

إن محور التركيز الرئيسي لهذه الأطروحة هو الأصول العقارية في دولة الإمارات العربية المتحدة كممثل لأسواق العقارات الناشئة. وتتناول هذه الرسالة قضية الكفاءة في الأصول العقارية، إذ أن هناك نقص حاد في الدراسات التي تبحث في أداء الأصول العقارية في الأسواق الناشئة في الشرق الأوسط. شهدت الإمارات العربية المتحدة في العقدين الأخيرين نمواً متسارعاً في جميع الجوانب الاقتصادية نتيجة للنمو السكاني من قرابة ثلاثة ملايين إلى ما يقرب من 10 ملايين نسمة، والذي دفع بمجال العقارات بالنمو كذلك. ونتيجة لذلك، أصبح الاستثمار في العقارات من أهم الأنشطة الاقتصادية الرئيسية. ومع ذلك، فإن مقارنة أداء الأصول العقارية ليست مهمة سهلة بسبب عدم وجود الدراسات اللازمة.

تحاول هذه الرسالة ملئ هذه الفجوة بالتحقيق في الكفاءة في العقارات، حيث تم استخدام التحليل التطويقي للبيانات كمنهجية رئيسية في هذا البحث. وتم جمع بيانات لـ57 من الأصول العقارية. وأظهرت النتائج أن معظم الأصول العقارية في هذا البحث يمكن اعتبارها معتدلة فيما يتعلق بالكفاءة من حيث مقاييس CapEx، ومن ناحية أخرى، تواجه مقاييس OpEx مجموعة واسعة من قيم الكفاءة، مما يشير إلى وجود حاجة لتحسين كفاءة الأصول العقارية. وأخيراً، ساهمت هذه الأطروحة في توسيع تعريف الأداء العقاري خارج الأداء المالي وفي التحقيق في تفرد كفاءة الأصول العقارية في الاقتصادات الناشئة من خلال استخدام البيانات المحلية فقط.

DEDICATION

This thesis is dedicated to my wife who for her unflagging support and inspiration throughout this process. She spent endless hours encouraging me and pushing me to carry on. She dedicated herself to help me out in a field that is totally irrelevant to hers of medical laboratory sciences. I truly could not have completed this thesis without her, and I am eternally grateful to her.

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CHAPTER 1: INTRODUCTION

The real estate market is one of the most important sectors in any economy and is more evident in emerging economies. The United Arab Emirates (UAE) is an example of such emerging economies, where the real estate sector is one of the major drivers of economic growth. Since the beginning of twenty-first century, the UAE has witnessed accelerated growth in its real estate sector to cope with the increased population. This study tries to analyse performance efficiency of the real estate market in the UAE.

1.1 Theoretical background to the research

Real estate management refers to all the activities that involve funding, development, control, monitoring, and operation aspects of the real estate. Investment in real estate is one of the most lucrative investments globally due to its diversified impact and potential revenue (Osagie, 2018). There is a significant surge of interest in real estate worldwide from both individuals and corporate businesses. Real estate performance is of paramount importance to investors and operators. Several authors have used portfolio theory and discounted cash flow to assess the efficiency of investments in real estate. It is reported that the Capital Asset Pricing Model is deficient and inadequate to study the efficiency of real estate (Osagie, 2018, Christersson et al. 2015 and Sengupta, 2003). Probably, this could be because in the past most real estate portfolios were generally built on one property at a time. Studies covering other real estate markets like Germany (Schaefers, 2009), Singapore (Chiang et al., 2016), India (Roy and Kohli, 2016), and Taiwan (Hai-feng and Shuang, 2015) reach different conclusions with regard to CapEx efficiency. For instance, CapEx efficiency for real estate assets in Europe is moderately high (Hartmann, 2015). This is confirmed by Ge and Guo (2014) to some extent since European market management has very mature financing infrastructure. These studies focused on the financial instrument related to real estate Capex and OpEx rather than operation efficiency of the building assets. Furthermore, these types of empirical analyses are normally ex-post analyses which may only confirm the ex-ante investment decisions (Chiang et al., 2016). However, as a result of special properties characteristics (very inhomogeneous), there are a variety of problems in selecting the appropriate asset for investment. Thus, this may require different forms of analysis (Virginia & Richard, 2009). The modern market has become increasingly competitive, and that has given rise to the need for constantly evolving and improving the real estate performance (Stein et al., 2017). The performance paradigm that follows an input-output oriented methodology is associated with efficiency theory. The theory states that (Osagie, 2018) “an organization is cost efficient if it is able to use its allotted resources (input), to achieve a higher-level of output without incurring incremental cost of operation or if such a firm uses the least possible cost to generate the same level of output.”

The efficiency of real estate management was discussed from an operational perspective (Ge & Guo, 2014; Hai-feng & Shuang, 2015; Lins et al., 2005; Anderson et al., 2000; Arribas et al., 2016). Real estate performance is also analysed from development and construction points of view (Jin et al., 2015; Li et al., 2014). There is also an increased amount of research in real estate management from the perspective of financial investment and portfolio construction (Chiang et al., 2016; Chuweni et al., 2017). Ge and Guo (2014) pointed out that there is an increased number of real estate companies which are listed in the stock market. The authors claimed that these companies aim to demonstrate their operational efficiencies so that they can raise capital. The authors went on to highlight that most of the inefficiency in the real estate management in China is due to operation funding problems. On a similar note, Hai-feng and Shuang (2015) performed a comparative efficiency study between listed real estate companies in China and Taiwan. They concluded that the technical efficiency of Chinese companies is lower than their counterparts in Taiwan. Lins et al. (2005) used DEA to analyse the price efficiency of real estate units. The authors claimed that DEA methodology is superior to traditional techniques such as regression analysis. Anderson et al. (2000) performed an efficiency analysis of real estate management based on Bayesian Stochastic Analysis. Their findings pointed out that inefficiency of real estate companies is mostly due to the failure to increase profit instead of reducing cost. Arribas et al. (2016) used Hierarchal Linear Models to identify variables which are most affecting efficiency in real estate management. Many of these studies suffer from serious limitations. For example, most of the real estate studies focused on the capital expenditure, as a reliable measure to account for the profitability, instead of the actual operation efficiency evaluation (Zheng et al., 2014). CapEx performance indicators are highly volatile to the market condition, which is usually beyond the control of the management (Arribas et al., 2016). Most of the prior studies on real estate used the return on investment as a proxy for the financial performance and did not use all the OpEx, CapEx and real estate physical characterises determinants as standard metrics for real estimate operation competitiveness and efficiency. The efficiency measurement diverts the focus of the evaluator to the inputs that have been invested into the real estate and the resulting outputs (Stein et al., 2017). Moreover, the majority of existing literature on real estate was conducted in developed economies (Hartmann, 2015). These markets are very mature compared to emerging economies such as the UAE. Laws governing performance efficiency in these markets may not apply to local real estate markets.

In line with this theory, real estate efficiency is viewed as a maximisation exercise in the sense that the operators/ investors are interest in maximizing profits given the costs of inputs and output. Therefore, real estate operation and investment is regarded “performance-efficient if it is able to generate an optimum mix of output from a given level of inputs (resources)” (Osagie, 2018). Thus, the success of investment in real estate depends on the ability of the building asset operators to enhance the financial efficiency of their assets compared to their competitors and the market benchmark. To enhance the efficiency of real estate assets, this research proposed a Data Envelopment Analysis (DEA), which produces a meaningful set of indices that show best practices and pinpoints the inefficiency that may exist in the inputs in relation to the output in the management of real estates.

1.2 Problem Statement

Research into real estate management can be addressed from three main perspectives. First, many works in the literature discuss the efficiency of real estate management from an operational perspective (Ge & Guo, 2014; Hai-feng & Shuang, 2015; Lins et al., 2005; Anderson et al., 2000; Arribas et al., 2016). Second, another body of work is concerned about real estate management from development and construction perspectives (Jin et al., 2015; Li et al., 2014). Thirdly, there is an increased amount of research in real estate management from the perspective of financial investment and portfolio construction (Chiang et al., 2016; Chuweni et al., 2017). Thus, there is deficiency in the literature in addressing the efficiency of real estate from the life cycle (that is combining characteristics of the asset, CapEx and OpEx parameters) point of view.

Ge and Guo (2014) used DEA to investigate the efficiency measurement of the top 100 real estate companies in China where they found out that 25% of these companies have a high operational inefficiency. In addition, this research found that most of the inefficiency in the real estate management in China is due to their financing conditions. On a similar note, Hai-feng and Shuang (2015) performed a comparative efficiency study between listed real estate companies in China and Taiwan. The majority of the real estate studies have merely put their focus on the capital expenditure instead of the actual efficiency evaluation (Zheng et al., 2014). Many researchers have placed their focus on the CapEx as a reliable measure to account for the profitability of real estate investments. On the other hand, the measures pertaining to the CapEx are highly volatile to the market condition, which is usually beyond the control of the management (Arribas et al., 2016). On the other hand, several researchers and economists have put forth the argument that efficiency measurement is a more reliable way of looking into the riskier aspects of decision making. Thus, this study endeavours to extend the knowledge in this area by trying to make reliable estimates relating to the real estate efficiency. One needs to pay attention to the selection of inputs metrics that go into the real estate operations in order to produce the desired outcomes or outputs. The selection of these inputs and outputs is heavily dependent upon the goals of the management responsible for the real estate (Arribas et al., 2016). Former studies do not provide a clear insight into the definition of inputs and outputs pertaining to real estate. For instance, some previous studies claim that the total asset value of the real estate should be considered the actual output of any real estate management.

The previous research also fails to account for the inclusion of investor's perspective in the method of measurement particularly in the development stages of the model (Azmi et al., 2015). A conscious and a thorough approach needs to be adopted to overcome this shortcoming.

Most of the prior studies on real estate used the return on investment as a proxy for the financial performance and did not use all the OpEx and CapEx determinants as standard metrics for real estimate operation competitiveness. Thus, to fill the gap by the prior researchers, this thesis measures the operational efficiency of real estate based on occupancy rate, OpEx, CapEx and other qualitative factors with view to identify the inputs primarily responsible for the revenue success and/or failure. Another research issue is that the fact that most existing literature on real estate was conducted in developed economies such as USA and UK (Hartmann, 2015). These markets are very mature compared to emerging economies such as the UAE. Law governing performance efficiency in these markets may not apply to local real estate market. At the same time, the rate of acceleration of UAE real estate is rarely witnessed throughout the world. This acceleration, without any doubt, will play a role on how real estate developers and operators will approach performance and management efficiency.

1.3 Significance of Study

In order to maintain the global competitive advantage, it is necessary to conduct a thorough performance analysis (Virginia & Richard, 2009). The modern market has become increasingly competitive, and that has given rise to the need for constantly evolving and improving the real estate practices (Stein et al., 2017). Much of the former research has focused on the CapEx while giving very little attention to the efficiency measurement of general operations. It is extremely important to gauge the efficiency of a real estate management to reduce cost and enhance the overall profitability. The efficiency measurement diverts the focus of the evaluator to the inputs that have been invested into the real estate and the resulting outputs (Stein et al., 2017). It answers the questions whether the efforts undertaken in the investment produced the desired results or were they merely wasted without adding any value. To emerge as the leading player in the real estate market, one needs to put particular emphasis on the efficiency side of things (Cvijanovic, 2014). An efficient approach can lead to greater gains by eliminating wastages and directing the focus to the right areas.

Thus, this study attempts to extend the knowledge in the real estate performance efficiency by taking into consideration OpEx, CapEx, performance (revenue and churn) and real estate physical characterises. The present study makes a noteworthy contribution regarding the scope of performance metrics. Most existing research focuses on few performance metrics to measure real estate management efficiency. This study takes into consideration 44 metrics in its analysis. These efficiency indicators allow the real estate FM managers and investors to effectively allocate and manage resources to maximise possible output in the form of an increased value of the asset.

The significance of the research can be delineated as follows

- *The research discovered a set of efficient real estate assets , which can be used as a benchmark for input resource allocation to achieve the desired revenue for inefficient assets*
- *The study identified data (input) on the utilisation of real estate's resources , which can be used to assist in the management of real estate operation and investment*
- *The research uncovered information on the revenue augmentation level and the input resources minimisation levels that may lead to improving the efficiency of the inefficient assets*
- *The research identified specific input, which are leading assets to have inefficient revenue, thus, the estate managers should concentrate on these inputs to improve the performance*

Findings of this research bear practical implications for real estate management and investor, as well as the economy in general. Firstly, the world's population is growing, which leads to an expansion in global investable real estate. Non-financial indicators, such as technology innovation and sustainability will be key drivers for building assets value. Thus, in order to prepare for these implications, the real estate analysts and the organisations will need to make sure that they understand the value drivers that propel real estates' operation efficiency. Secondly, the high energy prices, climate change, government regulation, and technology disrupting real estate economics will reshape the entire investment in the sector, providing understanding of the risks for real estate investment opportunity for real estate investors and asset managers. Thirdly, form the general economic point of view, it's necessary to improve operating efficiency of investable assets because efficiency is a central problem in economics, and consequently, finding indictors that contribute to efficiency will help to develop and identify prime assets.

1.4 Research Objectives

The main aim of this research was to analyse performance efficiency of 57 real estate assets in the UAE and provide improvement information for the estate managers using DEA. The DEA analysis can handle multiple inputs and outputs of the operational aspect of the real estate without a preceding knowledge of the mathematical or production function that may exists between the input and output. The DEA is considered superior to multiple regression analysis in measuring the efficiency of a given organisation. The aim of this thesis is executed through the following objectives:

- To identify the most important performance metrics that are the most relevant to efficiency analysis of real estate building assets.
- To construct a model for investigating the relationship between input and output performance metrics.
- To conduct an extensive performance efficiency analysis based on data envelopment analysis to identify the less efficient real estate units
- To identify the amount of excess input/output resources used by each of the less efficient real estate units
- To identify the ability to increase performance for less efficient real estate units without requiring additional resources

1.5 Research Questions

The study aimed to answer the following questions.

- How do the real estate assets compare to each other regarding their levels of Efficiency in terms of input and output resources?
- What conditions may explain the differences in the level of performance within similarly efficient assets?
- What factors or input resources that contributed to the inefficient real estate assets?
- Does the performance efficiency of real estate assets change over the years?

1.6 Thesis Structure

This thesis is composed of ten chapters including the introduction. These chapters are described as follows:

Chapter 1: This is the introduction chapter where focus of research is introduced along with the problem statement and research objectives. In addition, research questions and research gaps are highlighted.

Chapter 2: This chapter covers literature review where real estate business model is discussed, and the general operations management is emphasized. The second chapter presents an extensive literature review to highlight real estate management complexity.

Chapter 3: The main goal of the third chapter is to identify the most important performance metrics in real estate

Chapter 4: The fourth chapter presents the research methodology and performs the necessary modelling to link all performance metrics under investigation.

Chapter 5: The fifth chapter provides descriptive and correlation analysis respectively for the collected data in this research. Data envelopment analysis was performed in this chapter for all specified performance metrics. Data envelopment analysis was also performed on average data where the time domain is eliminated. In addition, efficiency frontier analysis is discussed regarding the real estate building assets under investigation

Chapter 6: This chapter discusses the findings of the investigation and provides explanation of certain patterns, where possible.

Chapter 7: The seventh chapter concludes this thesis and demonstrates areas to which it contributed.

CHAPTER 2: LITERATURE REVIEW

The main purpose of this chapter is to give the necessary background for the reader to understand the complexity of real estate management. In addition, the importance of efficiency of such management is highlighted so that justification for this research can be built up. The real estate sector is becoming one of the main sectors in any economy nowadays. This is especially the case in developing economies such as the UAE. Literature has addressed real estate management issues in the context of developed economies, especially the Western countries. The same cannot be said about Middle Eastern countries. This chapter will try to highlight the most important aspects of real estate management as they are found in literature. At the beginning, the most related works will be discussed. Then, elaboration and more discussion about real estate management operations will be delivered. Finally, efficiency concept in the context of real estate management will be deliberated.

2.1 Existing Studies in Measuring Efficiency in Real Estate

The main goal of this section is to highlight the most related works so that the reader can appreciate the increased interest in real estate management research. There is a quite range of research topics covering both real estate management and efficiency measurement. However, the amount of research combining both of them is very limited. Most existing research tries to focus on a narrow scope. For example, there are few research papers focusing specifically on measuring efficiency of real estate management in terms of energy consumption only. For instance, Nappi-Choulet and Decamps (2013) were concerned about capitalization of energy efficiency in asset value and rent cost. They used regression modelling on a set of industrial, commercial and office buildings. They utilized these factors:

- Rent or asset value of building
- Energy consumption of building
- Building type
- Building size
- Number of stories
- Age of building
- Employment level of building

Their main finding was that energy efficiency is more capitalized in rent operations than asset value calculations. This capitalization differs from one building type to another.

On a similar note, Christersson et al. (2015) used discounted cash flow (DCF) method to analyse the influence of energy conservation on the actual property value. They focused on financial performance of energy efficiency in office buildings. They adopted the traditional approach for assessing the profitability of energy conservation. The main used factors were:

- Payback period
- Internal rates of returns
- Returns on investments of energy efficiency

Findings showed advantages of energy efficiency investments at the building portfolio level, highlighting positive impacts on the property values on average.

A very informative work in the literature is published by Wang et al. (2015), where they reviewed several works studying real estate efficiency in China. The major value of this paper is in summarizing inputs and outputs factors used in reviewed works as depicted in the following table.

Table 2. 1 Inputs and outputs factors

Papers	**Input**	**Output**	**Methodology**
Zhang (2006)	• Total assets • Capital • Number of employees	• Total profit • Operating profit	Two-stage DEA
Liu and Sun (2006)	• Average total assets • Average shareholders' equity	• Prime operating revenue • Prime operating profit • Net profit • Turnover of total capital	CCR/BCC (Comparison of efficiency results), (Banker, Charnes and Cooper Model)
Meng, Xing, and Chen (2008)	• Number of employees • Total assets	• Net profit • Operating revenue	CCR/BCC
Ren and Qian (2009)	• Number of employees • Average shareholders' equity	• Prime operating revenue • Net profit	CCR/BCC
Dong (2012)	• Total assets • Long-term debt • Number of employees • Cash paid to employees • Taxation and dues	• Operating revenue • Operating profit • Total profit • Net profit	BCC (Banker, Charnes and Cooper Model)
Ran and Xu (2013)	• Total assets • Shareholders' equity	• Net profit • Profit rate to net worth • Return on equity	BCC (Banker, Charnes and Cooper Model)

Source: (Alafeefi, A., 2018)

The most recent and related work is published by Roy and Kohli (2016). The authors used Data Envelopment Analysis to point out areas of inefficiency in real estate, which are a result of turnover inventory and excess manufacturing expenses. They used Overall Technical Efficiency (OTE) which helps to determine inefficiency due to the input/output configuration.

The OTE is a measure of efficiency under the constant returns to scale. The inputs and the output parameters used to measure efficiency for this study were:

- Capital Resources
- Turnover Inventory
- Manufacturing Expenses
- Employee Cost
- Selling and administrative expenses
- Miscellaneous Expenses
- Operating Profit Margin
- Net Profit

Other papers discussed efficiency in real estate from different perspectives. For example, Qian et al. (2013) were more concerned about developing accurate mathematical models to measure energy efficiency in real estate.

A report delivered by Credit Suisse in 2008 regarding the performance of three prominent Dubai real estate and construction companies (Arab Tech Company, Emaar Properties and Union Properties) attracted attention among prospective investors during that period. The study analysed the financial statements of the aforesaid companies, constructed ratios and analysed the reasons for their respective performance. The main success factors highlighted were a significant rise in oil prices, freehold ownership rights, increase in population, the establishment of free trade zones and the general peak in the economy.

Another report by the Kuwait Finance House (2008) on real estate in the UAE revealed that the maximum growth in real estate transaction volume was reported in the UAE. This was followed by Oman, Qatar and Saudi Arabia, respectively. The study projected acceleration in the real estate and construction sector in the coming years and did not expect the bubble to burst (Al-Malkawi & Pillai, 2013).

2.2 Techniques to Evaluate Efficiency

2.2.1 Real Estate Management

Real estate management refers to all the activities that involve control, monitoring, and operation aspects of the real estate. Management represents a requirement to monitor, manage and be accountable for certain aspects of the business. Real estate management is a lot similar in its essence to management of any commercial business. Real estate management also covers aspects like monitoring and management of the personal artefacts, physical assets, tools, and equipment that are being utilized in the maintenance, repair or construction of a property (Brueggeman & Fisher, 2008). Real estate management deals with the entire lifecycle of a property from acquisition, control, accountability, utilization to disposition.

The duties under the banner of real estate management include aspects like screening, testing, and monitoring of an individual. This also includes active involvement in assessing the criminal, rental and credit history of the client in question (Schaefers, 2009). It also covers aspects relating to the leasing, and rental agreements based on the legal agreements. An effective real estate management also deals with the repair and maintenance aspect issues of a property while staying strictly in the folds of available budget.

Real estate management has a very wide scope it encompasses fields like financial management, physical management, as well as professional management of the properties. The management would need to engage with the clients, insurance agencies, and a mass of other stakeholders to ensure the continued existence of a property in the pristine state (Virginia & Richard, 2009). Although in many other fields legal aspects are considered to be entirely different function, a legal expert may assist in the proper management of the legal aspects of a property. Particular care needs to be taken when dealing with the eviction, tenant/landlord, power of attorney, harassment, public nuisance, and the pre-arranged services. Therefore, it becomes extremely important the property management is well-versed in the legal aspects of the real-estate (Brueggeman & Fisher, 2008).

2.2.2 Business Models

There are several business models adopted by practitioners in the industry (Schaefers, 2009). The popularity of these models depends on many factors such as business culture and the level of economic development in the country. The following represents the most common business models adopted in real estate management.

2.2.2.1 Percentage of Rent

This is most widely used model in the field of real estate management. There are a lot of real estate management companies that favour the percentage of rent model. Under this model, the owner of the property establishes a contract with the company that gives it the right to let the property to a tenant and become entitled to the resulting rent. The owners are not involved in the hassle of assessing or shortlisting the tenants for their property. The company manages the property; it takes 10 to 15 per cent of the rent as commission while the rest is transferred to the property owner (Sivitanides, 1997).

2.2.2.2 Fixed Fees

It is a widely-used model of collecting revenue for real estate management companies that deal with unoccupied homes or land sites. The responsibility of the property management revolves around ensuring the property is properly maintained and kept safe while communicating any unusual circumstances to the owners. Because these properties are unoccupied, a fixed fee is levied to the owner to compensate the company for their services (Song & Lee, 2019).

2.2.2.3 Guaranteed Rent

This model is also very popular amongst residential spaces, but tends to be more widely used in high value and high demand properties. Under this model, the company enters in a contract with the owner regarding a fixed rent payment to the owner. The company gets the right to rent the property to any tenant while the owner enjoys a steady flow of income through rent. The company earns a commission by renting the property on higher rents than the rent that they are actually paying to the owner (Roten & Johnston, 2019).

2.2.2.4 Revenue Share

This model is applicable to the commercial properties that constantly generate revenues. The retail shops, business centres, or showrooms are some examples of revenue generating properties, where the revenue share model would be effective. Under this model, the company establishes a contract with the owner where the company gets an entitlement to transform the property into a revenue generating property. The company then shares a pre-determined rate of revenue with the owner rather than paying a fixed rental amount. In certain scenarios, a hybrid model can also be used where company pays a fixed monthly rental plus an additional revenue share (Boudry, et al., 2018).

2.2.3 Real Estate Operations

The term Real Estate Operations is a fairly new creation in the world of real estate management (Korngold, 2015). In case of leased properties, this mode is referred to as building management, but the basic essence and the skills involved remain largely unchanged. Real estate operations model operates under the principles of productivity, maintenance efficiency, cost-reduction and satisfaction of the tenants (Korngold, 2015). It can become extremely difficult for a real estate management company to continuously provide better services to the tenants while keeping the costs low. Under this model, the company has to constantly balance the cost of service against the benefits and quality being received by the tenants (Cvijanovic, 2014).

2.2.4 Plant Operations

It is one of the most ignored real estate operations in the field of real estate management (Stein et al., 2017). Not giving due attention to the plant operation can have serious consequences for the entire property (Brown et al., 2013). It is important to note that the rapid progression of technology has made some significant improvements to the operations. The literature does not agree on a universal definition of plant operations, but, in general, the following items are taken under the plant category. The first item of plant operations is related to heating, air-conditioning, climate control, and ventilation facilities. Other items are transportation, electricity, plumbing system, and emergency power measurements.

Plant operations are very routine in nature (Stein et al., 2017). Although their routine nature may create a false belief that they are not that important or central for real estate management, in reality, they play a huge rule. Poor ventilation, heating, or cooling can cause serious discomfort and reduce the efficiency of a property. Poor plant operation management can have serious health and safety consequences as well.

The most important aspect of efficient plant operations management lies in the identification of energy saving and consumption protocols while having centralized resource management and ventilation systems in place (Brown et al., 2013). The energy aspect of the operation management can be achieved through Building Maintenance System (BMS). An effective centralized management system would only require a single resource monitoring the entire operations effectively. The resource does not need to have a high-grade experience or knowledge in order to function effectively. The constant monitoring and maintenance of the centralized system would ensure perfect plant operations management. The single individual managing the resources only needs to monitor different computer output and relay them to the particular maintenance department once an issue is identified.

Usually distinct functions of the building are monitored by different departments. In the most common setting, buildings have a separate security and operation centre. The security department manages the health and safety protocols while the operation centre looks after the repair and maintenance aspects of the building. This approach has better accountability and monitoring system but has higher cost associated with it (Brown et al., 2013).

The newer buildings and properties have introduced automated system for the maintenance of the building. Whereas these systems are highly effective in managing the buildings in which they are installed, they can be nearly impossible to install in older properties. Automated systems are quickly becoming viable as plant operations due to the rapid growth in the technology. There are several different companies which operate in this sphere; they are responsible for designing highly effective real estate management systems with more and more features being introduced every year.

2.2.5 Energy Management

Energy management is another very important aspect of real estate management (Mahadevan, 2015). Although it is extremely important, it is not a separate activity and is rather involved in nearly every system. Once the importance of the energy management was established, it became a critical factor in the real estate operations that needed particular attention and care. Whether analysing energy from the cost perspective or from the activities perspective, it serves an extremely important role that cannot be ignored. The new initiate focus on the energy enhanced the importance of energy management even further. A creative and consistent energy management system can save nearly 30 to 33% of the energy costs in a building (Mahadevan, 2015). Energy forms nearly 30% of the total spending that a building management program incurs.

The increased focus and importance of the energy management has forced the companies to devise strategies that would result in the maximum savings in the energy related costs. This emphasis on cost cutting comes with a drastic price. Now the companies think of energy in terms of expense that needs to be curtailed more and more with every passing year. This way of thinking can lead to reduction in quality as a factor to create additional savings. Furthermore, the smaller users are at risk of bearing the brunt of this cut as they do not have economies of scale to absorb the higher cost of energy.

A sound energy management system can earn some tangible savings to the company. The management, building, and business can benefit a lot from an effective energy management program. The energy management has quickly taken on a very competitive profile where each player attempts to reduce their cost and gain the best possible service that the market has to offer. The higher degree of focus over cost cutting with regards to the energy management would boost competition and creative highly competitive prices for building assets management that can be extremely beneficial for the business at large (Mahadevan, 2015).

In addition to cost reduction, the deregulation of the energy service would also let the management exercise their own spin or plan of energy management, resulting in better savings and higher quality of energy service. Such a practice of energy management would also create opportunities for the management, where they can actually sell excess energy to the other participants and earn some additional return on their effective energy management.

The energy companies operating in the market have to enhance their standard to attract the customers under their banner. This would increase the overall quality of the service while keeping the costs to the minimum. The energy companies would also be forced to create newer and better products in order to remain relevant in the market. Such intense competition and deregulation would be highly beneficial for the management as they reap additional rewards from their energy management program.

2.2.6 Recycling and Waste Management

Recycling is another key factor that real estate management must take keen interest in (Guerrero et al., 2013). Growing environmental regulation and people awareness have made it essential for the real estate operations practitioners to devise effective recycling and waste reduction strategies (Guerrero et al., 2013). The improvement in the technology and mass awareness has also made it easier to reduce wastage and increase recycling in waste management. Individuals, companies, and managers who have devised successful waste reduction and recycling strategies have earned a lot of respect among their peers and customers. It is important to have a full-time or part-time dedicated resource for waste management in its initial stages.

Recycling is not cheap. It has higher costs per tenant in the initial stages (Wu et al., 2016). The biggest hurdle that waste management policymakers have to face is a lack of dedicated space for dealing with the waste. This problem is particularly persistent in urban areas. Furthermore, a real estate company needs to have dedicated employees that sort the waste in different categories based on their attributes. This creates an additional expense. Although a lot of attention is being directed towards waste management, it is still an up-and-coming field, where many things are undefined and not streamlined yet.

2.2.7 Air Quality Operations

Air quality management can be one of the trickiest aspects of the real estate operations (Zheng et al., 2014). Many old and new buildings fail to take necessary measures to ensure the perfect flow and quality of the air within a constructed space. Most of the commercial buildings lack the sophisticated systems necessary to ensure perfect air quality and temperature regulation. Due to the high operating costs, companies tend to ignore air quality management. It has been observed that the air vents, ducts, air-conditioning, and humidity controls in commercial buildings are very poorly managed.

Air quality is a critical factor that has several legal and safety consequences in commercial as well as residential buildings (Kumar et al., 2015). Real estate management needs to take a proactive role when it comes to air quality management. They need to provide advice, communicate policy, and devise strategies that facilitate better air quality within their premise. Higher emphasis on air quality management needs to be exercised by ensuring better maintenance, proper construction choices and a dedicated budget. Better air quality can lead to better productivity and lower health and safety related costs (Zheng et al., 2014). It is also essential for the well-being of the tenants to have a property air quality management. This is a critical area where real estate management can make significant contribution.

2.2.8 Inventory Management

Inventory management serves dual function (Geman & Tunaru, 2013). It allows the managers to have a clear understanding about the different aspects that they have to manage. Additionally, it also helps in financial management where the idea of the value of the fixture, fittings and assets on the property can help in proper depreciation allocation. The rules and premise of the inventory management is usually defined by a separate department like procurement or purchasing. A dedicated department outlines the requirements and scope of the inventory management that can later be implemented by real estate management. The function of the real estate manager largely involves dealing with the inventory of the furniture, fittings, and their related procurement and disposal (Geman & Tunaru, 2013). There are several different methods that can be used to ensure effective inventory management; one such approach is the barcode method (Abatecola et al., 2013).

Under the barcode method, each piece of the inventory (furniture, fixtures or assets) is assigned a number that can be used to track its physical location as well as its general condition and maintenance (Abatecola et al., 2013). A single spreadsheet program or computer generated application can download the entire database of the inventory and track it based on the location, type, class, condition, and other useful factors. A well-designed inventory management system based on the bar coding method can assist the management in dealing with the inventory from acquisition to disposal. The rapid expansion in technology has made significant contributions in the field of real estate management, where it is becoming easier and more feasible for the companies to adopt a computer-based inventory management system rather than relying on manual processes. A well-maintained inventory database would assist the organization in proper financial planning, better strategic decision-making, and achieving better revenues in the future.

2.2.9 Information Technology Management

Nearly 50% of real estate management has to deal with information technology management as well (Mahadevan, 2015). It is another critical factor that significantly enhances or compromises the functionality and utility of a property. In the modern day and era, telecommunication has become a necessity without which a commercial or residential premise cannot function properly. Such high degree of importance has made it critical for real estate management to pay particular attention to this aspect.

In the past, the communication management only entailed paying the phone bills on the time. However, the inter-connected nature and fast communication channels have completed transformed this area (Mahadevan, 2015). In the modern era, communication management is a dynamic and multifaceted problem that real estate management have to deal with. Increased automation, better infrastructure, and rapidly developing technology have made this a critical function of real estate management.

Communication is a key factor that requires a unique set of management and technical skills to deal with properly (Mahadevan, 2015). It is highly likely that communication management would be handled by a completely dedicated department (IT department) in a property, but there have also been instances where real estate management has been directly involved. Communication is the lifeblood of modern economy; it is the pathway through which all the information flows throughout the organization. Communication has become so critical that several physical and technical requirements are placed into the plan before construction of a property (Mahadevan, 2015). Communication systems require physical hardware such as wires, antennas, routers, electricity, switches, and a dedicated space to function properly and effectively. An uninterrupted communication system requires a proactive and consistent approach. The coordination between different departments involved in the communication management is therefore very important.

Equipment involved in the communication system has different physical and technical requirements that must be adhered to (Brown et al., 2013). Technical staff needs to constantly monitor the space, electrical and cooling requirements of the communication to ensure uninterrupted communication. Real estate management needs to construct a dedicated database similar to the inventory management for the communication system to ensure that each part of the communication framework can be properly maintained and regulated. Real estate management also needs to be aware of the impact of physical movement of different equipment, so that the proper planning protocols can be placed.

More and more real estate companies are opting for wireless communication channels such as Wi-Fi (Mahadevan, 2015). Wireless technology not only ensures seamless communication, but also reduces the physical space requirement for an effective communication system. The wireless communication systems are more in line with the mobile nature of the modern world. The rapid expansion of technology has significantly improved the communication structure, where a user can simultaneously connect with different devices without needing any strong physical equipment. Where the wireless systems have modernized the communication system, they have also introduced a unique set of problems that did not exist in the past. The instant communication modules have created several safety and data protection concerns. The tenants need to be properly educated about how they can keep their data secure over different connections (Brown et al., 2013).

With that in mind, changing technologies make modifications management one of the most popular aspects of real estate management. A majority of the property managers have one or other form of dealing with this function. The constant technological upgrades and technology innovations create a need for change in the different facilities of a property. These alteration managements need to be monitored carefully or they may result in significant disruptions. The alteration management becomes particularly tricky when the maintenance and alteration budgets are clumped together. If the alteration is not managed properly, it can cause a substantial hike in maintenance costs (Mahadevan, 2015).

A proper documentation procedure can provide a lot of assistance in properly managing the constant modifications. Real estate management needs to ensure that adjustment and maintenance tasks are carried out simultaneously so that any damages or interruptions can be minimized. Real estate management needs to pay close attention to the progress and flow of the modification project from start to finish. The design and alteration division needs to remain in close coordination so that all the projects are properly managed and executed.

Before undertaking any modification project, proper planning must be done (Mahadevan, 2015). An independent expert must be taken on board, who can assess the cost and time that would be involved in the completion of the project. The expert needs to have prior experience in dealing with such complex projects. Above all, the quick completion of the project should be the main focus of real estate management, but it should not compromise the overall quality of the project. Real estate management must utilize the expertise of an external resource to ensure proper strategic planning.

2.2.10 Budgeting

Among all the real estate operations, the one that needs management attention is budgeting (Klein, 2016). It is the backbone of maintenance and repair, controlled annually, using several review points. Each organization has its own procedure of identifying its requirements; however, sometimes, they neglect a few crucial sources of requirements. A comprehensive scheme is required for gathering all essential requirements (Klein, 2016).

As per the model, all requirements are studied and listed before they are being put in the budget. In case the availability of funds is beyond the critical needs, they are ranked by priorities recognized in the mid-year plan. Minor construction and modification funds are never mixed with the maintenance and repair funds. Strict guidelines are followed regarding the leakage of maintenance and repair money into the alteration capitals.

As soon as the budget is accumulated, multiple analyses are conducted by the management, which also include unit cost and historical comparisons, target percentage of existing replacement value comparison, trend analysis and comparisons to the budget of the current year (Klein, 2016). Along with these issues, variance becomes a core part of the budget's narrative. If the gathered requirements are greater than the funding guidance, then statements regarding the effect of funding limitations defined by categories are submitted.

During the time of budget execution, large real estate companies decide whether they should track the expenses or commitment details or a combination of both. On the other hand, small companies, those who have inventory of buildings, keep track of the unit cost of service orders and preventive maintenance. There are some large companies that prefer tracking total maintenance and repair funds by activity code, putting stress on the critical trends. There are at least three guidelines for which it is important to mention the effect of capital budget on maintenance and repair budgeting. First, additions to the capital inventory should serve as the basis for maintenance and repair. Second, decisions made on the grounds of life-cycle costing instead of capital costs may have positive and downstream impact on the future maintenance and repair budgeting. Third, designing for maintaining a core concept in all the design procedures is a must.

2.2.11 Personnel and Staffing

Good real estate management depends on the size of a company and many other factors. One of the most important factors is staffing (Azmi et al., 2015). For instance, staff of maintenance and repair should be as technically proficient as possible. This is due to the fact that the maintenance and repair staff is responsible for reviewing all operations and activities in real estate management. Maintenance and repair staff should always be full-time unless the size of the building inventory is small. As a result, maintenance and repair staff can inspect all the deficiencies along with checking the maintenance and repair work itself. Training is provided for improving the management and technical competencies. Leadership qualities in managers are highlighted for making the maintenance and repair staff proactive.

The right combination of contract and in-house workforce is crucial, particularly during the execution of real estate operations (Azmi et al., 2015). There is no hard and fast rule; however, the selection of the staff depends on what the management can afford as per the staff positions and the available budget for salaries. Tasks related to standards, policymaking, budgeting, quality control, work plan development and evaluation needs to be managed by the in-house staff.

With brain drain on the rise, capability to operate, repair and maintain the real estate units has been hindered. Furthermore, older staff is retiring and the current staff along with training programs are usually not enough to fill the void. A solution to this problem is smart asset management approach in which experienced technicians are considered to be a valuable resource. Experienced staff is used for assigning tasks and tracking progress just like spare parts and equipment are tracked. The less-experienced techs, on the other hand, are assigned less critical tasks. However, this does not completely resolve the problem because, in the current developed world, very few young individuals participate in such technical apprentice (Azmi et al., 2015).

2.2.12 Life-Cycle Costing

Among the many core economic concepts, the most crucial one to comprehend is life-cycle costing (Ristimaki et al., 2013). If it is conducted properly, this procedure lets you compare two different options with varied anticipated lives or the total worth of an option over its anticipated life. It can further be used for comparing the benefits of outsourcing a service or retaining in-house, for comparing two diverse choices of an equipment to perform the same job, or for determining whether equipment needs repair or replacement.

Unfortunately, the application of life-cycle costing is very limited in real estate management (Ristimaki et al., 2013). If it is applied to real estate operations, it can acknowledge whether a company should buy certain chain of costs while buying a building i.e. the price of ownership. Life-cycle of costs can be used for evaluating two different choices for meeting the same product requirement—for example, whether to construct a building in the suburbs or lease a building in the city. When it comes to the project level, it can be used to assess whether new equipment should be installed in the building instead of the expense of repairing and fixing the old existing equipment.

Proper use of life-cycle costing allows real estate mangers to compare two different actions with different life expectancies, which reveals the time value of the capital. It is not easy to recognize the savings for offered projects, and it is even more complicated to quantify and document them. The real estate department staff and the financial economist or analyst have to work together to quantify the costs and savings (Ristimaki et al., 2013). Although these tasks can be outsourced, it is better to develop them in-house. Major real estate management judgments made on the basis of first costs are never considered good. Life-cycle costing should be included in the standard best practices for professional results.

2.2.13 Financial Planning

Financial forecasts play the role of bridges (Masalskyte et al., 2014). They help in assessing the plan according to the available financial resources and then create a budget. Their primary job is to do financial planning. A forecast surely helps in project estimates and budgeting, but, primarily, it has to do with planning. Real estate management uses various forecasting techniques for obtaining the total figure of the budget. It is crucial to know whether the budget is going be in constant, especially in the period of inflation. If the decrease or increase in the value over time is not accounted for, it can affect the budget estimates on a serious note (Masalskyte et al., 2014). There are lots of sophisticated forecasting methods available at hand; the most common ones include moving averages, simple projection, exponential smoothing, regression analysis, econometric modelling and Delphi method (Ameyaw et al., 2016).

Each company follows its own forecasting technique. As a capital budget comprises of discrete tasks and projects, it is actually a total of individual estimates. Other than this, different forecasting techniques are required for the budget of operations and maintenance, depending on each real estate operation. Financial forecast includes historical extrapolation in a dynamic environment and the increments for increases/decreases as a result of new requirements times the unit cost, which depends on inflation.

Forecasts, when applied to projects, are known as estimates. When it comes to large projects within real estate operations, even in its early stage, it is essential to determine its cost. Often, an estimate is required soon after the conceiving of the project to get the approval of the board or executives. In some cases, this happens before the architect i.e. the conceptual design of the project. Later on, other estimates might be conducted to get administrative approval or for completing the project budget on the basis of its design. This type of estimating is only possible if most of the design is developed (Ameyaw et al., 2016). Likewise, often real estate management is involved in various small projects that it becomes impractical and even unnecessary to make detailed construction estimation for each project. In this situation, a budget figure is needed for controlling each project, making sure the total of all projects does not go beyond the actual budget itself. Such figures are best achieved via financial estimating.

Financial estimates are of three types (Masalskyte et al., 2014). The informal one is also called intuitive. It is attained from the simplest of information and is done quickly. Phrases such as ballpark, blue sky, approximate figure and guesstimate are used for estimates like these. The informal estimate is used for determining whether resources should be allocated for conducting a research or for studying the project feasibility. Such estimates are not that reliable; however, the results depend on the skill and experience of the estimator. Top management, unfortunately, takes the informal estimate as a reliable estimate, especially at high expectation times. Often the qualifying footnotes are separated from the estimates, so, it is best not to count on them. Real estate management tries to escape the situation of being checked on the grounds of the calculated informal estimate.

Generic estimate is calculated by consulting a database of standardized costs and the duration of a detailed aspect of a function or project. Each item is specified and a total for all the items is calculated. Indexes are there to mention specific variances. Mostly, the financial estimates are either generic or informal. The most reliable initial estimate is the one that is most comprehensive. It provides complete information on the materials, procedures and processes. It is more useful than the rest because it throws light on the variations in how a project is to be finished under various circumstances. It is not just a picture of costs and durations (Masalskyte et al., 2014).

2.3 Data Envelopment Techniques and Applications

2.3.1 Efficiency

This thesis will attempt analysing and developing the necessary theoretical framework surrounding real estate management. It will also analyse how effective the related measurement techniques are and their overall contribution towards real estate management efficiency. As mentioned earlier, this research will take empirical literature to deduce the overall efficiency of the measurements that can help in reducing the total expenditure. It is important to understand the main components used in performance measurement to understand their function and effectiveness. This study will also attempt to reveal and summarize the findings and reveal the efficiency of real estate management. The research will solely focus on exploring the efficiency of real estate management studies. The subsequent sections will analyse and discuss the conventional models used in the measurement of efficiency of real estate management.

2.3.1.1 Efficiency and Performance

In short, performance measurement is a set of well-designed processes that assist an organization in analysing, measuring, monitoring, and identifying key competencies, systems, and processes (Taylor, 2013). Real Estate management could exist in a commercial setting. Real estate businesses, like other businesses, are expected to utilize their resources efficiently to accumulate higher earnings. These earnings help the companies to grow by investing into better equipment, infra-structure, and competent resources.

It is a general belief that performance measurement techniques are generally used by the manufacturing industries (Taylor, 2013). Performance measurement techniques are communicated through different ratios and measures like net profit margins, leverage, and liquidity. The profit-driven companies are cost-driven and their performance is measured on the basic of the productivity and efficiency of the utilization of the resources. The conventional measures of the performance evaluation usually explore the relationship between the inputs (Costs or resources) and the outputs (Products or resulting gains).

It is important to note that there are several shortcomings in the conventional measurement techniques (Yin et al., 2016). Despite their weaknesses, the conventional methods do provide better understanding of the operations and their performances. Many companies use financial measures to evaluate their costs and revenues, but on the long run they have also been proven to be inadequate in identifying the positive steps that an organization can take to improve their overall efficiency (Ohsato & Takahashi, 2015). It has also been observed that the commercial companies that solely rely on financial methods for performance measurement have the sole objective of achieving better profit margins. Such strong focus on the profit margins leads to short-term decision-making. The short-term also discounts the importance of internal and external environmental factors that may be essential for long-term survival of the companies (Yin et al., 2016).

Different companies have different ideologies and measurement techniques when it comes to performance measurement (Taylor, 2013). Different companies use different varieties of performance measurement tools, as well as financial and non-financial methodologies to attach a tangible number to the organization's performance measurement. There is a strong belief that performance measurement for real-estate companies should be based on the outcome of the operations (Yin et al., 2016). The outcome of operations is a complex model that also takes qualitative aspects in performance measurement. The location of the property and the condition of neighbourhood, therefore, become important aspects of the performance measurement for the real-estate companies.

Experts have revealed that performance measurement is a critical aspect of the executive decision-making process. Before undertaking any project, an organization needs to evaluate and understand its existing performance. The performance evaluation lays down the foundation on which the decision-making process can take place. If the results are not in line with the organization's goals, then actions could be taken to achieve the desired goal. Nevertheless, in reality, it is extremely complex to measure an organization's performance in tangible terms.

The issue of performance evaluation becomes even more complex when qualitative factors – non-cost departments, human resources, and designs – are added into the equation.

Researchers have identified a correlation between an organization's performance and its associated processes. Most of the companies with unsatisfactory performance usually have poorly designed processes. The discussion so far has revealed that different companies and researchers have different beliefs and definitions regarding performance measurement. Performance measurement is a multi-dimensional subject that is dependent upon different variables and interdependencies. Furthermore, the methods and the definition of efficiency changes from industry to industry and organization to organization. The financial tools like liquidity and profitability ratios provide a deep understanding regarding performance measurement, but they have their inherent limitations that fail to take qualitative and environmental factors into account. The following section highlights complex issues that real estate companies have to deal with when conducting performance measurement. It also explores the importance of conducting performance evaluation in a commercial as well as not-for-profit setting.

2.3.1.2 Performance Measurement

The need for performance measurement exists in every organization irrespective of the industry or sector (Yin et al., 2016). Whether an organization operates in manufacturing or investor's funds, it needs to evaluate its performance for decision-making purposes. In every type of organization there is a valued activity that generates revenue or meets the basic purpose of the existence of that organization. Performance measurement lets organizations understand how the resources relating to these activities are consumed. Performance measurement helps the organization attach a tangible value to its performance and efficiency of the consumption of resources. It also facilitates internal as well as external comparisons. This comparison then lets the organization take corrective actions if the resources are not being consumed effectively. Consequently, performance measurement helps in organization growth, customer satisfaction, and strategic objectives.

Conventional financial performance measurement tools provide a clear assessment regarding the financial and cost aspects of the organization (Melnyk et al., 2014). Adopting such performance measure tools helps the organization to widen its scope of comparison. The organization then gets a better source of the different resources consumed and the productivity achieved as a result of those consumptions. Performance measurement tools force the organization to take different external as well as internal factors into consideration to achieve clearer performance appraisal.

Performance measurement with regards to real-estate poses different kinds of challenges. The customer base for the real-estate is very wide. The real-estate companies cater to the poor customers, who require financial assistance, as well as the wealthy clientele, who desire premier housing schemes. Real-estate companies have a variety of objectives that they need to fulfil in order to achieve the desired results. Different qualitative factors also take central stage when analysing the overall picture of the performance measurement in real-estate.

Research has revealed that performance measurement regarding real-estate management revolves around effectiveness, economy, and efficiency. Economy studies the relation between expenses incurred to achieve certain inputs (material, resources, and assets) and the resulting outputs achieved from them. Efficiency is the relation between the quantity and quality of the output as a direct derivation from the resources invested. Effectiveness measures the accuracy and ability of the activities in achieving the desired objectives. Other factors such as quality and quantity of the output must also be considered.

Dozens of studies have been carried out in order to effectively measure the performance of a real-estate organization. Some experts suggest the combination of financial as well as non-financial data in order to appraise the performance of a real-estate enterprise. Non-financial measures usually consider the qualitative aspects of the performance measurement; they focus on customer satisfaction, improvement of the organization, and flexibility of the organization to respond to the change.

This thesis attaches the performance appraisal of real-estate management to efficiency. The following reasons led to the adoption of this methodology. Productive efficiency proves to be highly accurate in evaluating different activities that are controlled by the management. Furthermore, efficiency helps to understand the way in which an organization consumes its resources to achieve certain objectives. The deeper understanding of these factors assists the decision-making process and facilitate the productivity, cost control, and technical competencies of the organization.

2.3.1.3 Efficiency Measurement

It is essential to understand the main methodology used for efficiency evaluation. This understanding would lay the basic framework that would be implementable in the subsequent empirical review of the research. The word efficiency was first used for measurement in the 1950s (Fallah-Fini et al., 2014). Researchers in that period described performance efficiency as a way of achieving higher output without reducing any input. Furthermore, distance function was purported for the output expansion to achieve multiple-output modelling technology. In addition, multiple technology modelling was never realized in any other production scenario; that is exactly the reason that inspired the selection of parametric and non-parametric functions for estimation. By analysing these two models, further functions of investigation were identified that could help in performance appraisal of a real-estate management. In reality, the selection of a particular method is highly dependent upon the objective that the organization wishes to achieve as part of the investigation and the type of data available at their disposal.

To analyse the efficiency of a particular management process, it is important to utilize the conventional methods of measurement (Fallah-Fini et al., 2014). The following section covers conventional methods as well as the frontier approaches of the efficiency measurement that are suggested in the empirical analysis. Such an approach would help in understanding the actual strengths and weaknesses of a particular measure rather than the technical details of the method.

Ratio Analysis

Ratio analysis is the simplest and most effective method of analysing the technical efficiency with the help of different variables plotted into the ratios (Dokas et al., 2014). For real estate purposes, these common indicators include average occupation time of the tenant and the life of the rent. Efficiency is said to be achieved when a resource is utilized in such a way that it produces the maximum quantity possible. The most commonly used ratios rely on a single input and a single output for the nominator as well as the denominator. However, it is important to understand that multiple ratios need to be analysed simultaneously in order to achieve a clearer picture.

Incomplete ratio analysis in isolation can lead to misleading results. For instance, merely concentrating on the occupancy rates would reveal how often a property is occupied once it is available. This would help in achieving or understanding efficiency because availability of multiple real estate units would indicate wastage of resources while too few available properties indicate poor management. However, an ideal occupancy rate may not reveal the cost associated with each tenant. Yet, when the occupancy rate is compared with the cost per tenant, it helps real estate management in devising a clear strategy regarding the maximization of their profits.

Regression Analysis

Regression analysis is a method that investigates the relationship between certain dependent and specific independent variables (Giacomini et al., 2015). This relationship is portrayed through a fixed form expressed as a function that attempts to identify the relative efficiency. In the real-estate management scenario, regression analysis approach can be used to gather information regarding the efficiency of Decision-Making Unit (DMU) (Giacomini et al., 2015). For instance, the production activities of real-estate concern can be assumed as the overall output of the organization while the human resources, machines, assets, and financial resources can be used as inputs. This connection can be explained using a multiple linear regression or any other parametric econometric process. In a scenario where only one input is used to achieve a single output, the regression method would reveal the average of output for each input invested by the DMU to discover the fitted value of the regression.

The linear production function can be denoted as the representation of the average efficiency of each input invested into the activity (i.e. average rate of efficiency). Any divergence away from the fitted line would directly represent the divergences in the efficiency levels (Giacomini et al., 2015). In simple terms, the smaller the random errors (unobservable factors), the much more improved regression estimate, creating a much more effective DMU.

In practical terms, regression analysis can have multiple inputs, but it can only produce a single output for the investigation (Giacomini et al., 2015). Therefore, to assess or analyse multiple instances for an investigation, it is necessary to run multiple regression analysis that can then be analysed simultaneously to get a clearer picture. In other words, it is a shortcoming of the regression analysis that it cannot explain or identify the case where multiple instances of an output could exist. Although researchers have tried various variations of the regression analysis approach to deal with multiple outputs, none of them has been able to deliver perfect results.

A possible solution to this problem can be discovered in form of multivariate generalization that helps in figuring out multiple instances by introducing more parameters into the equation. The parameters describe the deeper relation between different variables with respect to their power and precision. Another limiting factor in the regression method is that it requires a very specific function to establish the relation of outputs with the inputs. In the real world, it might not be possible to devise such a function since real estate management has varied objectives that are driven through a huge number of inputs and outputs that could seriously complicate the process of measurement.

Despite all these arguments, regression analysis carries a serious fault in its analysis. Regression analysis expresses or identifies efficiency in average terms rather than absolute terms (Giacomini et al., 2015). A comparative analysis may help an organization to achieve a deeper understanding, but there are no ways through which qualitative information can be incorporated into the function. The real world also lacks any concrete representations of the inefficiencies that complicate the measurement even further.

Frontier Analysis

The method of frontier analysis presents two distinct approaches to measure efficiency using parametric as well as non-parametric methods (Cardoso & Ravishankar, 2015; Assaf & Josiassen, 2016). These techniques were first highlighted in the 1950s as viable appraisal techniques for efficiency. The frontier analysis approach identifies allocative efficiency as well as technical efficiency. These two efficiencies are then combined into a single measure to establish the total economic efficiency. The two distinct efficiencies are achieved through relevant frontier based on the observable data.

Parametric Frontier Analysis

The parametric approach of frontier analysis is conducted by identifying structural form regarding the production function. The two methods of the frontier analysis were developed to identify all the coefficients that are attached to the production function that pertain to an accurate parametric frontier. The deterministic frontier is non-statistical in nature that fails to identify any random deviations or instances in the data. The examples of random deviation include random noise as well as human error. Frontier analysis is achieved through mathematical representation or econometric regression techniques. Similarly, the stochastic frontier approach attaches random aspects to the data and can be studied through econometric regression analysis techniques. These techniques are explored further in the subsequent sections.

Deterministic Parametric Frontier

This approach seeks to explain the production function by identifying the deterministic relationship of the inputs and their related outputs. Therefore, a successful application requires that a specific and clear production function is identified. The independent variables are represented by the inputs through which different divergences of the dependent values or output are explained. The divergences arising through the frontier can be itemized as the inherent technical inefficiency in the DMU model. Based on these findings, the production function is assigned a fully deterministic value with regards to the technical efficiency. There are two main techniques that can be used to measure inefficiency parameters. The two methods include regression analysis and mathematical programming. The regression analysis method involves Corrected Ordinary Least Squares (COLS) as well as the Modified Ordinary Least Squares (MOLS). Both of these techniques are assumed to be the part of the conventional techniques.

The biggest advantage of using the deterministic parametric methods is that they do not require explanation regarding the distributional attributes of the inefficiency. On the other hand, the disadvantage of this approach lies in the assumption that any random error can be attached to the technical efficient while discounting the random shocks and measurement errors regarding the external variables or unobservable factors.

Stochastic Parametric Frontier

This model was devised in the 1970s. The basic idea behind this technique is to increase the deterministic frontier by maximizing the component elements that arise in the production function due to random errors. In simple terms, it assumes that the values that diverge from the frontier are likely to be beyond the control of the function. It was suggested that an additional non-negative random value needs to be included in the equation to deal with the inefficiency.

Subsequently, the biggest advantage of this approach lies in its ability to deal with the random shocks and components of the technical inefficiency independently. This helps in reducing the chances of error in the dependent variables or outputs. This approach requires a very clear and accurate distributional structure for the items of technical inefficiency and the related random errors. On top of that, in order to deal with the technical inefficiency, a distinct function of the technological change must also be defined as a technological function; it is usually believed that the technical inefficiencies have a half-normal, truncated or gamma distribution nature.

These assumptions impose significant restrictions over the methodology and may seriously compromise the ability of this method. For instance, considering a scenario where the technological function has not been properly specified as a result of this the technical efficiency and the random error's influence would be completely eliminated.

Non-Parametric Frontier Analysis

Non-Parametric analysis bases itself on the generated values of the production frontier without the attempt to parameterize the function of production. This would mean that the production function would remain undefined and the related distribution attributes need not to be identified either. The non-parametric approaches are based upon the linear analysis and any divergence away from the frontier is dubbed as the actual inefficiency. The non-parametric frontier analysis can be achieved through two distinct approaches called stochastic and deterministic approaches.

Non-Parametric Deterministic Frontier

The non-parametric approaches do not set a requirement for a functional structure. There are mainly two different representative non-parametric methods that are highlighted in the subsequent sections. These approaches are the data envelopment analysis (DEA) and the free disposal hull analysis (FDH).

Data Envelopment Analysis

It is a non-parametric programming method used to estimate the efficiency and utilization capacity to effectively explain the production frontier (Wang et al. 2015). This method was devised in 1970s as a performance measurement tool for the efficiency of the non-profit organizations involved in the public dealing. DEA is dependent upon the principles that the associated performance of a particular DMU must be comparable to the related frontier of the best practices (Cooper et al., 2004). The best practice frontiers are defined as the optimum benchmarks of a very efficient DMU. The best practice frontier is, therefore, an accumulation of all the efficiency operations that exist in a function. This methodology assumes that any divergence from the frontier is resultant of a technical inefficiency. This research uses the DEA approach for determining the efficiency of a real-estate management.

Free Disposal Hull

FDH approach does not adopt such strict assumptions over the convexity. It can, therefore, be dubbed as a general offshoot of the main DEA model. The logic behind this model is that it reduces the attention towards the observable performance in a DMU by reducing the strictness of the input-sustainability factors that are necessary in the DEA method. In other words, the FDH model assumes that there is a level of freedom in certain inputs that can be introduced into the production without accumulating any additional cost or expense. It translates to the assumption that certain inputs do not have the attributes to replace other attributes in a fixed production setting. Furthermore, these inputs in question must be used based on the predetermined proportion and any excess then becomes wastage.

The FDH method is more accurate in dealing with the real-life behaviour of a real estate management, but it lacks the ability to accurately measure the efficiency due to the fact that it lacks a solid input-sustainability, which results in the inability of the producer to achieve all the optimum outcomes. The production frontier constructed through the DEA approach would result in a convex linear arrangement of instances for a varied range of input quantities. Therefore, it is not beyond the realm of possibility that the DEA curve would also incorporate the FDH curve.

Non-Parametric Stochastic Frontier

As it was pointed in earlier discussion, the DEA approach does not have the ability to account for random errors because its structure is constructed out of only observable data. The stochastic DEA approach takes measures to overcome this shortcoming. In stochastic function, it is assumed that the production function is not known or observable and, therefore, the researchers diverged towards the bootstrapping methods for acquiring an estimate regarding the output re-sampling. This means that the simulation process has the ability to draw multiple observations from a single set while also allowing for the possibility of drawing the same multiple times. The bootstrapping methodology, therefore, has the ability to acquire multiple pseudo samples from a single observation resulting in a fairly accurate distribution. This eliminates the need for a specific structure for production frontier.

2.3.2 Decision Theory

In real estate investment there are models for the pricing and allocation of assets; these asset allocation models suggest an optimum allocation between the respective asset classes based on retrospective judgments of performance and risk. A substantial part of the UK and US real estate literature concentrates on these quantitative asset allocation models. However, decisions are made relative to current expectations and current business constraints. While a decision-maker may believe in the required optimum exposure levels as dictated by an asset allocation model, the final decision may/will be influenced by factors outside the parameters of the mathematical model (Berger, 2013).

Decision theory is an interdisciplinary approach to determine how decisions are made given unknown variables and an uncertain decision environment framework. Decision theory brings together psychology, statistics, philosophy, and mathematics to analyse the decision-making process. It is devoted to all aspects of decision-making, exploring research in psychology, management science, economics, the theory of games, statistics, operations research, artificial intelligence, cognitive science, and analytical philosophy. Moreover, it addresses cross-fertilization among these disciplines (Northcraft & Neale, 1987; French, 2001).

Chapter 3: EFFICIENCY METRICS

3.0 Introduction

Tracking metrics allows the study to improve overall results and align the study population and processes with the objectives of selected building assets. With regard to the purpose of using efficiency metrics, activity and efficiency metrics measure a company's ability to use its resources efficiently. However, the analysts view these metrics as measures of management effectiveness. Therefore, the present study provides several metrics, which are ratios between two management parameters; hence, the aims of study are to show how to choose the right real estate metrics and to find out the averages, and differences, by the following: efficiency distribution, total potential improvement, Input-Output potential improvement, and reference frequency.

3.1 Operations Modelling

As discussed in the previous chapter, there are several metrics related to real estate management that can be used in efficiency analysis (Silver et al., 2016). These metrics were divided into subcategories according to their relationship to CapEx and OpEx management (Abatecola et al., 2013). The following sections discuss the primary justification for the connection between different metrics belonging to different subcategories (Haque et al., 2014).

3.2 Rent with Churn

The combination of Rent with Churn subcategories has 1 input and 5 outputs. The relationship between cost per square meter as an input and tenant retention rate as an output highlights the fact that expensive real estate units may not be able to attract large customer base as cheaper ones (Lieser et al., 2014). Similarly, it is clear that the impact of cost per square meter on time to re-let constitutes the difficulty of renting expensive units (Cherif et al., 2014). The link between cost per square meter and the percentage of vacant units is established based on the same narrative (Hartmann et al., 2015). Likewise, both the cost per square meter and the percentage of occupancy rate have a strong negative correlation (Weber et al., 2013).

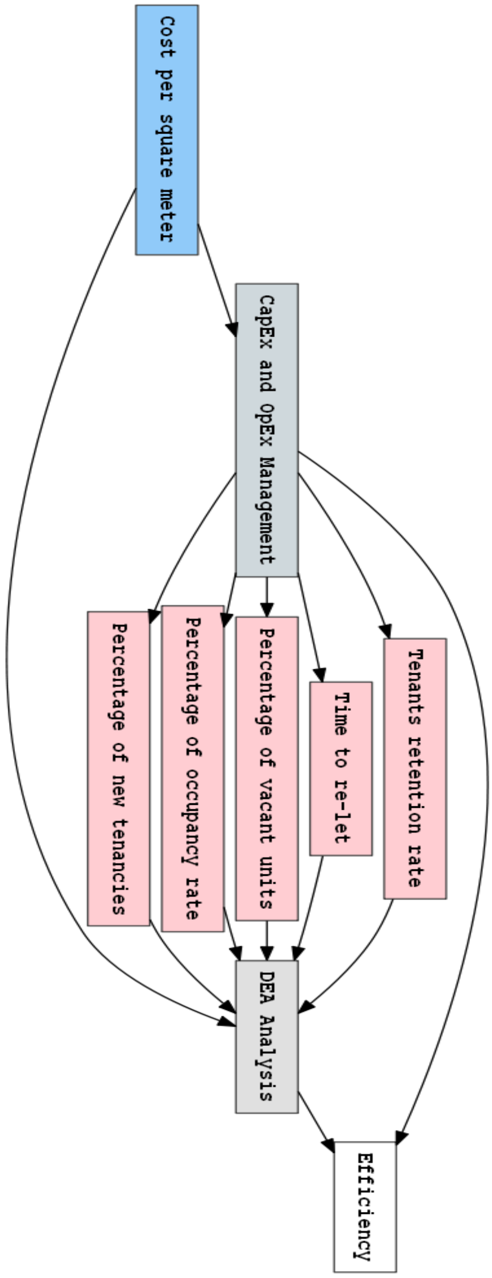

Figure 3.1 Diagram of the model for Rent and Churn

Moreover, the relationship between cost per square meter as an input and the percentage of new tenancies as an output emphasizes the fact that new tenants are usually targeting cheaper real estate units (Wu et al., 2015).

3.3 Rent with Cleaning

Both Rent with cleaning subcategories have 3 inputs and 2 outputs.

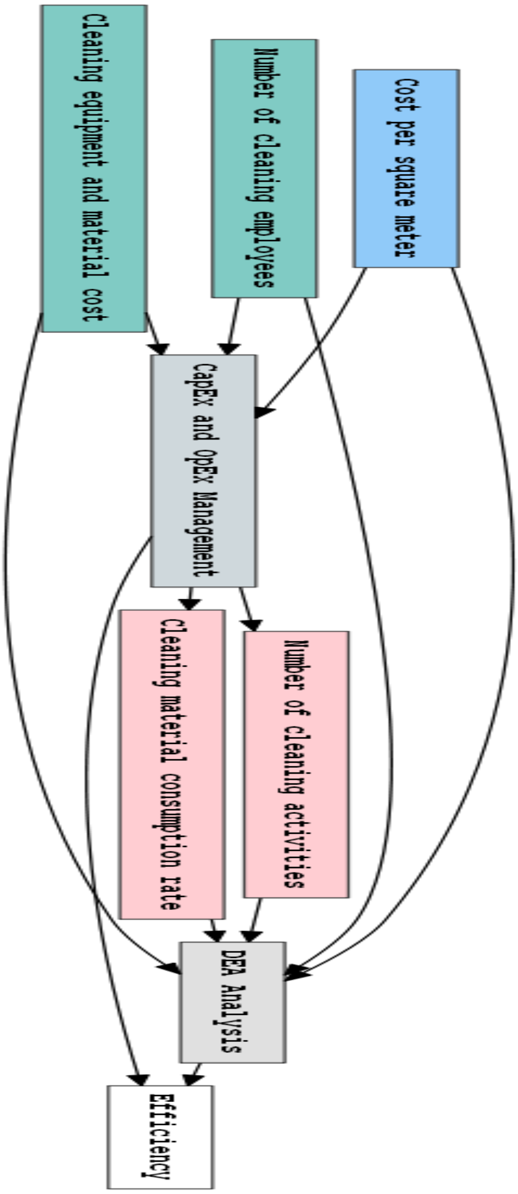

Figure 3.2 Diagram of the model for Rent and Cleaning

The connection between cost per square meter and cleaning material consumption rate demonstrates the reality that expensive units require more care (Kurlat et al., 2015). Similarly, the relationship between cost per square meter as an input and number of cleaning activities as an output highlights the same idea (Ramanathan, et al., 2016).

3.4 Rent with Debt

Real estate management process based on Rent with Debt subcategories has 2 inputs and 4 outputs.

It is clear that the impact of cost per square meter on length of time in rent debts constitutes hardship of financing occupancy in expensive units (Fregonara et al., 2013). Also, the link between cost per square meter and the percentage of overdue rent is positively correlated. Similarly, both the cost per square meter and amount overdue per tenant are highly connected, the relationship between cost per square meter as an input and the percentage of tenants with unpaid rent as an output follow the same logic (Liu, D., 2016).

3.5 Rent with Energy

The combination of Rent with Energy subcategories has 2 inputs and 2 outputs

The connection between cost per square meter and average energy consumption per building clears the reality that expensive residential units usually consume more power (Guan et al., 2014). Equally, the relationship between cost per square meter as an input and average energy consumption per tenant as an output highlights the same idea (Searle et al., 2014).

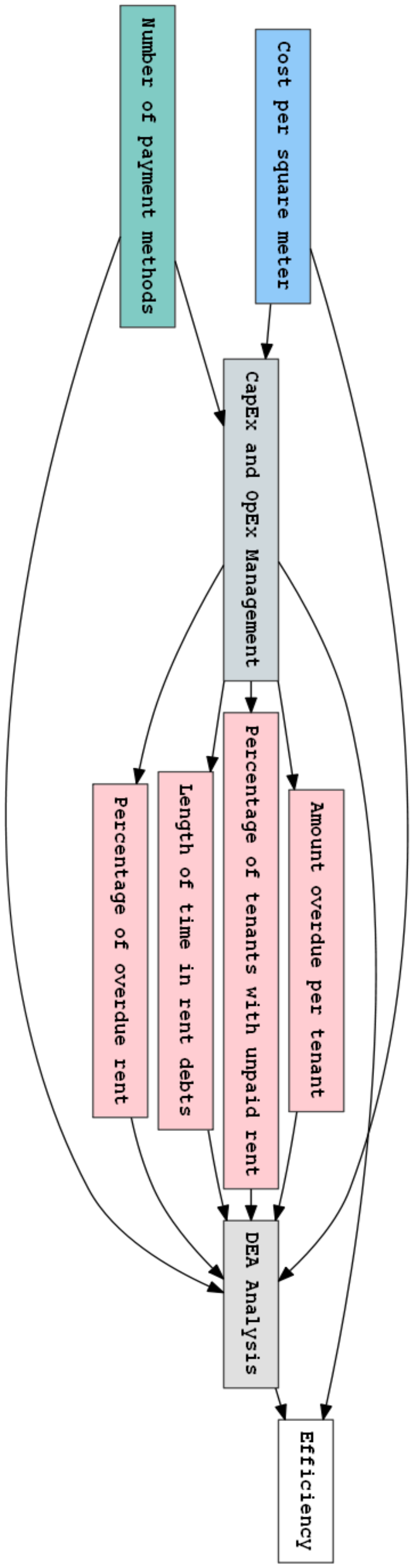

Figure 3.3 Diagram of the model for Rent and Debt

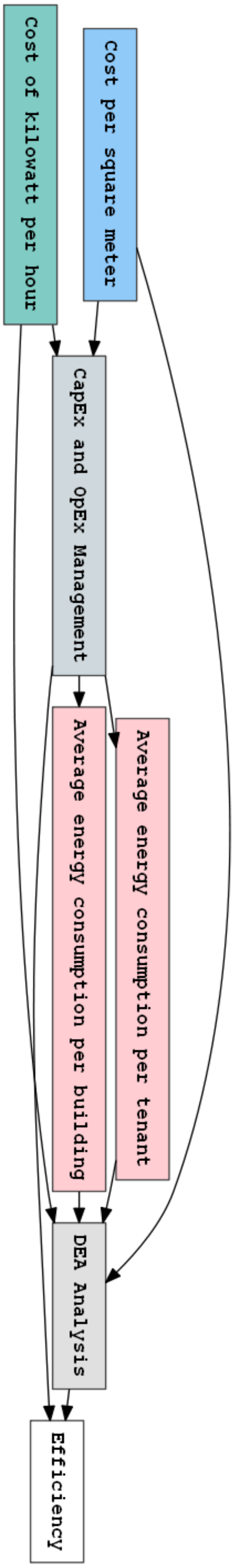

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Figure 3.4 Diagram of the model for Rent and Energy

3.6 Rent with Insurance

Both Rent with Insurance subcategories have 3 inputs and 1 output. It is clear that the impact of cost per square meter on number of insurance claims constitutes the tendency of reduced claims as the cost increases (Black et al., 2017).

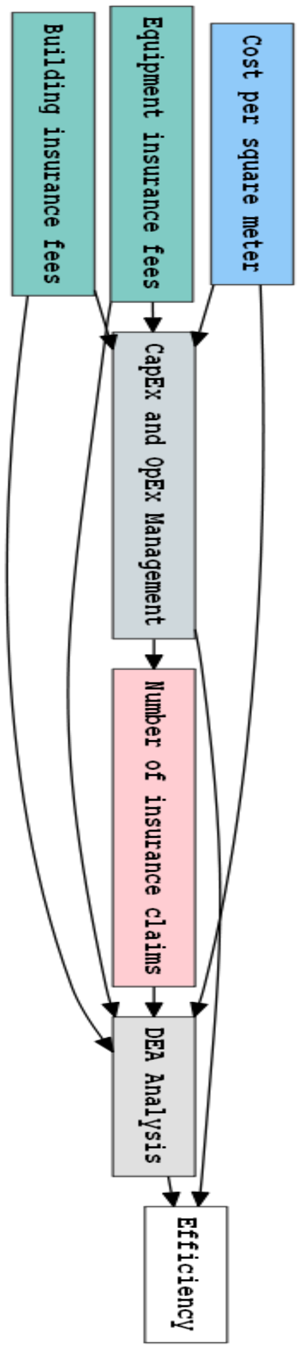


Figure 3.5 Diagram of the model for Rent and Insurance

3.7 Rent with Occupation Cost and Leasing

Real estate management process based on Rent with Occupation Cost and Leasing subcategories have 3 inputs and 6 outputs (Allen et al., 2013).

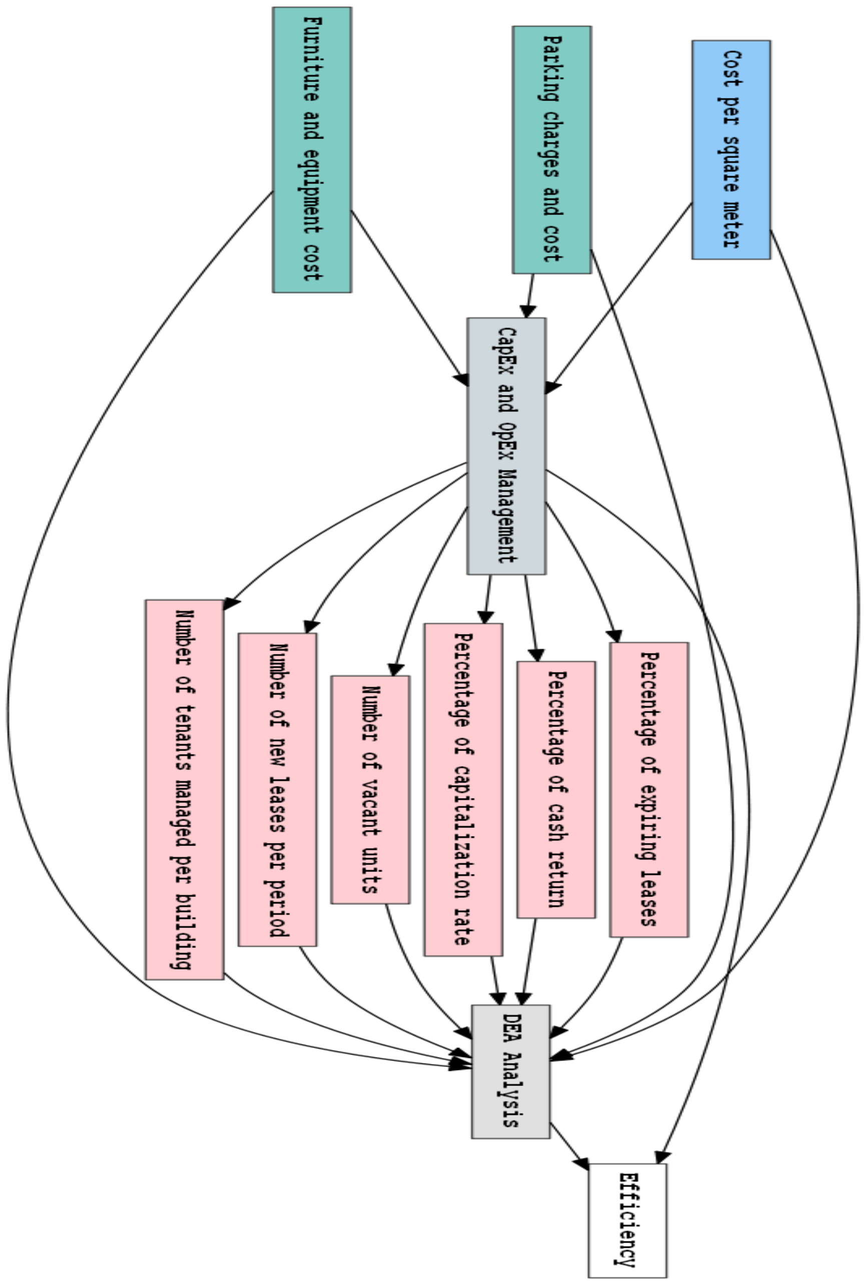


Figure 3.6 Diagram of the model for Rent and Occupation Cost and Leasing

The touch between cost per square meter and number of vacant units is established based on the idea that expensive units are more likely to be vacant (Paronin et al., 2014). Conversely, both cost per square meter and number of new leases per period usually has no strong connection (Bieszk et al., 2017). The relationship between cost per square meter as an input and number of tenants managed per building as an output emphasize the fact that as cost is lower, more tenants are expected (Yuan et al., 2013). The connection between cost per square meter and the percentage of expiring leases goes into the opposite direction. The relationship between cost per square meter as an input and the percentage of cash return as an output highlights the fact that it is easier to generate cash with cheaper units (Yao et al., 2014). Likewise, it is clear that the impact of cost per square meter on the percentage of capitalization rate has similar effect (Deng et al., 2014).

3.8 CapEx Rent with OpEx Rent

The combination of CapEx Rent with OpEx Rent subcategories has 1 input and 7 outputs.

The link between cost per square meter and average rent per building is established based on the tendency of rent to be higher as the cost is higher (Jin, Z., et al., 2015). Also, the connection between cost per square meter and rental revenue demonstrates the dependency between them (Thomsett et al., 2017). The relationship between cost per square meter as an input and average rent lost due to vacant units as an output highlights the fact that higher cost will lead to more lost rent (Cvijanović et al., 2014). In addition, it is clear that the impact of cost per square meter on rent amount per tenancy leads to increased rent as cost increased while the link between cost per square meter and the percentage of rent collection rate can be negligible (Cherif et al., 2014).

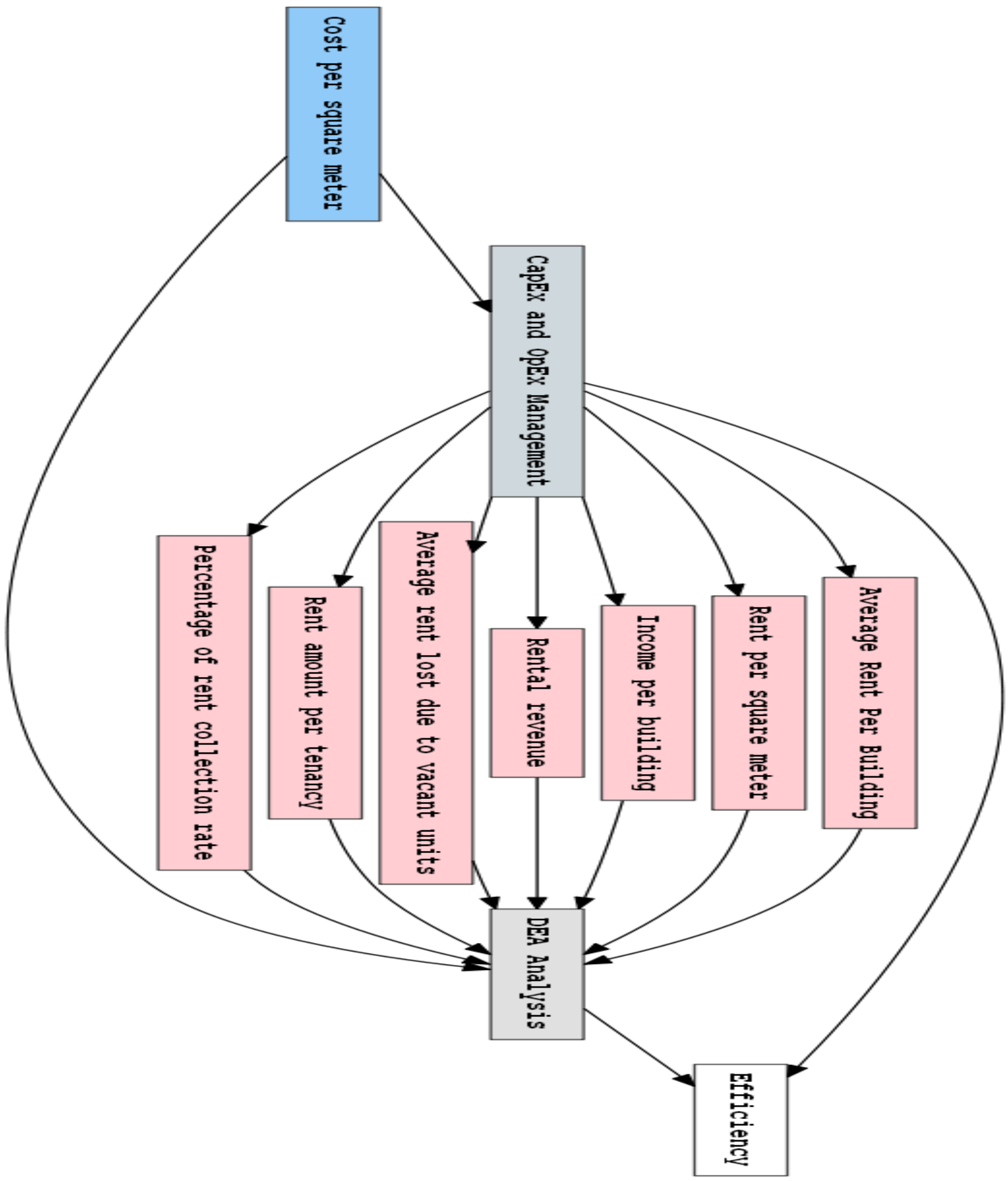


Figure 3.7 Diagram of the model for Rent and Rent

3.9 Rent with Repair and Maintenance

Both rent with repair and maintenance subcategories have 3 inputs and 4 outputs.

Both cost per square meter and number of planned maintenance requests are directly connected since expensive units may require more maintenance (Dawidowicz et al., 2014).

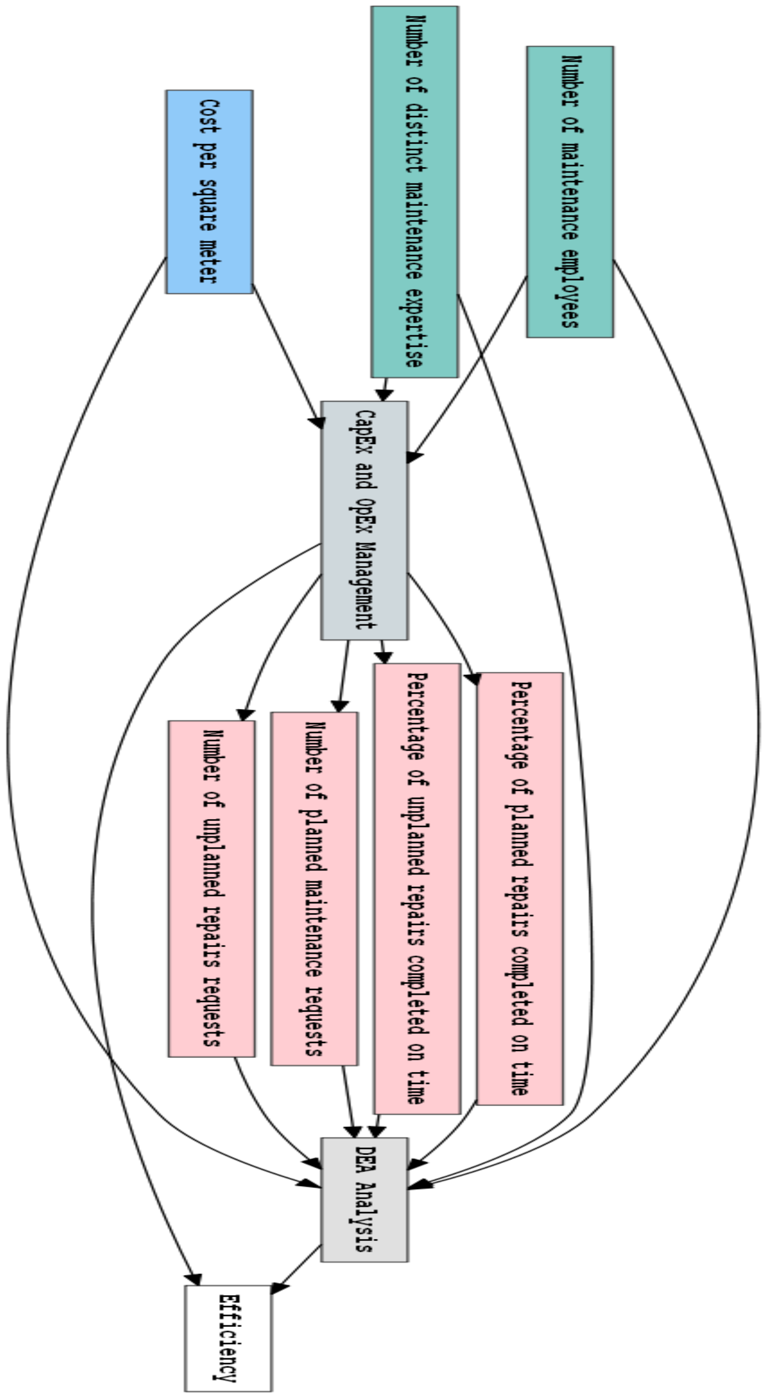


Figure 3.8 Diagram of the model for Rent and Repair and maintenance

Likewise, the relationship between cost per square meter as an input and number of unplanned repairs requests as an output emphasize the same fact. The connection between cost per square meter and the percentage of planned repairs completed on time should not be very strong (Crowe et al., 2013). Similarly, the relationship between cost per square meter as an input and the percentage of unplanned repairs completed on time as an output should be unrelated (Thomsett et al., 2017).

3.10 Rent with Water

Real estate management process based on rent with water subcategories has 2 inputs and 2 outputs.

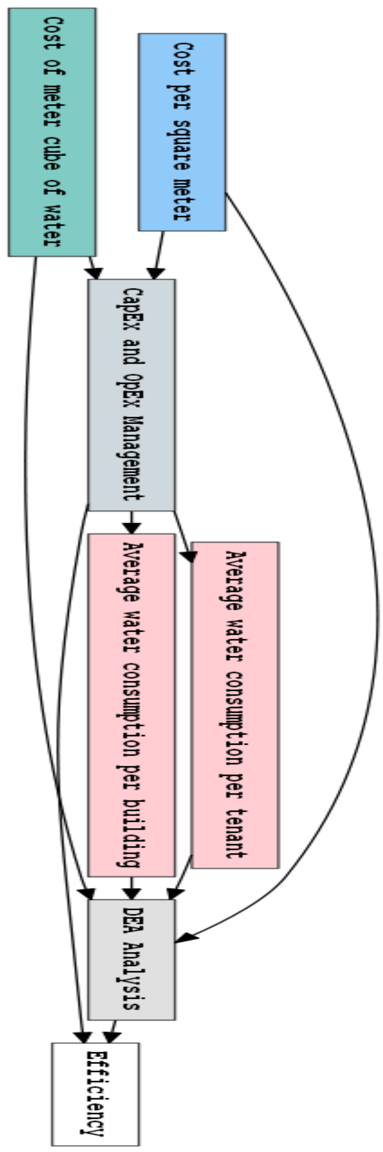


Figure 3.9 Diagram of the model for rent and water

It is clear that the impact of cost per square meter on average water consumption per building constitutes the increased needs of tenants of expensive buildings (Wu et al., 2015). On average, the link between cost per square meter and average water consumption per tenant should be the same (Jin, Z., et al., 2015).

3.11 Rent with Operational Characteristics

The combination of rent with operational characteristics subcategories has 5 inputs and 1 output.

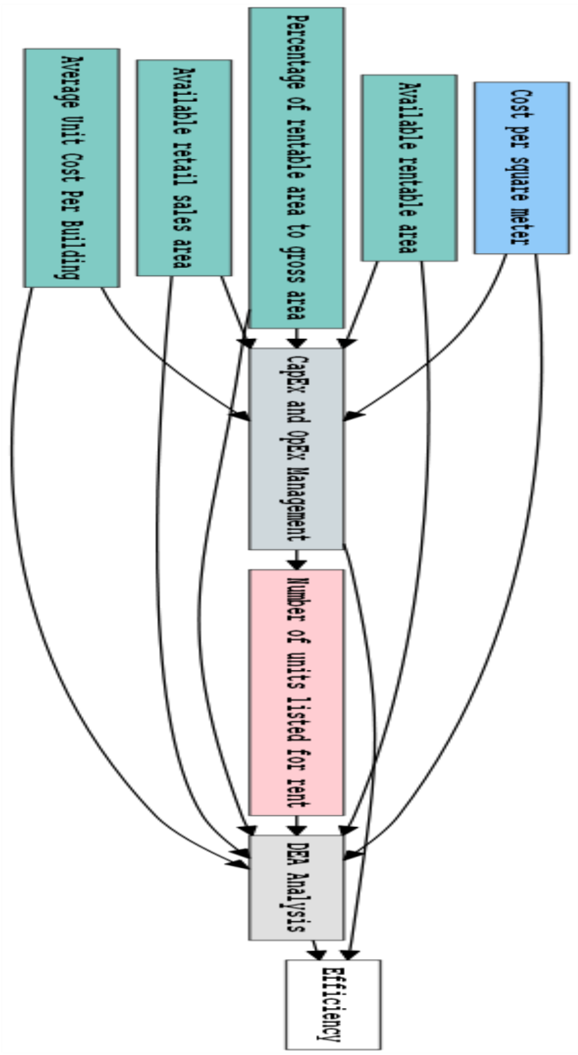


Figure 3.10 Diagram of the model for rent and operational characteristics

Both cost per square meter and number of units listed for rent are directly connected due to the fact that the cost of a unit will decide its applicability for leasing (Weber et al., 2013).

3.12 Churn with Cleaning

Both churn with cleaning subcategories have 2 inputs and 7 outputs.

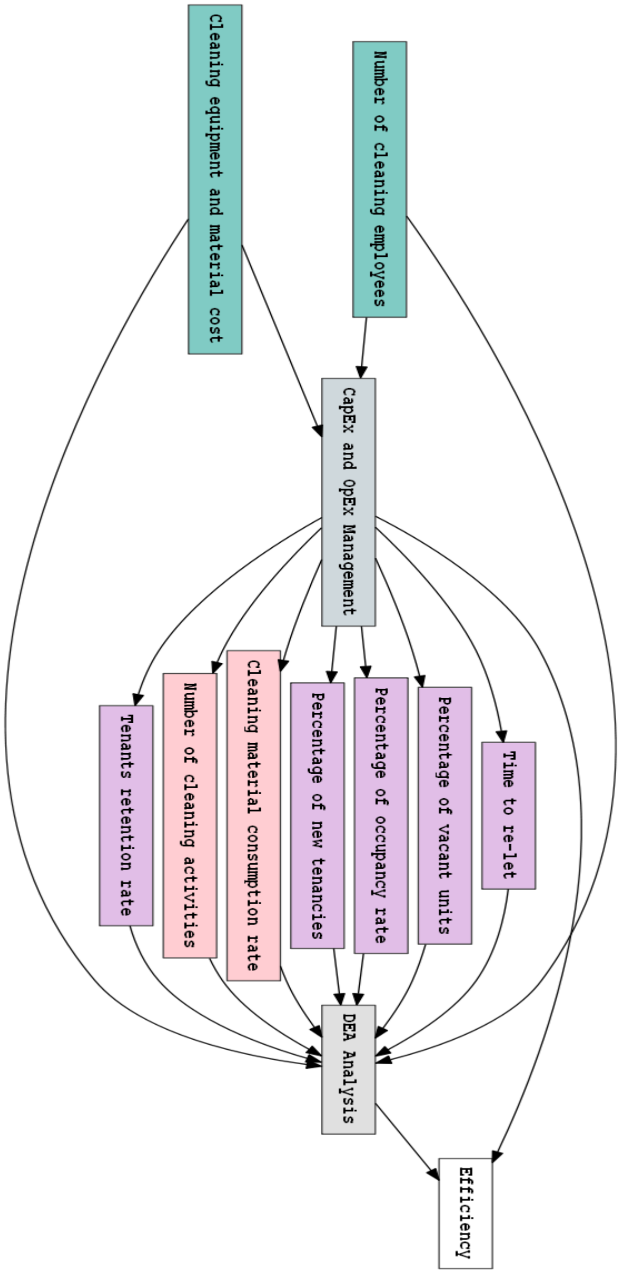


Figure 3.11 Diagram of the model for churn and cleaning

The relationship between the number of cleaning employees as an input and tenant retention rate as an output emphasize the fact that service with higher quality will lead to more customer (Cerutti et al., 2017). The connection between the number of cleaning employees and time to re-let reflects the fact that units with higher services do not stay long to be leased (Salzman et al., 2017). The relationship between the number of cleaning employees as an input and the percentage of vacant units as an output is similar to the previous one, in addition, it is clear that the impact of the number of cleaning employees on the percentage of occupancy rate constitutes has the same behaviour which is the same for the link between the number of cleaning employees and the percentage of new tenancies (Ramanathan, et al., 2016).

Both cleaning equipment and material cost and tenant retention rate are not very connected, the relationship between cleaning equipment and material cost as an input and time to re-let as an output is also negligible; the same goes for connection between cleaning equipment and material cost and the percentage of vacant units (Bieszk et al., 2017). Finally, the relationship between cleaning equipment and material cost as an input and the percentage of occupancy rate as an output does not deviate from the previous discussion (Deng et al., 2014).

3.13 Churn with Debt

Real estate management process based on churn with debt subcategories has 1 input and 9 outputs.

The touch between the number of payment methods and tenant retention rate is clearly very important since having easy payment will attract more tenants (Allen et al., 2013). In addition, the relationship between the number of payment methods as an input and the percentage of vacant units as an output emphasizes the fact that units are more likely to be rented if there are many payment options (Yuan et al., 2013). The same goes for the connection between the number of payment methods and the percentage of occupancy rate, the relationship between the number of payment methods as an input and the percentage of new tenancies as an output highlights the same idea (Baronin et al., 2014).

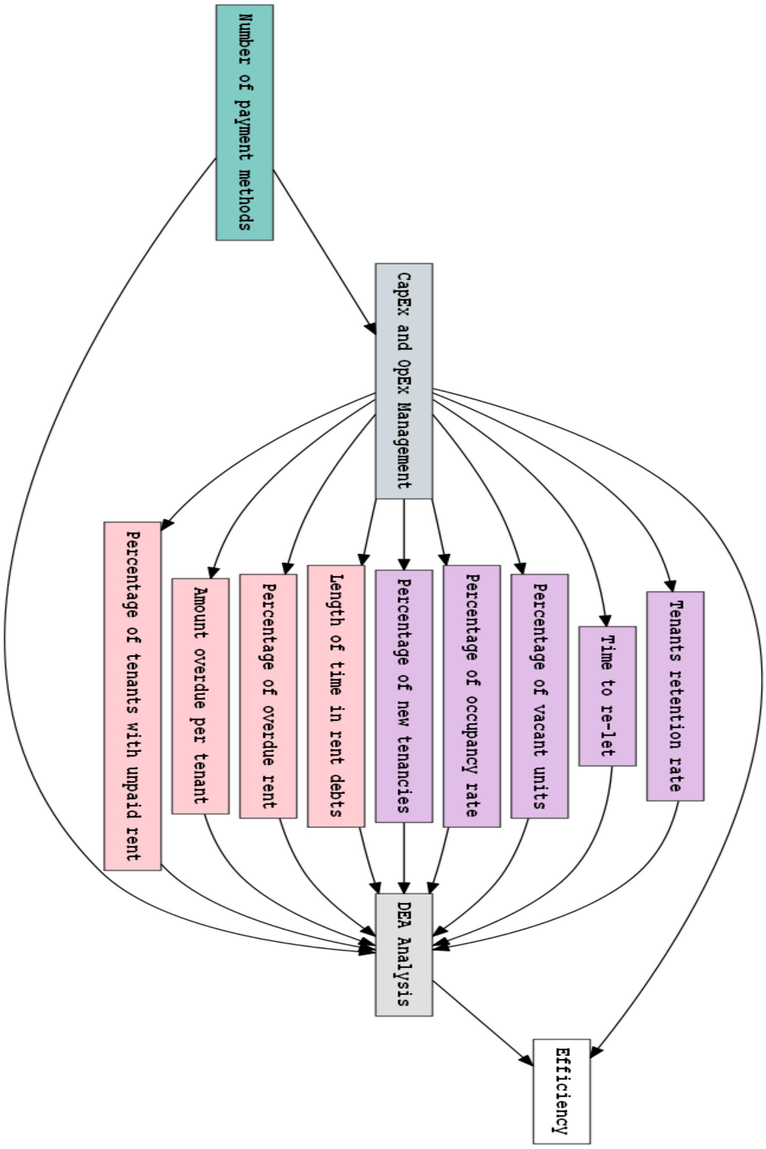


Figure 3.12 Diagram of the model for churn and debt

3.14 Churn with Energy

The combination of churn with energy subcategories has 1 input and 7 outputs.

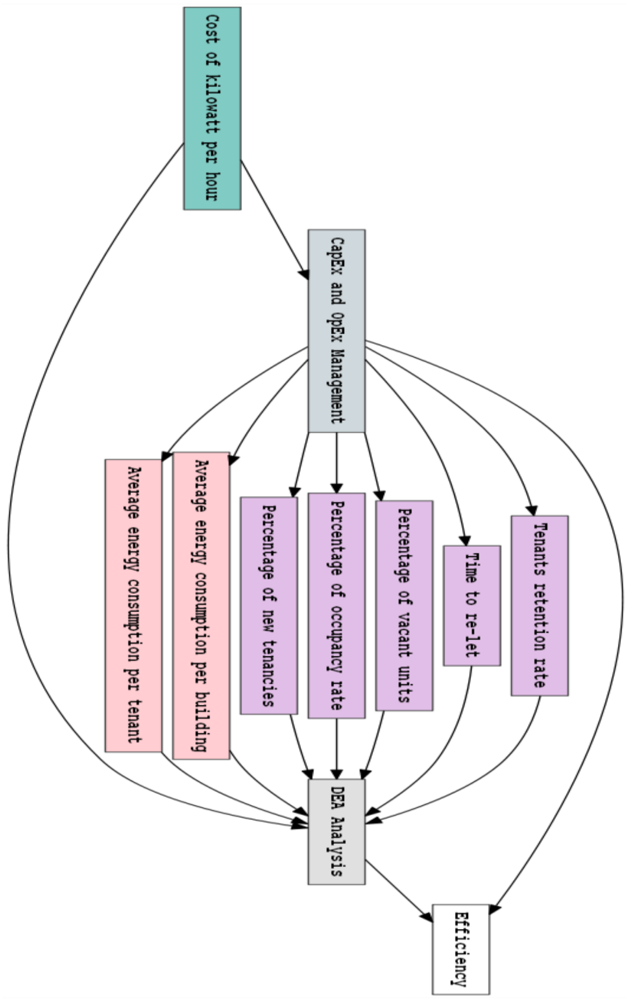


Figure 3.13 Diagram of the model for churn and energy

It is clear that the impact of the cost of kilowatt per hour on tenant retention rate is minimal in the UAE because there is limited number of power companies (Searle et al., 2014).

3.15 Churn with Insurance

Both churn with insurance subcategories have 2 inputs and 6 outputs.

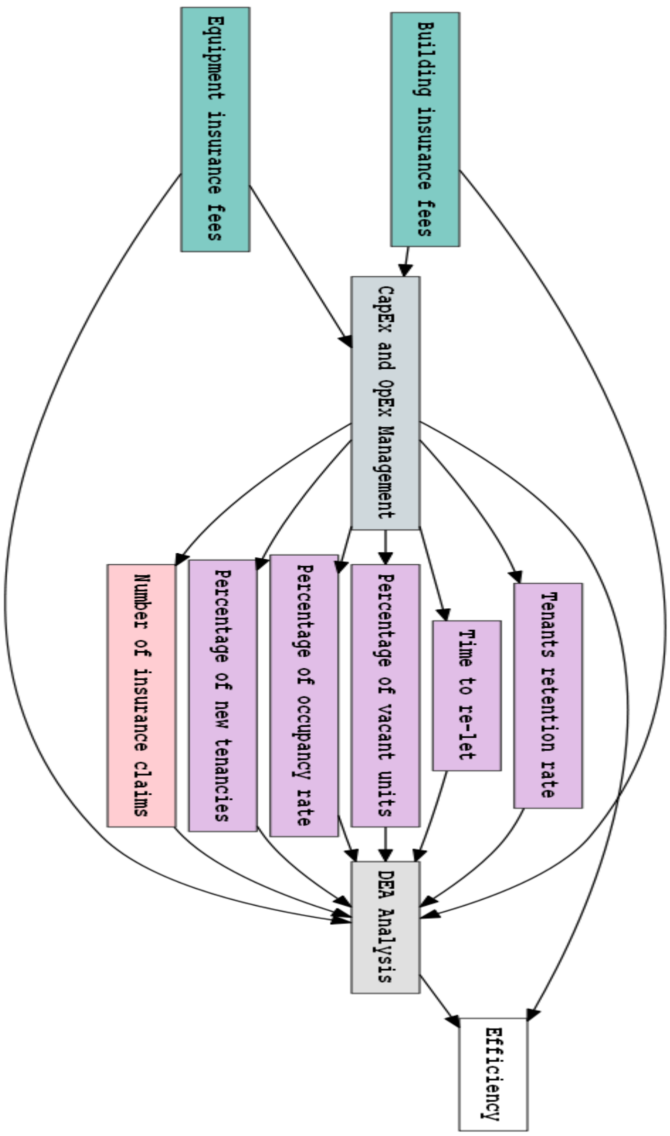


Figure 3.14 Diagram of the model for churn and insurance

The liaison between building insurance fees as an input and tenant retention rate as an output is indirectly established since higher insurance cost will lead to higher prices which reduces retention rate (Liu, D., 2016). The same goes for the impact of building insurance fees on time to re-let (Yao et al., 2014). Also, the link between building insurance fees and the percentage of vacant units is very similar (Lieser et al., 2014).

3.16 Churn with Management and Overall Costs

Real estate management process based on churn with management and overall costs subcategories have 3 inputs and 5 outputs (Bird et al., 2014).

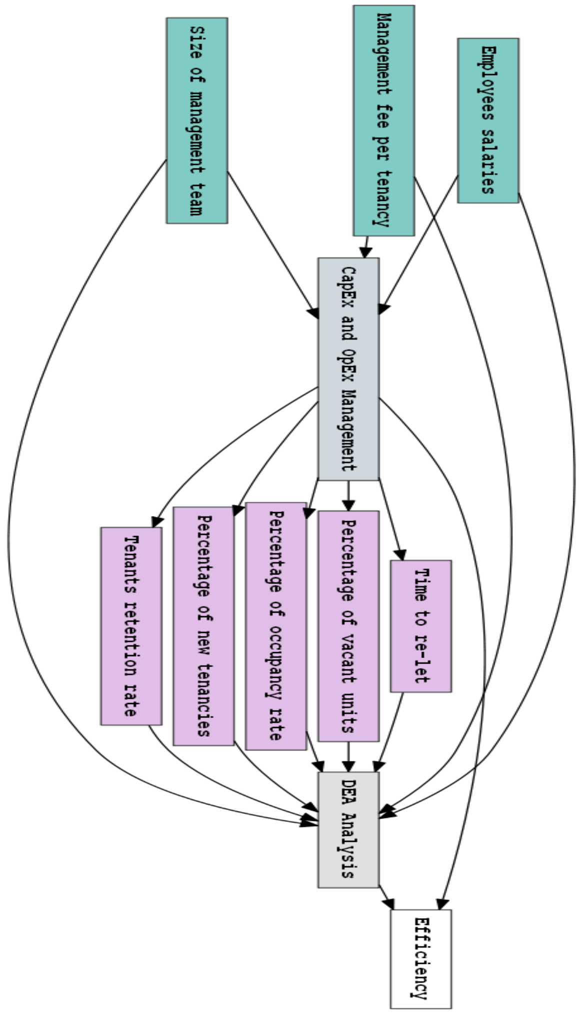


Figure 3.15 Diagram of the model for churn and management and overall costs

The relationship between employees' salaries as an input and tenant retention rate as an output is positively correlated (Abatecola et al., 2013). The connection between employees' salaries and time to re-let is not very clear (Silver et al., 2016). The relationship between employees' salaries as an input and the percentage of vacant units as an output highlights the fact that employees are the one who get tenants (Chen, et al., 2015). It is clear that the impact of employees' salaries on the percentage of occupancy rate constitutes is similar (Lieser et al., 2014). The link between employees' salaries and the percentage of new tenancies is established based on the same idea (Yuan et al., 2013).

Both management fee per tenancy and tenant retention rate has positive correlation (Weber et al., 2013). The relationship between management fee per tenancy as an input and time to re-let as an output emphases the fact that well paid management should reduce this time (Cvijanović et al., 2014). The connection between management fee per tenancy and the percentage of vacant units demonstrates the reality that it is all about management (Thomsett et al., 2017). The relationship between management fee per tenancy as an input and the percentage of occupancy rate as an output is very strong. Also, it is clear that the impact of management fee per tenancy on the percentage of new tenancies has the same behaviour (Bird et al., 2014).

The link between the size of the management team and tenant retention rate is established based on the ability of the team to handle all responsibilities with specific size (Dawidowicz et al., 2014). In addition, both the size of the management team and time to re-let has positive correlation (Allen et al., 2013). Conversely, the relationship between the size of the management team as an input and the percentage of vacant units as an output has a negative correlation (Mahdiloo et al., 2015). The connection between the size of the management team and the percentage of occupancy rate should be strong (Yao et al., 2014). Also, the relationship between the size of the management team as an input and the percentage of new tenancies as an output should be direct (Liu, D., 2016).

3.17 Churn with Occupation Cost and Leasing

The combination of churn with occupation cost and leasing subcategories has 2 inputs and 11 outputs (Jin, Z., et al., 2015).

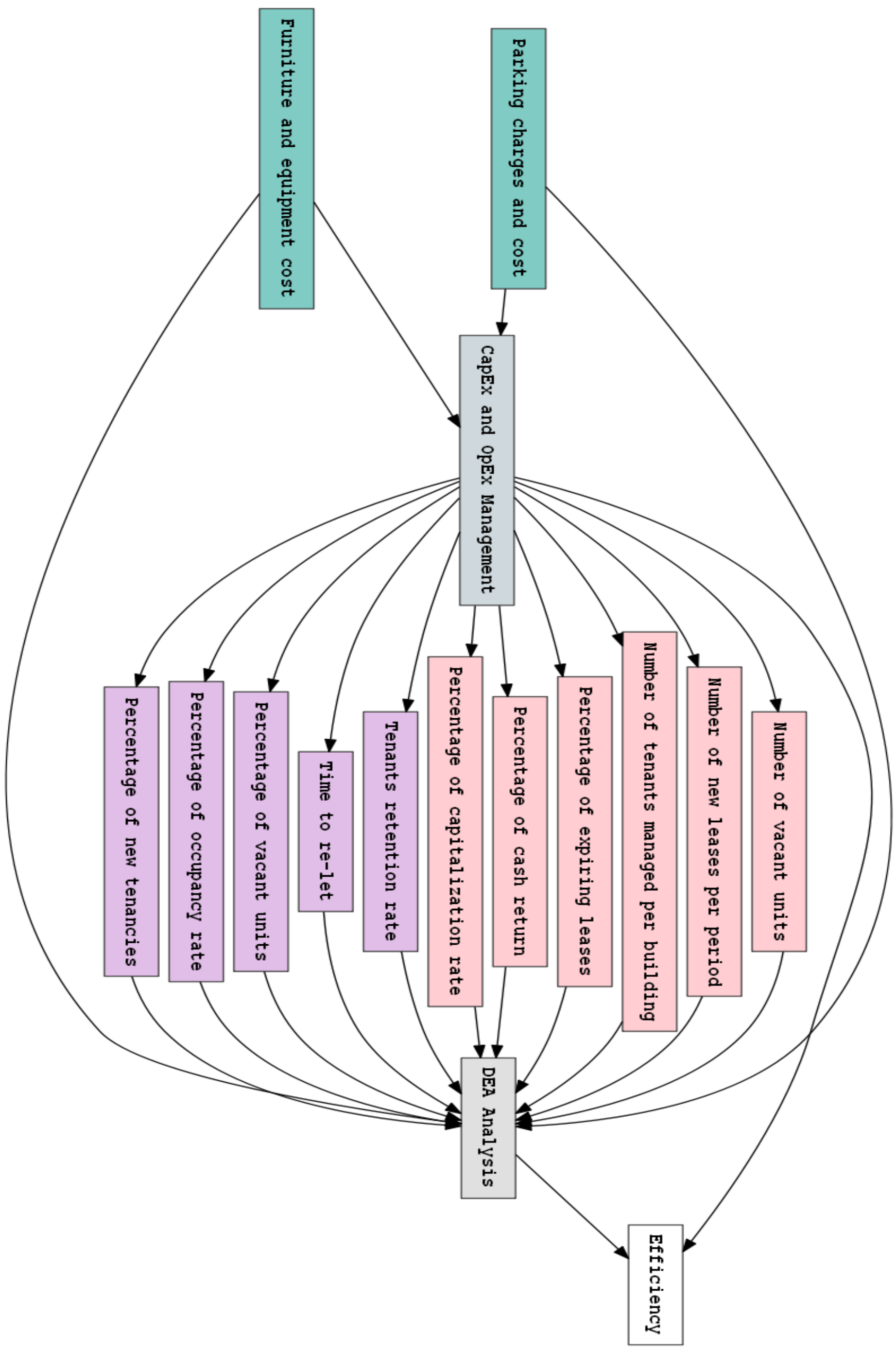


Figure 3.16 Diagram of the model for churn and occupation cost and leasing

It is clear that the impact of parking charges and cost on tenant retention rate is minimal (Baronin et al., 2014). Also, the link between parking charges and cost and time to re-let is next to nothing (Wu et al., 2015). The same goes for the connection between parking charges and cost and the percentage of new tenancies (Hartmann et al., 2015).

However, the same cannot be said about the relationship between furniture and equipment cost as an input and tenant retention rate as an output since they are very connected (Salzman et al., 2017). It is clear that the impact of furniture and equipment cost on time to re-let is negatively correlated. Also, the link between furniture and equipment cost and the percentage of vacant units is negatively correlated as well (Bieszk et al., 2017). Both furniture and equipment cost and the percentage of occupancy rate has direct relationship (Silver et al., 2016). The same can be said about the relationship between furniture and equipment cost as an input and the percentage of new tenancies as an output (Kurlat et al., 2015).

3.18 Churn with Repair and Maintenance

Both churn with repair and maintenance subcategories have 2 inputs and 9 outputs.

The connection between the number of maintenance employees and tenant retention rate demonstrates the reality about the importance of maintenance services to the tenants (Abatecola et al., 2013). Likewise, the relationship between the number of maintenance employees as an input and time to re-let as an output highlights the fact that it is easier to let a well-maintained units (Searle et al., 2014). On the same note, it is clear that the impact of the number of maintenance employees on the percentage of vacant units is negatively correlated while the link between the number of maintenance employees and the percentage of occupancy rate is positively correlated; both the number of maintenance employees and the percentage of new tenancies have a strong relationship (Cherif et al., 2014).

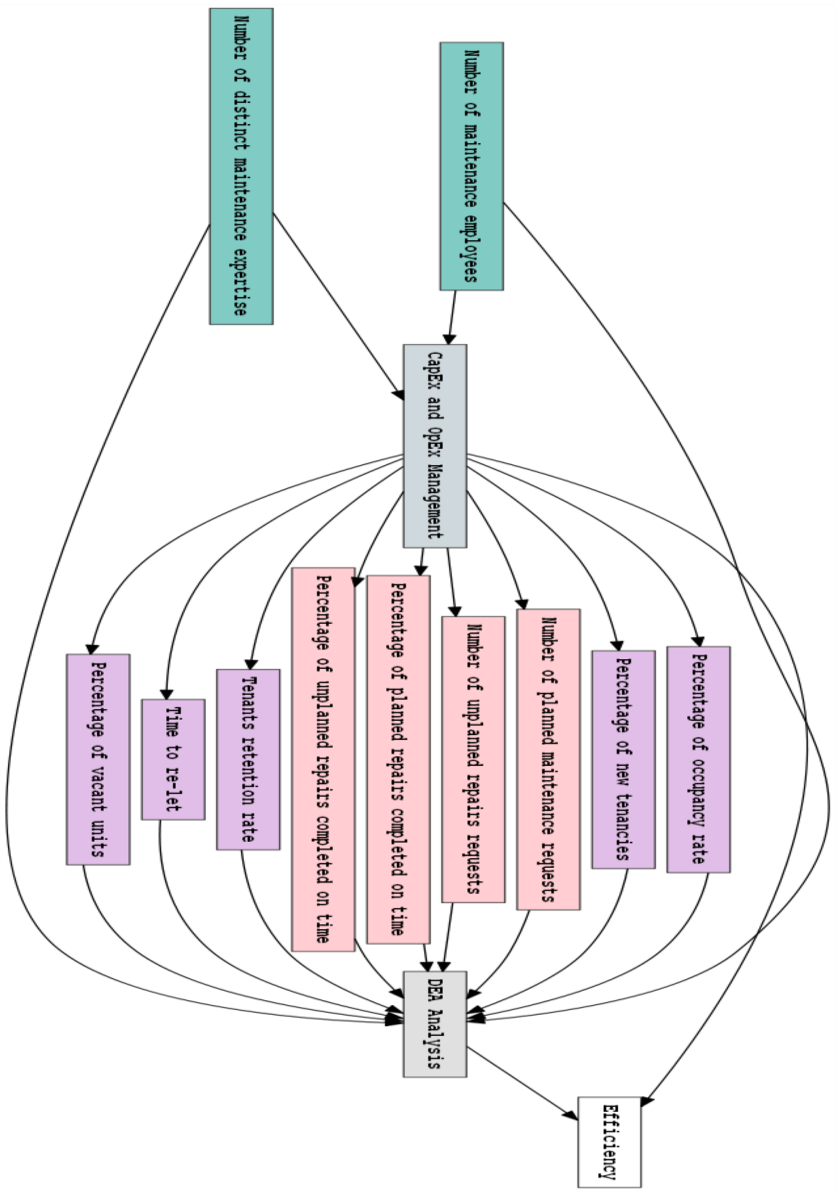


Figure 3.17 Diagram of the model for churn and repair and maintenance

The liaison between the number of distinct maintenance expertise as an input and tenant retention rate as an output is strong since tenants who always get their repair requests addressed quickly will prefer to stay in the building (Ramanathan, et al., 2016). The connection between the number of distinct maintenance expertise and time to re-let indirectly follows the same logic (Fregonara et al., 2013). The opposite can be said about the relationship between the number of distinct maintenance expertise as an input and the percentage of vacant units as an output. Also, it is clear that the impact of the number of distinct maintenance expertise on the percentage of occupancy rate constitutes higher retention and hence higher occupancy. Moreover, the link between the number of distinct maintenance expertise and the percentage of new tenancies is indirectly connected (Jin, Z., et al., 2015).

3.19 Churn with Security

Real estate management process based on churn with security subcategories has 5 inputs and 5 outputs (Fregonara et al., 2013).

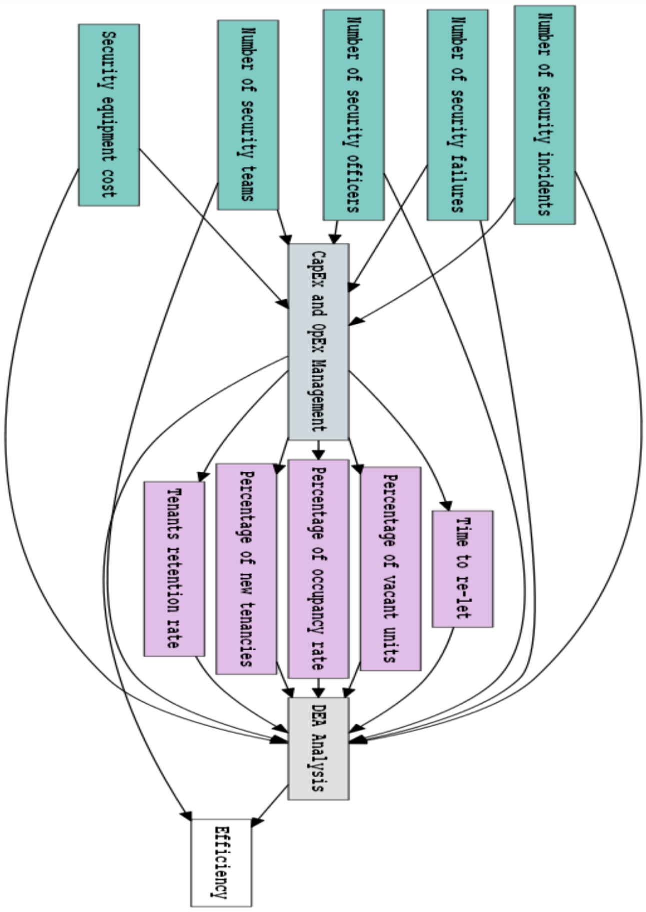


Figure 3.18 Diagram of the model for churn and security

The number of security officers and tenant retention rate has a strong connection since security is very important to tenants (Black et al., 2017). The relationship between the number of security officers as an input and time to re-let as an output follows the same narrative (Silver et al., 2016). Also, the connection between the number of security officers and the percentage of vacant units is negatively correlated while the relationship between the number of security officers as an input and the percentage of occupancy rate as an output is positively correlated (Cerutti et al., 2017). In addition, it is clear that the impact of the number of security officers on the percentage of new tenancies is very strong (Hu, X., & Liu, C., 2015).

Similarly, the link between the number of security teams and tenant retention rate is apparent as well (Liu, D., 2016). Furthermore, the relationship between the number of security teams as an input and the percentage of vacant units as an output is negatively correlated (Searle et al., 2014). The connection between the number of security teams and the percentage of occupancy rate is positively connected. Likewise, the relationship between the number of security teams as an input and the percentage of new tenancies as an output is direct (Baronin et al., 2014).

The link between security equipment cost and time to re-let is weak (Salzman et al., 2017). Both the security equipment cost and the percentage of vacant units have no relation (Yuan et al., 2013). The relationship between security equipment cost as an input and the percentage of occupancy rate as an output is not important. The connection between security equipment cost and the percentage of new tenancies does not count (Kurlat et al., 2015).

The relationship between the number of security incidents as an input and tenant retention rate as an output is clearly very related (Lieser et al., 2014). Also, it is clear that the impact of the number of security incidents on time to re-let constitutes the fear of possible future tenants (Wu et al., 2015). This defines the link between the number of security incidents and the percentage of vacant units. Moreover, both the number of security incidents and the percentage of occupancy rate have a negative correlation (Abatecola et al., 2013). The relationship between the number of security incidents as an input and the percentage of new tenancies as an output is very strong (Yao et al., 2014).

The same can be said about the connection between the number of security failures and tenant retention rate (Crowe et al., 2013). Also, it can be said about the relationship between the number of security failures as an input and time to re-let as an output as well (Weber et al., 2013). It is clear that the impact of the number of security failures on the percentage of vacant units is positively correlated while the link between the number of security failures and the percentage of occupancy rate is negatively correlated (Chen, et al., 2015). Likewise, the number of security failures has a negative impact on the percentage of new tenancies (Hartmann et al., 2015).

3.20 Churn with Water

The combination of churn with water subcategories has 1 input and 7 outputs.

The link between the cost of meter cube of water as an input and tenant retention rate as an output is minimal (Guan et al., 2014). The same goes for the connection between the cost of meter cube of water and time to re-let (Thomsett et al., 2017). Also, it is similar for the relationship between the cost of meter cube of water as an input and the percentage of vacant units as an output (Deng et al., 2014). Likewise, it is clear that the impact of the cost of meter cube of water on the percentage of occupancy rate is negligible, and the link between the cost of meter cube of water and the percentage of new tenancies is weak.

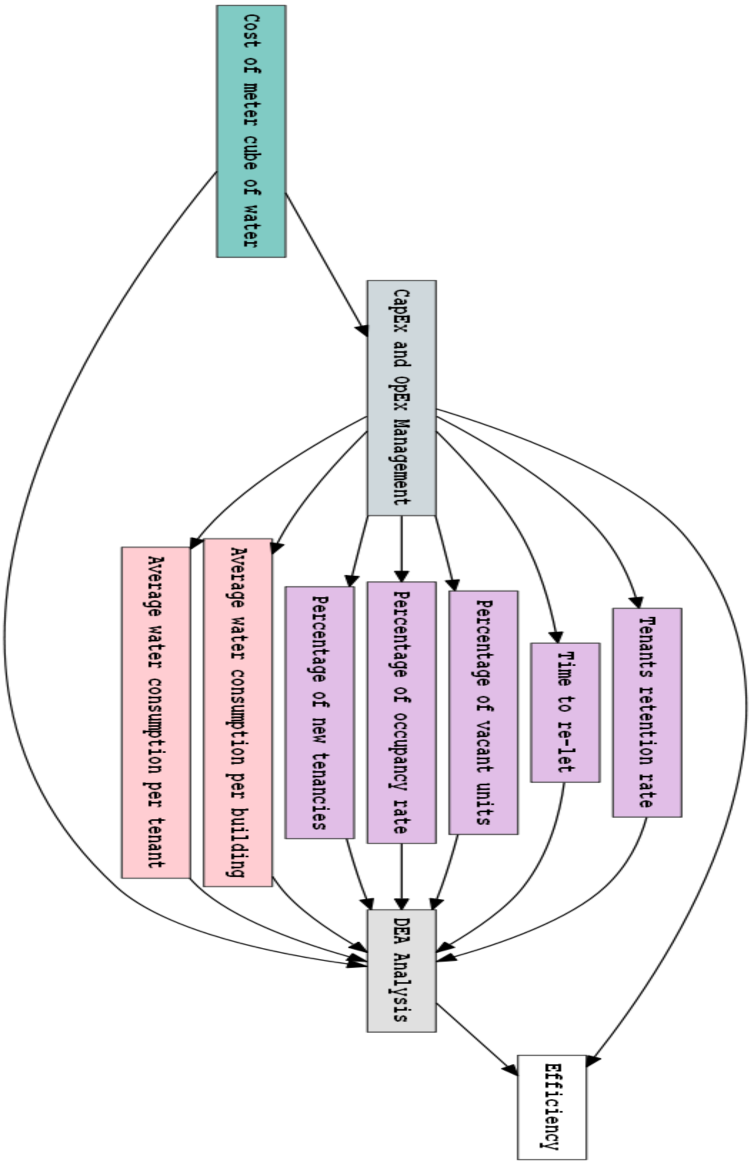


Figure 3.19 Diagram of the model for churn and water

3.21 Churn with Operational Characteristics

Both churn with operational characteristics subcategories have 4 inputs and 6 outputs.

Both the available rentable area and tenant retention rate are negatively correlated over time (Allen et al., 2013). The relationship between available rentable area as an input and time to

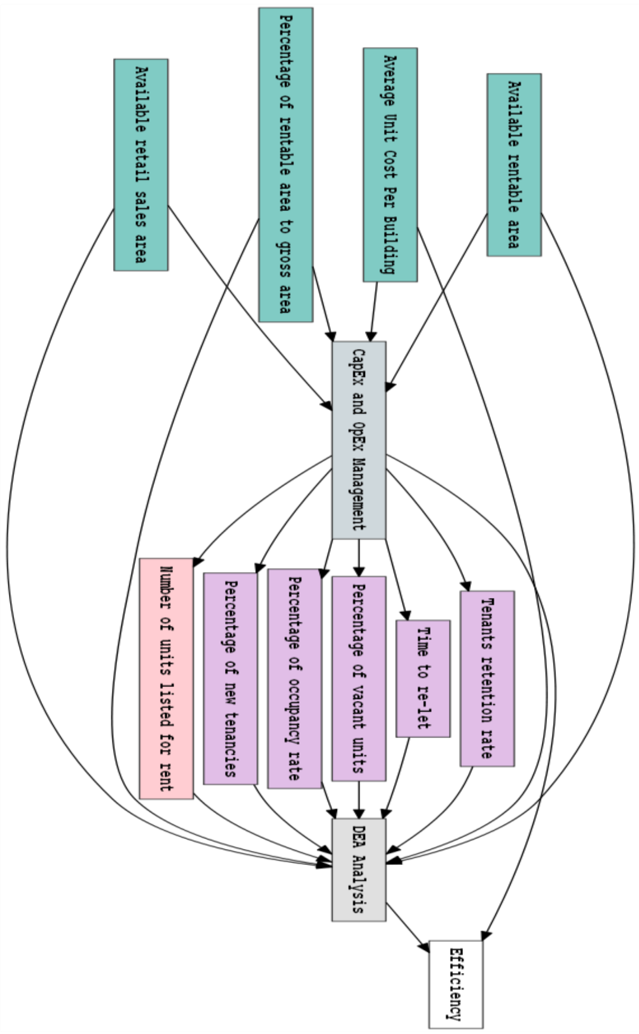


Figure 3.20: diagram of the model for churn and operational characteristics

re-let as an output is positively correlated (Bieszk et al., 2017). Likewise, the connection between available rentable area and the percentage of vacant units is positively correlated while the relationship between available rentable area as an input and the percentage of occupancy rate as an output is negatively correlated (Lieser et al., 2014). It is clear the impact of available rentable area on the percentage of new tenancies.

The link between average unit cost per building and tenant retention rate is direct and clear. Both the average unit cost per building and time to re-let have a strong link as well (Bieszk et al., 2017). Likewise, the relationship between average unit cost per building as an input and the percentage of vacant units as an output is important (Allen et al., 2013). Also, the connection between average unit cost per building and the percentage of occupancy rate can be examined easily (Chen, et al., 2015). The relationship between average unit cost per building as an input and the percentage of new tenancies as an output highlights the fact that new tenants are attracted by lower cost (Jin, Z., et al., 2015). It is clear that the impact of available retail sales area on tenant retention rate constitutes having more services linked to the building, which increases its value (Yuan et al., 2013). The link between available retail sales area and time to re-let is very strong (Liu, D., 2016). Both the available retail sales area and the percentage of vacant units have a negatively correlated relationship (Wu et al., 2015). The relationship between available retail sales area as an input and the percentage of occupancy rate as an output is strong. The connection between available retail sales area and the percentage of new tenancies is strong as well (Silver et al., 2016).

The relationship between the percentage of rentable area to gross area as an input and tenant retention rate as an output is negligible (Weber et al., 2013). It is clear that the impact of the percentage of rentable area to gross area on time to re-let constitutes nothing. The link between the percentage of rentable area to gross area and the percentage of vacant units is to some extent related (Thomsett et al., 2017). Both the percentage of rentable area to gross area and the percentage of occupancy rate have no relation (Yao et al., 2014). The relationship between the percentage of rentable area to gross area as an input and the percentage of new tenancies as an output is weak (Bird et al., 2014).

3.22 Churn with Physical Characteristics

Real estate management process based on churn with physical characteristics subcategories have 7 inputs and 5 outputs (Cvijanović et al., 2014).

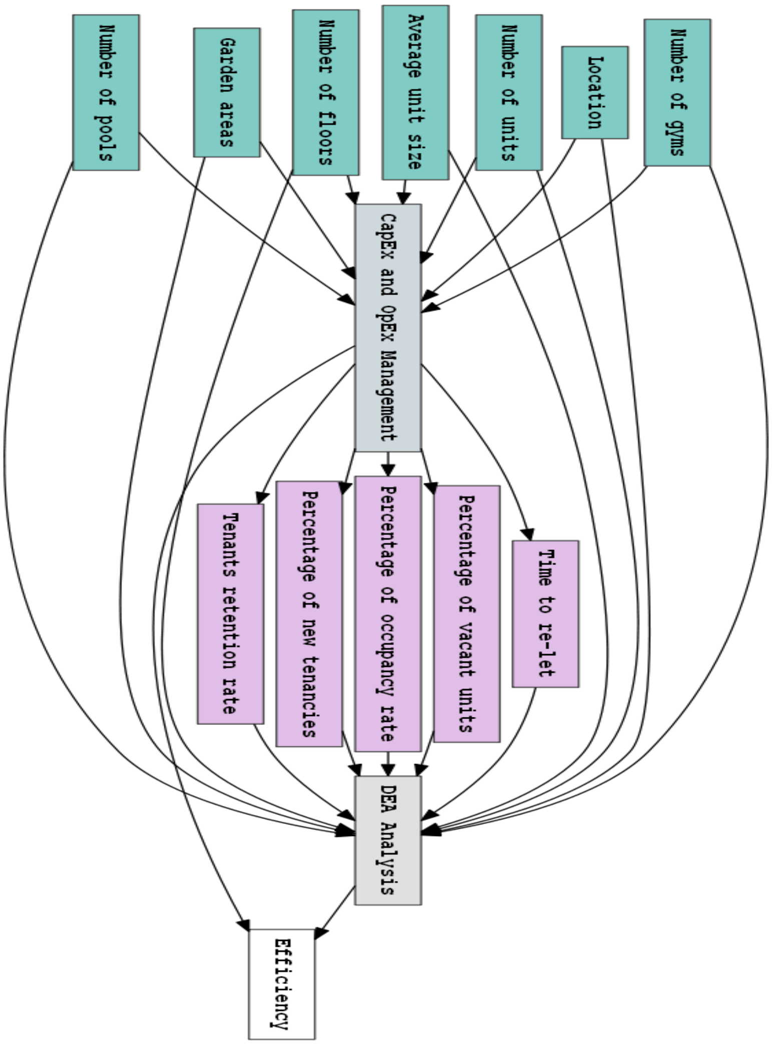


Figure 3.21 diagram of the model for churn and physical characteristics

The connection between the number of units and tenant retention rate is weak; the relationship between the number of units as an input and time to re-let as an output is next to nothing (Searle et al., 2014). It is clear that the impact of the number of units on the percentage of vacant units is very strong (Hu, X., & Liu, C., 2015). Similarly, the link between the number of units and the percentage of occupancy rate is straight forward (Salzman et al., 2017). Both the number of units and the percentage of new tenancies have a strong connection (Kurlat et al., 2015).

The relationship between average unit size as an input and tenant retention rate is very clear; the connection between average unit size and time to re-let is strong (Abatecola et al., 2013). The relationship between average unit size as an input and the percentage of vacant units as an output is mildly strong. It is clear that the impact of average unit size on the percentage of occupancy rate constitutes positive correlation (Fregonara et al., 2013).

Both the number of floors and tenant retention rate has a weak relation (Crowe et al., 2013). The relationship between the number of floors as an input and time to re-let as an output is very strong; the connection between the number of floors and the percentage of vacant units is also very strong (Lieser et al., 2014). The relationship between the number of floors as an input and the percentage of occupancy rate as an output is direct (Yao et al., 2014). It is clear that the impact of the number of floors on the percentage of new tenancies is positive (Crowe et al., 2013).

Both the number of pools and time to re-let have a strong connection, as well (Guan et al., 2014). The relationship between the number of pools as an input and the percentage of vacant units as an output is negatively correlated ((Yang, et al., 2019). The connection between the number of pools and the percentage of occupancy rate is positively correlated (Egilmez, G. et al., 2016). Also, the relationship between the number of pools as an input and the percentage of new tenancies as an output is positively correlated (Cerutti et al., 2017).

The connection between location and tenant retention rate demonstrates the reality about tenants' preferences location-wise (Yuan et al., 2013). The relationship between location as an input and time to re-let as an output is very important. It is clear that the impact of location on the percentage of vacant units is direct (Wu et al., 2015). The link between location and the percentage of occupancy rate is strong and both the location and the percentage of new tenancies are very connected (Allen et al., 2013).

3.23 Cleaning with Debt

The combination of cleaning with debt subcategories has 3 inputs and 6 outputs.

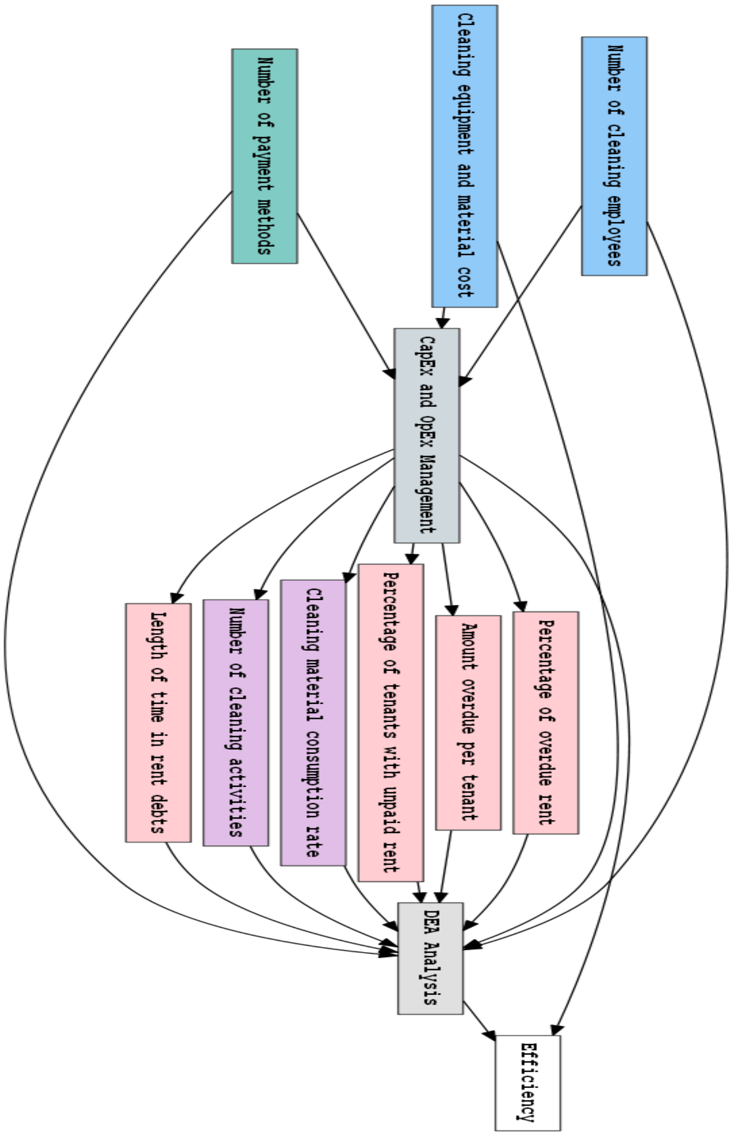


Figure 3.22 diagram of the model for cleaning and debt

The connection between the number of cleaning employees as an input and length of time in rent debts as an output is negligible (Hu, X., & Liu, C., 2015). Likewise, the connection between the number of cleaning employees and the percentage of overdue rent is not there (Cherif et al., 2014). The relationship between the number of cleaning employees as an input and amount overdue per tenant as an output is next to nothing (Thomsett et al., 2017). It is clear that the impact of the number of cleaning employees on the percentage of tenants with unpaid rent constitutes no valuable information; the link between cleaning equipment and material cost and length of time in rent debts is also very weak (Hartmann et al., 2015). Both the cleaning equipment and material cost and the percentage of overdue rent are separate (Paronin et al., 2014). The relationship between cleaning equipment and material cost as an input and amount overdue per tenant as an output emphasize nothing (Abatecola et al., 2013). The connection between cleaning equipment and material cost and the percentage of tenants with unpaid rent demonstrates no information (Liu, D., 2016).

The relationship between the number of payment methods as an input and cleaning material consumption rate as an output highlights nothing as well; and it is clear that this extends to the impact of the number of payment methods on the number of cleaning activities (Cvijanović et al., 2014).

3.24 Cleaning with Energy

Both the cleaning with energy subcategories has 3 inputs and 4 outputs.

The tying between the number of cleaning employees and average energy consumption per building does not exist (Silver et al., 2016). The number of cleaning employees and average energy consumption per tenant has no relation (Deng et al., 2014). The relationship

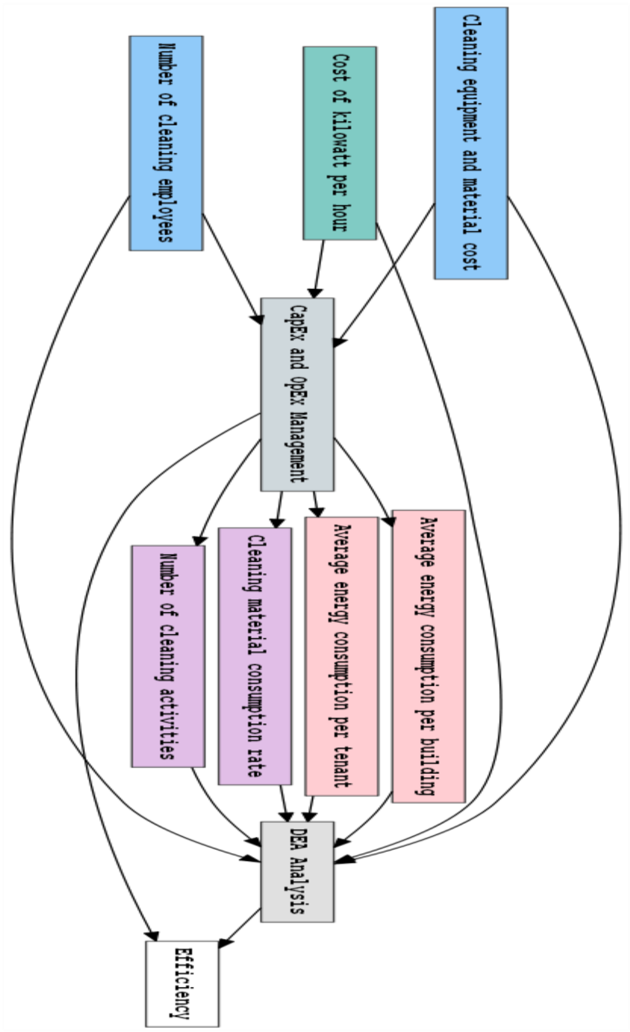


Figure 3.23 diagram of the model for cleaning and energy

between cleaning equipment and material cost as an input and average energy consumption per building as an output emphasize nothing (Black et al., 2017). The connection between cleaning equipment and material cost and average energy consumption per tenant demonstrates no real information.

The relationship between the cost of kilowatt per hour as an input and cleaning material consumption rate as an output highlights nothing (Bieszk et al., 2017). Also, the impact of the cost of kilowatt per hour on number of cleaning activities does not exist (Salzman et al., 2017).

3.25 Cleaning with Insurance

Real estate management process based on cleaning with insurance subcategories has 4 inputs and 3 outputs (Weber et al., 2013).

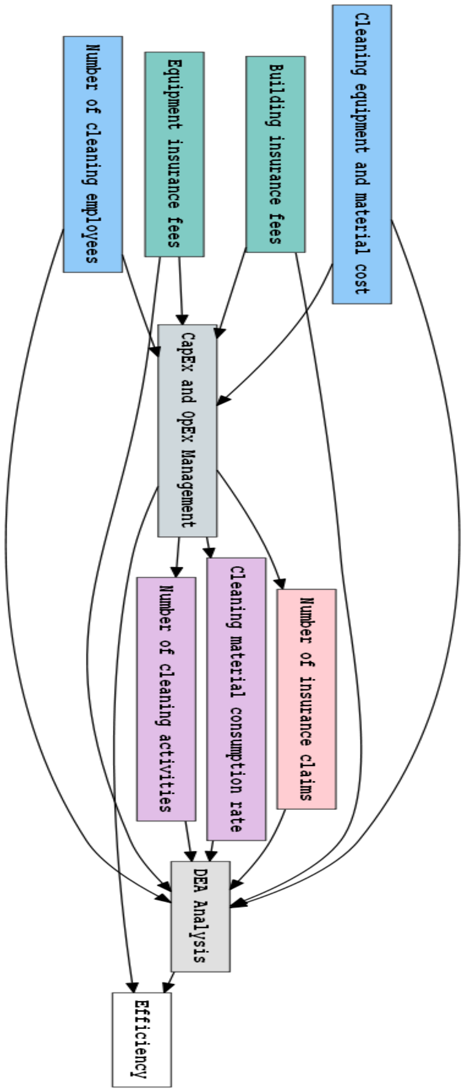


Figure 3.24: diagram of the model for cleaning and insurance

The link between the number of cleaning employees and number of insurance claims is established based on no justifications; both the cleaning equipment and material cost and number of insurance claims have nothing to do with each other (Searle et al., 2014).

The relationship between building insurance fees as an input and cleaning material consumption rate as an output emphasize no information (Silver et al., 2016). The connection between building insurance fees and number of cleaning activities demonstrates nothing (Searle et al., 2014). The relationship between equipment insurance fees as an input and cleaning material consumption rate as an output highlights no real information (Guan et al., 2014). It is clear that the impact of equipment insurance fees on number of cleaning activities does not exist (Black et al., 2017).

3.26 Cleaning with Management and Overall Costs

The combination of cleaning with management and overall costs subcategories has 5 inputs and 2 outputs (Deng et al., 2014).

The connection between employees' salaries and cleaning material consumption rate is very weak (Weber et al., 2013). Both the employees' salaries and number of cleaning activities have nothing to do with each other (Dawidowicz et al., 2014). The relationship between management fee per tenancy as an input and cleaning material consumption rate as an output emphasize no real information (Salzman et al., 2017). The relationship between the size of the management team as an input and cleaning material consumption rate as an output is weak (Baronin et al., 2014). It is clear that the impact of the size of the management team on number of cleaning activities constitutes nothing (Cerutti et al., 2017).

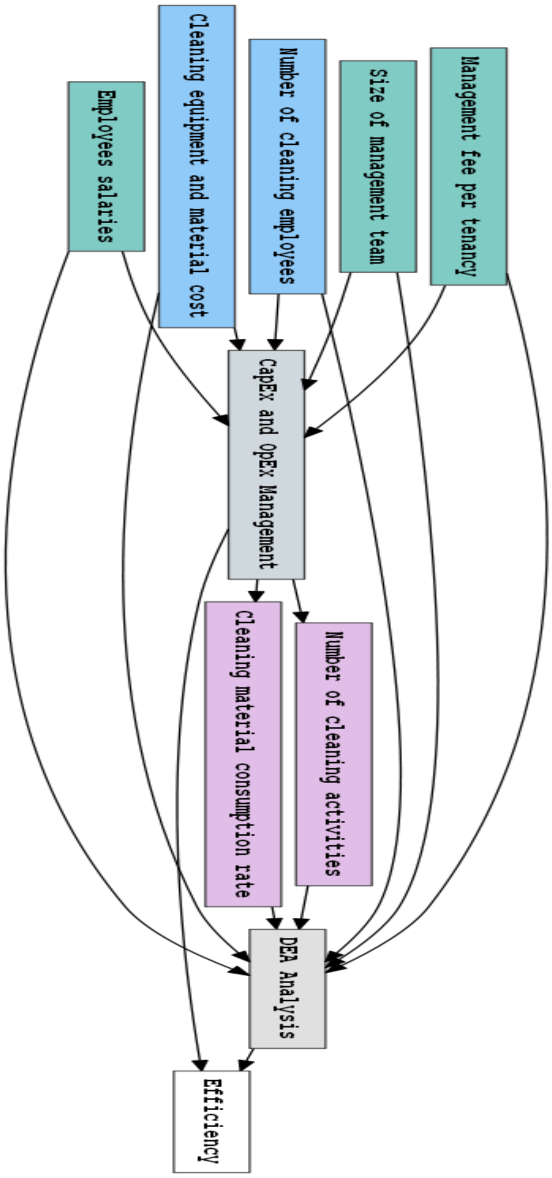


Figure 3.25: diagram of the model for cleaning and management and overall costs

3.27 Cleaning with Occupation Cost and Leasing

Both the cleaning with occupation cost and leasing subcategories have 4 inputs and 8 outputs.

The link between the number of cleaning employees and number of vacant units is weak (Hartmann et al., 2015). Both the number of cleaning employees and number of new leases

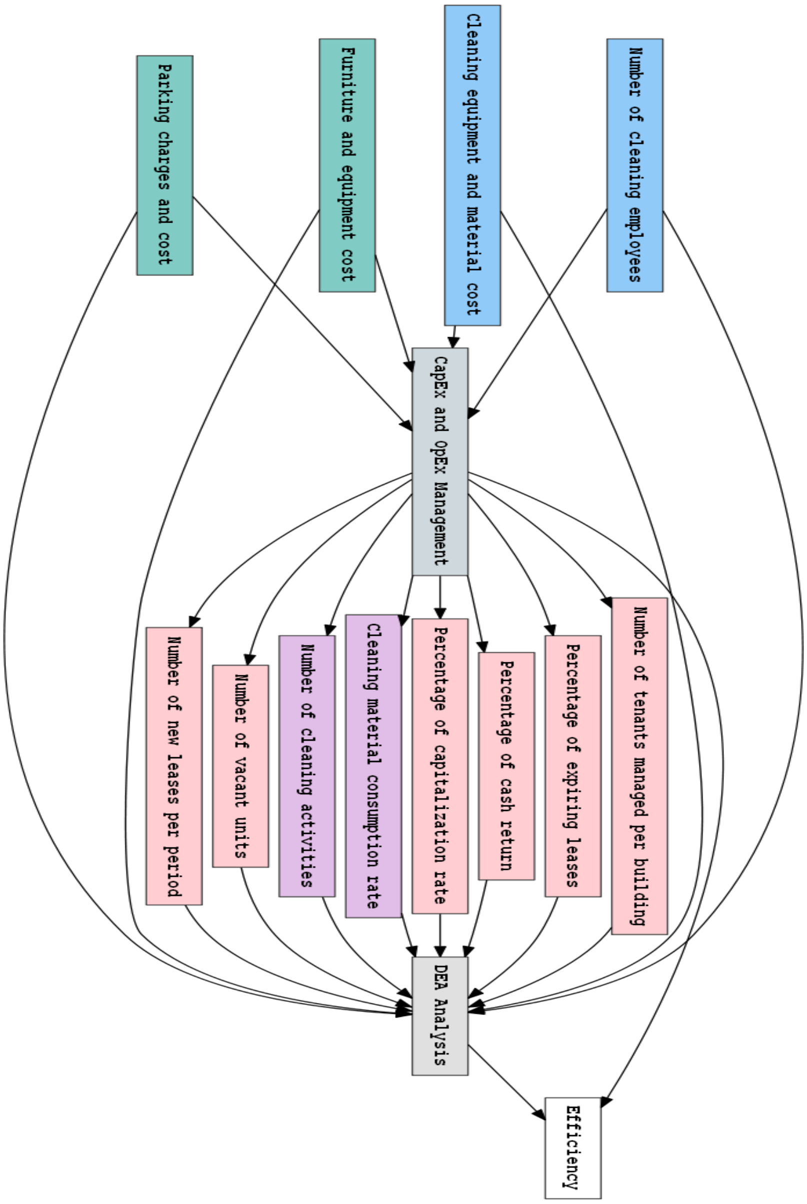


Figure 3.26: diagram of the model for cleaning and occupation cost and leasing

per period have nothing to do with each other (Yao et al., 2014). The relationship between the number of cleaning employees as an input and number of tenants managed per building as an output has some strength. The connection between the number of cleaning employees and the percentage of expiring leases can be established (Lieser et al., 2014). The relationship between the number of cleaning employees as an input and the percentage of cash return as an output highlights the fact that services create revenue (Yuan et al., 2013). It is clear that the impact of the number of cleaning employees on the percentage of capitalization rate constitutes some information (Bieszk et al., 2017). The link between cleaning equipment and material cost and number of vacant units is weak (Yang, et al., 2019). Both cleaning equipment and material cost and number of new leases per period have nothing to do with each other. The relationship between cleaning equipment and material cost as an input and number of tenants managed per building as an output emphasize nothing (Hu, X., & Liu, C., 2015). The connection between cleaning equipment and material cost and the percentage of expiring leases does not exist (Cherif et al., 2014). The relationship between cleaning equipment and material cost as an input and the percentage of cash return as an output has some relation in budgetary terms (Abatecola et al., 2013). It is clear that the impact of cleaning equipment and material cost on the percentage of capitalization rate constitutes next to nothing (Allen et al., 2013).

The bond between parking charges and cost and cleaning material consumption rate does not exist (Bird et al., 2014). Both the parking charges and cost and number of cleaning activities have nothing to do with each other (Fregonara et al., 2013). The relationship between furniture and equipment cost as an input and cleaning material consumption rate as an output is strong to some extent (Liu, D., 2016). The connection between furniture and equipment cost and number of cleaning activities is positively correlated (Wu et al., 2015).

3.28 Cleaning with Rent

Real estate management process based on cleaning with rent subcategories has 2 inputs and 9 outputs (Cvijanović et al., 2014).

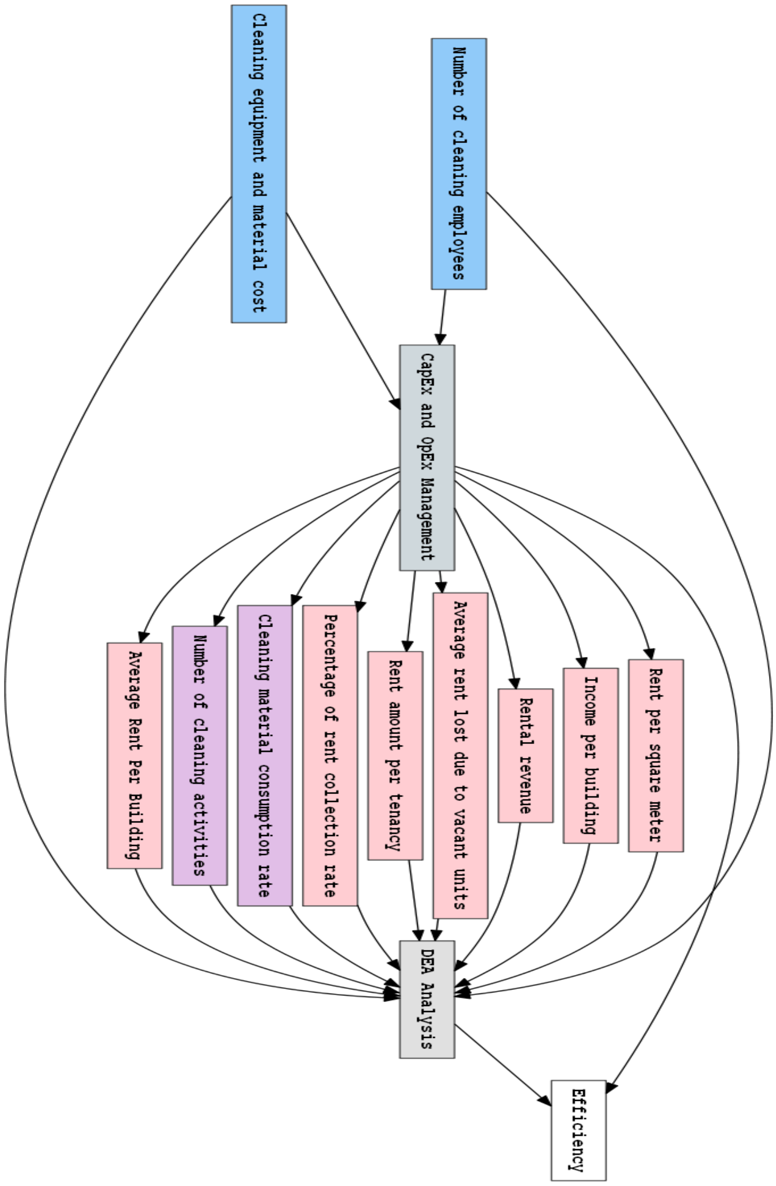


Figure 3.27: diagram of the model for cleaning and rent

The link between the number of cleaning employees as an input and average rent per building as an output has some strength (Thomsett et al., 2017). It is clear that the impact of the number of cleaning employees on rent per square meter is direct (Egilmez, G. et al., 2016). The link between the number of cleaning employees and income per building is established based on the fact that well serviced buildings generate income (Crowe et al., 2013). Both the number of cleaning employees and rental revenue have a strong relation (Yang, et al., 2019). The relationship between the number of cleaning employees as an input and average rent lost due to vacant units as an output may not be there. The connection between the number of cleaning employees and rent amount per tenancy is strong (Baronin et al., 2014). The relationship between the number of cleaning employees as an input and the percentage of rent collection rate as an output highlights nothing (Egilmez, G. et al., 2016). It is clear that the impact of cleaning equipment and material cost on average rent per building constitutes nothing as well (Yuan et al., 2013). The link between cleaning equipment and material cost and rent per square meter does not exist (Silver et al., 2016). Both the cleaning equipment and material cost and income per building are mildly connected (Lieser et al., 2014). The relationship between cleaning equipment and material cost as an input and rental revenue as an output emphases nothing (Yao et al., 2014). The connection between cleaning equipment and material cost and average rent lost due to vacant units demonstrates no information; the relationship between cleaning equipment and material cost as an input and rent amount per tenancy as an output highlights weak relation and it is clear that the impact of cleaning equipment and material cost on the percentage of rent collection rate does not exist (Bieszk et al., 2017).

3.29 Cleaning with Repair and Maintenance

The combination of cleaning with repair and maintenance subcategories has 4 inputs and 6 outputs. The link between the number of cleaning employees and number of planned maintenance requests is not there (Salzman et al., 2017). Both the number of cleaning employees and number of unplanned repairs requests have nothing do with each other (Cvijanović et al., 2014). The relationship between the number of cleaning employees as an input and the percentage of planned repairs completed on time as an output emphasize no information (Weber et al., 2013). The connection between the number of cleaning employees and the percentage of unplanned repairs completed on time demonstrates nothing.

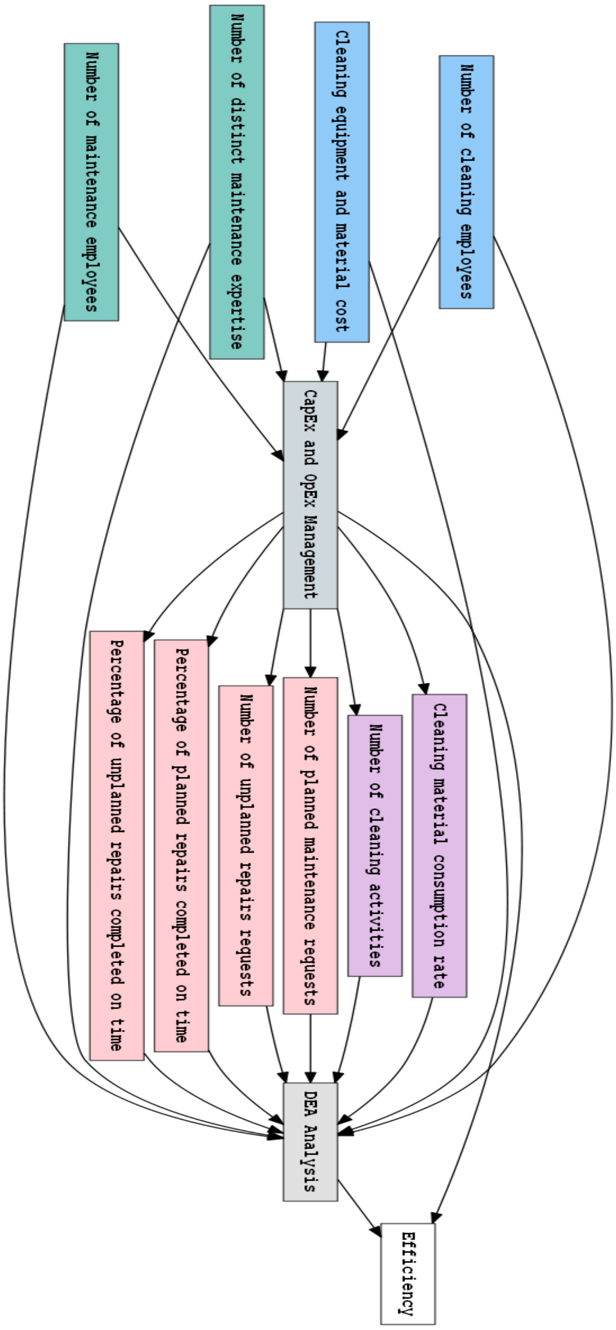


Figure 3.28: diagram of the model for cleaning and repair and maintenance

The relationship between cleaning equipment and material cost as an input and number of planned maintenance requests as an output highlights nothing. It is clear that the impact of cleaning equipment and material cost on number of unplanned repairs requests does not exist

(Guan et al., 2014). The link between cleaning equipment and material cost and the percentage of planned repairs completed on time is not there (Abatecola et al., 2013). Both the cleaning equipment and material cost and the percentage of unplanned repairs completed on time have nothing to do with each other (Wu et al., 2015).

The link between the number of maintenance employees as an input and cleaning material consumption rate as an output emphasizes nothing (Kurlat et al., 2015). The connection between the number of maintenance employees and number of cleaning activities demonstrates no valuable information (Allen et al., 2013). The relationship between the number of distinct maintenance expertise as an input and cleaning material consumption rate as an output highlights nothing; it is clear that the impact of the number of distinct maintenance expertise on number of cleaning activities constitutes no information (Liu, D., 2016).

3.30 Cleaning with Security

Both the cleaning with security subcategories have 7 inputs and 2 outputs.

The link between the number of security officers and cleaning material consumption rate does not exist; both the number of security officers and number of cleaning activities have nothing to do with each other (Fregonara et al., 2013). The relationship between the number of security teams as an input and cleaning material consumption rate as an output emphasize no information (Hu, X., & Liu, C., 2015). The connection between the number of security teams and number of cleaning activities demonstrates nothing (Searle et al., 2014). The relationship between security equipment cost as an input and cleaning material consumption

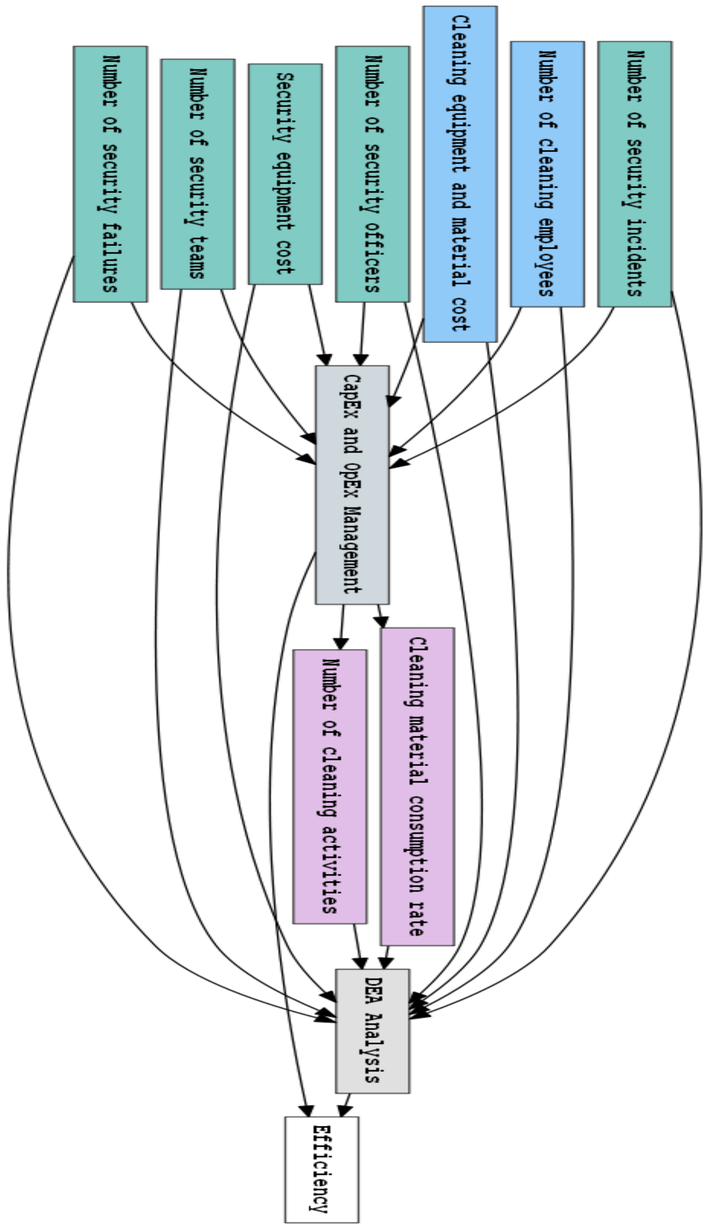


Figure 3.29: diagram of the model for cleaning and security

rate as an output highlights nothing (Thomsett et al., 2017). The link between the number of security incidents and cleaning material consumption rate does not exist (Dawidowicz et al., 2014). Both the number of security incidents and number of cleaning activities have nothing to do with each other (Searle et al., 2014). The relationship between the number of security failures as an input and cleaning material consumption rate as an output emphasizes no information (Dawidowicz et al., 2014). The connection between the number of security failures and number of cleaning activities demonstrates nothing (Weber et al., 2013).

3.31 Cleaning with Water

Real estate management process based on cleaning with water subcategories have 3 inputs and 4 outputs (Crowe et al., 2013).

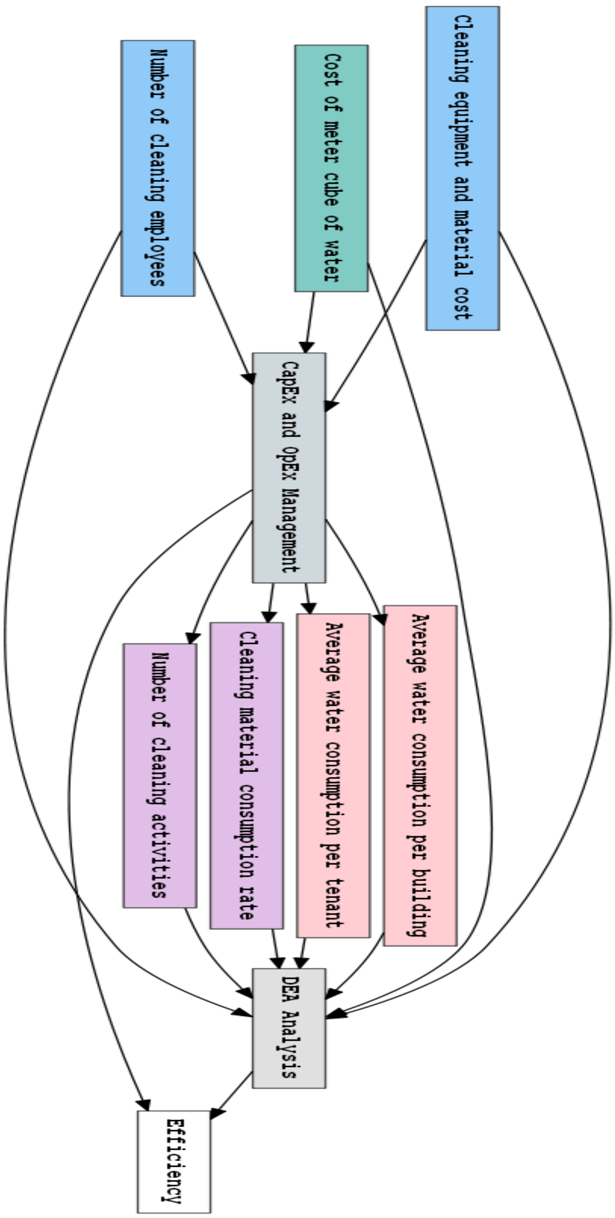


Figure 3.30: diagram of the model for cleaning and water

The connection between the number of cleaning employees as an input and average water consumption per building as an output is very direct (Ramanathan, et al., 2016). It is clear that the impact of the number of cleaning employees on average water consumption per tenant positively correlates (Abatecola et al., 2013). The link between cleaning equipment and material cost and average water consumption per building is obvious (Baronin et al., 2014). Both the cleaning equipment and material cost and average water consumption per tenant have a strong relation (Bird et al., 2014).

The relationship between the cost of meter cube of water as an input and cleaning material consumption rate as an output is mildly connected (Lieser et al., 2014). The connection between the cost of meter cube of water and number of cleaning activities is very strong (Hartmann et al., 2015).

3.32 Cleaning with Operational Characteristics

The combination of cleaning with operational characteristics subcategories has 6 inputs and 3 outputs.

The connection between the number of cleaning employees as an input and number of units listed for rent as an output highlights nothing (Yao et al., 2014). It is clear that the impact of cleaning equipment and material cost on number of units listed for rent does not exist (Agarwal et al., 2015).

The link between available rentable area and cleaning material consumption rate is very strong (Cherif et al., 2014). Both the available rentable area and number of cleaning activities have a positive correlation; the relationship between average unit cost per building as an input and cleaning material consumption rate as an output is mildly strong (Allen et al., 2013). The

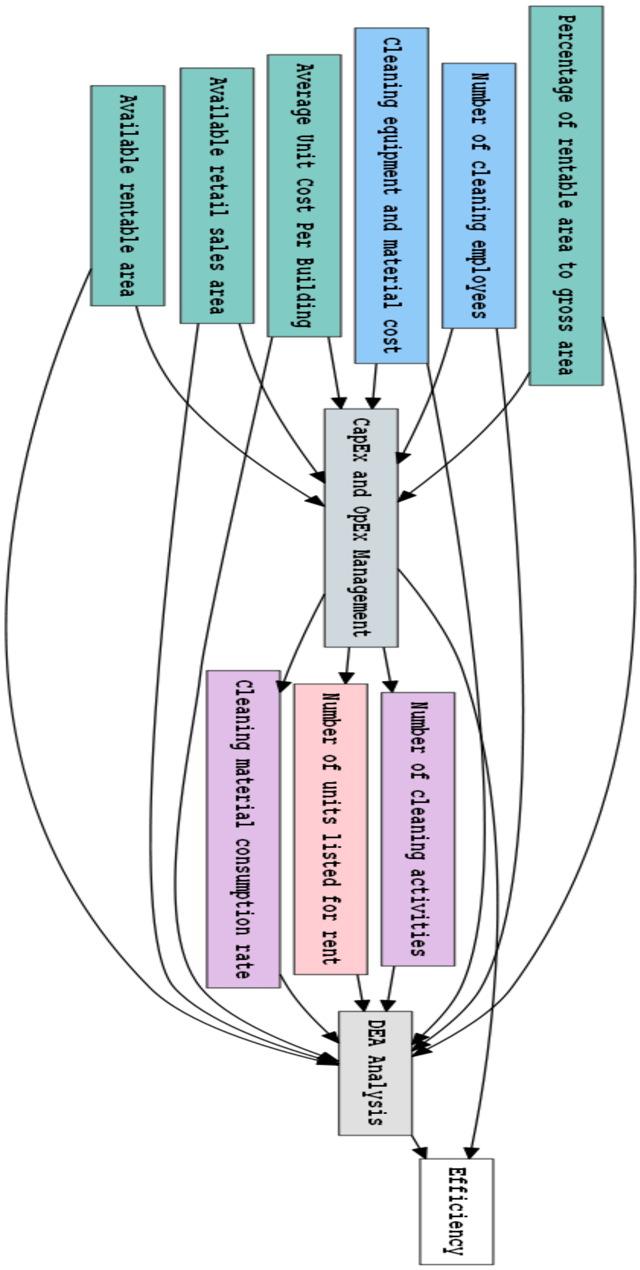


Figure 3.31: diagram of the model for cleaning and operational characteristics

connection between average unit cost per building and number of cleaning activities is strong as well (Liu, D., 2016). The relationship between available retail sales area as an input and cleaning material consumption rate as an output is direct (Silver et al., 2016). It is clear that the impact of available retail sales area on number of cleaning activities positively correlate (Yuan et al., 2013). The link between the percentage of rentable area to gross area and cleaning material consumption rate is very strong and both the percentage of rentable area to gross area and number of cleaning activities are connected (Guan et al., 2014).

3.33 Cleaning with Physical Characteristics

Both the cleaning with physical characteristics subcategories have 9 inputs and 2 outputs.

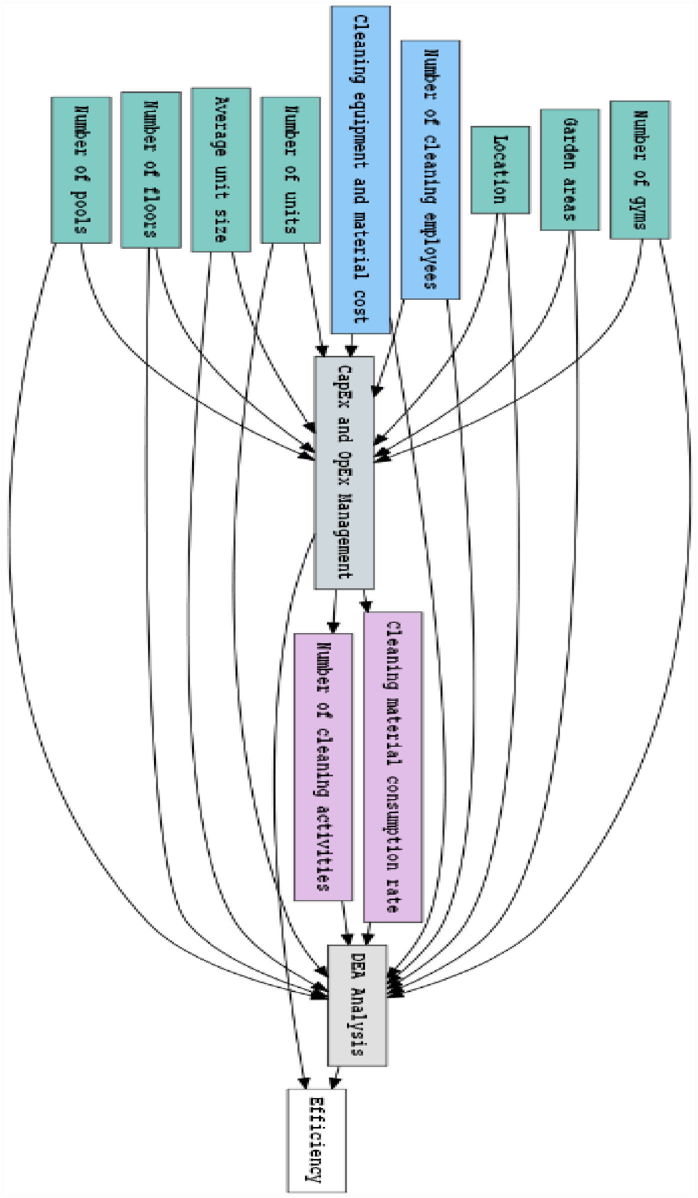


Figure 3.32: diagram of the model for cleaning and physical characteristics

The link between the number of units as an input and cleaning material consumption rate as an output is very strong (Fregonara et al., 2013). The connection between the number of units and number of cleaning activities is strong as well. The relationship between average unit size as an input and cleaning material consumption rate as an output is positively correlated (Kurlat et al., 2015). It is clear that the impact of average unit size on number of cleaning activities is direct (Wu et al., 2015). The link between the number of floors and cleaning material consumption rate is positively correlated (Thomsett et al., 2017). Both the number of floors and number of cleaning activities have a direct relation (Cerutti et al., 2017). The relationship between the number of pools as an input and cleaning material consumption rate as an output does exist (Deng et al., 2014).

The connection between the number of pools and number of cleaning activities is very related (Salzman et al., 2017). The relationship between the number of gyms as an input and cleaning material consumption rate as an output mildly correlate (Haque et al., 2014). It is clear that the impact of the number of gyms on number of cleaning activities constitutes some information (Bieszk et al., 2017). The link between garden areas and cleaning material consumption rate is established based on the need to clean available gardens (Wu et al., 2015). Both the garden areas and number of cleaning activities have a direct relation to some extent; the relationship between location as an input and cleaning material consumption rate as an output emphasize nothing (Thomsett et al., 2017). The connection between location and number of cleaning activities demonstrates no information (Silver et al., 2016).

3.34 Debt with Energy

Real estate management process based on debt with energy subcategories have 2 inputs and 6 outputs.

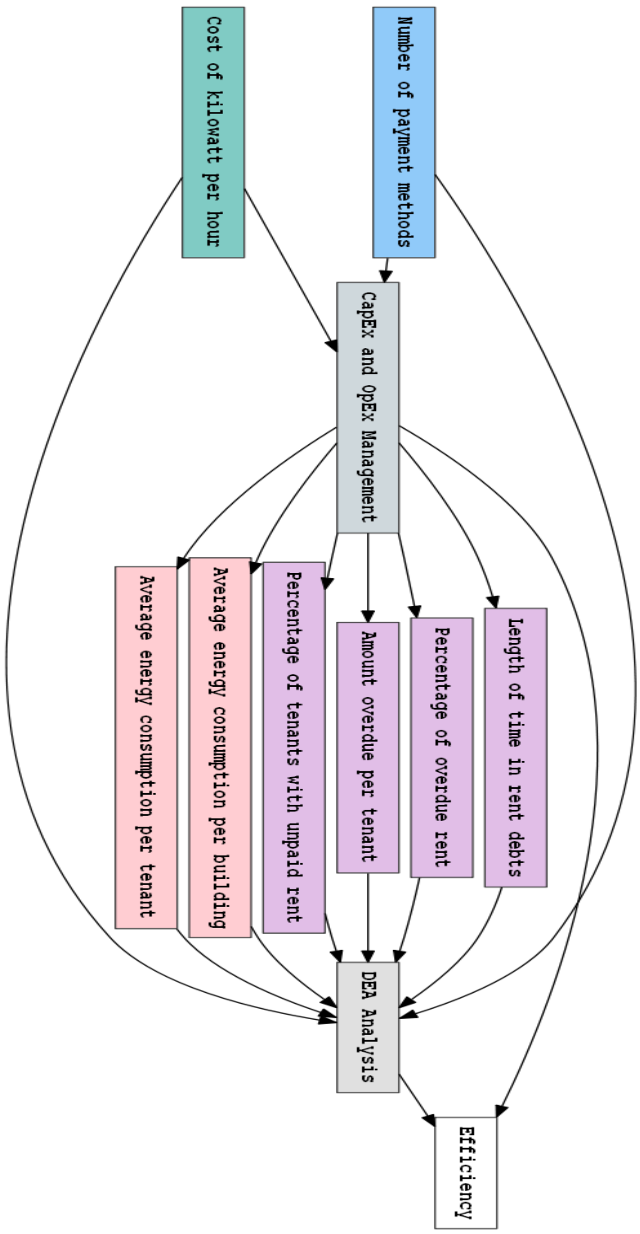


Figure 3.33: diagram of the model for debt and energy

The relation between the number of payment methods as an input and average energy consumption per building as an output is negligible and shows they have nothing to do with each other (Bieszk et al., 2017). It is clear that the impact of the number of payment methods on average energy consumption per tenant constitutes nothing (Kurlat et al., 2015). The link between the cost of kilowatt per hour and length of time in rent debts is very weak (Hartmann et al., 2015). Both the cost of kilowatt per hour and the percentage of overdue rent have nothing to do with each other (Liu, D., 2016). The relationship between the cost of kilowatt per hour as an input and amount overdue per tenant as an output emphasizes no information (Paronin et al., 2014). The connection between the cost of kilowatt per hour and the percentage of tenants with unpaid rent demonstrates nothing (Cerutti et al., 2017).

3.35 Debt with Insurance

The combination of debt with insurance subcategories has 3 inputs and 5 outputs.

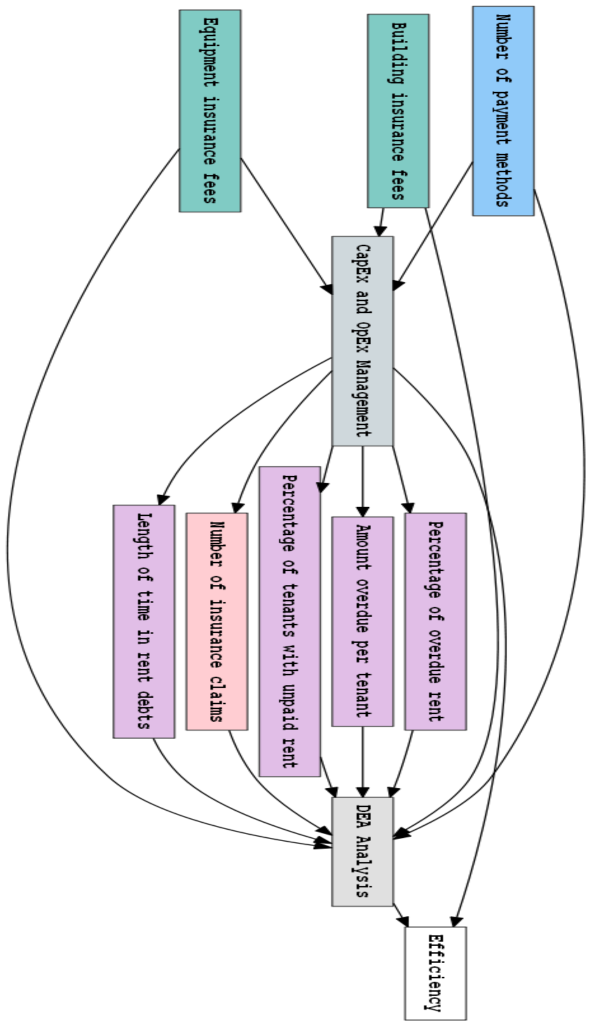


Figure 3.34: diagram of the model for debt and insurance

It is clear that the impact of building insurance fees on length of time in rent debts constitutes nothing as well. The link between building insurance fees and the percentage of overdue rent is not there (Weber et al., 2013). Both the building insurance fees and amount overdue per tenant have nothing to do with each other (Allen et al., 2013). The relationship between building insurance fees as an input and the percentage of tenants with unpaid rent as an output emphasizes no information (Dawidowicz et al., 2014). The connection between equipment insurance fees and length of time in rent debts demonstrates nothing (Cherif et al., 2014). The relationship between equipment insurance fees as an input and the percentage of overdue rent as an output highlights nothing as well (Searle et al., 2014). It is clear that the impact of equipment insurance fees on amount overdue per tenant is very weak, and the link between equipment insurance fees and the percentage of tenants with unpaid rent is not there (Yao et al., 2014).

3.36 Debt with Management and Overall Costs

Both the debt with management and overall costs subcategories have 4 inputs and 4 outputs.

Both the employees' salaries and length of time in rent debts have nothing to do with each other. The relationship between employees' salaries as an input and the percentage of overdue rent as an output does not exist (Yuan et al., 2013). The connection between employees' salaries and amount overdue per tenant demonstrates nothing (Abatecola et al., 2013). The relationship between employees' salaries as an input and the percentage of tenants with unpaid rent as an output highlights nothing as well (Ramanathan, et al., 2016). It is clear that the impact of management fee per tenancy on length of time in rent debts constitutes nothing (Deng et al., 2014). The link between management fee per tenancy and the percentage of overdue rent is very weak; both the management fee per tenancy and amount

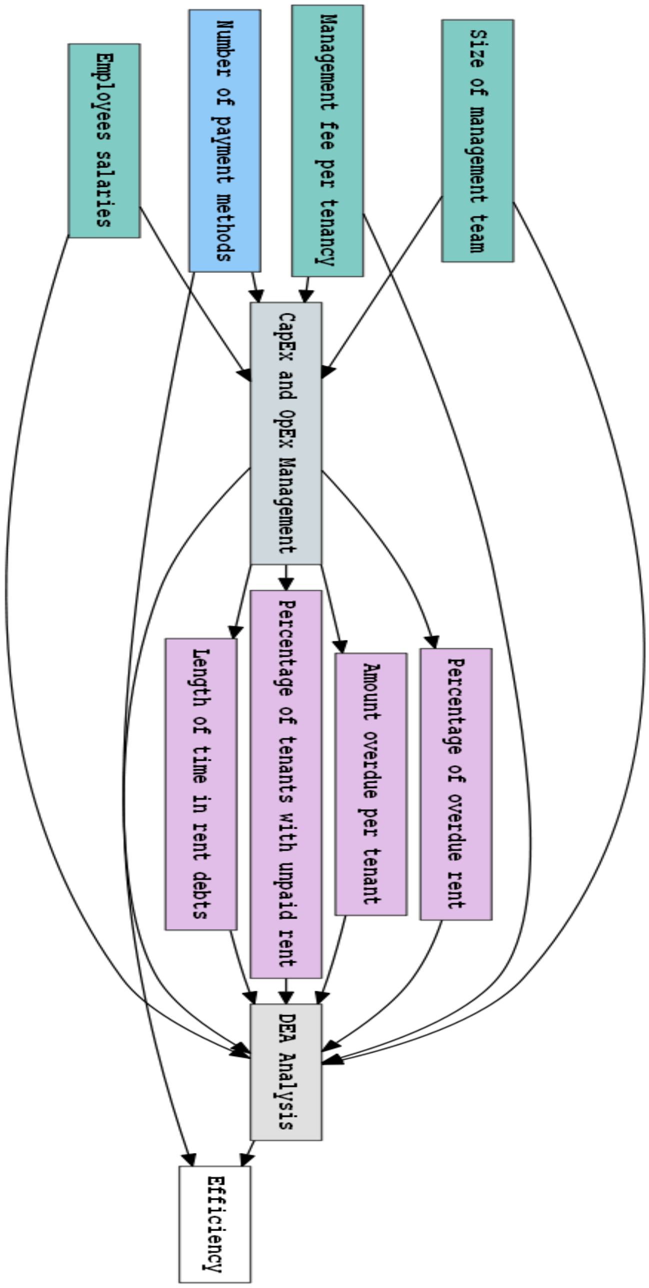


Figure 3.35: diagram of the model for debt and management and overall costs

overdue per tenant have a weak relation (Mahdiloo et al., 2015). The relationship between management fee per tenancy as an input and the percentage of tenants with unpaid rent as an output emphasize no information (Lieser et al., 2014). The connection between the size of the management team and length of time in rent debts demonstrates nothing. The relationship between the size of the management team as an input and the percentage of overdue rent as an output highlights nothing as well (Yang, et al., 2019). It is clear that the impact of the size of the management team on amount overdue per tenant constitutes no real value (Salzman et al., 2017). The link between the size of the management team and the percentage of tenants with unpaid rent does not exist (Guan et al., 2014).

3.37 Debt with Occupation Cost and Leasing

Real estate management process based on debt with occupation cost and leasing subcategories have 3 inputs and 10 outputs (Liu, D., 2016).

Both the number of payment methods and number of vacant units have some relation (Cvijanović et al., 2014). The relationship between the number of payment methods as an input and number of new leases per period as an output emphasizes the fact that tenants prefer more options (Allen et al., 2013). The connection between the number of payment methods and number of tenants managed per building demonstrates the same reality (Black et al., 2017). The relationship between the number of payment methods as an input and the percentage of expiring leases as an output should be negatively correlated. It is clear that the impact of the number of payment methods on the percentage of cash return constitutes positive relation (Mahdiloo et al., 2015). The link between the number of payment methods and the percentage of capitalization rate is the same as well (Salzman et al., 2017).

Both the parking charges and cost and length of time in rent debts have nothing to do with each other (Bird et al., 2014). The connection between parking charges and cost and amount overdue per tenant does not exist (Fregonara et al., 2013). The relationship between parking charges and cost as an input and the percentage of tenants with unpaid rent as an output

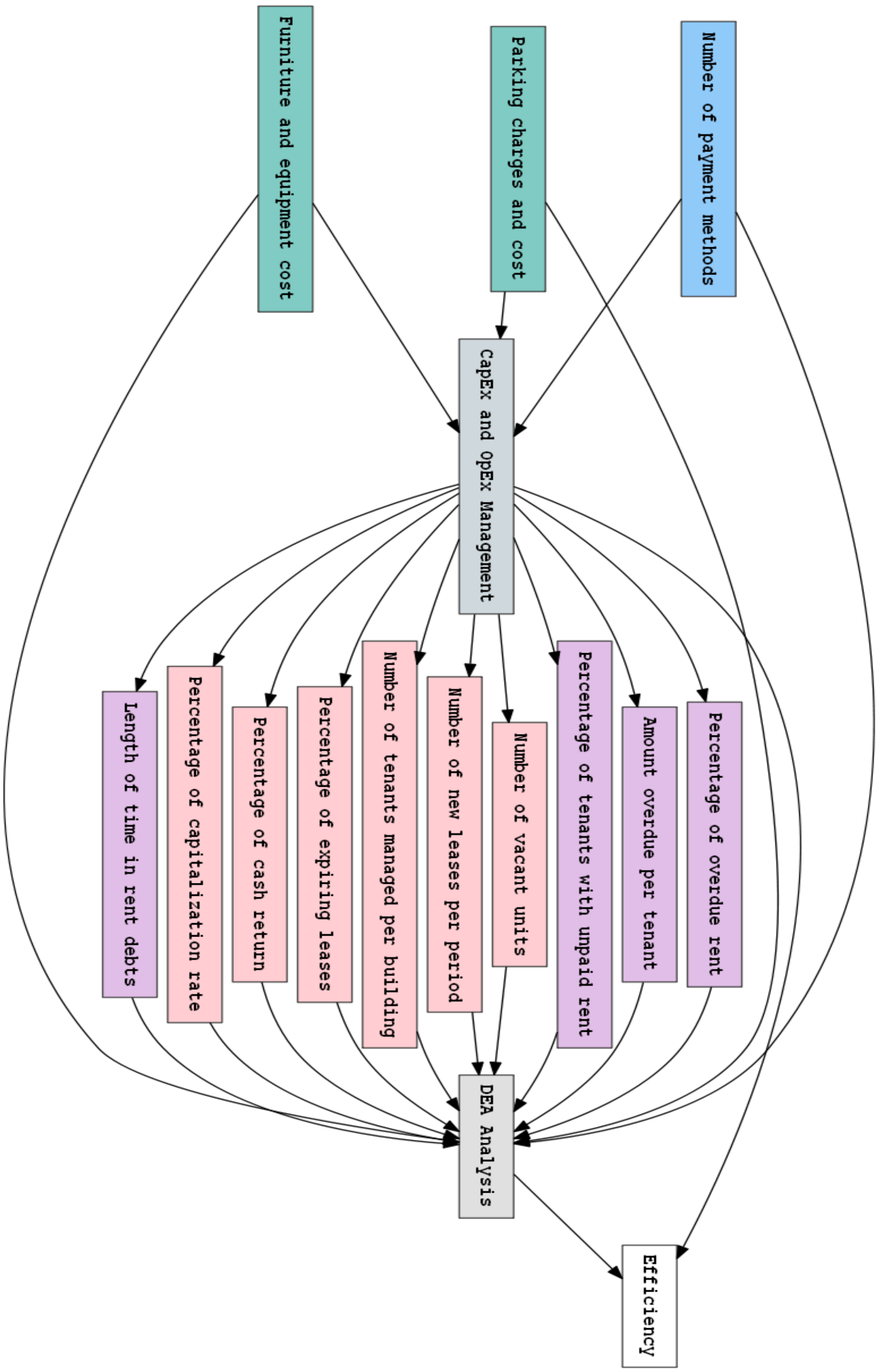


Figure 3.36: diagram of the model for debt and occupation cost and leasing

highlights no information (Hartmann et al., 2015). It is clear that the impact of furniture and equipment cost on length of time in rent debts constitutes nothing, and the link between furniture and equipment cost and the percentage of overdue rent does not exist (Deng et al., 2014). Both the furniture and equipment cost and amount overdue per tenant have no relation (Baronin et al., 2014). The relationship between furniture and equipment cost as an input and the percentage of tenants with unpaid rent as an output does not exist (Dawidowicz et al., 2014).

3.38 Debt with Rent

The combination of debt with rent subcategories has 1 input and 11 outputs.

The relevance between the number of payment methods and average rent per building is very strong (Cherif et al., 2014). The relationship between the number of payment methods as an input and rent per square meter as an output highlights a positive relation (Abatecola et al., 2013). It is clear that the impact of the number of payment methods on income per building constitutes positive correlation (Lieser et al., 2014). The link between the number of payment methods and rental revenue is very strong (Yuan et al., 2013). Both the number of payment methods and average rent lost due to vacant units have a relation to some extent (Yao et al., 2014). The relationship between the number of payment methods as an input and rent amount per tenancy as an output is very strong (Ramanathan, et al., 2016). The connection between the number of payment methods and the percentage of rent collection rate does exist (Silver et al., 2016).

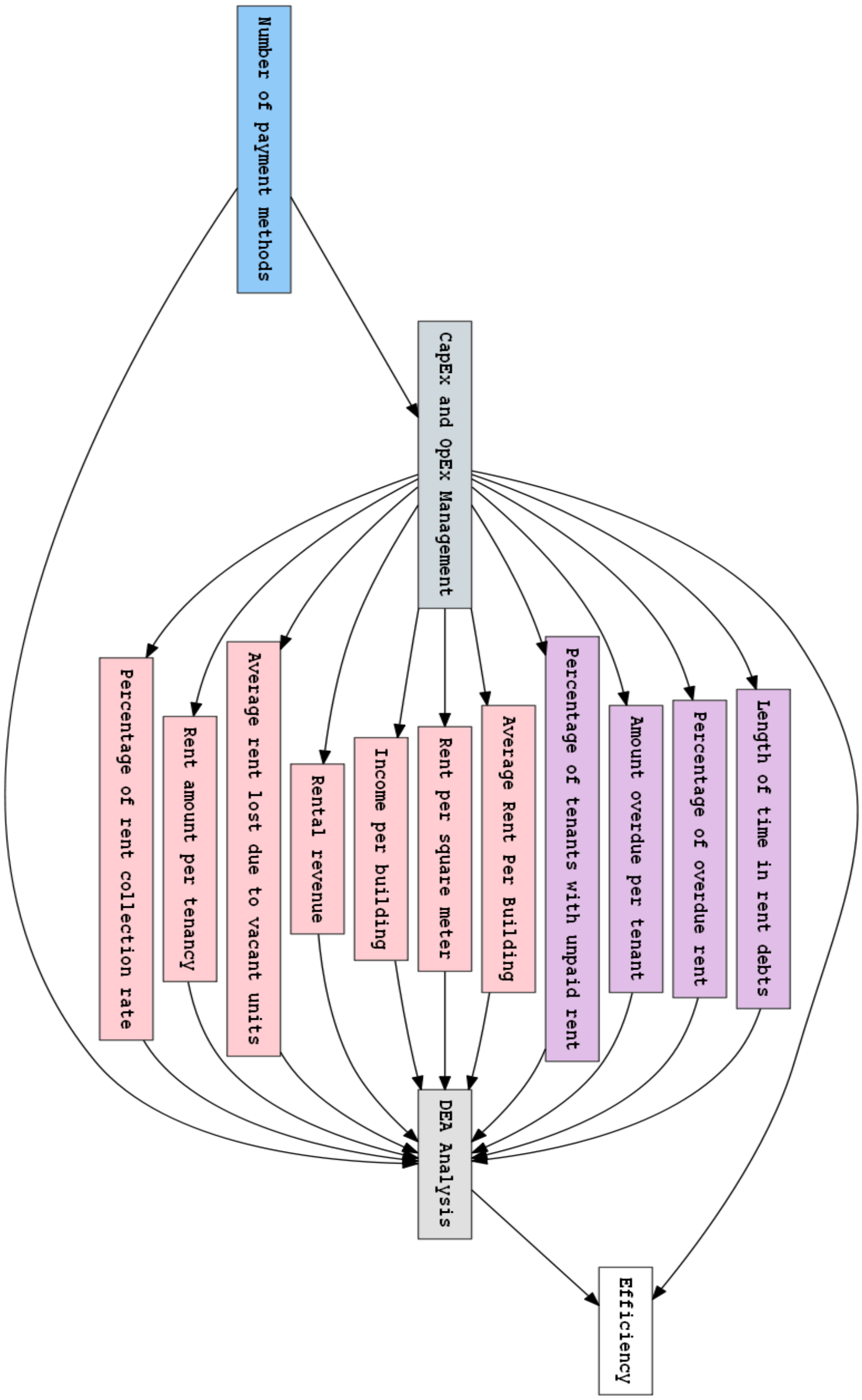


Figure 3.37: diagram of the model for debt and rent

3.39 Debt with Repair and Maintenance

Both the debt with repair and maintenance subcategories have 3 inputs and 8 outputs.

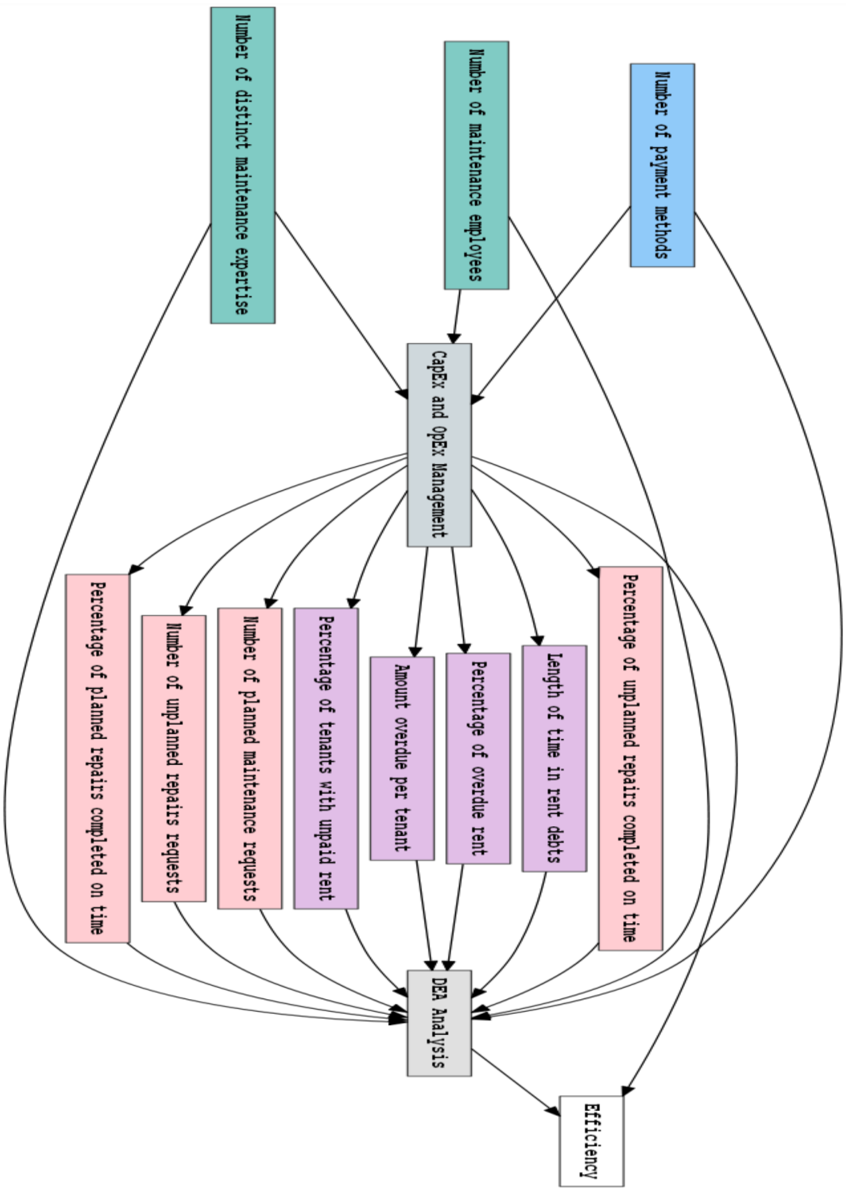


Figure 3.38: diagram of the model for debt and repair and maintenance

The limit between the number of payment methods as an input and number of planned maintenance requests as an output highlights nothing (Bieszk et al., 2017). It is clear that the impact of the number of payment methods on number of unplanned repairs requests constitutes nothing as well (Wu et al., 2015). The link between the number of payment methods and the percentage of planned repairs completed on time is very weak (Cerutti et al., 2017). Both the number of payment methods and the percentage of unplanned repairs completed on time have nothing to do with each other (Kurlat et al., 2015).

The relationship between the number of maintenance employees as an input and length of time in rent debts as an output emphasizes nothing (Searle et al., 2014). The connection between the number of maintenance employees and the percentage of overdue rent demonstrates no information (Crowe et al., 2013

3.40 Research Framework

All the ratios discussed above take different inputs into account to ascertain different segments of a business's operational activities. The ratios also come in very handy in getting an approximate picture regarding the management and company's performance over the course of a period of time. The ratio analysis is a quick tool that can be extremely useful in short-term, as well as long-term, decisions.

These ratios measure how efficient and effective a real estate management has been in converting its assets into revenue. They also measure the efficiency of the business in converting the earned revenue into cash. In short, they carefully analyse the efficiency in creating value for shareholders. Value delivered to shareholders of a corporation because of management's ability to increase sales, earnings, and free cash flow over time, leads to the ability to increase dividends and encourage capital gains for equity owners. The detailed analysis of these ratios can shed valuable light over the performance and standing of the business. It is the first step through which the management can make key decisions to improve its overall operations and achieve competitive advantage over the rest of the competitors in the market.

To fully understand the efficiency aspect of real estate management, this research will assume five main drivers behind the total value created by efficient management. These drivers are Financial Performance, Functional Performance, Operational Performance, Environmental Performance, and Management Performance.

Each of these drivers includes several controllable attributes and metrics. These attributes have a direct link in regard to each driver and its efficiency. It is obvious that the financial performance driver will have a direct relationship with financial attributes such as CapEx and OpEx. There are several metrics which are related to these attributes, namely net present value, which is the calculation of cash flow as a result of project operations compared to the initial capital. Also, internal rate of return is another metric related to financial performance attributes. Likewise, whole life cost and net operating income are also metrics that can be used to describe the financial performance driver. In addition, economic value added metric and cost per square-foot metrics are directly related to performance in financial terms.

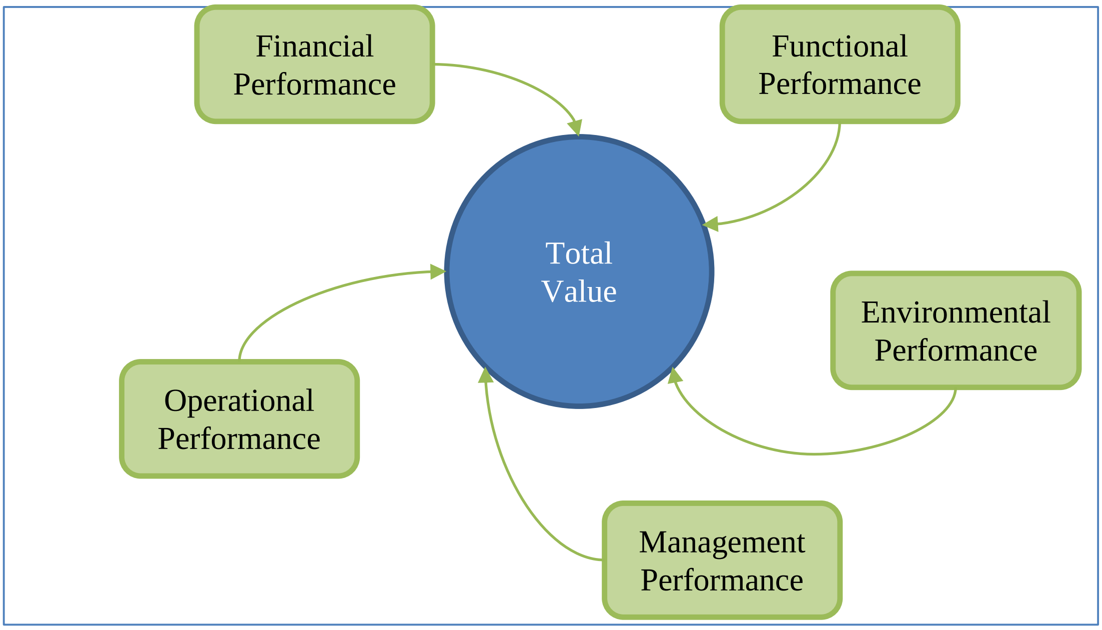


Figure 3.39 : Main drivers behind efficient management value in real estate

On the other hand, functional performance has several attributes which are related to the specific functions that are intended for the real estate unit. Real estate can be categorized as commercial and residential. Furthermore, commercial units can be also categorized depending on the functionality such as industrial or office spaces. Hence, adaptability is one of the most important attributes in functional performance driver. Reliability and security are very important in this driver, as well. Another important attribute is durability, where the ability for the real estate unit to function for long time is very important especially in industrial settings. Efficiency is also an important attribute, where efficiency is defined as the ability to increase space utilization. In other words, higher utilization of the same space with the same functionality for a real estate unit more than the others is preferable. Lastly, functional performance can be attributed based on the convenience of tenants, which is dependent on the ability to access outside services such as transportation.

Another important driver for the efficient real estate management is operational performance. This driver can be attributed based on energy and maintenance efficiency. Real estate units that do not consume a lot of energy and do not require a lot of maintenance are easier to manage than other real estate units. From a management perspective, continuous maintenance and optimized energy usage will improve the efficiency in these two attributes in the long run. For instance, regular maintenance improves real estate units' conditions in a way that these units will not require a lot of maintenance in the future. In addition, utilities, cleaning, air conditioning and lighting are closely related to operational performance. Added to that are both advertisement and available inventories as very important attributes in regard to the operational performance driver.

There are several metrics that can be used to measure these attributes, most importantly survey metrics, where the maintenance condition and satisfaction of tenants are recorded. At the same time, cost per unit can be a very valuable metric especially in regard to operation costs, cleaning cost and maintenance cost. In addition, energy per unit and utility per unit are as important as the other mentioned metrics. Add to these metrics the number of issues such as maintenance request per units and per employee over specific period of time.

Also, advertisement cost per sale or rent of residential or commercial units can be used as a measurement for these attributes. Finally, inventory turnover has a direct relationship with the available inventory attribute. Environmental performance drivers are becoming very important with regard to value creation and real estate management. This can be attributed to three main aspects—microclimate, carbon emission and waste management. The costs for real estate unit per employee are straightforward metrics that can be used to measure these attributes. Keep in mind that the value of real estate units is increasingly dependent on environmental aspects of management because of regulation reasons. The last discussed driver behind efficiency in real estate management is management team performance. This driver is dependent on several attributes, such as the professionalism of the management team, the effectiveness of the team, stakeholder satisfaction and market share.

Metrics that are used to measure these attributes are time and budget delivery of the management team with regard to any operation in real estate management. Also, quality assurance and control are very important processes, and their measurement can be used as an indication to the mentioned attributes in this driver. Another very important metric that can be used is revenue per employee which is used by every business or company in the market. In real estate management, the number of employees is usually not very large in the management team. Hence, revenue per employee can be a very indicative metric for management performance. Commissions and operating cycle are also very important metrics.

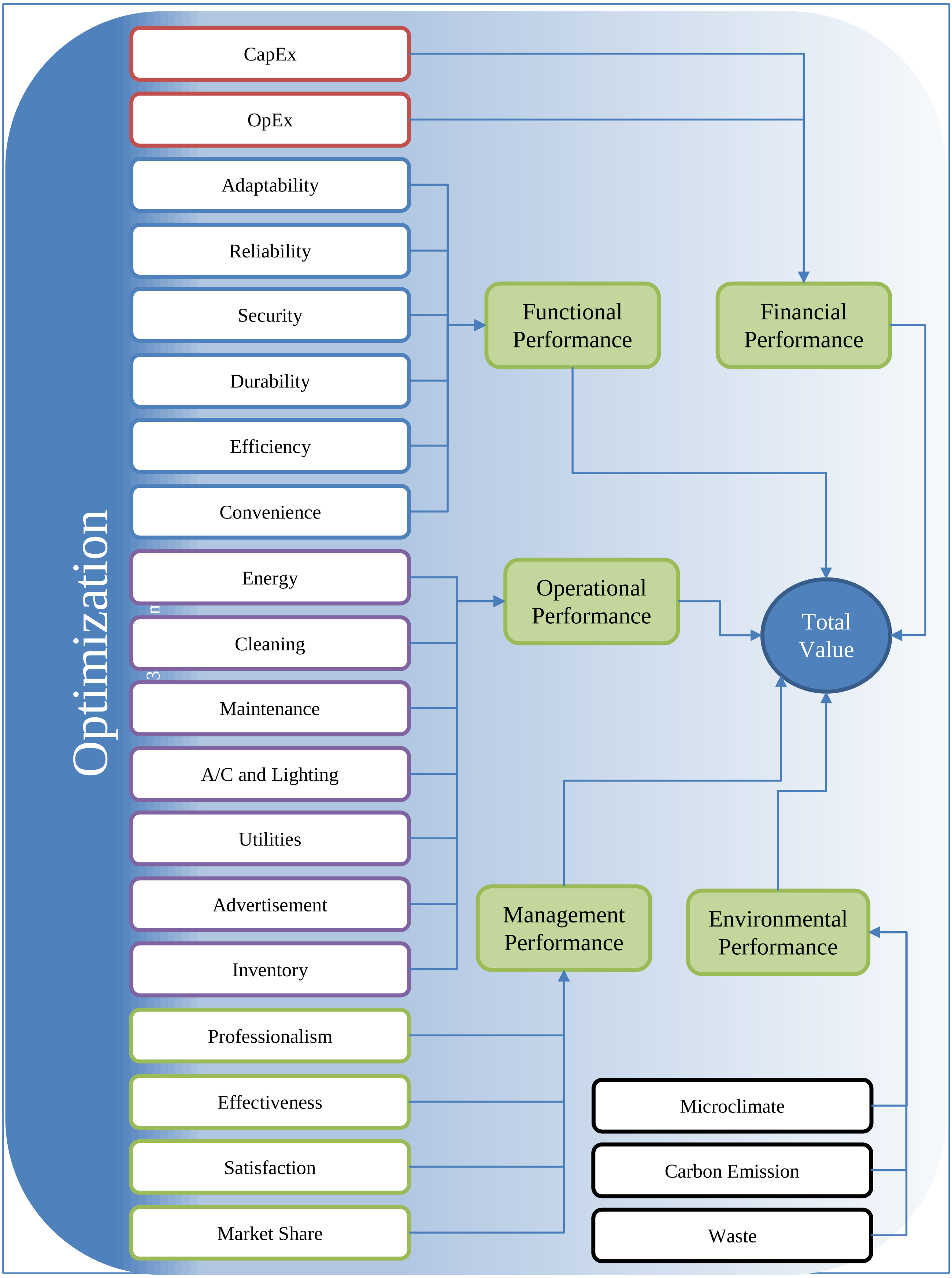


Figure 3.40: Research Framework

Table 3. 1: Attributes and metrics summary

Main Value Drivers	Controllable Value Attributes	Possible Value Metrics
Financial Performance	• CapEx • OpEx	• NPV • IRR • WLC • NOI • ROA/ROI • EVA • Cost per square foot
Functional Performance	• Adaptable- useful to all • Reliable -safer • Security –health and safety • Durable –last longer • Efficient –add capacity • Convenience – ease to access outside services	• Design to conditions • Quality control • Space utilization ratio • Cost per unit of functional area • Net usable area to gross area ratio • Service life • Car parking per unit • Location
Operational Performance	• Low Energy usage • Cleaning • Maintenance • Heating, cooling and lighting • Utilities • Advertisement • Available inventory	• Maintenance condition survey score • Satisfaction survey score • Operation cost per unit area • Cleaning cost per unit • Maintenance per unit • Energy per unit • Utilities per unit • Average issue response time • Number of issues per employee • Advertising per sale/rent • Inventory turnover
Environmental Performance	• Respond to site microclimate • Low carbon in use • Efficient waste management	• Eco-cost per unit • Waste cost per unit • Waste cost per tenant • Waste cost per employee
Management Performance	• Management professionalism • Management effectiveness • Stakeholders satisfaction • Market share	• On time delivery • On budget delivery • Quality assurance and control • Percentage of project on schedule and budget • Revenue per employee • Commission margin • Average commission per sale • Average commission per salesperson • Operating cycle • Stakeholders survey scores • Market share growth • Sold/leased units per available inventory ratio

Finally, the differentiator between several distinct management teams in real estate industry is their market share growth. This metric is one of the most important to measure management performance and efficiency in general.

A theoretical framework consists of concepts and, together with their definitions and reference to relevant scholarly literature, existing theory that is used for a particular study. The theoretical framework must demonstrate an understanding of theories and concepts that are relevant to the topic of research and that relate to the broader areas of knowledge being considered. The theoretical framework is most often not something readily found within the literature.

The theoretical framework strengthens the study in the following ways:

1. An explicit statement of theoretical assumptions permits the reader to evaluate them critically.

2. The theoretical framework connects the researcher to existing knowledge. Guided by a relevant theory, hypotheses and choice of research methods are given a basis

3. Articulating the theoretical assumptions of a research study forces addressing questions of why and how. It permits to intellectually transition from simply describing a phenomenon observed to generalizing about various aspects of that phenomenon.

4. Having a theory helps identify the limits to those generalizations. A theoretical framework specifies which key variables influence a phenomenon of interest and highlights the need to examine how those key variables might differ and under what circumstances.

By virtue of its applicative nature, good theory in the social sciences is of value precisely because it fulfils one primary purpose: to explain the meaning, nature, and challenges associated with a phenomenon, often experienced but unexplained in the world in which we live, so that we may use that knowledge and understanding to act in more informed and effective ways (Swanson & Chermack, 2013).

3.41 Decision Theory

Based on the above, the study depends on decision theory, which explains that the focus of decision theory is on mathematical models. These may be probability-based, loss functions, or other forms of statistical representations of judgements. Yet, much of decision theory does not lie entirely within any one discipline; it draws on psychology, economics, mathematics, statistics, social sciences and many other areas of study. It also investigates investors' perceptions and attitudes towards real estate and highlights the important difference between theoretical exposure levels and pragmatic business considerations. In addition, it suggests a prescriptive model to explore the judgements, beliefs and preferences of decision-makers and to inform decision-making. Much of decision theory does not sit comfortably within any one discipline. Decision theory embraces work from philosophy in the form of work relating to ethics (Bacharach and Hurley, 1991; French & French, 1997).

Chapter 4: METHODOLOGY AND DEA MODELLING

4.0 Introduction

This chapter explains the methods that were adopted to carry out this research. Also, the chapter presents the process flow chart that was followed in accomplishing the objectives of this study.

4.1 Methods

This research adopts DEA method of analysis to establish the efficiency of the investigated building assets. The DEA is one of the tools in management sciences and operations research literature (Khodakarami, et al., 2015). It is usually used to measure efficiency of operations and management (Dawidowicz et al., 2014). It is a non-parametric approach, which requires no parameters to be optimized (Yao et al., 2014). The primary component in DEA is called Decision-Making Units (DMU), which, in this research context, is the management team responsible for real estate operations (Salzman et al., 2017). The first model of DEA was introduced in 1978, which was called CCR after its creators Charnes, Cooper, and Rhodes (Searle et al., 2014). DEA investigations have been carried out in all sectors of the industry and business—for example, in banking (in the banking sector (Eriki and Osifo, 2014), insurance (Faruk and Rahaman, 2015) in manufacturing (Ahmadi and Ahmadi, 2012) and Real Estate Investment (Harun, Tahir and Zaharudin 2012). Most of the studies that adopted the use of DEA methodology in real estate performance efficiency evaluation did not attempt to use the determinants of CapEx, OpEx and assets characteristics in evaluating the performance efficiency of real estate assets. This study is based on DEA multi-output/multi-input-oriented model (Osagie, 2018). The rationale behind the methodology is to optimise the outputs to inputs by estimating a group of weights that satisfy the conditions assumed by the linear equations as demonstrated in the next section.

4.2 Mathematical Formulation of the Research Problem

Usually, efficiency is calculated based on the ratio between the inputs and outputs of the operation under consideration (Haque et al., 2014). Comparing DMUs based on ratio between single input and output may not be very valuable. For example, comparing two real estate management teams based on the ratio between the number of employees and the number of rental rates does not reflect many aspects of management challenges and characteristics (Black et al., 2017). Two real estate management teams may have the same rental rate and number of employees (Weber et al., 2013). One team may be managing a large real estate building while the other is managing a much smaller building (Allen et al., 2013). Clearly, in such situation the management team with larger building is able to achieve the same efficiency metric which makes it more efficient than the other team (Bieszk et al., 2017).

To model efficiency based on CCR, let us have o DMUs, m inputs (x), and n outputs (y).

$$\frac{\sum_j^n v_j y_j}{\sum_i^m u_i x_i}$$

Formula 1

Where the weight is assigned to j-th output and the weight is assigned to the i-th input (Demosthenous, A., 2017).

$$\boldsymbol{Y} = \begin{bmatrix} y_{11} & y_{12} & \cdots & & & \\ y_{21} & y_{22} & \cdots & & \cdots & \\ \vdots & \vdots & \vdots & & & \\ & & & y_{jk} & y_{j(o-1)} & y_{jo} \\ & \vdots & & y_{(n-1)k} & y_{(n-1)(o-1)} & y_{(n-1)o} \\ & & & y_{nk} & y_{n(o-1)} & y_{no} \end{bmatrix}$$

$$\boldsymbol{X} = \begin{bmatrix} x_{11} & x_{12} & \cdots & & & \\ x_{21} & x_{22} & \cdots & & \cdots & \\ \vdots & \vdots & \vdots & & & \\ & & & x_{ik} & x_{i(o-1)} & x_{io} \\ & \vdots & & x_{(m-1)k} & x_{(m-1)(o-1)} & x_{(m-1)o} \\ & & & x_{mk} & x_{m(o-1)} & x_{mo} \end{bmatrix}$$

Formula 2

Here, this represents the j-th output of the k-th MDU (Baronin et al., 2014). Similarly, it represents the i-th input of the k-th DMU (Abatecola et al., 2013). At this point, setting values for both can be done manually, where there is a designer who specifies these values depending on subjective importance evaluation for both the input and output values (Kurlat et al., 2015). Alternatively, these weight values for can be set based on the available performance data of different real estate companies (Lieser et al., 2014). The latter is the adopted approach in DEA (Guan et al., 2014).

Let's assume that the efficiency values lie between zero and one. Also, let's assume that all weights have to be more than zero (Yuan et al., 2013).

$$maximize\ \frac{\sum_j^n v_j y_{jk}}{\sum_i^m u_i x_{ik}}$$

Subject to:

$$\frac{\sum_j^n v_j y_{jk}}{\sum_i^m u_i x_{ik}} \leq 1$$
$$u_i > 0$$
$$v_j > 0$$

Formula 3

This can be simplified by exploiting the fact that minimizing ratios can be done minimizing numerator only if the denominator is fixed (Yuan et al., 2013).

$$maximize\ \boldsymbol{v}^T \boldsymbol{Y}_k$$

Subject to:

$$\boldsymbol{u}^T \boldsymbol{X}_k = 1$$
$$\boldsymbol{v}^T \boldsymbol{Y} - \boldsymbol{u}^T \boldsymbol{X} \leq 0$$
$$\boldsymbol{u} > 0$$
$$\boldsymbol{v} > 0$$

Equation 4

$$minimize\ \theta_z - \varepsilon \left(\sum_i^m s_i^- + \sum_j^n s_j^+ \right)$$

Subject to:

$$\theta_z x_{iz} = \sum_{k}^{o} x_{ik}\lambda_k + s_i^-$$
$$y_{jz} = \sum_{k}^{o} x_{jk}\lambda_k - s_j^+$$
$$\sum_{k}^{o} \lambda_k = 1$$
$$\lambda_k, s_i^-, s_j^+ \geq 0$$

Formula 5

Based on this formulation, z-th DMU is said to be fully efficient if, and only if, it is equal to one and both, of and, are equal to zero (Salzman et al., 2017).

4.3 Steps for DEA method

Figure 4.1 illustrates the steps used to analyse the performance the real estates.

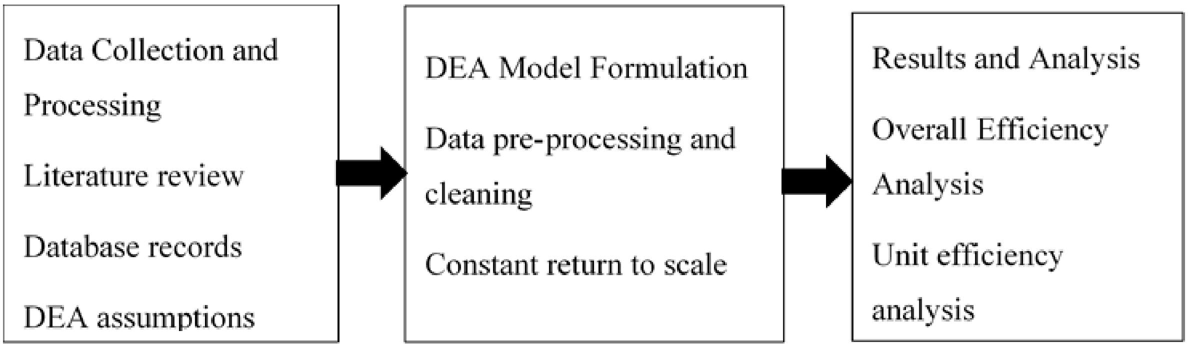


Figure 4.1: Procedures used to undertake this research

DEA method consists of the following steps.

- Define and select the units of assessment (DMU) and associated input and output decision variables. In this work 57 DMU (buildings) where selected
- Data collection of inputs and outputs (see table 4.1)
- Data pre-analysis to deal with outliers and missing data (see table 5.1)
- The calculation of efficiency scores for each unit (DMU)
- Generation of the efficiency metrics

- Interpretation of the efficiency scores

In order to compare the efficiency of building FM management, a DEA output-oriented model under the assumption of constant returns to scale was used, as formulated in Giannakis et al. (2004). Using the above steps, several DEA models were established for the sampled building assets in this study. The above algorithm generates several efficiency scores (Coelli, Rao and Battese 1998) that are used to interpret the results from DEA.

4.3.1Data collection

The collected data is classified into the following clusters (the rationale for classification is explained in chapter 3). The data used in this study was collected from real estate accounts of 57 assets in Abu Dhabi, UAE. Table 2 (appendix 1) shows the input and output variables used in this study. The data was based on annual reports and accounts. The input and output variables for this study are based on the suggestions advanced by Bieszk et al., (2017) and others (see appendix 1, table 1). All the figures for the data from different decision units were converted to cost per square meter. This was necessary to normalise data for comparison purposes (Boussabaine and Kirkham 2006). This is necessary to eliminate the effect of externalities on the analysis of buildings assets rental efficiency, which may skew the results.

The study utilised 40 input variables and 4 output variables to evaluate and analyse the relative efficiency of the sampled 57 rented buildings.

4.3.2Data Processing

Data envelopment analysis by following the standard approach was tested extensively in literature throughout previous decades. Well-known software tools which implement data envelopment analysis were utilized during the analysis. Therefore, it is highly unlikely that any inaccurate results will be due to the actual implementation of DEA. Any inaccuracy will certainly be a result of experiment design or data collection. For the latter, great deal of attention was given during data collection phases to have the most accurate data. A lot of data cleaning and elimination were performed to achieve this goal.

The variables used in the data collection are extracted from extensive literature review. Chapter 2 documents the importance and sources of the input and output used in this investigation

4.3.3Real Estates Operational Indicators of efficiency: Inputs/outputs

Chapters 2 and 3 have discussed and justified all the metrics that can be used in modelling the operation performance of real estate assets. Real estate businesses, like other businesses, are expected to utilize their resources efficiently to accumulate higher earnings. Performance measurement is a set of well-designed processes that assist an organization in analysing, measuring, monitoring, and identifying key competencies, systems, and processes (Taylor, 2013). Many companies use financial measures to evaluate their costs and revenues. On the long run, they have also been proven to be inadequate in identifying key indicators that an organization can use to improve their overall efficiency (Ohsato & Takahashi, 2015). This is consistent with the view that commercial companies that focus on the profit margins will have a short-term decision-making. The short-term also discounts the importance of internal and external environmental factors that may be essential for long-term survival of the companies (Yin et al., 2016). Performance measurement with regards to real estate poses different kinds of challenges. The customer base for the real estate is very diverse. Real-estate companies have a variety of objectives that varies from social investment to private equity funds. Different qualitative factors also take central stage when analysing the overall picture of the performance measurement in real estate.

The existing literature provides several metrics to evaluate efficiency. The main metrics are shown in Table 4.1. The performance indicators are categorised into three clusters of inputs and one output performance. The first input is Capital Expenditure (CapEx), associated with the acquisition, construction or enhancement of significant fixed assets including land, buildings and equipment. It is included as an input because of its influence on the operational aspects of building assets (Sun et al., 2015). This expenditure is indispensable for acquiring and upgrading the property. Variables such as age, location, and property type can influence how much CapEx is required to acquire and operate an asset. This in turn will determine the level of the yield from the investment (Crosby et al., 2012). The second input is operating expenditures (OpEx), that is, expense that is incurred in the normal course of running a real estate business (Gibler & Lindholm, 2012). This includes (but is not limited to) expenses such as payroll, rent, equipment, insurance, software services, utilities, office expenses, and operating leases. The yield from real estate is highly correlated with OpEx. As demonstrated in the previous section, if the goal of real estate investment is to maximize net income or profit, then minimizing OpEx is a crucial part of real estate management. Thus, understanding the contributing factors to OpEx and improving their efficiency will maximise the revenue. The third input category is building asset characterises like location, age, sustainability features, technological innovation (e.g., smart building management systems), environmental performance, fabric etc. While assets' sale prices do reflect buildings quality rating, equally also poor characteristics undermine value and return from building assets (Bernheim et al., 2013). The last category is output performance measure, which is related to income from rent and vacancy rates (Plazzi, et al 2011). Both vacancy rates and the length of time to rent are indicators for real estates expected returns, and also can be used as a proxy for the supply versus demand relation in rental real estate markets.

Table 4. 1: Select Performance Metrics

Input/output variables	Reference
Capital Expenditures (CapEx) Cost per square meter (CR 1) total cost/ total rentable area) (CR 2) current income/estimate income (CR3) Rented time/down time (CR4)	Crosby et al., (2012), Li, L. (2016), Sun et al., 2015, Baucells & Bodily, 2018, Bieszk et al., 2017
Operational Expenditures (OpEx) (Repair and maintenance OR, Cleaning OC, Energy OE, Water OW, General Consumption OG, Churn OH, Security OS, Insurance OI, Management and overall costs OM, Rent OT, Occupation Cost and Leasing, OO and Debt OD)	Gibler & Lindholm, 2012, Boussabaine and Kirkham 2005, Bieszk et al., 2017
Building Characteristics Available rentable area BO1, Average Unit Cost Per Building BO2, Percentage of rentable area to gross area BO3, Number of all units BP1, and Average unit size BP2	Bernheim et al., 2013, Plazzi, A., Torous, W., and Valkanov, R., (2011) Boussabaine and Kirkham 2005
Performance Rental Revenue (PR1) Percentage of vacant units (PR2) Average rent lost due to vacant units (PC1) Length of Time to re-let (PC2)	Plazzi, A., Torous, W., and Valkanov, R., (2011), Bieszk et al., 2017

The data was collected according to input and output variables shown in the above table 4.1. The data was collected for each real estate building; this is a key element in the DEA analysis. It is important that the input and output mix must cover all aspects of the management of the real estate units under investigation. The decision to choose the study period was decided by the completeness and data availability.

4.3.4 Data Reliability and Validity

The researcher extracted data from actual databases from real estate building assets. Hence, because the data represents the actual performance of the real estate assets, it is considered to be highly reliable. It is well documented that secondary data have a pre-established degree of validity and reliability. Thus, as long as the data is authentic, the researcher need not re-examine the data. However, in this work, descriptive statistics were used to check the variability and authenticity of the data. Thus, the DEA evaluation would be able to show the actual efficiency of the investigated assets.

Since DEA is a non-parametric method that does not require assumption on the data distribution, data validity is not an issue in this study. Furthermore, one of the key assumptions in DEA is that all the data required must be available. The data DEA algorithm cannot handle missing values. Thus, in this study only units that have completed data records were included in the analysis. Moreover, scatter diagrams and descriptive analysis were used to detect outlier values.

4.3.5 Data Analysis

The DEA analysis was carried out by Banxia Frontier Analyst software. The research data spans from 2012-16. Thus, each variable is considered along the five-year period. Also, the average value of each of input and output variables was computed to minimise spread of data and yield accurate results. The descriptive statistics of the data used in the study are shown in Chapter 5. In this study, the scale to return input-oriented model of DEA is used to model the behaviour of the real estate units. This is because in the real estate environment, it is easier to control the inputs rather than the outputs. Efficiency scores obtained from the analysis are then compared to the benchmark or reference unit. Then, the results were discussed and interpreted.

4.3.6DEA Model Formulation

The mathematical optimization tool DEA - Data Envelopment Analysis was used in the present study. Data Envelopment Analysis (DEA), a class of mathematical programming models – with a now long tradition according to Zervopoulos, et al., (2016), is being applied to a broad range of situations involving the analysis of production frontiers in a multi-unit, multi-input, and multi-output framework in such a way that usual parametric restrictions are absent.

Data Envelopment is an analytical tool designed to identify the best practices for use of resources, which, in the present study, comprise those input/output resources shown in table 4.1 the module formulated according the equations in section 4.2. The input/output variables of the building rental operation problem are the weights, and the solution produces the weights (Baronin et al., 2014) most favourable as a measure of efficiency. The solution to the above problem produces the efficiency of a building k, and weights leading to that efficiency. The resulting formulation is an optimal technical efficiency value (E_k) that is at most equal to unity. If $K_k = 1$, then no other building is more efficient than building k for its selected weights. This means that building k lies on the optimal frontier and is not dominated by any other building in the data set. Though, if $E_k<1$, then building k does not lie on the optimal frontier and there is at least one other building that is more efficient for the optimal set of weights estimated from the above equations.

The efficiency scores or weights are calculated using the above formulation. These scores are then used to rank buildings in the data set in terms of their FM operational efficiency in using infrastructure resources to generate revenue for the operators.

4.3.7 Results and Analysis

The results generated from the modelling are analysed based on the efficiency in relation to the best performing real estate unit. The analysis was carried based on yearly data and on average value of data. The following were used in the analysis:

- Efficiency Distribution
- Potential Improvement
- Input/output Potential Improvement
- Reference Frequency
- Efficiency Frontier

4.3.8 Choosing the DEA Optimisation Model

There are two methods in DEA; the first assumes constant returns to scale. This method implies that any change in the input, and the output will change with the same proportion. The second method developed is used to measure efficiency using variable returns to scale. The second method puts emphasis on the input reduction, or, alternatively, output improvement. Since this study aims to analyse the performance of real estates in relation to the input resources, the second method, variable returns to scale, is used. This approach is consistent with studies elsewhere (Khodakarami, et al., 2015, Dawidowicz et al., 2014, Yao et al., 2014, Salzman et al., 2017, Searle et al., 2014, Eriki and Osifo, 2014, Faruk and Rahaman, 2015, Ahmadi and Ahmadi, 2012, and Harun, Tahir and Zaharudin 2012).

4.3.9 Validating the DEA Model

This section describes validating the use of the DEA model in this study. When validating models for research, a number of criteria are kept in mind. These include descriptive validation, experimental validation, and analytical validation (Gass & Harris, 2001). Descriptive validation attempts to show how suitable the model structure is and how well it can achieve its objectives. Experimental validation addresses how efficient and sound model implementation processes are, including cost, data transfer, tests and documentation. Finally, analytical validation addresses the credibility of results as well as their characteristics. In this study, chapter four details the structure and formulation of the model and also describes its implementation. It also addresses potential issues with study results. Further evidence on the consistency of the findings is shown in chapter six. In addition, the fact that the input data was based on real-life annual reports asserts the validation of input, which in turn, contributes to validating model. Consequently, the DEA has been validated through the various tests carried out as explained in chapters four and six.

Chapter 5: DATA ANALYSIS AND RESULTS

5.0 Introduction

The objective of this chapter is to analyse the data and provide knowledge in the development of a present study framework to find out the efficiency of each building asset as well as effective indicators and sustainable performance. This chapter provides a descriptive analysis of metrics used to investigate efficiency in real estate management. The collected data for some metrics has zero variability, which means that the data has constant value. Such metrics were omitted from this analysis. Hence, the present chapter presents the best available knowledge and interpretation of the data analysis through descriptive analysis and Data Envelopment Analysis, as well as the Efficiency Distribution for indicators, Potential Improvement, Input/Output Potential Improvement, Reference Frequency, and Average analysis.

5.1 Descriptive Analysis

The study utilised 40 input variables and 4 output variables to evaluate and analyse the relative efficiency of the sampled 57 rented buildings. Table 5.1 shows the descriptive statistics of the 57 investigated buildings for the period of 2012-2016 fiscal years. The table is composed of descriptive statistics that include means and standard deviations of costs included in the research. The analysis reveals the significant variation and range and standard deviation for all building assets. In light of this variation shown in Table 5.1, it would be problematic to ascertain the efficiency of these assets in terms of how well they have used their resources and equity input to generate revenue output. Therefore, this issue required the need for DEA analysis since descriptive statistics cannot show their relative performance in the context of weighted inputs and outputs. The details of the characteristics of the buildings are provided in in Appendix 55.

Table 5. 1 Descriptive Statistics

Input /OutputVariables				Static			
	Categories	Sub-Categories	Metrics	Mean	Standard Deviation	Minimum	Maximum
InputVariables	Capital Expenditures (CapEx)	Cost	Cost per square meter	3,162.60	130.84	3,000.00	3,500.00
		GlobalCost	Cost per square meter(total cost/ total rentable area)	2,894.02	1,118.68	483.27	5,388.53
		Utilization	Income /expected income provided its rented all the year round	0.85	0.15	0.59	1.19
		Availability	rented time / (rented time + under maintenance + marketing time)	0.96	0.00	0.96	0.96
	Operational Expenditures (OpEx)	Repair and maintenance	Number of planned maintenance requests	6,363.16	3,054.65	300.21	11,485.35
			Number of unplanned repairs	2,007.29	1,036.94	132.20	4,601.84
			Percentage of planned maintenance completed on time	1,489.96	2,598.22	0.85	9,938.97
			Percentage of unplanned repairs completed on time	991.55	1,529.19	0.86	5,130.92
		Cleaning	Number of cleaning employees	6.15	2.84	0.00	13.78
			Equipment and material cost	112,920.70	23,248.38	75,640.58	140,640.00
			Number of cleaning activities	365.00	0.00	365.00	365.00
		Energy	Cost of kilowatt per hour	17.96	0.00	17.96	17.96
		Water	Cost per meter cube	4.04	0.00	4.04	4.04
		General Consumption	Electricity and Water for General Services	601,085.80	264,578.55	161,621.73	1,111,985.65
		Churn	Percentage of new tenancies	0.20	0.00	0.20	0.20
		Security	Number of security officers	1.00	0.00	1.00	1.00
			Number of security teams	1.00	0.00	1.00	1.00
			Security equipment cost	3,000.00	0.00	3,000.00	3,000.00
			Number of security incidents per tenant	17.36	3.61	11.80	24.40
		Insurance	Building insurance fees	48,643,949.56	19,112,835.22	20,000,000.00	80,000,000.00
			Equipment insurance fees	121,500.07	63,082.91	38,931.82	239,000.00
		Management and overall costs	Employees' salaries	86,564.35	10,809.91	73,600.00	106,493.66
			Management fee per tenancy	0.02	0.00	0.02	0.02
			Number of management team member	22.13	2.99	18.40	27.40
		Rent	Average Rent Per Building	13,969,986.78	6,123,247.90	4,358,000.00	27,846,573.98
			Rent per square meter	899.39	190.89	566.62	1,259.07
			Income per building	11,383,949.93	5,261,234.82	4,110,048.00	22,395,061.61
			Percentage of rent collection rate	1.00	0.00	1.00	1.00
		Occupation Cost and Leasing	Number of vacant units	10.99	8.09	0.00	32.20
			Percentage of expiring leases	0.08	0.01	0.06	0.11
			Percentage of cash return	0.85	0.16	0.59	1.19
			Percentage of capitalization rate	0.72	0.13	0.51	0.97
		Debt	Length of time in rent debts	30.00	0.00	30.00	30.00
			Percentage of overdue rent	0.09	0.00	0.09	0.09
			Percentage of tenants with unpaid rent	0.08	0.01	0.06	0.10
	Building Characteristics	Operational Characteristics	Available rentable area	19,780.29	8,903.65	6,540.00	36,317.34
			Average Unit Cost Per Building	96.73	34.66	27.54	152.91
			Percentage of rentable area to gross area	0.89	0.05	0.78	0.98
		Physical Characteristics	Number of all units	394.69	267.55	46.00	844.00
			Average unit size	194.87	48.95	116.00	280.00
Output Variables	Performance	Rent	Rental Revenue	10,804,811.84	4,815,965.85	4,110,048.00	22,368,451.09
			Average rent lost due to vacant units	1,552,766.52	1,130,822.84	73,187.55	4,718,315.12
		Churn	Time to re-let	144.93	7.34	129.60	156.67
			Percentage of vacant units	0.10	0.08	0.00	0.35

5.2 Data Envelopment Analysis

This chapter performs data envelopment analysis (DEA) on the collected data. There are 57 building assets under investigation. Similarly, there were 44 metrics for each of these building assets (***none of the existing studies have studies this amount on input/output metrics***). These metrics are divided into four categories as follows:

- Capital Expenditures (CapEx) – CR
- Operational Expenditures (OpEx) – PR2
- Building Characteristics – PC1
- Performance – PC2

DEA modelling was performed based on these metrics that include rental revenue for each year, lost rent due to vacant units, time to re-let vacant units and percentage of vacant units. Any real estate management will try its best to improve its performance according to these metrics. Rental revenue can be considered as the primary metric for any investment in real estate. This metric has a direct relationship to CapEx. The remaining performance metrics are more related to OpEx.

5.3 Efficiency Distribution

The research question here is how the performances of the building assets compare to each other in their level of efficiency over the study period. This research question is addressed directly by results from the DEA model. The following sections report on these results:

5.3.1Capital Expenditures (CapEx)

The results showed that in 2012, 19 real estate buildings had 100% efficiency and the remaining assets of the system were below the 100% efficiency level. However, 45% of the buildings had efficiency in the range 90-100 and only 19% have efficiency in the range 80-90. Similarly, in

2013, 21 assets have 100% efficiency, 8% have efficiency in the range 90-100 and 28% have efficiency in the range 80-9.

On the other hand, in 2014, 17 buildings had 100% efficiency and 47% have efficiency in the range 90-100 and 22% have efficiency in the range 80-90. In 2015, there were 19 building assets with 100% efficiency and 19% have efficiency in the range 90-100 and 40% have efficiency in the range 80-90. The remaining inefficient assets represent 7%. With respect to 2016, a number of buildings achieved 100% efficiency; 31% have efficiency in the range 90-100 and 28% have efficiency in the range 80-90. The remaining inefficient building assets represent 7%. The results of the analysis based on the average Capital Expenditures (CapEx) showed 16 real estate assets with 100% efficiency (see appendix 3 for table 5.4 and figure 5.12).

5.3.2 Repair and maintenance

In repair and maintenance, in 2012, there were 1% of the assets that have efficiency in the range 90-100 and 15% have efficiency in the range 80-90. The remaining inefficient buildings represent 45%. With respect to 2013, the number of 28% assets (6 buildings) achieved 100% efficiency, 17% have efficiency in the range 90-100 and 14% have efficiency in the range 80-90. The remaining inefficient buildings represent 40%. On the other hand, 2014 had 18 (31%) buildings which achieved 100% efficiency, 8% assets have efficiency in the range 90-100 and 10% have efficiency in the range 80-90. The remaining inefficient buildings represent 49%. In 2015, there were 17 (29%) building assets with 100% efficiency, about 10% have efficiency in the range 90-100 and 8% have efficiency in the range 80-90. The remaining inefficient buildings represent 50%. The range for these efficiency scores has a size of 52.19. With respect to 2016, 26% of the buildings achieved 100% efficiency, 1% of the assets have efficiency in the range 90-100 and 10% have efficiency in the range 80-90. The remaining inefficient buildings represent 61%.

Based on the DEA average performance model from repair and maintenance cost results, efficiency analysis indicated that 11 real estate assets were 100% efficient. This demonstrated that on average, the investigated buildings perform well in terms of repair and maintenance. This may indicate that the management regime is efficient.

5.3.2 Cleaning

The DEA analysis results demonstrated that in 2012, there were 43% building assets with 100% efficiency, 38% have efficiency in the range 90-100 and 17% have efficiency in the range 80-90. The average value of efficiency scores is 96.01 with standard deviation of 4.63. The range for these efficiency scores has a size of 14.41. This may suggest these buildings are very efficient in terms of cost of cleaning. However, in 2013, the number of buildings which achieved 100% efficiency dropped 19 or 33%. There were 40% of the assets that have efficiency in the range 90-100 and 26% have efficiency in the range 80-90. The range for these efficiency scores has a size of 16.68. In 2014, the number of 100% efficient buildings slightly increased to 35%; 47% of the buildings have efficiency in the range 90-100 and 17% have efficiency in the range 80-90. In 2015, there were 21 building assets with 100% efficiency. However, the percentage of buildings in the range 90-100 dropped significantly 22%. Also, there were 33% of the assets with efficiency in the range 80-90. The remaining inefficient buildings represent 7%. This is the first time there were assets in the inefficient cluster. The performance in 2016 is almost the same as 2015, there were 38% assets in the reference set, 21% have efficiency in the range 90-100 and 35% have efficiency in the range 80-90. The remaining inefficient buildings represent 5%. The average value of efficiency scores is 92.72 with standard deviation of 7.3. The range for these efficiency scores has a size of 23.22. Further, the results demonstrated that, on average, 18 out of 24 real estate assets were 100% efficient. These global findings reinforce the view that cleaning costs are optimised and managed efficiently (see appendix 5 for table 5.6 and figure 5.14).

5.3.3General Consumption

In 2012, there were 17 building assets with 100% efficiency. This number represents 29% of investigated building assets while 47% have efficiency in the range 90-100 and 22% have efficiency in the range 80-90. While in 2013, the number of buildings which achieved 100% efficiency was 21. This number represents 36% of investigated building assets while 33% have efficiency in the range 90-100 and 29% have efficiency in the range 80-90. On the other hand, 2014 had 12 buildings which achieved 100% efficiency. This number represents 21% of investigated building assets while 50% have efficiency in the range 90-100 and 28% have efficiency in the range 80-90. In 2015, there were 17 building assets with 100% efficiency. This number represents 29% of investigated building assets while 22% have efficiency in the range 90-100 and 35% have efficiency in the range 80-90. The remaining inefficient buildings represent 12%. With respect to 2016, the number of buildings which achieved 100% efficiency was 16. This number represents 28% of investigated building assets while 31% have efficiency in the range 90-100 and 33% have efficiency in the range 80-90. The remaining inefficient buildings represent 7%. The average value of efficiency scores is 91.33 with standard deviation of 7.23. The range for these efficiency scores has a size of 25.87. The results based on the average performed are shown in appendix 6 for table 5.7.

The results show that only half of the stock performed in an efficient manner. Thus, there is ample opportunity to improve on electricity and water consumption. Assets managers should adopt technical and managerial strategies for lowering the consumption, leading to an increase in revenue.

5.3.4 Churn

This sub-category was assessed by the Percentage of new tenancies (OH 4). The DEA model results demonstrated that in 2012, there were 24% building assets with 100% efficiency, 49% had efficiency in the range 90-100 and 26% had efficiency in the range 80-90. Similarly, in 2013, 24% of the buildings achieved 100% efficiency, 40% have efficiency in the range 90-100 and 35% have efficiency in the range 80-90. Whereas in 2014, only 15% of the buildings had 100% efficiency, 47% have efficiency in the range 90-100 and 36% have efficiency in the range 80-90. In 2015, 19% building assets with 100% efficiency, 14% have efficiency in the range 90-100, 52% have efficiency in the range 80-90 and 14% were inefficient. It appears that in 2016 the tenancy level dropped sharply. The results showed 17% assets had 100% efficiency, 26% have efficiency in the range 90-100, 45% have efficiency in the range 80-90 and 10% of the buildings were inefficient in attracting new tenants. The average performance of the studied stock indicated that 29% of the assets were efficient. This might indicate that 30% of rental value is lost on average over the 4 studied years. This is a considerable sum. These results suggest that further customer retention strategies are required (see appendix 7 for table 5.8 and figure 5.16).

5.3.5 Security

The DEA results showed that in 2012, there were 28% building assets with 100% efficiency, 52% have efficiency in the range 90-100 and 19% have efficiency in the range 80-90. With respect to 2013, 28% of the buildings had 100% efficiency, 43% have efficiency in the range 90-100 and 28% have efficiency in the range 80-90. On the other hand, 2014 had 24% buildings achieved 100% efficiency, 49% had efficiency in the range 90-100 and 26% have efficiency in the range 80-90. Similarly, in 2015, 24% building assets had 100% efficiency. While only 15% had efficiency in the range 90-100 and 45% have efficiency in the range 80-90. The remaining 14% were inefficient. The 2016 results were comparable to 2015, 26% of the buildings had achieved 100% efficiency, 29% have efficiency in the range 90-100 and 33% have efficiency in the range 80-90. The remaining inefficient buildings represent 10%.

The overall results demonstrated that, on average, only 45% of studied assets are efficient in the management of security costs. This is surprisingly low. One expected the efficiency to be high due to the fact that the wages are very low (see appendix 8 for table 5.9 and figure 5.17).

5.3.6Insurance

The efficiency of this sub-metric is measured by Building insurance fees (OI1), and Equipment insurance fees (OI2). The DEA model results showed that in 2013, 21% of building assets had 100% efficiency, 5% have efficiency in the range 90-100 and 14% have efficiency in the range 80-90. The remaining 59% were inefficient. Correspondently, 2013, 15% of had 100% efficiency, 15% of investigated building assets while 10% have efficiency in the range 90-100 and 7% have efficiency in the range 80-90. The remaining 66% were inefficient. The 2014 performance is slightly better, 19% assets had 100% efficiency, 5% have efficiency in the range 90-100 and 10% have efficiency in the range 80-90. The remaining 69% were inefficient. The 2015 performance is almost like the 2013, except in that 68% of the assets were inefficient.

With respect to 2016, 17% of the assets had 100% efficiency, 7% have efficiency in the range 90-100 and 10% have efficiency in the range 80-90. The remaining inefficient buildings represent 64%.

The results illustrated that, on average, around 50% of studied assets have less than 80% efficiency. This suggests the insurance expenses are high in the UAE (see appendix 9 for table 5.10 and figure 5.18). These are very surprising results. Alternative measures might necessary to reduce the insurance premium.

5.3.7 Management and overall costs

This performance sub-category is assessed by Employees' salaries (OM1), Management fee per tenancy (OM2) and Number of management team member (OM3). The idea here is to assess if the operation management costs influence the performance. The DEA model for this sub-section showed that in 2012, there were 24% building assets with 100% efficiency, 49% had efficiency in the range 90-100 and 26% had efficiency in the range 80-90. With respect to 2013, 29% of the buildings achieved 100% efficiency, 54% had efficiency in the range 90-100 and 15% had efficiency in the range 80-90. On the other hand, 2014, 22% of the buildings achieved 100% efficiency, 54% had efficiency in the range 90-100 and 22% had efficiency in the range 80-90. The 2015 performance is comparable to 2014, 22% building assets had 100% efficiency, 26% have efficiency in the range 90-100 and 42% have efficiency in the range 80-90. The remaining inefficient buildings represent 8%. The results from 2016 appear to show that the percentage of highly performing assets dropped. In 2016, only 19% of the buildings had 100% efficiency, 49% have efficiency in the range 90-100 and 24% have efficiency in the range 80-90. The remaining inefficient buildings represent 7%.

The average analysis on the management overall costs showed 13 real estate assets were 100% efficient. This is around 54% of the stock. The results demonstrated that a huge improvement is required in optimising the management cost. This indicates that the assets are over managed (see appendix 10 for table 5.11 and figure 5.19).

5.3.8Rent

This sub-category of performance metrics is evaluated by Average Rent per Building (OT1), Rent per square meter (OT2), Income per building (OT3), and Percentage of rent collection rate (OT6). The DEA model results demonstrated that in 2012, there were 42% building assets with 100% efficiency, 43% have efficiency in the range 90-100 and 14% have efficiency in the range 80-90. Similar performance was observed in 2013, 40% of the buildings achieved 100% efficiency, 43% have efficiency in the range 90-100 and 15% have efficiency in the range 80-90. On the other hand, 2014 had 21 buildings which achieved 100% efficiency, 50% have efficiency in the range 90-100 and 12% have efficiency in the range 80-90. In 2015, there were 42% building assets had 100% efficiency, 28% had efficiency in the range 90-100 and 24% have efficiency in the range 80-90. The remaining inefficient buildings represent 5%. The results appear to show the performance in 2016 slumped slightly. Compared to the previous years, only 36% of the buildings achieved 100% efficiency, 40% have efficiency in the range 90-100 and 15% have efficiency in the range 80-90. The remaining inefficient buildings represent 7%.

The overall results demonstrated that only 22 real estate assets had 100% efficient. This indicated the rent occupancy rate is not uniform through the stock. This should be reflected on the revenue return. Results are included in appendix 11 in table 5.12 and figure 5.20.

5.3.9 Occupation Cost and Leasing

The inputs to the DEA model for sub-category consist of Number of vacant units (OO1), Percentage of expiring leases (OO2), Percentage of cash return (OO3), Percentage of capitalization rate (OO4). The results showed that in 2012, 49% building assets had 100% efficiency, 26% have efficiency in the range 90-100 and 12% have efficiency in the range 80-90. The remaining inefficient buildings represent 12%. However, in 2013, 38% of the buildings had 100% efficiency, 19% have efficiency in the range 90-100 and 26% have efficiency in the range 80-90. The remaining inefficient buildings represent 15%. On the other hand, 2014 the performance increased, 54% of the buildings had 100% efficiency, 15% have efficiency in the range 90-100 and 14% have efficiency in the range 80-90. Despite the increase of the efficient assets there were 15% of the assets considered inefficient. In 2015, 29% building assets had 100% efficiency, 28% have efficiency in the range 90-100 and 19% have efficiency in the range 80-90. The remaining inefficient buildings represent 22%. With respect to 2016, 40% of the buildings had 100% efficiency, 19% had efficiency in the range 90-100 and 15% have efficiency in the range 80-90. The remaining inefficient buildings represent 24%.

The average value of efficiency scores is 90.35 with standard deviation of 10.76. The range for these efficiency scores has a size of 34.47. The results showed that only 18 assets were efficient (See appendix 12 for table 5.13 and figure 5.21).

5.3.10Debt

The debt input to DEA model is measured by Length of time in rent debts (OD1), Percentage of overdue rent (OD2), and Percentage of tenants with unpaid rent (OD3). In 2012, there were 26% of building assets with 100% efficiency, 52% have efficiency in the range 90-100 and 21% have efficiency in the range 80-90. The performance in 2013 is not far off from that in 2012, 24% of the buildings had 100% efficiency, 42% have efficiency in the range 90-100 and 33% have efficiency in the range 80-90. On the other hand, 2014 the performance was lower, 17% buildings had 100% efficiency, 57% have efficiency in the range 90-100 and 24% have efficiency in the range 80-90. In 2015, 22% building assets with 100% efficiency 26% have efficiency in the range 90-100 and 36% have efficiency in the range 80-90. The remaining inefficient buildings represent 14%. With respect to 2016, 26% of the buildings which achieved 100% efficiency, 35% have efficiency in the range 90-100 and 28% have efficiency in the range 80-90. The remaining inefficient buildings represent 10%.

Based on Debt, the average analysis result showed that only 10 real estate assets were efficient. This indicates nearly half of the stock is inefficient. This suggests that there is an issue with Debt. If this is not managed well, the debt service will increase the overall OpEx cost, leading to lower return on investment (See appendix 13 for table 5.14 and figure 5.22).

5.3.11 Operational Characteristics

Operational Characteristics input metrics are measured by Available rentable area (BO1), Average Unit Cost per Building (BO2) and Percentage of rentable area to gross area (BO3). The DEA model results showed that in 2012, 26% of building assets had 100% efficiency, 24% have efficiency in the range 90-100 and 40% have efficiency in the range 80-90. The remaining inefficient buildings represent 8%. With respect to 2013, 22% of the buildings had 100% efficiency 29% have efficiency in the range 90-100 and 36% have efficiency in the range 80-90. The remaining inefficient buildings represent 10%. On the other hand, 2014 similar to some extent to the previous year, 21% of the buildings had 100% efficiency, 24% have efficiency in the range 90-100 and 43% have efficiency in the range 80-90. The remaining inefficient buildings represent 10%. In 2015, there were 14 building assets with 100% efficiency. This number represents 24% of investigated building assets while 17% have efficiency in the range 90-100 and 38% have efficiency in the range 80-90. The remaining inefficient buildings represent 19%. With respect to 2016, the number of buildings which achieved 100% efficiency was 17. This number represents 29% of investigated building assets while 35% have efficiency in the range 90-100 and 19% have efficiency in the range 80-90. The remaining inefficient buildings represent 15%.

The analysis showed that on average 50% of the studied assets were efficient based on Operational Characteristics (See appendix 14 for table 5.15 and figure 5.23).

5.3.12 Physical Characteristics

This sub-category of inputs consists of Number of all units (BP1) and Average unit size (BP2). The DEA model showed that in 2012, there were 13 building assets with 100% efficiency, 8% have efficiency in the range 90-100 and 10% have efficiency in the range 80-90. The remaining inefficient buildings represent 57%. With respect to 2013, 10 buildings which achieved 100% efficiency, 8% have efficiency in the range 90-100 and 12% have efficiency in the range 80-90. The remaining inefficient buildings represent 61%. On the other hand, 2014 had 10 buildings which achieved 100% efficiency; 10% have efficiency in the range 90-100 and 14% have efficiency in the range 80-90. The remaining inefficient buildings represent 57%.

In 2015, there were 12 building assets with 100% efficiency, 8% have efficiency in the range 90-100 and 14% have efficiency in the range 80-90. The remaining inefficient buildings represent 56%. With respect to 2016, 13 buildings achieved 100% efficiency; 8% have efficiency in the range 90-100 and 14% have efficiency in the range 80-90. The remaining inefficient buildings represent 54%.

The average value of efficiency scores is 76.71 with standard deviation of 19.26. The range for these efficiency scores has a size of 57.96. Similar to the operational characterises, 50% of the assets in this study were 100% efficient based on their physical characteristics. This might indicate the design, layout and value of unit per asset play a major role in rental efficiency (See appendix 15 for table 5.16 and figure 5.24).

5.4 Potential Improvement

The purpose of this efficiency metric is to show the level of efficiency of the DMUs (buildings) in the analysis. The results will demonstrate if the building assets in the analysis are performing well or perhaps may need improvement. The results indicate how efficient each building assets are in a particular facility management provision compared relatively to the best reference buildings. The reference set indicates the buildings that are used by the models as a benchmark for a particular building in the cluster. Whereas, the percentage of improvements in FM inputs and outputs indicate the relative increase or decrease of FM resources a building needs to achieve in order to gain a comparable facility management efficiency (compared to the best performing buildings in the data set).

In observing the results, a total of three buildings were found to lie on the efficiency frontier (E_k =100) in all the studied models. Thus, these three buildings within the data set have a DEA score equal to 100 across all FM inputs and revenue performance indicators, and therefore, can be considered relatively efficient (best in class). These efficient buildings do not need any improvements (relative to other buildings in the data set) as these lie on the efficient frontier. Furthermore, no input/output gain is required for these assets. This indicates that the managers of these assets were able to optimise the FM input resources to maximise the rental revenue. In contrast, the majority of the other buildings in the data set show that through some decrease in FM resources, potential revenue increase exists (see figures 5.1 and 5.2).

Table 5.2 summarises the average efficiency score, changes in input/output levels that would lead inefficient building units to achieve efficiency. The efficiency averages were calculated by obtaining the mean value of efficiency improvement score across all the 12 models.

It is noticeable from the descriptive statistics shown in Table 5.2 that there are large differences in the relative efficiency scores. The scores of the inefficient FM operation parameters range from 7 to 99.9 depending on the input variable used to generate the relative efficiency index. This shows that while some building assets are very efficient in the allocation of resources, others need considerable improvement in the management of FM resources. It is also very perceptible that the reference set for the non-efficient assets is only dominated by three buildings. The FM operation performance of these assets should be at least subjected to further analysis in order to deduce any best practices that can be used to ameliorate the FM management of the inefficient buildings.

The results in Table 5.2 illustrate that the studied assets performed badly in maintenance, insurance, and operational characteristics (e.g., available rentable area). The results showed that on average the inefficient buildings are 75 per cent relatively less efficient in maintenance, in term of revenue generation, than the benchmark building. Likewise, on average, the inefficient buildings are 60 per cent relatively less efficient in insurance. This anomaly in performance might be attributed to the fact that the rent revenue from these assets is very low as indicated by the large percentage gains (here the gain is related to output increase and input decrease) shown in figures 5.2 and 5.3. Equally, one might argue that the FM operation management in the reference set buildings is uniquely different.

Table 5. 2: Efficiency Scores Descriptive Statistics

	capex	*repaire*	*cleaning*	*elect*	*churn*	*security*	*insurance*	*staff*	*rent*	*leasing*	*debt*	*charact*	*phy*
Mean	92	75	93	92	92	92	60	92	94	88	92	88	70
Median	93	88	93	92	92	92	55	93	95	90	93	88	69
Standard Deviation	4	30	4	4	4	4	20	4	4	8	4	7	17
Range	16	93	16	16	16	16	68	16	15	32	16	26	56
Minimum	84	7	83	84	83	83	32	83	85	68	83	73	42
Maximum	99.4	99.9	99.7	99.4	99.4	99.4	99.8	99.4	99.8	99.6	99.4	99.8	98.8

The projection shown in Figure 5.1 entails a reduction of the FM input resources and an increase of the level of revenue. The increase in revenue or decrease in FM input resources are expressed as a percentage of the original inputs and outputs data for each respective building asset. The results from the Capital Expenditures model showed 16 real estate assets with 100% efficiency. It shows that the level of CapEx spending is not translated into inputs to produce superior outputs. This is clearly demonstrated in Figure 5. 2., where most building assets were unable to translate capital spending up front into efficient revenue. The repair and maintenance cost model revealed that only 18 real estate assets were efficient. This demonstrated that in general, the investigated buildings performed poorly in terms of repair and maintenance. This may indicate that the maintenance management regime is inefficient.

In the cleaning model, the average value of efficiency scores is 92.72. Further, the results demonstrated that, on average, only 18 out of 57 real estate assets were 100% efficient. The average score might signal that cleaning costs are optimised and managed efficiently. However, the lower number of the efficient assets might suggest the opposite. Not surprising, the electricity consumption model showed that just 13 out of 57 buildings were efficient. This could be directly related to local environment and air-conditioning usage. The average performance of the studied stock indicated that 12.5% of the assets were efficient in churn as measured per percentage of new tenancies. This might imply that marketing to attract new occupants is necessary. The insurance DEA model showed on average around 50% of studied assets have less than 80% efficiency. This suggests that the insurance expenses are high in the UAE.

The management overall costs DEA model exhibited no more than 12 real estate assets were 100% efficient. This is around 21% of the stock. The results demonstrated that a huge improvement is required in optimising the management cost. This means that the assets are over managed. This is surprisingly low; one expected the efficiency to be high because the staff wages in the UAE are very low compared to developed world. The model based on the rent construct revealed that just 22 out of 57 real estate assets that were 100% efficient rent management as measured by (Average Rent per Building, Rent per square meter, income per building, and Percentage of rent collection rate). Occupancy cost and leasing score is 90.35 as demonstrated in 18 assets were efficient. Whereas, the Debt model showed only 10 real estate assets were efficient. This reveals nearly one over six of the stock is inefficient. This suggests that there is an issue with Debt servicing. If this is not managed well, the debt service will increase the overall OpEx cost, leading to lower return on investment. The analysis showed that on average 50% of the studied assets were efficient based on available rentable area and percentage of rentable area to gross area parameters. The results demonstrate that 50% of the studied assets are underutilised. Similar to the operational characteristics, just 50% of the assets in this study were 100% efficient based on their physical characteristics. This might signify the design, layout and value of unit per asset play a major role in rental efficiency.

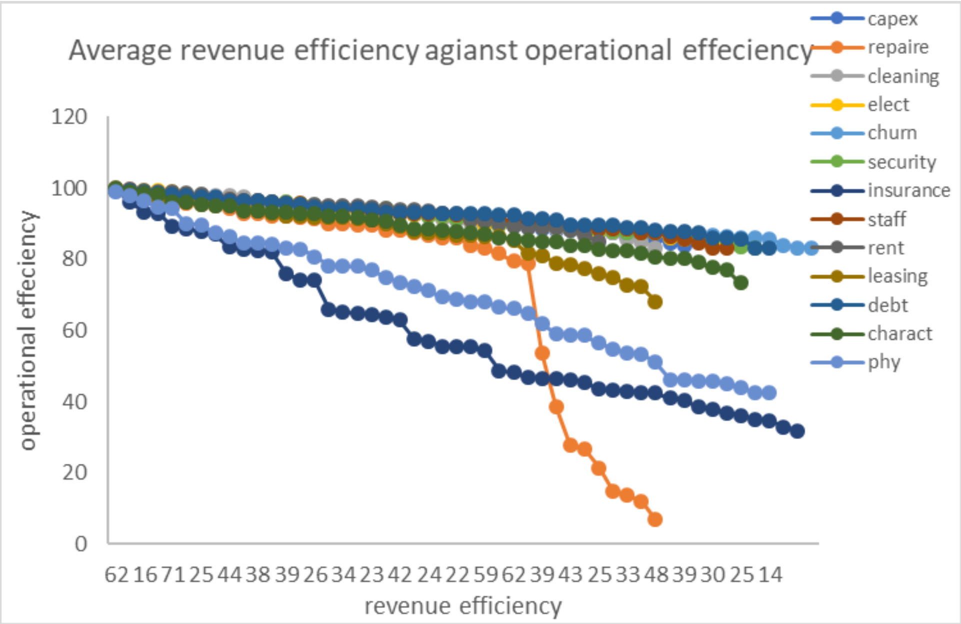


Figure 5. 1 Comparison of Operational Inputs Resources Efficiency to Revenue Efficiency

In some of the assets (as shown in figure 5.1), the projection of savings in repair and maintenance (planned maintenance requests, unplanned repairs, and percentage of planned maintenance completed on time) are considerable. Similarily, it appears that a huge reduction in insurance, churn and leasing costs is also required to bring the assets to the benchmark buildings level.

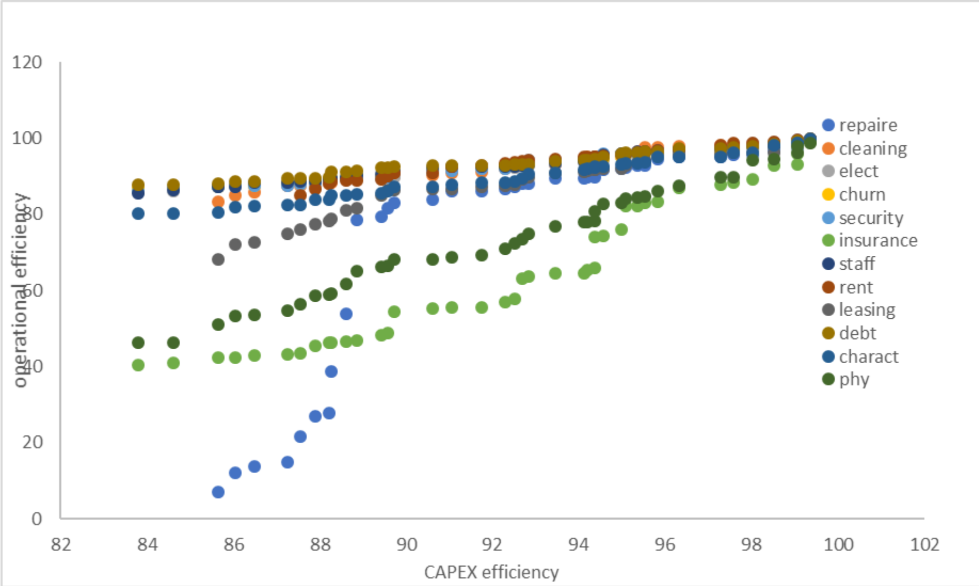


Figure 5. 2 Comparison of Operational Inputs Resources Efficiency to CapEx Efficiency

The results showed that, on average, the rental Revenue needs to be increased by 17% to proportional to the maintenance and repairs costs. Also, the average rent lost due to vacant units must be reduced by 30%. Also, the consumption must be reduced by 39% to bring the inefficient units to the level of efficiency. The average potential rental lost due to churn was 49%. Similarly, the security operation must be improved by 38% to bring the level of Rental Revenue to the reference or benchmark unit. Average rent lost due to vacant units, has the largest required total potential improvement with value (-29%) compared to the real estate assets that were efficient (100%). Time to re-let, one of the Churn metrics, has the largest required total potential improvement with a value of (39%) compared to the real estate assets that were efficient (100%). To increase the revenue of their assets, they have to determine the relationships between their business activities and their revenue stream by monitoring metrics such as churn by lean into their best customers, being proactive with communication, define a roadmap for their new customers, offer incentives, ask for feedback often, analyse churn when it happens, and stay competitive. Further they can react to business conditions faster and run their building assets more efficiently. Occupation Cost and Leasing expenses need to be reduced by 27% to bring the average rent lost due to vacant units to the level of the real estate assets that were efficient (100%). To increase the efficiency of Occupation Cost and Leasing, the study suggests the following points to decrease the non-payment of rents and vacant units: market for the right tenants, keep a nice property and market that fact, maintain excellent tenant service and relations, offer incentives to tenants to renew their lease, and do accurate and comprehensive walkthroughs.

Figure 5.3 showed the potential improvement in the output between the years. The results demonstrated that the studied assets were inefficient Cost per square meter and total cost/ total rentable area by more than 60%. This suggests capital spent on building is not translated to the rent. This could be due to the fact that there is wasted space for circulation and other recreation areas. Expected income was acceptable in 2013, but for the other years, the inefficiency was more than 60%; it appears the percentage of vacant units fluctuates between the years.

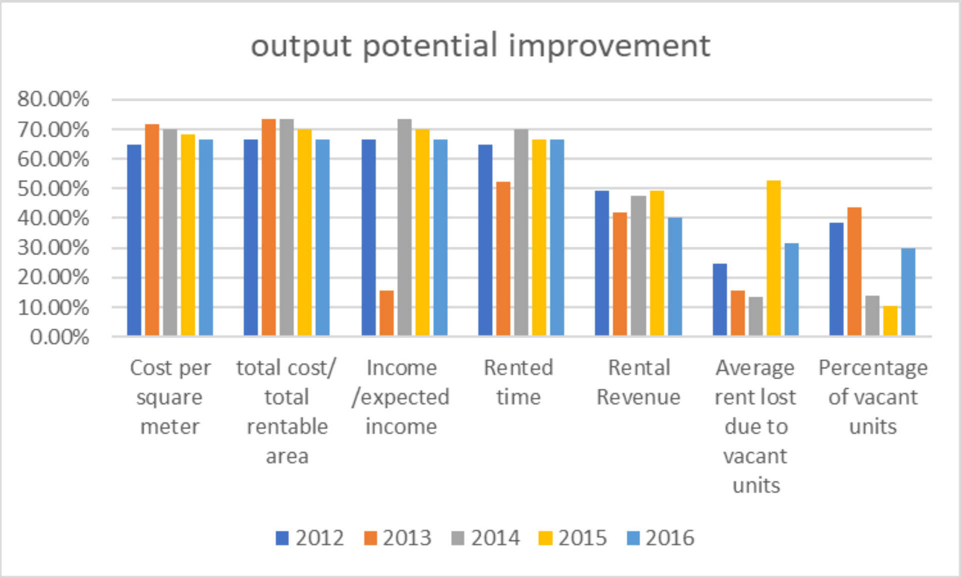


Figure 5. 3 Output Potential Improvement in Relation to the Input Resources

5.5 Input/output Potential Improvement

Figure 5.4 shows the average percentage of improvements in output in each of the DEA models. The figure shows the percentage improvements required relative to the references set (or benchmark sets). The results demonstrated that the revenues need to be increased by over 20% over all the models. One key finding is that the capital spent on front to build assets appears not to tally with the revenue. Similarly, leasing cost must be substantiality reduced to improve the revenue. In the cleaning, churn, security, insurance and electricity consumption, models reveal that the percentage of vacant units need to be reduced substantially more than increasing the revenue relative to the reference sets. In the repair and maintenance model both length of time to re-let and percentage of vacant units' indicators need to be lowered more than increasing revenue to achieve relative optimum performance.

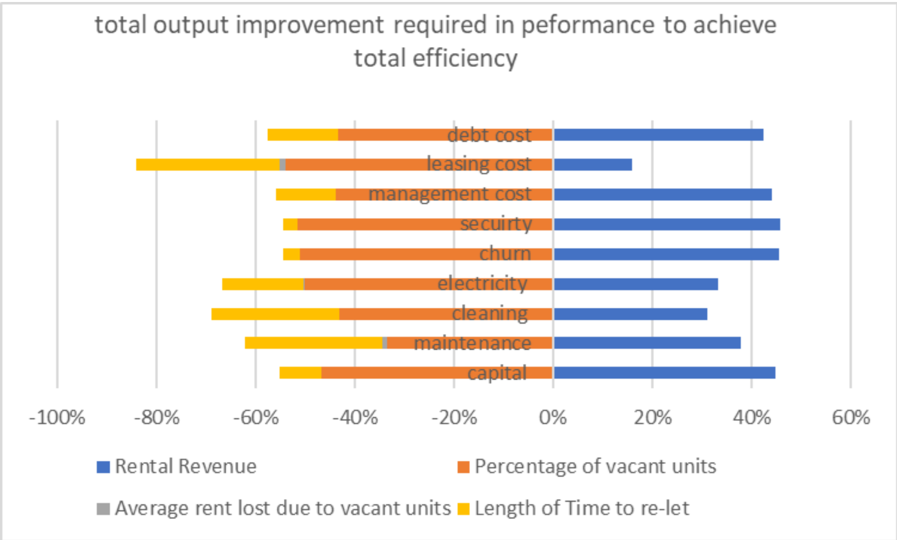


Figure 5. 4 Revenue Performance Improvement

Figure 5.5 shows the improvement required for of the models' inputs. It shows that CR3, OR1, OI1 and OI2 are the most inefficient parameters in the study. These inputs need to be reduced between 35-40% to achieve the relative efficiency required. Similarly, OR2, OR3 and OO1 need to be decreased by around 20% to attain the required relative comparative efficiency. All other inputs need to be cut down by at least 5% to accomplish comparability with the reference building sets.

Figure 5. 5 Efficiency Improvement in the FM Input Resources

5.6 Reference Frequency

The purpose of this analysis to identify "global leader" buildings that can be used as best operating practice for the inefficient building assets. The idea here is that the higher the frequency that a particular building appears in reference sets, the more likely it indicates it is a good example of good practice and performance. The performance analysis of the data set over the 5-year period to identify how many times a building appears in the reference in each of the study metrics is shown the table below. The results in table show that buildings c12, c3, c30, c34, c37 and c50 emerged as global leaders.

Table 5. 3 Reference Frequency Based on the DEA Models

Capital Expenditures	Repair and maintenance	Cleaning	General Consumption	churn	Security	insurance	Management and overall costs	Rent	Occupation Cost and Leasing	Debt	Operational Characteristics
C12	C12	C11	C12	C12	C12	C11	C12	C12	C12	C10	C11

C15	C19	C12	C23	C3	C21	C3	C19	C18	C3	C12	C12
C19	C23	C21	C28	C30	C3	C30	C21	C19	C30	C23	C18
C20	C3	C3	C3	C34	C30	C34	C3	C21	C31	C3	C23
C3	C30	C30	C30	C37	C34	C49	C30	C30	C34	C30	C30
C30	C32	C31	C34	C50	C37	C60	C34	C34	C37	C31	C34
C31	C34	C33	C37	C7	C50	C69	C35	C36	C45	C34	C49
C34	C42	C34	C49		C51	C77	C36	C37	C49	C35	C50
C37	C49	C36	C50		C65		C37	C45	C50	C37	C67
C45	C50	C37	C51		C69		C39	C50	C7	C49	C71
C50	C53	C40	C59		C7		C40	C52		C53	
C51	C61	C49	C61				C45	C53		C7	
C53	C62	C50	C7				C49	C59			
C62	C63	C58					C50	C61			
C67	C65	C60					C58	C62			
C7	C69	C65					C59	C65			
	C77	C7					C61	C7			
	C9	C72					C65	C71			
							C7				
							C72				
							C77				
							C78				

Furthermore, the analysis indicated that C37 has the largest number of references for Capital Expenditures (CapEx). It has 39 inefficient buildings as references, which were (68%) of these building assets. The average number of references for efficient buildings was 8.06 with a standard deviation of 10.12. Similarly, the average size of the reference set for the inefficient buildings is 2.76 with a standard deviation of 0.93 (See appendix 42 table 5.43 and figure 5.51).

For repair and maintenance, C30 has the largest number of references. It has 34 inefficient buildings as references, which is 59% of these building assets. The average number of references for the efficient buildings is 12.06 with standard deviation of 11.49. Similarly, the average size of reference set for the inefficient buildings is 4.7 with standard deviation of 0.78. The results of the analysis showed that C37 has the largest number of references for Cleaning. It has 38 inefficient buildings as references, which are 66% of the building assets. The average number of references for efficient buildings is 7.94 with a standard deviation of 10.18.

Similarly, the average size of the reference set for the inefficient buildings is 3.21 with a standard deviation of 1.04 (See appendix 44 table 5.45 and figure 5.53). Similarly, the analysis showed C37 has the largest number of references for General Consumption. It has 42 inefficient buildings as references, which are 73% of these building assets.

The average number of references for efficient buildings is 10.31 with a standard deviation of 12.1. Similarly, the average size of the reference set for the inefficient buildings is 2.75 with a standard deviation of 0.8 (See appendix 45 table 5.46 and figure 5.54). Results from churn analysis showed C12 has the largest number of references. It has 42 inefficient buildings as references, which is 73% of these building assets. The average number of references for the efficient buildings is 7.0 with standard deviation of 11.99. Similarly, the average size of reference set for the inefficient buildings is 1.93 with standard deviation of 0.9. The study results found that C37 has the largest number of references for Security. It has 47 inefficient buildings as references, which are 82% of these building assets. The average number of references for efficient buildings is 11.0 with a standard deviation of 15.5. Similarly, the average size of the reference set for the inefficient buildings is 2.39 with a standard deviation of 0.64 (See appendix 47 table 5.48 and figure 5.56). The result of the investigation showed C30 has the largest number of references for Insurance. It has 44 inefficient buildings as references, which are 77% of these building assets. The average number of references for efficient buildings is 20.75 with a standard deviation of 13.46. Similarly, the average size of the reference set for the inefficient buildings is 3.22 with a standard deviation of 0.65 (See appendix 48 table 5.59 and figure 5.57).

The present study found that C37 has the largest number of references for Management and overall costs. It has 41 inefficient buildings as references, which represent 71% of the building assets. The average number of references for efficient buildings is 9.15 with a standard deviation of 12.51. Similarly, the average size of the reference set for the inefficient buildings is 2.36 with a standard deviation of 0.71 (See appendix 49 table 5.60 and figure 5.58).

Furthermore, that C37 has the largest number of references for Rent. It has 23 inefficient buildings as references, which are 40% of these building assets. The average number of references for efficient buildings is 7.73 with a standard deviation of 5.79. Similarly, the average size of the reference set for the inefficient buildings is 4.23 with a standard deviation of 1.07 (See appendix 50 table 5.61 and figure 5.59). The results show that C37 has the largest number of references for Debt. It has 39 inefficient buildings as references, which represent 68% of these building assets. The average number of references for efficient buildings is 11.7 with a standard deviation of 12.85. Similarly, the average size of the reference set for the inefficient buildings is 2.28 with a standard deviation of 0.61 (See appendix 52 table 5.63 and figure 5.61). Results based on the Operational Characteristics DEA model showed that C37 has the largest number of references. It has 36 inefficient buildings as references, which is 63% of these building assets. The average number of references for the efficient buildings is 11.57 with standard deviation of 12.4. Similarly, the average size of reference set for the inefficient buildings is 3.44 with standard deviation of 0.84.

5.7 Efficiency Frontier Analysis

This section analyses efficiency frontier plots of all investigated building assets. It uses output maximization paradigm. The output is Rental Revenue while the inputs are:

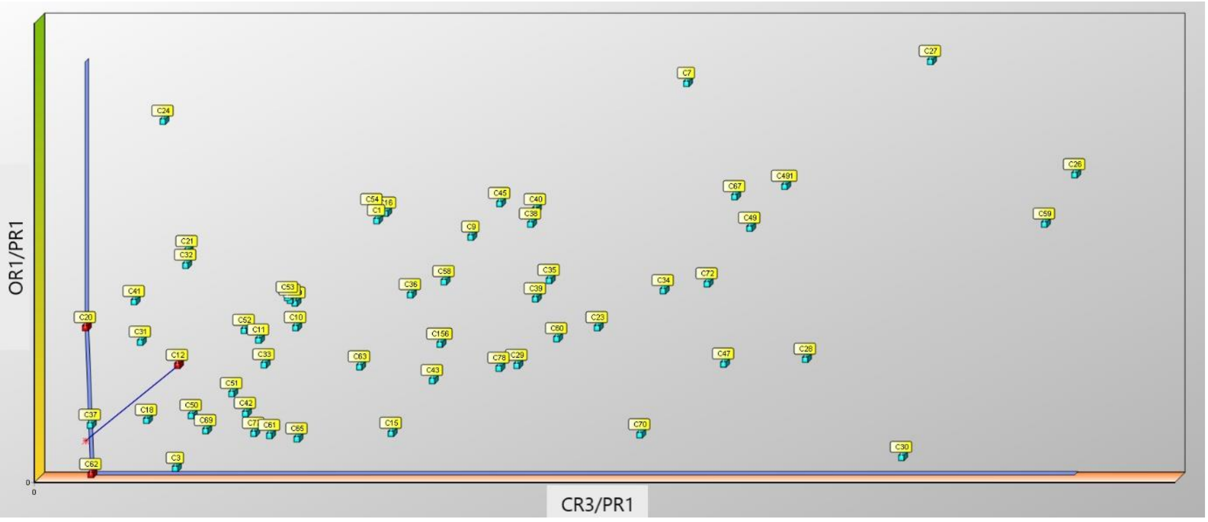
- Capital Expenditures (CapEx)
- Repair and Maintenance
- General Consumption
- Operational Cost (OpEx)

Keep in mind that the comparison is between ratios of these inputs to the outputs. Since output maximization is used, the frontier will be moving toward zero.

5.7.1Capital Expenditures (CapEx) vs. Repair and Maintenance

The efficiency graph in fig 5.6 shows that building assets c20, c37 and c62 demonstrate a high of performance to all other units in term of rental revenue to repair and maintenance input resources. These units present the best achieved performance in the set. As a result, they can be used as a threshold against the performance (in terms of revenue to repair and maintenance) of other units. However, this does not mean that the buildings on the frontiers line cannot improve their performance. The results here only indicate their performance in relation to other buildings in the analysis.

Figure 5. 6: Frontier plot for Rental Revenue vs. Repair and Maintenance



Unit C20 was able to achieve high efficiency with regard to Capital Expenditures (CapEx). It has the minimum ratio to Rental Revenue as shown in Figure (5.105). Compare this to unit C26 which has the maximum ratio with regard to Capital Expenditures (CapEx). The normalized ratio value for unit C20 is 4.57%, which means that unit C20 is 21.89 times better than unit

C26 with respect to Capital Expenditures (CapEx). In other words, unit C26 has to improve its Capital Expenditures (CapEx) 21.89 times to be as efficient as unit C20. Note that both of C20 and C26 have similar capital expenditure to some extent. However, the total rental revenue collected by C20 was more than 11 million per year while C26 had around 4 million. The main reason for C20 to be a benchmark is its ability to generate more revenue.

By analysing data for ratio Repair and Maintenance, we can see that unit C62 is the best. It has the minimum ratio to Rental Revenue. On the other hand, we have unit C27 with the maximum ratio to Rental Revenue. This unit has to improve its Repair and Maintenance 104.86 times to be comparable with unit C62 since unit C62 managed to have normalized ratio value of 0.95%. C62 was able to be the benchmark here because of its capability to achieve high percentage of completed planned maintenance task (~90%). On the other hand, C27 was barely able to complete 50% of planned maintenance. By combining the analysis of ratios Capital Expenditures (CapEx) and Repair and Maintenance, we can see that the closest unit to origin is C62. This unit has a distance of 5.22% from the origin. Similarly, the farthest unit from origin is C27. This unit has a distance of 131.94% from the origin. These numbers state that unit C62 is 25.3 times better than unit C27.

Unit C36 has the lowest average of inter-distances to other building assets. This average is 30.25% with standard deviation of 15.53%. The range of inter-distances for C36 to other units is 70.57% with minimum value of 4.56% and maximum value of 75.12%. The closest unit to C36 is C58 while the farthest is C27. By comparing unit C36 to unit C62 (which has the minimum distance to origin), we can see that unit C36 has to improve its operations 10.9 times to be as efficient as unit C62. Note that unit C36 is still better than the farthest unit from origin (unit C27) by 2.32 times. With respect to only Capital Expenditures (CapEx) ratio, unit C36 is worse than the best unit in this ratio by 7.86 times while it is better than the worst by 2.79 times.

On the other hand, Repair and Maintenance ratio data shows that unit C36 is worse than the best unit in this ratio by 46.23 times while it is better than the worst by 2.27 times.

Similarly, unit C27 has the largest average of inter-distances to other building assets. This average is 81.48% with standard deviation of 24.52%. The range of inter-distances for C27 to other units is 103.77% with minimum value of 24.14% and maximum value of 127.91%. The closest unit to C27 is C7 while the farthest is C62. By comparing unit C27 to unit C62 (which has the minimum distance to origin), we can see that unit C27 has to improve its operations 25.3 times to be as efficient as unit C62. With respect to only Capital Expenditures (CapEx) ratio, unit C27 is worse than the best unit in this ratio by 18.84 times while it is better than the worst by 1.16 times. On the other hand, Repair and Maintenance ratio data shows that unit C27 is worse than the best unit in this ratio by 104.86 times.

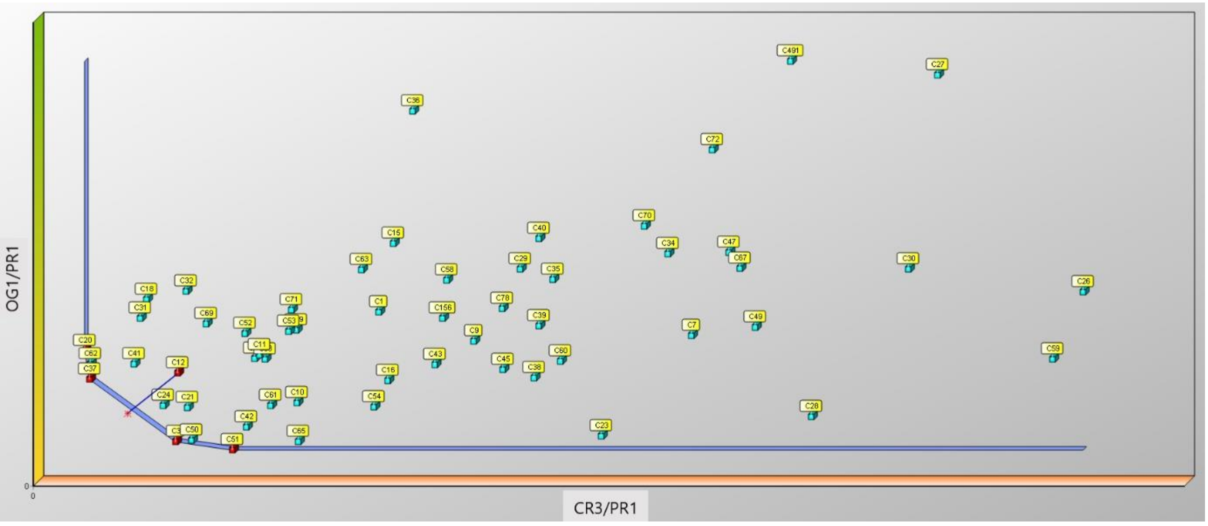
The buildings that are not in the frontier could become efficient if they improve their revenue, in the same proportions as the efficient units, whilst keeping their inputs the same. If the management act on this strategy eventually the inefficient building units will reach the frontier. Alternatively, the management could opt for reducing the repair and maintenance cost considerably while keeping the revenue at the same level, this will have the same effect as the previous strategy.

5.7.2Capital Expenditures (CapEx) vs. General Consumption

Figure 5.7 shows that building units c20, c62, c37, c51 and c50 are on the frontier line. Thus, they are considered 100% efficient in terms of the ratio of revenue to consumption. The other building units are not 100% efficient because they are not on the frontier. The least efficient buildings were c491, c27 and c26.

By analysing data for ratio General Consumption, we can see that unit C51 is the best. It has the minimum ratio to Rental Revenue as shown in Figure (5.106). On the other side, we have unit C491 with the maximum ratio to Rental Revenue. This unit has to improve its General Consumption 12.91 times to be comparable with unit C51 since unit C51 managed to have normalized ratio value of 7.74%. By combining the analysis of ratios Capital Expenditures (CapEx) and General Consumption, we can see that the closest unit to origin is C3. This unit has a distance of 16.37% from the origin. Similarly, the farthest unit from origin is C27. This unit has a distance of 129.4% from the origin. These numbers state that unit C3 is 7.9 times better than unit C27.

Figure 5. 7: Frontier plot for Capital Expenditures (CapEx) vs. General Consumption



Unit C156 has the lowest average of inter-distances to other building assets. This average is 27.78% with standard deviation of 15.04%. The range of inter-distances for C156 to other units is 68.45% with minimum value of 6.08% and maximum value of 74.52%. The closest unit to C156 is C78 while the farthest is C27. By comparing unit C156 to unit C3 (which has the minimum distance to origin), we can see that unit C156 has to improve its operations 3.36 times to be as efficient as unit C3. Note that unit C156 is still better than the farthest unit from origin (unit C27) by 2.35 times. With respect to only Capital Expenditures (CapEx) ratio, unit C156 is worse than the best unit in this ratio by 8.49 times while it is better than the worst by 2.58 times. On the other hand, General Consumption ratio data shows that unit C156 is worse than the best unit in this ratio by 5.04 times while it is better than the worst by 2.56 times.

Similarly, unit C27 has the largest average of inter-distances to other building assets. This average is 80.23% with standard deviation of 22.47%. The range of inter-distances for C27 to other units is 98.99% with minimum value of 14.47% and maximum value of 113.46%. The closest unit to C27 is C491 while the farthest is C3. By comparing unit C27 to unit C3 (which has the minimum distance to origin), we can see that unit C27 has to improve its operations 7.9 times to be as efficient as unit C3. With respect to only Capital Expenditures (CapEx) ratio, unit C27 is worse than the best unit in this ratio by 18.84 times while it is better than the worst by 1.16 times. On the other hand, General Consumption ratio data shows that unit C27 is worse than the best unit in this ratio by 12.48 times while it is better than the worst by 1.03 times.

Thus, the inefficient building units can reach the efficient frontier

- Reduce the amount spend on the operational aspects of the buildings or
- Increase the revenue in the same proportion

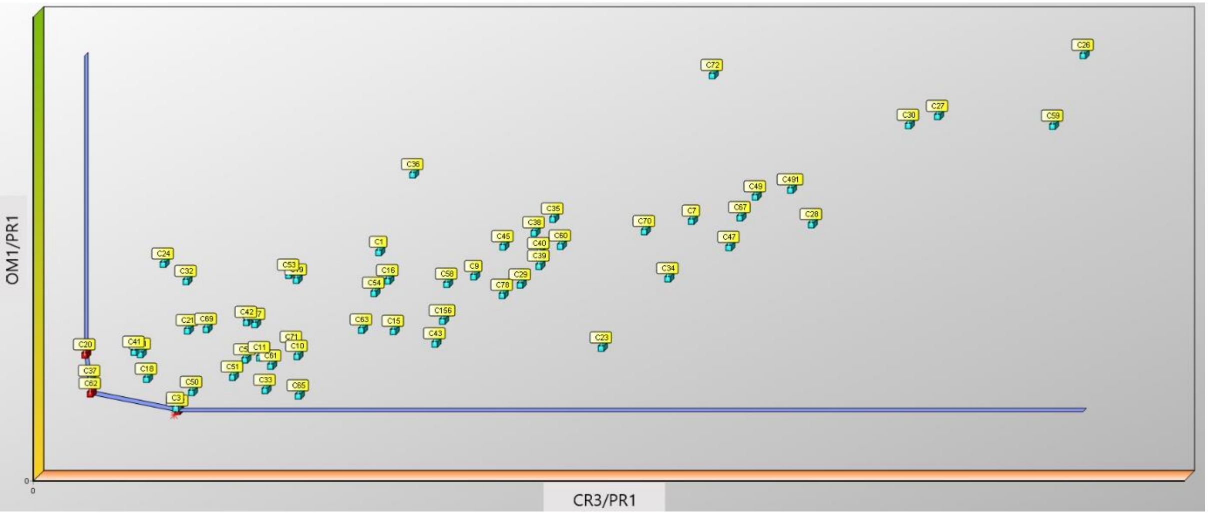
For those units that further away from the frontier line may strategies of efficiency should be introduced such as increasing productivity and eliminating wasted operational resources.

5.7.3Capital Expenditures (CapEx) vs. Operational Cost (OpEx)

Figure 5.8 shows the frontier plot of capital expenditure/revenue ratio plotted against operational cost/revenue ratio. The plot shows that units c20, c62, c37, and c3 are on the frontier line. Thus, they are considered 100% efficient. The other building units are not 100% efficient because they are not on the frontier. The least efficient buildings were c26, c59, c27, c30 and c72.

By analysing data for ratio Operational Cost (OpEx), we can see that unit C12 is the best. It has the minimum ratio to Rental Revenue as shown in Figure (5.107). On the other side, we have unit C26 with the maximum ratio to Rental Revenue. This unit has to improve its Operational Cost (OpEx) 6.43 times to be comparable with unit C12 since unit C12 managed to have normalized ratio value of 15.55%. The outperformance of unit C12 is due to lower consumption of electricity and water. This may be a result of using green technologies and power saving utilities. By combining the analysis of ratios Capital Expenditures (CapEx) and Operational Cost (OpEx), we can see that the closest unit to origin is C62. This unit has a distance of 20.36% from the origin. Similarly, the farthest unit from origin is C26. This unit has a distance of 141.42% from the origin. These numbers state that unit C62 is 6.94 times better than unit C26.

Figure 5. 8: Frontier plot for Capital Expenditures (CapEx) vs. Operational Cost (OpEx)



Unit C54 has the lowest average of inter-distances to other building assets. This average is 26.77% with standard deviation of 17.45%. The range of inter-distances for C54 to other units is 84.93% with minimum value of 3.28% and maximum value of 88.21%. The closest unit to C54 is C16 while the farthest is C26. By comparing unit C54 to unit C62 (which has the minimum distance to origin), we can see that unit C54 has to improve its operations 2.66 times to be as efficient as unit C62. Note that unit C54 is still better than the farthest unit from origin (unit C26) by 2.61 times. With respect to only Capital Expenditures (CapEx) ratio, unit C54 is worse than the best unit in this ratio by 7.05 times while it is better than the worst by 3.11 times. On the other hand, Operational Cost (OpEx) ratio data shows that unit C54 is worse than the best unit in this ratio by 2.8 times while it is better than the worst by 2.3 times.

Similarly, unit C26 has the largest average of inter-distances to other building assets. This average is 85.04% with standard deviation of 27.63%. The range of inter-distances for C26 to other units is 107.19% with minimum value of 17.1% and maximum value of 124.29%. The closest unit to C26 is C59 while the farthest is C62. By comparing unit C26 to unit C62 (which has the minimum distance to origin), we can see that unit C26 has to improve its operations 6.94 times to be as efficient as unit C62. With respect to only Capital Expenditures (CapEx) ratio, unit C26 is worse than the best unit in this ratio by 21.89 times. On the other hand, Operational Cost (OpEx) ratio data shows that unit C26 is worse than the best unit in this ratio by 6.43 times. Thus, unit 26 need to improve its revenue 22 times proportional to the unit c20. Or alternatively reduce its operational costs by 22 times

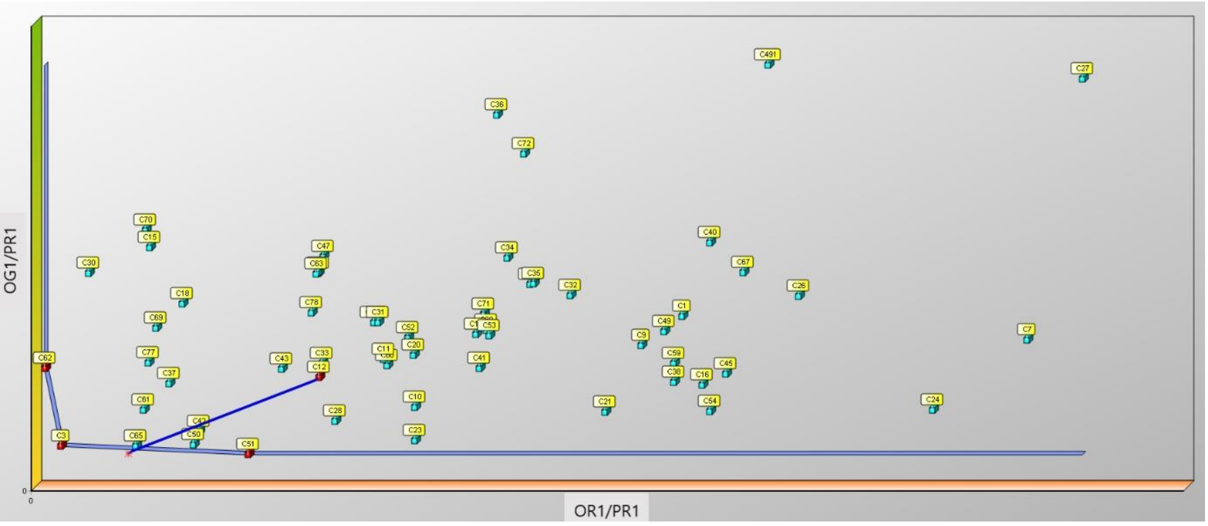
5.7.4 Repair and Maintenance vs. General Consumption

Figure 5.9 shows the frontier plot of Repair and Maintenance /revenue ratio plotted against General Consumption /revenue ratio. The plot shows that units c3, c62, c65, and c51 are on the frontier line. Thus, they are considered 100% efficient. The other building units are not 100%

efficient because they are not on the frontier. The least efficient buildings were c26, c491, c27, and c7.

By combining the analysis of ratios Repair and Maintenance and General Consumption, we can see that the closest unit to origin is C3. This unit has a distance of 9.96% from the origin. Similarly, the farthest unit from origin is C27. This unit has a distance of 139.06% from the origin. These numbers state that unit C3 is 13.96 times better than unit C27. Thus, proportionally unit 37 has to improve its output or reduce its input by 14 times to reach the efficiency of building c3.

Figure 5. 9: Frontier Plot for Repair and Maintenance vs. General Consumption



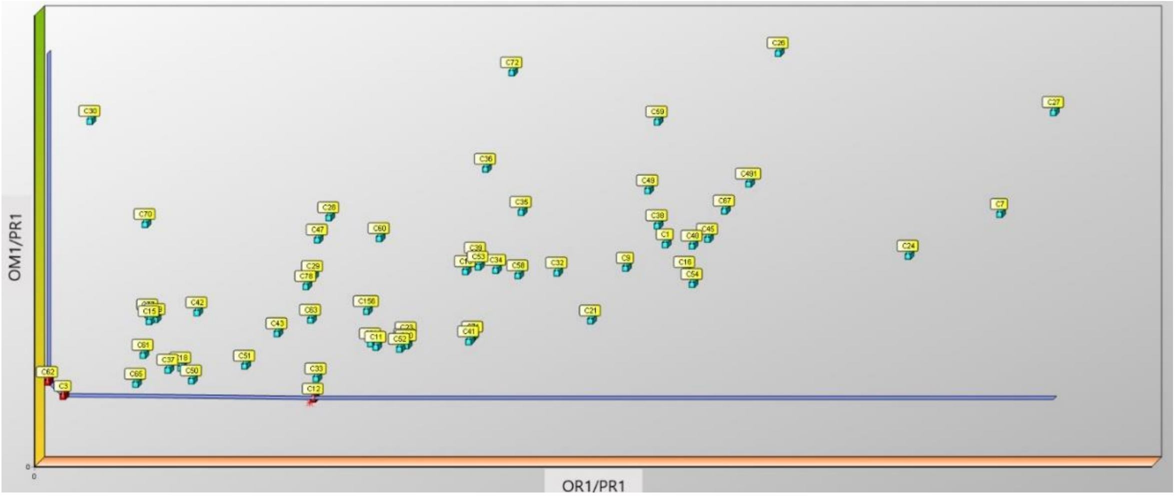
Unit C52 has the lowest average of inter-distances to other building assets. This average is 26.37% with standard deviation of 16.61%. The range of inter-distances for C52 to other units is 84.71% with minimum value of 4.22% and maximum value of 88.93%. The closest unit to C52 is C20 while the farthest is C27. By comparing unit C52 to unit C3 (which has the minimum distance to origin), we can see that unit C52 has to improve its operations 5.03 times to be as efficient as unit C3. Note that unit C52 is still better than the farthest unit from origin (unit C27) by 2.77 times. With respect to only Repair and Maintenance ratio, unit C52 is worse than the best unit in this ratio by 37.29 times while it is better than the worst by 2.81 times. On the other hand, General Consumption ratio data shows that unit C52 is worse than the best unit in this ratio by 4.56 times while it is better than the worst by 2.83 times.

Similarly, unit C27 has the largest average of inter-distances to other building assets. This average is 88.67% with standard deviation of 20.56%. The range of inter-distances for C27 to other units is 100.47% with minimum value of 30.21% and maximum value of 130.67%. The closest unit to C27 is C491 while the farthest is C3. By comparing unit C27 to unit C3 (which has the minimum distance to origin), we can see that unit C27 has to improve its operations 13.96 times to be as efficient as unit C3. With respect to only Repair and Maintenance ratio, unit C27 is worse than the best unit in this ratio by 104.86 times. On the other hand, General Consumption ratio data shows that unit C27 is worse than the best unit in this ratio by 12.48 times while it is better than the worst by 1.03 times.

5.7.5 Repair and Maintenance vs. Operational Cost (OpEx)

Figure 5.10 shows the frontier plot of Repair and Maintenance /revenue ratio plotted against Operational Cost /revenue ratio. The plot shows that units c3, c62 and c12 are on the frontier line. Thus, they are considered 100% efficient. The other building units are not 100% efficient because they are not on the frontier. The least efficient buildings were c26, c27, and c7.

Figure 5. 10: Frontier plot for Repair and Maintenance vs. Operational Cost (OpEx)



By combining the analysis of ratios Repair and Maintenance and Operational Cost (OpEx), we can see that the closest unit to origin is C3. This unit has a distance of 16.39% from the origin. Similarly, the farthest unit from origin is C27. This unit has a distance of 131.6% from the origin. These numbers state that unit C3 is 8.03 times better than unit C27. Thus, unit c27 has to improve its revenue by 8 times or reduce its maintenance and operational costs by the same proportion to reach the efficiency of c3.

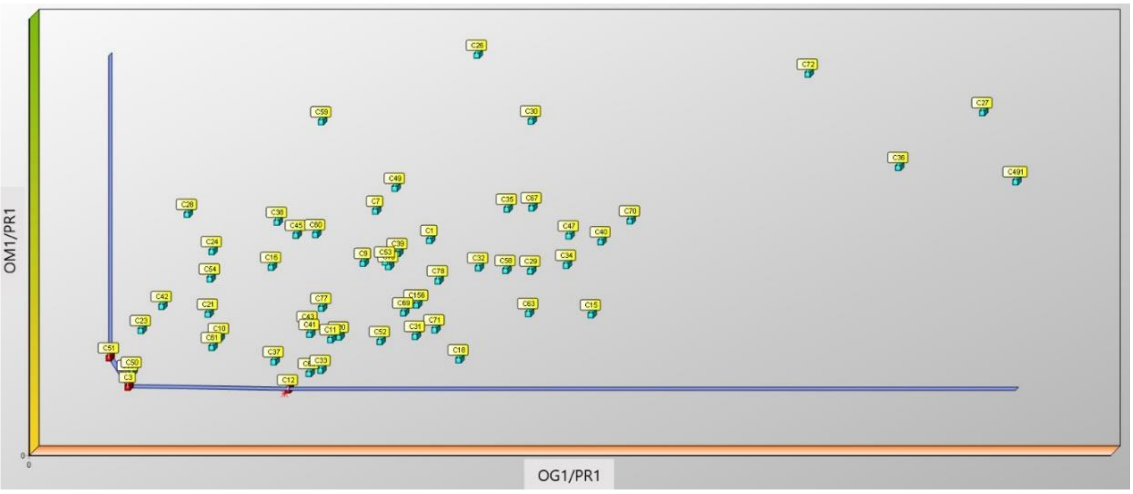
Unit C19 has the lowest average of inter-distances to other building assets. This average is 27.26% with standard deviation of 14.59%. The range of inter-distances for C19 to other units is 68.02% with minimum value of 1.7% and maximum value of 69.72%. The closest unit to C19 is C53 while the farthest is C27. By comparing unit C19 to unit C3 (which has the minimum distance to origin), we can see that unit C19 has to improve its operations 3.84 times to be as efficient as unit C3. Note that unit C19 is still better than the farthest unit from origin (unit C27) by 2.09 times. With respect to only Repair and Maintenance ratio, unit C19 is worse than the best unit in this ratio by 44.13 times while it is better than the worst by 2.38 times. On the other hand, Operational Cost (OpEx) ratio data shows that unit C19 is worse than the best unit in this ratio by 3.0 times while it is better than the worst by 2.14 times.

Similarly, unit C27 has the largest average of inter-distances to other building assets. This average is 76.05% with standard deviation of 24.18%. The range of inter-distances for C27 to other units is 94.21% with minimum value of 25.46% and maximum value of 119.66%. The closest unit to C27 is C7 while the farthest is C3. By comparing unit C27 to unit C3 (which has the minimum distance to origin), we can see that unit C27 has to improve its operations 8.03 times to be as efficient as unit C3. With respect to only Repair and Maintenance ratio, unit C27 is worse than the best unit in this ratio by 104.86 times. On the other hand, Operational Cost (OpEx) ratio data shows that unit C27 is worse than the best unit in this ratio by 5.5 times while it is better than the worst by 1.17 times.

5.7.6 General Consumption vs. Operational Cost (OpEx)

Figure 5.11 shows that building units c3, c12, c3 and c51 are on the frontier line. Thus, they are considered 100% efficient in terms of the ratio of consumption/revenue. The other building units are not 100% efficient because they are not on the frontier. The least efficient buildings were c491, c27, 72 and c36.

Figure 5. 11: Frontier plot for General Consumption vs. Operational Cost (OpEx)



By combining the analysis of ratios General Consumption and Operational Cost (OpEx), we can see that the closest unit to origin is C3. This unit has a distance of 18.85% from the origin. Similarly, the farthest unit from origin is C27. This unit has a distance of 129.06% from the origin. These numbers state that unit C3 is 6.84 times better than unit C27. Therefore, unit c27 to become efficient has to improve its revenue by 7 times compared to unit c3.

Unit C19 has the lowest average of inter-distances to other building assets. This average is 24.06% with standard deviation of 15.35%. The range of inter-distances for C19 to other units is 70.66% with minimum value of 1.18% and maximum value of 71.84%. The closest unit to C19 is C53 while the farthest is C27. By comparing unit C19 to unit C3 (which has the minimum distance to origin), we can see that unit C19 has to improve its operations 3.13 times to be as efficient as unit C3. Note that unit C19 is still better than the farthest unit from origin (unit C27) by 2.18 times. With respect to only General Consumption ratio, unit C19 is worse than the best unit in this ratio by 4.67 times while it is better than the worst by 2.76 times. On the other hand, Operational Cost (OpEx) ratio data shows that unit C19 is worse than the best unit in this ratio by 3.0 times while it is better than the worst by 2.14 times.

Similarly, unit C27 has the largest average of inter-distances to other building assets. This average is 74.9% with standard deviation of 21.45%. The range of inter-distances for C27 to other units is 94.98% with minimum value of 16.26% and maximum value of 111.24%. The closest unit to C27 is C36 while the farthest is C3. By comparing unit C27 to unit C3 (which has the minimum distance to origin), we can see that unit C27 has to improve its operations 6.84 times to be as efficient as unit C3. With respect to only General Consumption ratio, unit C27 is worse than the best unit in this ratio by 12.48 times while it is better than the worst by 1.03 times. On the other hand, Operational Cost (OpEx) ratio data shows that unit C27 is worse than the best unit in this ratio by 5.5 times while it is better than the worst by 1.17 times.

Observation on Efficiency Frontier Results

The performance information on the building units presented is all based on the proportionality of the output to input ratios. The position of each of the studied buildings in the frontier line depends on their amount of inputs in relation to the reference units or 100% efficient units or in the level of revenue (output) in relation to the benchmark unit.

A couple of different things to observe that are interesting; one was as the study reduces the Capital Expenditures, sometimes this curve comes back in this direction, indicating that actually the Repair and Maintenance was increasing as the study reduce the Capital Expenditures. While, for the most part, owners do not want those sorts of portfolios. In other words, who wants a lower Capital Expenditures portfolio with more Repair and Maintenance? Moreover, the researcher typically looked only at portfolios above this line, as the study might have assumed, the name of this line is the efficient frontier. Furthermore, what does that mean, the efficient frontier? It means that there is essentially no building here, and that any building units that’s on this side of the frontier, is suboptimal in some way. The efficiency all proportional to the reference unit. This also does not mean the benchmark building is perfect. It is far from it. The units in the frontiers they still can improve their performance, but in the DEA analysis there is demonstrable measure the text to which they can improve their performance.

Unit C20 was able to achieve high efficiency with regard to Capital Expenditures (CapEx). It has the minimum ratio to Rental Revenue as shown in Figure (5.105). Compare this to unit C26 which has the maximum ratio with regard to Capital Expenditures (CapEx). However, the total rental revenue collected by C20 was more than 11 million per year while C26 had around 4 million. The main reason for C20 to be a benchmark is its ability to generate more revenue and with a certain level of input resources.

Chapter 6: DISCUSSION

6.0 Introduction

The main goal of this chapter is to discuss results presented in the previous chapter. As a starting point, the main issues discussed by this thesis will be presented. Then, analysis results will be summarized. After that, the relationship between the work presented in this thesis and the existing related works in literature will be highlighted. Finally, generalizability and significance of the results presented in this research will be evaluated.

6.1 Efficiency Metrics for Real Estate Management

This study was set to review and extract the CapEx, OpEx and other metrics for analysing the efficiency for real estate assets. It has extracted the following metrics:

6.1.1Capital Expenditure

The literature review has shown that multiple CapEx metrics include unit cost and historical comparisons, target percentage of existing replacement value comparison, trend analysis and comparisons to the budget of the current year (Klein, 2016). Along with these issues, variance becomes a core part of the budget's narrative. If the gathered requirements are greater than the funding guidance, then new CapEx planning regarding the effect of funding limitations defined by categories is devised. Here, a budget that enables resource allocation to be aligned to strategic goals and targets is set for each building asset. Forecasting tracks the expected performance of the building units, so that timely decisions can be taken to address shortfalls against the target, or maximize an emerging opportunity.

A fully integrated performance management framework is essential to provide corporate visibility of the activities that directly deliver growth and provide a clear framework for determining how to continuously allocate resources to support the management of the building assets (Masalskyte et al., 2014). They help in assessing the plan according to the available financial resources and then create a budget. A forecast surely helps in project estimates and budgeting, but, primarily, it has to do with planning. Real estate management uses various forecasting techniques for obtaining the total figure of the budget. It is crucial to know whether the budget is going to be constant. If the decrease or increase in the value over time is not accounted for, it can affect the budget estimates on a serious level (Masalskyte et al., 2014).

In addition, the literature shows that among the many core economic concepts related to CapEx, the most crucial one to comprehend is life-cycle costing (Ristimaki et al., 2013). If it is conducted properly, this procedure allows you to compare two different options—having varied anticipated lives or the total worth of an option over its anticipated life. It can further be used for comparing the benefits of outsourcing a service or retaining it in-house, for comparing two diverse choices of an equipment to perform the same job, or for determining whether a piece of equipment needs repair or replacement. Unfortunately, the application of life-cycle costing is very limited in real estate management (Ristimaki et al., 2013). If it is applied to real estate operations, it can assess whether a company should buy certain chain of costs while buying a building i.e. the price of ownership. Based on CapEx literature, this research selects the following metrics to represent the CapEx element in each building asset:

- Cost per square meter
- Cost per square meter (total cost/ total rentable area)
- Income/ expected income provided if rented all year round
- Rented time/ (rented time + under maintenance + marketing time)

These metrics used input to analyse the efficiency of each of the building asset units investigated in this study. The findings on these metrics are discussed in section 1.2.1

6.1.2Operating Expenditure

The literature relating to real estate operations stressed that OpEx is related to daily outgoings in operating a building and its associated physical assets. In the UAE, real estate operations consume nearly 50 to 75% of total budget available for real estate management (Apgar, 1993). These operations include general consumption (electricity and water) management, which is a very important aspect of the real estate OpEx (Mahadevan, 2015). A creative and consistent general consumption management system can save nearly 30 to 33% of the energy costs in a building (Mahadevan, 2015). Another metric of OpEx is maintenance, which is one of the most ignored real estate operations in the field of real estate management (Stein et al., 2017). Maintenance operations are very routine in nature (Stein et al., 2017). Their routine nature may create a false belief that they are not that important or central for real estate management, but, in reality, they play a huge rule.

Furthermore, a very important metric in OpEx of real estate assets is staffing (Azmi et al., 2015). For instance, the staff charged with maintenance and repair should be as technically proficient as possible. This is due to the fact that the maintenance and repair staff is responsible for reviewing all operations and activities in real estate management. In addition, inventory management serves a dual function (Geman & Tunaru, 2013) with relation to OpEx and CapEx. It allows the management to have a clear understanding of the different aspects that they have to manage. Additionally, it also helps in financial management where the idea of the value of the fixture, fittings and assets on the property can help in proper depreciation allocation.

The following metrics have been taken forward in the analysis:

1. Capital Expenditures (CapEx) including: (Cost) cost per square meter; (Global Cost) cost per square meter (total cost/ total rentable area); (Utilisation) income /expected income provided its rented all the year round; (Availability) rented time / (rented time + under maintenance + marketing time).
2. Operational Expenditures (OpEx) including: (Repair and maintenance) number of planned maintenance requests, number of unplanned repairs, percentage of planned maintenance completed on time, and percentage of unplanned repairs completed on time; (Cleaning) number of cleaning employees, equipment and material cost, and number of cleaning activities; (Energy) cost of kilowatt per hour; (Water) cost per meter cube; (General Consumption) electricity and water for general services; (Churn) percentage of new tenancies; (Security) number of security officers, number of security teams, and security equipment cost; (Insurance) building insurance fees, and equipment insurance fees; (Management and overall costs) employees' salaries, management fee per tenancy, and number of management team members; (Rent) average rent per building, rent per square meter, income per building, and percentage of rent collection rate; (Occupation Cost and Leasing) number of vacant units, percentage of expiring leases, percentage of cash return, and percentage of capitalization rate; (Debt) length of time in rent debts, percentage of overdue rent, and percentage of tenants with unpaid rent.
3. Building Characteristics: (Operational Characteristics) available rentable area, average unit cost per building, and percentage of rentable area to gross area; (Physical Characteristics) number of all units and average unit size.
4. Performance: (Rent) rental revenue and average rent lost due to vacant units; (Churn) time to re-let, and percentage of vacant units.

6.2 Discussion of Findings from the Descriptive Analysis

6.2.1 CapEx

Results presented in this research agree with works presented in the literature review chapter, where the general agreed upon fact is that there is an increasing number of real estate assets in many countries around the globe. For example, Ge and Guo (2014) showed that real estate assets are always increasing in China because the economy is expanding rapidly. In the recent decades, the same observation is witnessed in this study regarding the UAE. The number of real estate assets is increasing probably due to the fact that the UAE economy is accelerating.

In this study, fifty-seven real estate assets in the UAE were investigated. They were investigated based on three categories of performance metrics. The total number of metrics was forty-four. The first of these categories was the capital expenditure. Analysis of the collected data shows that the majority of the real estate assets achieved a moderate efficiency with regard to the performance of capital expenditure. Ge and Guo (2014) pointed out that the main source of performance inefficiency is due to the fact that the financing infrastructure in China is not coping with the rapid expansion of the economy. The same cannot be said about real estate infrastructure in the UAE. Results showed that most of the capital expenditure metrics achieved moderate to high efficiency.

On a similar note, studies covering other real estate markets like Germany (Schaefers, 2009), Singapore (Chiang et al., 2016), India (Roy and Kohli, 2016) and Taiwan (Hai-feng and Shuang, 2015) reach different conclusions with regard to CapEx efficiency. For instance, CapEx efficiency for real estate assets in Europe is moderately high (Hartmann, 2015). This is confirmed by Ge and Guo (2014) to some extent since European market management has very mature financing infrastructure. Furthermore, the same cannot be said for India (Roy and Kohli, 2016), where the financing infrastructure is not very advanced. Nevertheless, real estate management there is achieving good efficiency with regard to CapEx. Direct comparison against studies by Chiang et al. (2016) and Hai-feng and Shuang (2015) is problematic due to different scopes adopted with regard to this thesis and the nature of economy. These studies focused on the financial instrument related to real estate Capex and OpEx and other unrelated metrics to the work presented in this thesis. Moreover, this thesis is about the efficiency of building assets rather than companies. Hence, one cannot compare the results in a direct manner.

6.2.2OpEx

With regard to OpEx, work presented in Anderson et al. (2000) agrees with this study's presented results to some extent. They pointed out that the inefficiency of performance observed in real estate assets is mainly due to the inability to increase the profit margin instead of reducing cost. Although this study investigated the performance of assets, in an indirect way one can argue that the results presented in this thesis are comparable where the total potential improvements are mainly focused on increasing output performance. In other words, most of the investigated real estate assets are better if their management focused on increasing the rental revenue rather than reducing the operational cost of the services provided by the real estate asset.

For example, repair and maintenance metrics show that most of the real estate assets were facing a very high level of difficulty to achieve a high performance. More than half of the investigated real estate assets achieved very low efficiency with regard to repair and maintenance metrics. A similar observation can be seen in the insurance metric as well. In fact, the insurance category witnessed one of the worst performances with regard to the efficiency.

This suggests that there might be an extra burden put on building assets leading to lower return on investment.

The same cannot be said about findings, from Finland, China, India and Germany, in Masalskyte et al. (2014); Queena et al. (2013); Ran and Xu (2013); Roy and Kohli (2016); Schaefers (2009); Wang et al. (2015); and Yin et al. (2016). Researchers of these works argue that most of inefficiencies can be eliminated by reducing cost. It is worth mentioning that reducing cleaning costs will increase efficiency according to results in this thesis. This is a direct result of the fact that cleaning operations are fixed in terms of output (i.e. no need to clean what is already clean). Hence, the only way to improve efficiency is by reducing cost.

6.2.3Characteristics of the Assets

At the same time, the analysis shows that most of the studied assets were not able to fully utilise all physical characteristics of their real estate assets. Since data envelopment analysis was conducted on data collected from local real estate assets only, it can be concluded that many of the real estate assets can improve their performance with regard to utilisation.

6.3 Discussion of Findings from the DEA

6.3.1Efficiency

One of the most important aspects of studying efficiency in real estate management is to differentiate between different real estate assets. As the real estate market matures, the return form real estate assets will increase rapidly. Building assets management may try to optimise their operations so that they increase their output and rental revenue. However, one of the most important findings of this research shows that the size of the building does not really reflect on the level of the performance and efficiency. Keep in mind that larger buildings generate more rental revenue. Nevertheless, this does not mean that larger building size increases the efficiency as well. To the contrary, it may lead to decreasing the efficiency as larger buildings require a larger scale of operations, which increases the complexity of management. This requires more effort to achieve the same level of efficiency as seen in smaller buildings. It is worth mentioning that the analysis shows that large buildings with high CapEx are usually more efficient than large buildings with low CapEx. A possible reason for this observation is the pressure put on management of real estate assets which have high level of capital expenditure to achieve better results to justify such expenditure.

Keep in mind that building size can be considered a proxy for other performance metrics such as CapEx and OpEx metrics. Larger buildings tend to have larger CapEx and larger OpEx. Therefore, argument in the previous paragraph can be applied to these metrics as well. However, analysis shows that some of these metrics do not totally agree with this argument where efficiency decreases as the size increases. For instance, rent per Unit metric usually decreases as the size of the building increases due to economy of scale effect. This research found that decreasing these metric results in increasing the efficiency (Kenton, 2019). Such behaviour introduces complexity that shapes efficiency of real estate assets. Hence, the main finding of this thesis lies in the fact that any serious analysis of the efficiency of real estate assets must include many performance metrics so that the whole picture is totally understood.

6.3.2 Potential Improvement

Some of the real estate assets existing in the market were able to achieve way better performance than the majority. Analysing total potential improvement showed that performance of capital expenditure is dependent on both of inputs and outputs of the investigated operations metrics. The possible total potential improvement is equally distributed among both inputs and outputs. However, this cannot be said about the cleaning category, where most of the improvement can be achieved by increasing the outputs of the operations. This does not mean that inputs of cleaning metrics do not play a huge role in total potential improvement. In fact, they take almost more than twenty-five per cent of possible potential improvement. The same observation goes to the security category as well, where metrics of this category can be potentially improved by increasing the improvement of outputs of the operation. The rest of the categories of performance have to some extent an equal distribution of total potential improvement of either inputs or outputs.

Another aspect of evaluation and analysis shows similar behaviour around observations with regard to the efficiency of real estate assets' performance in the UAE in general. Most of the real estate assets investigated can be considered moderate with regard to performance, based on few of the investigated categories. However, for the majority of the categories, investigation shows that major potential improvement can be achieved with regard to the efficiency of management performance. As real estate market growth is expected, real estate assets will find a better approach is to improve performance efficiency. At the same time, the growth of real estate market will lead to the increase in the number of real estate assets, which will increase competition among these assets. In addition, it will lead to the increase of real estate specialization and customer segmentation which may have a positive impact on the real estate performance.

Keeping in mind that while many works in literature relate to the work presented in this thesis, a lot of research exists with regard to real estate efficiency that does not really align with the research presented in the thesis. For example, there is a lot of literature that focuses on the performance efficiency with regard real estate construction aspects (Jin et al., 2015; Li et al., 2014). This research has provided insight into the performance of real estate building assets.

The results from this study can be used to aid investment and management of assets. Also, the results can be utilised to optimise the input resources in relation to the performance or revenue from the assets.

6.4 Interpreting of the Results

The overall improvement summary indicates that the real estate owners have the greatest potential in raising their revenue if the operational aspects can be managed well (see Figures 5.3 and 5.4). Therefore, asset managers should expect to gear their effort towards the FM areas that are deficient. The efficiencies discovered in this study would usually be taken as indicative of the fact that building assets in the benchmark set use management practices, which, if less efficient buildings managers were to adopt, would enable them to improve the performance of their assets.

The results clearly demonstrated the presence of specific areas of inefficiency by giving data on the comparative reduction in specific inputs and the proportional increase in specific revenue parameters. The results in this study are in line with the view that life-cycle costing is an essential element of CapEx and OpEx management of real estate assets (Ristimaki et al., 2013). The results also demonstrate that the capital spent per square meter to build the asset has direct influence on the efficiency of OpEx and revenue outcomes.

The inefficiency discovered in this study confirms the findings by Apgar (1993) and Mahadevan, (2015). The authors pointed that in the UAE, real estate general consumption of electricity and water consume over 50% of the total budget available for real estate management. A creative and consistent general consumption management system can save nearly 30 to 33% of the energy costs in a building (Mahadevan, 2015).

The results in this study are consistent with findings in Masalskyte et al. (2014); Queena et al. (2013); Ran and Xu (2013); Wang et al. (2015); Yin et al. (2016); Roy and Kohli (2016); and Schaefers (2009), who examined real estate assets in Finland, China, India, and Germany, respectively. Researchers of these works argue that most of inefficiencies can be eliminated by reducing cost. The results presented this paper are also along the lines of the findings in Kenton (2019). The author pointed out that decreasing these metrics results in increasing the efficiency.

Almost all the assets in the sample suffered from deficiency in maintenance and repair, probably due to bad construction methods in the first place or huge turnover between occupants. Findings related to the effect of deficiency of maintenance on a building overall performance and life-cycle were also found in Zhang et al. (2014), who studied residential units in Canada. Another finding that is important to note is that building assets in the sample are not able to manage insurance expenses.

In general, the results show that assent managers have not been able to use their FM operational resource input effectively to generate higher revenue outputs. On the long run, this implies that the building sample in this study used more inputs to produce relative less income to the investors. The three buildings that have shown complete efficiency indicate that their managers were busy minimising inputs to achieve better proportional yield when equated to other sampled buildings. This means that the management of these real estates were successful in using their relative input resources to generate income relatively better than peer real estate in the sample.

This type of information will help real estate managers to work towards improving the performance of their assets towards the efficiency frontier in relation to revenue performance. A fully integrated performance management framework is essential to provide corporate visibility of the activities that directly deliver growth and provide a clear framework for determining how to continuously allocate resources to support the management of the building assets (Masalskyte et al., 2014).

Following the above analysis, one could suggest that investigated buildings are technically inefficient under a constant return to scale assumption. Further work should take into consideration the size in terms of asset base of the real estate companies**.**

Chapter 7: CONCLUSION

The main goal of this chapter is to provide concluding remarks of the present study. It revisits research objectives and discusses how they are achieved and realised. Also, this chapter highlights challenges and limitations faced in this thesis. Finally, it suggests some future research to expand this work and build on it.

7.1 Accomplishing Research Objectives

This research focused on analysing performance efficiency in real estate buildings. It elected the following as the main research objectives:

Objective1: To identify the most important performance metrics which are the most relevant to efficiency analysis of real estate building assets.

This objective was achieved in the second chapter of the present study; an all-embracing literature review was conducted to find out the most useful performance metrics in real estate management literature in the second chapter. Then, the importance of these metrics was highlighted with their associated operations in the third chapter where inputs metrics were categorised as well as output metrics. In accomplishing this objective this study has reached the following conclusions:

- The importance of a performance metric may not be the same from real estate assets to others. Energy consumption metrics and space utilisation metrics are less important than CapEx metrics. This is due to the fact that the UAE is very rich in terms of energy, which reduces its cost. Similarly, space is not a constraint since the local real estate market is relatively young.

- There are many performance metrics in literature which are quite customised to specific portions in real estate industry.
- Further, one of the most efficient performances for the Rental Revenue (PR1) metrics from Capital Expenditures (CapEx) has achieved the highest performance in analysis; this is due to the fact that UAE properties continued to provide high rental yields despite sales prices and rents softening in the first half of the year, according to a report by real estate listings portal, Property Finder. Dubai properties consistently offer rental yields of more than 7 per cent on average, which compares favourably with other major cities. Average rental yields in New York stand at 2.9 per cent, London 2.7 per cent, Singapore 2.5 per cent and Hong Kong 2.4 per cent (Rahman, F. 2019).

Objective 2: To construct a model for investigating the relationship between input and output performance metrics.

The achievements of this objective are presented in chapter three. The relationship between each inputs category and output metrics was established from theory and conceptually modelled. In accomplishing this objective, this study has reached the following conclusions:

- Real estate performance metrics are highly correlated. For instance, rental revenue is positively correlated with cost per square foot. Also, it is negatively correlated with the number of vacant units. There are very few metrics that are not highly correlated. For example, the number of vacant units is mildly correlated with cost per square foot.
- Dependency of performance metrics is exposed to external factors. For example, level of wealth of customer segmentation (the standard of living) may increase the impact of one metric over the other. Rent per unit is more exposed to cost per square foot when this metric is high compared to others in the real estate market.

- Many performance metrics are connected indirectly through other metrics. For instance, Rental Revenue is connected to Available Rental Space through Number of Rentable Units.
- These metrics were divided into subcategories according to their relationship to (CapEx) and (OpEx) management to discuss the connection between different metrics belonging to different subcategories. For example, the study suggested a set of Rent with Churn subcategories has 1 input and 5 outputs. On the other hand, the effect of cost per square meter on time to re-let constitutes the difficulty of renting expensive units. The relation between cost per square meter and the percentage of vacant units is established based on the same narrative. Hence, both cost per square meter and percentage of occupancy rate have a strong negative correlation.

Objective 3: To conduct an extensive performance efficiency analysis based on data envelopment analysis to identify the less efficient real estate units

The achievements of this objective are presented in Chapter 5; analysis results were consistent and insightful. Accomplishing this objective, this study has reached the following conclusions:

- Total potential improvement statistics from Capital Expenditures (CapEx) for Physical Characteristics. The following metrics are the less efficient (CR1Cost) Cost per square meter, (CR4 Utilisation) Income /expected income provided it's rented all the year-round, (CR5 Availability) rented time / (rented time + under maintenance + marketing time), (PC1 Churn) Time to re-let, and (PC2 Churn) Percentage of vacant units. The purpose here was to identify the most efficient real estate assets that use the least resources to lead to the maximum revenue at or above the performance standard of other real estate asset units. This was achieved through the identification of the amount of excess CapEx and OpEx resources used by each of the less efficient real estate units.

- Most of the real estate assets in this investigation can be considered moderate with regard to efficiency in terms of CapEx metrics. Nevertheless, OpEx metrics experience a wider range of efficiency values.
- The study indicated that the essential potential improvement can be achieved with regard to the efficiency of management performance, especially for OpEx metrics.

Objective 4: To identify the amount of excess input/output resources used by each of the less efficient real estate units

The achievements of this objective are presented through investigation of data analysis; the relationship between each inputs category and output metrics was established. In accomplishing this objective, this study has reached the following conclusions:

- As operational expenses make up the bulk of a building asset's regular costs, management typically looks for ways to reduce operating expenses without causing a critical drop in quality output.
- It is important to note that sometimes an item that would ordinarily be obtained through capital expenditure can have its cost assigned to operating expenses if a building asset management chooses to lease the item rather than purchase it. This can be a financially attractive option if the building asset management has limited cash flow and want to be able to deduct the total item cost for the year.
- On the other hand, some building operation expenses, such as purchases of new information technology innovations, can lower net income over the short term but raise

income potential over the long term. Capital expenses on equipment and other fixed assets can be depreciated over several years, lowering the immediate impact on profits.

Objective 5: To identify the ability to increase performance for less efficient real estate units without requiring additional resources

The achievements of this objective are presented in Chapter 5 where the analysis and results based on collected data are presented. Therefore, the objective was achieved by performing multiple extensive analyses; results were consistent and insightful. Accomplishing this objective, this study has reached the following conclusions:

- The real estate assets in the study can be considered moderate with regard to efficiency in terms of CapEx and the OpEx metrics experience a wider range of efficiency values.
- Investigation shows that major potential improvement can be achieved with regard to the efficiency of management performance, especially for CapEx and the OpEx metrics through renewal units rent.

7.2 Conclusion

Real estate renting sectors respond to internal microeconomic and external macroeconomic upheavals that influence the trend of the efficiency and productivity of the UAE real estate market. The revenue from rent largely reflects the general situation of the economy. This study investigated the efficiency for a sample 57 real estate assets for the year-2012-2016. DEA was used for operational inefficiency i.e.; inputs are not managed properly, or inefficiency is due to the level of revenue. Only there were three buildings that were found to be efficient among the sampled set.

Scores of efficiencies ranged from 7% to 99% in some of the models. This implied that managers need to considerably reduce the operational resources (input) of their inputs. Result also showed that 95% of the building assets in the sample are by large operating at decreasing returns to scale (if output increases by less than that proportional change in inputs). This phenomenon is attributed to the managerial inefficiency caused by rises in input expenses (operational costs) that were not converted to adequate revenue. Thus, the study demonstrated that building assets underperform in the utilization of inputs to create optimum revenue.

This study therefore recommends that the managers of the inefficient building assets should benchmark their operational aspects of with the management of the efficient in the sampled data set. Further research is required to study the managerial causes behind underperform assets.

The sole purpose of this work was to compare the FM operation efficiency in relation to the revenue. Consequently, any change in the sample under consideration would modify the relative efficiency measures and the consequences associated with them. In other words, interpolation and extrapolation of information is only valid within this set of building assets.

7.3 Contributions to Knowledge

This research contributes to the existing body of literature on real estate management with the following main contributions:

- The present investigation, to the best of author knowledge, is the first to study the inefficiency with respect to the use of individual inputs-outputs metrics in the UAE building real estates. Other studies elsewhere tend to analyse efficiency measures based on global (not aggregated) input, without knowing the contribution of each input on the micro-level to the overall performance of the building assets.
- The first contribution of this thesis manifests in the collection of vast number of performance metrics for real estate management. These metrics were analysed together

to find out the relationships among them. Literature lacks research where tens of performance metrics were investigated at the same time on the same dataset. Modelling the interaction and impact of each metric on the overall efficiency of real estate management is a very important contribution to the literature. By doing so, one can weigh each metric impact in relation to other metrics, which can have a very significant influence on real estate efficiency analysis.

- Data on input-output inefficiency levels are of paramount importance to real estate policy makers in term of creating management policies to drive efficiency levels. This type of study is of paramount importance to measure the effectiveness of management policies.
- The results from this are of importance to building asset management seeking to improve the performance imputes leading to better decision-making.
- Another contribution is the fact that this research has expanded literature by conducting an extensive study on real estate assets in the UAE as a representative of emerging economies. Real estate industry plays a huge role in the UAE economy. It is one of the main sources of economic progress. Due to increased population size, number of real estate organization is increasing rapidly. These assets expand a wide range of facilities, and they serve different segments of customers' base.
- Furthermore, an additional contribution of this research is related to the real estate assets nature and the selection of dataset. A great deal of care was given so that the collected data is oriented around management performance of building assets. The high standard of living combined with strong authority and regulations allowed real estate industry to thrive by providing a consistent environment of operations. This creates a unique situation where the variability of performance between real estate assets is mostly due to the management style. Performance of different real estate assets may depend merely

on their management. As a result, efficiency of performance will be a very important aspect to understand in such an emerging market especially for external investors or internal regulators. There is an extreme lack of studies performed in this regard, which this research contributes to mitigating.

- Moreover, this research contributes to literature by investigating diverse characteristics of real estate management operations. Most of the existing studies focused on regular financial performance. However, different aspects of management operations are very important as well to understand the whole picture of real estate environment. These aspects include insurance, debt, maintenance operations, cleaning operations, and many others. By analysing these overlooked aspects, many insights were found which are very important in a practical sense.

To summarize, work in this research tries to address two main issues: expanding the definition of real estate performance outside financial performance domain and investigating the uniqueness of real estate industry in emerging economy by utilising local data only. This thesis tackled these issues by utilising the Data Envelopment Analysis approach.

7.4 **Research Challenges and Limitations**

Several challenges were faced during this research. One of the most difficult challenges was acquiring very detailed data to provide different degrees of granularity. Generally speaking, since detailed information on building assets may be considered confidential, hardly any real estate assets are willing to provide detailed information about every aspect of building assets such as revenue, expenses, losses, or profits. Some are willing to provide only, if any, non-financial annual data for the whole building. This creates a challenge for all research investigating this field. Consequently, one limitation of this research is the inability to go deeper in analysing every detailed aspect of the building assets.

Another challenge was related to the timing of the research. Data used in this study was collected during the period 2012-2016. In this period, the UAE witnessed slowing economic growth due to the drop of oil prices. This impacted rental revenue negatively. One may argue that real estate management took a longer time to realise the change of economic situation and they did not alter their management style to address this change, which may have led to reduced efficiency. This will introduce the limitation of unfairness of the analysed results. The constraints of the investigation rotate around variables, for example, restricted example size, non-accessibility of information for the aforementioned periods, low straightforwardness in uncovering some monetary subtleties and non-accessibility of yearly industry midpoints.

Furthermore, previously, laws concerning off-plan property sales in Abu Dhabi were a legal blind-spot that caused ambiguity and failure in securing the interests of the investors. However, the establishment of Law Number 3 of 2015 on the Regulation of Real Estate Sector in Abu Dhabi came as a relief since it had explicitly mentioned the provisions regarding off-plan sales. The salient off-plan features of this legislation include the establishment of the interim register and escrow that had already been established in Dubai a few years ago.

Therefore, the significant features of the new Law, concerning Article 15 of the new Law, is that the developers are not allowed to sell any unit unless they fulfil the conditions as stated. The most significant feature is that the developers—apart from getting a license from Department of Economic Development— are required to obtain an NOC from the Department of Municipal Affairs (DMA) that they are eligible to undertake the development of such real estate project, which ensures the qualification of the developer and its professional capacity. This requirement as to NOC is a significant aspect of curbing: (i) any mismanagement of the real estate project where the interest of the public is involved at large; and (ii) the developer breaches its obligations and misuses its position and entitlements. Earlier, the terms of the agreement signed between parties were binding. However, the absence of regulations has deprived several investors from their legitimate rights.

7.5 Recommendations for Further and Future Research

The first suggested future work is to conduct another data collection which covers a longer period of time so that a wider understanding of performance efficiency can be achieved. Another suggestion for future work is to sub-divide real estate assets under consideration into sub-groups with more common characteristics. For example, one may group these real estate assets based on the average income of the occupants. However, such attempt will require collecting more detailed data. Nevertheless, it will provide the chance to shed light on some aspects that may explain sources of inefficiency. To illustrate, imagine a luxuries real estate building. Analysis may show very low efficiency with regard to electricity and water consumption. If detailed data is available, water and electricity consumption related to luxurious facilities such as swimming pools with warm water can be excluded during general analysis of the whole market. At the same time, it can be included for the specific group analysis.

The research needed to approach the new science of assessment envisioned by the researcher needs to focus on those issues that lie at the intersection of cognitive and measurement science. In this section, we present the recommendations for research organized into three broad categories: (1) synthesis of existing knowledge, (2) research to expand the current knowledge base, and (3) some initial steps for building the knowledge base.

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APPENDICES

Appendix 1: Efficiency Data

Table 1: Efficiency data for Capital Expenditures (CapEx) in 2012

Building	Efficiency	Input				Output				Reference Set
		CR 1	CR 3	CR 4	CR 5	PR 1	PR 2	PC 1	PC 2	
C 1	88.89	- 14.7	- 11.1	- 24.4	- 11.1	125.5	- 24.3	0	- 24.3	C 12, C 20
C 10	87.67	- 15.5	- 35.9	- 18.2	- 12.3	18.4	0	0	- 38.6	C 12, C 23
C 11	96.33	- 9.8	- 20.1	- 3.7	- 3.7	0	- 14.5	0	- 7.4	C 12, C 3, C 51
C 12	100	0	0	0	0	0	0	0	0	NA
C 15	92.18	- 18.2	- 53.8	- 7.8	- 7.9	0	0	0	0	C 23, C 19, C 67, C 31
C 156	100	0	0	0	0	0	0	0	0	NA
C 16	88.28	- 21.5	- 23.1	- 14.8	- 11.7	89.3	0	0	- 69.5	C 12, C 23
C 18	91.82	- 8.6	- 8.2	- 15.2	- 8.2	0	0	0	0	C 12, C 23, C 20, C 37, C 78
C 19	100	0	0	0	0	0	0	0	0	NA
C 20	100	0	0	0	0	0	0	0	0	NA
C 21	95.52	- 11.1	- 4.5	- 38	- 4.5	42.9	0	0	- 2.8	C 12, C 23, C 20
C 23	100	0	0	0	0	0	0	0	0	NA
C 24	92.56	- 7.4	- 7.4	- 7.4	- 10.8	72.3	- 17.6	0	0	C 20, C 31, C 37, C 36
C 26	87.07	- 19.6	- 74.8	- 12.9	- 12.9	205.6	0	0	- 11.5	C 12, C 23, C 20
C 27	93	- 8.4	- 28.6	- 19.7	- 7	295.8	- 62.4	0	0	C 12, C 9
C 28	89.13	- 15.7	- 40.8	- 33.2	- 10.9	223.4	- 32.1	0	- 1.8	C 12
C 29	87.67	- 18.3	- 34.4	- 14.4	- 12.3	122.4	- 44	0	- 69.3	C 12
C 3	100	0	0	0	0	0	0	0	0	NA
C 30	100	0	0	0	0	0	0	0	0	NA
C 31	100	0	0	0	0	0	0	0	0	NA
C 32	90.9	- 9.1	- 9.1	- 9.1	- 9.1	20.7	- 67.8	0	0	C 12, C 19, C 20, C 37, C 36
C 33	88.28	- 15	- 31	- 18.5	- 11.7	10.9	- 39.8	0	- 0.9	C 12
C 34	100	0	0	0	0	0	0	0	0	NA
C 35	100	0	0	0	0	0	0	0	0	NA
C 36	100	0	0	0	0	0	0	0	0	NA
C 37	100	0	0	0	0	0	0	0	0	NA
C 38	100	0	0	0	0	0	0	0	0	NA
C 39	86.23	- 13.8	- 26.8	- 29.8	- 14.3	124.4	0	0	0	C 12, C 38, C 36
C 40	94.17	- 11.8	- 30.9	- 25.4	- 5.8	143.3	- 18.5	0	- 58.7	C 12
C 41	100	0	0	0	0	0	0	0	0	NA
C 42	93.6	- 11.9	- 6.4	- 6.4	- 6.4	0	- 9.3	0	0	C 19, C 34, C 67, C 31, C 78
C 43	90.14	- 17.2	- 60.5	- 9.9	- 9.9	22.2	0	0	- 49.7	C 12, C 20
C 45	98.46	- 2.5	- 66	- 1.5	- 1.5	70.9	0	0	- 18	C 12, C 23, C 20
C 47	93.1	- 6.9	- 34.9	- 12.9	- 6.9	104.8	0	0	0	C 12, C 23, C 9, C 78
C 49	100	0	- 20.5	- 30.3	0	14.5	0	0	0	NA
C 491	89.51	- 10.6	- 41.3	- 27.7	- 10.5	208.4	- 1.8	0	- 39.8	C 12
C 50	90.34	- 10.2	- 9.7	- 16.6	- 9.7	0	0	0	- 60.3	C 12, C 156, C 3, C 37
C 51	100	0	0	0	0	0	0	0	0	NA
C 52	97.64	- 2.4	- 2.4	- 2.4	- 5.2	0	0	0	0	C 156, C 3, C 35, C 31, C 37, C 78
C 53	99.51	- 6.7	- 26.1	- 0.5	- 3.7	0	0	0	0	C 23, C 19, C 51, C 31
C 54	92.09	- 12.1	- 49.7	- 7.9	- 7.9	71.4	0	0	- 21.6	C 12, C 23, C 20
C 58	94.12	- 11.4	- 22.1	- 15.9	- 5.9	124.6	- 51.4	0	- 38	C 12
C 59	97.95	- 10.7	- 46.8	- 21.6	- 2.1	281.6	0	0	- 10.7	C 12, C 23
C 60	98.3	- 8.7	- 31	- 8.3	- 1.7	155.2	0	0	- 67.6	C 12, C 23
C 61	98.1	- 7.9	- 19.9	- 1.9	- 1.9	0	- 3	0	0	C 12, C 9, C 20, C 78
C 62	100	0	0	0	0	0	0	0	0	NA
C 63	95.2	- 6.3	- 29.3	- 4.8	- 4.8	69.6	0	0	- 40.7	C 12, C 20
C 65	92.21	- 13.3	- 46.6	- 28.3	- 7.8	0	0	0	- 32.8	C 12, C 23, C 3
C 67	100	0	0	0	0	0	0	0	0	NA
C 69	96.36	- 10.4	- 3.6	- 29.2	- 3.6	40.7	0	0	- 19.8	C 12, C 23, C 20
C 7	87.5	- 13.8	- 18.1	- 12.5	- 12.5	25.8	0	0	0	C 23, C 19, C 67, C 78
C 70	90.8	- 10.7	- 37.9	- 9.2	- 9.2	22.9	0	0	0	C 12, C 23, C 9, C 20
C 71	89.11	- 10.9	- 29.7	- 10.9	- 12.3	0	0	0	0	C 12, C 23, C 19, C 31, C 78
C 72	99.94	- 0.3	- 0.1	- 12.8	- 0.1	111.2	- 62	0	0	C 9, C 20, C 78
C 77	96.24	- 8.6	- 3.8	- 21	- 3.8	51.5	0	0	- 37.8	C 12, C 23, C 20
C 78	100	0	0	0	0	0	0	0	0	NA
C 9	100	0	0	0	0	0	0	0	0	NA

Table 2: Efficiency data for Repair and maintenance in 2012

Building	Efficiency	Input				Output				Reference Set
		OR 1	OR 2	OR 3	OR 4	PR 1	PR 2	PC 1	PC 2	
C 1	51.32	- 49.9	- 55.3	- 48.7	- 48.7	53.9	- 64.9	0	0	C 7, C 58, C 62
C 10	63.96	- 72	- 36	- 36	- 36	0	0	0	- 16.6	C 30, C 3, C 62, C 63, C 51
C 11	100	0	0	0	0	0	0	0	0	NA
C 12	77.39	- 39.3	- 25.7	- 22.6	- 22.6	0	0	- 10	0	C 23, C 62, C 33, C 78
C 15	81.88	- 18.1	- 18.1	- 18.1	- 18.1	88.5	- 100	0	0	C 30, C 3, C 62, C 51, C 78
C 156	100	0	0	0	0	0	0	0	0	NA
C 16	50.01	- 57.8	- 50	- 50	- 50	18.1	0	0	- 40.3	C 30, C 58, C 62, C 491
C 18	72.11	- 27.9	- 27.9	- 27.9	- 27.9	0	- 100	0	0	C 30, C 3, C 62, C 63, C 51, C 78
C 19	73.57	- 26.4	- 26.4	- 26.4	- 26.4	96.3	- 48.8	0	0	C 58, C 62, C 63, C 60, C 78
C 20	65.75	- 34.3	- 34.3	- 34.3	- 34.3	18.2	0	0	0	C 30, C 58, C 62, C 63, C 491, C 78
C 21	60.33	- 43.7	- 39.7	- 39.7	- 39.7	13.9	0	0	0	C 30, C 58, C 62, C 491, C 78
C 23	100	0	0	0	0	0	0	0	0	NA
C 24	53.04	- 60	- 47	- 47	- 47	79.5	- 31.5	0	0	C 7, C 58, C 62, C 78
C 26	78.28	- 21.7	- 21.7	- 35.5	- 21.7	96	- 100	0	0	C 30, C 59, C 63, C 78
C 27	87.64	- 12.4	- 12.4	- 12.4	- 12.4	119.8	- 17.8	0	0	C 58, C 62, C 63, C 60, C 78
C 28	70.64	- 29.4	- 45.9	- 29.4	- 67.7	180.1	0	0	0	C 30, C 62, C 51, C 78
C 29	70.37	- 29.6	- 29.6	- 29.6	- 29.6	15.4	- 100	0	- 21.5	C 30, C 59, C 62, C 63
C 3	100	0	0	0	0	0	0	0	0	NA
C 30	100	0	0	0	0	0	0	0	0	NA
C 31	74.24	- 34.9	- 45.6	- 25.8	- 25.8	0	- 91.7	0	0	C 7, C 62, C 51, C 78
C 32	75.07	- 46.4	- 24.9	- 39.9	- 24.9	0	- 39.6	0	- 60.9	C 63, C 491, C 78
C 33	100	0	0	0	0	0	0	0	0	NA
C 34	100	- 25.1	0	0	- 20.8	0.7	0	- 7	0	NA
C 35	100	0	0	0	0	0	0	0	0	NA
C 36	82.27	- 17.7	- 17.7	- 17.7	- 17.7	102.1	- 7.6	0	0	C 58, C 62, C 63, C 60, C 78
C 37	88.94	- 17.3	- 11.1	- 21.7	- 11.1	0	0	0	- 63.7	C 30, C 3, C 62, C 63
C 38	100	- 18.4	- 18.4	0	0	56.6	0	0	0	NA
C 39	65.19	- 34.8	- 34.8	- 34.8	- 34.8	49.2	0	0	0	C 30, C 58, C 62, C 63, C 60, C 78
C 40	78.31	- 77.1	- 27.5	- 21.7	- 21.7	98.8	0	0	0	C 30, C 7, C 58, C 62
C 41	58.07	- 41.9	- 44.5	- 41.9	- 41.9	0	- 90.8	0	0	C 7, C 58, C 62, C 51, C 78
C 42	81.46	- 18.5	- 18.5	- 18.5	- 19.5	78.7	- 52.8	0	0	C 3, C 62, C 51, C 78
C 43	64.14	- 46.7	- 35.9	- 35.9	- 35.9	0	0	0	- 24.3	C 30, C 3, C 62, C 63, C 51
C 45	89.94	- 69.3	- 45.8	- 10.1	- 10.1	86.5	- 52.9	0	0	C 7, C 58, C 62
C 47	89.67	- 26.5	- 10.3	- 10.3	- 10.3	18.2	- 100	0	0	C 30, C 63, C 70, C 78
C 49	100	- 72.2	- 72.2	0	0	0	0	0	0	NA
C 491	100	0	0	0	0	0	0	0	0	NA
C 50	78.34	- 61.9	- 21.7	- 21.7	- 21.7	0	0	- 2.4	- 58.6	C 30, C 3, C 62, C 51
C 51	100	0	0	0	0	0	0	0	0	NA
C 52	65.01	- 39.5	- 35	- 35	- 35	0	0	0	0	C 30, C 3, C 62, C 63, C 51, C 78
C 53	87.54	- 25.6	- 12.5	- 38	- 12.5	10.1	0	0	0	C 30, C 59, C 63, C 78
C 54	72.3	- 45.2	- 47.6	- 27.7	- 27.7	40.3	0	0	0	C 30, C 7, C 58, C 62
C 58	100	0	0	0	0	0	0	0	0	NA
C 59	100	0	0	0	0	0	0	0	0	NA
C 60	100	0	0	0	0	0	0	0	0	NA
C 61	89.43	- 10.6	- 48.2	- 10.6	- 69.9	17.4	0	0	0	C 30, C 62, C 51, C 78
C 62	100	0	0	0	0	0	0	0	0	NA
C 63	100	0	0	0	0	0	0	0	0	NA
C 65	100	0	0	0	0	0	0	0	0	NA
C 67	68.4	- 31.6	- 31.6	- 31.6	- 31.6	64.6	0	0	0	C 30, C 58, C 62, C 63, C 491, C 78
C 69	78	- 22	- 22	- 22	- 50.6	63.6	0	0	0	C 30, C 3, C 62, C 51, C 78
C 7	100	0	0	0	0	0	0	0	0	NA
C 70	100	0	0	0	0	0	0	0	0	NA
C 71	71.98	- 66.7	- 28	- 28	- 28	0	- 57.5	0	0	C 7, C 58, C 62, C 51, C 78
C 72	91.49	- 8.5	- 8.5	- 8.5	- 27.8	97.7	- 100	0	0	C 30, C 63, C 51, C 78
C 77	78.74	- 21.3	- 21.3	- 21.3	- 43.6	40.2	- 100	0	0	C 30, C 3, C 62, C 51
C 78	100	0	0	0	0	0	0	0	0	NA
C 9	67.12	- 32.9	- 32.9	- 32.9	- 32.9	87.9	0	0	0	C 30, C 58, C 62, C 63, C 60, C 78

Table 3: Efficiency data for Cleaning in 2012

Building	Efficiency	Input			Output				Reference Set
		OC 1	OC 2	OC 3	PR 1	PR 2	PC 1	PC 2	
C 1	89.8	- 25.3	- 10.2	- 10.2	80	0	0	- 46.2	C 23, C 31, C 37
C 10	87.86	- 16	- 12.1	- 12.1	0	- 32.5	0	- 16.7	C 12, C 31, C 37
C 11	100	0	0	0	0	0	0	0	NA
C 12	100	0	0	0	0	0	0	0	NA
C 15	92.58	- 47.3	- 7.4	- 7.4	50.7	0	0	- 32.3	C 23, C 31, C 37
C 156	100	0	0	0	20.5	0	- 14.7	0	NA
C 16	88.38	- 11.6	- 11.6	- 11.6	31.1	- 45.3	0	- 55.2	C 20, C 72, C 37
C 18	91.78	- 42.5	- 8.2	- 8.2	0	- 43	0	0	C 12, C 9, C 72, C 37
C 19	100	0	0	0	129.9	- 47.5	0	- 41.1	NA
C 20	100	0	0	0	0	0	0	0	NA
C 21	100	0	0	0	0	0	0	0	NA
C 23	100	0	0	0	0	0	0	0	NA
C 24	89.35	- 10.7	- 10.7	- 10.7	35.5	- 34.2	0	- 52.1	C 20, C 72, C 37
C 26	88.02	- 44.1	- 12	- 12	241.8	0	0	- 55.3	C 23, C 31, C 37
C 27	93	- 7	- 7	- 7	193.2	- 73.7	0	0	C 12, C 9, C 20, C 37
C 28	89.26	- 43.6	- 10.7	- 10.7	96.2	- 74.5	0	0	C 9, C 72, C 37
C 29	87.98	- 12	- 12	- 12	1.6	- 11	0	- 77.6	C 20, C 72
C 3	100	0	0	0	0	0	0	0	NA
C 30	100	0	0	0	172	0	- 14.7	0	NA
C 31	100	0	0	0	0	0	0	0	NA
C 32	90.78	- 9.2	- 9.2	- 9.2	35.6	- 51.1	0	0	C 12, C 9, C 20, C 37
C 33	100	0	0	0	0	0	0	0	NA
C 34	100	0	0	0	0	0	0	0	NA
C 35	100	0	0	0	0	0	0	0	NA
C 36	99.78	- 57.7	- 0.2	- 0.2	0	0	0	0	C 12, C 23, C 9, C 72, C 78
C 37	100	0	0	0	0	0	0	0	NA
C 38	100	0	0	0	88.7	0	- 14.7	0	NA
C 39	85.59	- 14.4	- 22.5	- 14.4	0	0	0	0	C 23, C 9, C 20, C 72
C 40	100	0	0	0	0	0	0	0	NA
C 41	94.12	- 44.2	- 5.9	- 5.9	0	- 44.6	0	0	C 12, C 9, C 72, C 78
C 42	92.62	- 47.6	- 7.4	- 7.4	0	- 66.5	0	0	C 12, C 9, C 72, C 37
C 43	90.14	- 42	- 9.9	- 9.9	31.9	- 27.9	0	- 49.4	C 12, C 37
C 45	98.46	- 13	- 1.5	- 1.5	131	- 49	0	- 26.4	C 12, C 37
C 47	94.54	- 33.4	- 5.5	- 5.5	0	0	0	- 31.2	C 23, C 21, C 72, C 31
C 49	100	0	0	0	116.1	0	- 14.7	0	NA
C 491	89.8	- 10.2	- 10.2	- 10.2	94.8	- 52.8	0	- 47.5	C 20, C 72, C 37
C 50	100	0	0	0	0	0	0	0	NA
C 51	93.44	- 6.6	- 6.9	- 6.6	0	- 60.5	0	- 35.1	C 12, C 20, C 50
C 52	100	0	0	0	0	0	0	0	NA
C 53	96.59	- 35.8	- 3.4	- 3.4	57.3	0	0	- 49.2	C 23, C 72, C 31
C 54	92.14	- 13.9	- 7.9	- 7.9	73.8	- 62.3	0	0	C 9, C 72, C 37
C 58	99.62	- 0.4	- 0.4	- 0.5	0	- 41.9	0	0	C 72, C 63, C 40, C 11
C 59	98.08	- 1.9	- 1.9	- 1.9	117.4	- 35.9	0	0	C 9, C 20, C 72, C 37
C 60	100	0	0	0	0	0	0	0	NA
C 61	98.54	- 42.8	- 1.5	- 1.5	0	0	0	0	C 12, C 23, C 72, C 31, C 78
C 62	87.67	- 12.3	- 12.3	- 12.3	1.5	- 47.1	0	- 60.4	C 12, C 20, C 37
C 63	100	0	0	0	0	0	0	0	NA
C 65	100	0	0	0	0	0	0	0	NA
C 67	98.52	- 44.3	- 1.5	- 1.5	24.9	0	0	0	C 23, C 9, C 72, C 37
C 69	96.36	- 29.3	- 3.6	- 3.6	69.7	- 18	0	- 27.7	C 12, C 37
C 7	95.98	- 36.7	- 4	- 9.1	0	0	0	0	C 23, C 21, C 34, C 72
C 70	90.8	- 39.3	- 9.2	- 9.2	6.1	- 3.3	0	0	C 9, C 72, C 37
C 71	93.88	- 35.5	- 6.1	- 6.1	0	0	0	0	C 23, C 34, C 31, C 52, C 11
C 72	100	0	0	0	0	0	0	0	NA
C 77	97.34	- 5.8	- 2.7	- 2.7	5.9	0	0	- 64.1	C 23, C 72, C 31
C 78	100	0	0	0	0	0	0	0	NA
C 9	100	0	0	0	0	0	0	0	NA

Table 4: Efficiency data for General Consumption in 2012

Building	Efficiency	Input			Output				Reference Set
		OE 1	OW 1	OG 1	PR 1	PR 2	PC 1	PC 2	
C 1	88.89	- 11.1	- 11.1	- 11.1	22.6	- 70.8	0	- 44.6	C 12, C 9
C 10	89.84	- 10.2	- 10.2	- 10.2	0	- 100	0	- 28.5	C 12, C 23, C 3
C 11	88.17	- 11.8	- 11.8	- 11.8	9.9	- 35.9	0	- 39.6	C 12, C 9
C 12	100	0	0	0	0	0	0	0	NA
C 15	91.71	- 8.3	- 8.3	- 14	99.8	0	0	- 15.2	C 12, C 23
C 156	100	0	0	- 66.7	20.5	0	- 14.7	0	NA
C 16	88.28	- 11.7	- 11.7	- 39.7	0	- 100	0	0	C 12, C 23, C 9
C 18	91.75	- 8.3	- 8.3	- 23.7	33.8	0	0	- 15.2	C 12, C 23
C 19	100	0	0	- 35.1	36.4	- 100	0	0	NA
C 20	100	0	0	0	10.4	- 69.5	0	- 53	NA
C 21	95.69	- 4.3	- 4.3	- 4.3	0	- 100	0	0	C 12, C 23, C 9, C 78
C 23	100	0	0	0	0	0	0	0	NA
C 24	89.83	- 10.2	- 10.2	- 10.2	30.7	- 100	0	0	C 23, C 35, C 28
C 26	87.07	- 12.9	- 12.9	- 19.2	99.4	- 100	0	0	C 23, C 9
C 27	93	- 7	- 7	- 7	231.9	- 71.3	0	- 7.3	C 12, C 9
C 28	100	0	0	0	0	0	0	0	NA
C 29	87.67	- 12.3	- 12.3	- 71.3	6.6	- 100	0	0	C 23, C 9
C 3	100	0	0	0	0	0	0	0	NA
C 30	100	0	0	- 35.5	172	0	- 14.7	0	NA
C 31	99.03	- 1	- 1	- 30.1	0	- 72.2	0	0	C 12, C 9, C 78
C 32	90.78	- 9.2	- 9.2	- 9.2	60.2	- 63.2	0	- 28.6	C 12, C 9
C 33	88.28	- 11.7	- 11.7	- 15.4	0	- 100	0	0	C 12, C 23, C 9
C 34	100	0	0	- 18.8	0	0	- 7	0	NA
C 35	100	0	0	0	0	0	0	0	NA
C 36	99.61	- 0.4	- 0.4	- 43	31.5	- 73.8	0	0	C 9, C 78
C 37	100	0	0	0	0	0	0	0	NA
C 38	100	0	0	- 20	88.7	0	- 14.7	0	NA
C 39	85.53	- 14.5	- 14.5	- 14.5	0.6	- 100	0	0	C 23, C 9, C 78
C 40	94.17	- 5.8	- 5.8	- 70.2	13.1	- 100	0	0	C 23, C 9
C 41	94.3	- 5.7	- 5.7	- 5.7	0	- 100	0	0	C 12, C 23, C 9, C 78
C 42	99.08	- 0.9	- 0.9	- 0.9	0	- 100	0	0	C 23, C 35, C 51, C 28
C 43	90.14	- 9.9	- 9.9	- 20.6	0	- 100	0	- 7.8	C 12, C 23
C 45	98.46	- 1.5	- 1.5	- 24	8.3	- 100	0	0	C 23, C 9
C 47	93	- 7	- 7	- 37.4	0.1	- 32.8	0	0	C 9, C 78
C 49	100	0	0	- 33.3	116.1	0	- 14.7	0	NA
C 491	89.51	- 10.5	- 10.5	- 76.6	35.4	- 100	0	0	C 23, C 9
C 50	98.54	- 1.5	- 1.5	- 1.5	0	0	- 2.1	- 62.3	C 23, C 3, C 51
C 51	100	0	0	0	0	0	0	0	NA
C 52	92.17	- 7.8	- 7.8	- 7.8	0	- 100	0	0	C 12, C 23, C 9, C 78
C 53	95.52	- 4.5	- 4.5	- 4.5	27.4	- 55.2	0	- 40.9	C 12, C 9
C 54	92.52	- 7.5	- 7.5	- 7.5	19.5	- 100	0	0	C 23, C 35, C 78
C 58	94.12	- 5.9	- 5.9	- 5.9	57.9	- 74.5	0	- 47.4	C 12, C 9
C 59	98.4	- 1.6	- 1.6	- 1.6	94	- 100	0	0	C 23, C 35, C 78
C 60	98.3	- 1.7	- 1.7	- 35.7	21.7	- 100	0	0	C 23, C 9
C 61	100	0	0	0	0	0	0	0	NA
C 62	87.67	- 12.3	- 12.3	- 13.8	8.3	- 34	0	- 65.3	C 12
C 63	95.2	- 4.8	- 4.8	- 63.6	0	- 100	0	0	C 12, C 23, C 9
C 65	98.19	- 1.8	- 1.8	- 1.8	0	0	- 1.3	- 35.8	C 23, C 3, C 51
C 67	98.23	- 1.8	- 1.8	- 19.8	9.7	0	0	0	C 23, C 9, C 78
C 69	96.36	- 3.6	- 3.6	- 3.6	39.8	- 35.9	0	- 41	C 12, C 9
C 7	89.23	- 10.8	- 10.8	- 10.8	24.9	- 100	0	0	C 23, C 35, C 78
C 70	90.8	- 9.2	- 9.2	- 25.4	45	0	0	0	C 12, C 23, C 9
C 71	87.48	- 12.5	- 12.5	- 27.4	0	- 9.9	0	0	C 12, C 9, C 78
C 72	99.82	- 0.2	- 0.2	- 8.2	80.6	- 76.1	0	0	C 9, C 78
C 77	96.24	- 3.8	- 3.8	- 3.8	0	- 26.3	0	- 49.8	C 12, C 9, C 37
C 78	100	0	0	0	0	0	0	0	NA
C 9	100	0	0	0	0	0	0	0	NA

Table 5: Efficiency data for Churn in 2012

Building	Efficiency	Input	Output				Reference Set
		OH 4	PR 1	PR 2	PC 1	PC 2	
C 1	88.89	- 11.1	139.8	- 27.5	0	- 28.4	C 12
C 10	87.67	- 12.3	18.4	0	0	- 38.6	C 12, C 23
C 11	88.17	- 11.8	12	- 32.1	0	- 38.9	C 12
C 12	100	0	0	0	0	0	NA
C 15	91.71	- 8.3	99.8	0	0	- 15.2	C 12, C 23
C 156	100	0	20.5	0	- 14.7	0	NA
C 16	88.28	- 11.7	89.3	0	0	- 69.5	C 12, C 23
C 18	91.75	- 8.3	33.8	0	0	- 15.2	C 12, C 23
C 19	100	0	198.2	- 56	0	- 53.3	NA
C 20	100	0	84.6	- 32.3	0	- 41.7	NA
C 21	95.52	- 4.5	95.9	0	0	- 26.7	C 12, C 23
C 23	100	0	0	0	0	0	NA
C 24	88.89	- 11.1	168.9	- 11.5	0	- 21.2	C 12
C 26	87.07	- 12.9	356.7	- 0.4	0	- 38.2	C 12
C 27	93	- 7	295.8	- 62.4	0	0	C 12, C 9
C 28	89.13	- 10.9	223.4	- 32.1	0	- 1.8	C 12
C 29	87.67	- 12.3	122.4	- 44	0	- 69.3	C 12
C 3	100	0	0	0	0	0	NA
C 30	100	0	172	0	- 14.7	0	NA
C 31	99.03	- 1	0	- 72.2	0	0	C 12, C 9, C 78
C 32	90.78	- 9.2	85.1	- 48.2	0	- 22.9	C 12
C 33	88.28	- 11.7	10.9	- 39.8	0	- 0.9	C 12
C 34	100	0	0	0	0	0	NA
C 35	100	0	0	0	0	0	NA
C 36	99.61	- 0.4	31.5	- 73.8	0	0	C 9, C 78
C 37	100	0	25.7	0	0	- 65	NA
C 38	100	0	88.7	0	- 14.7	0	NA
C 39	85.45	- 14.5	0	0	0	0	C 12, C 23, C 9, C 78
C 40	94.17	- 5.8	143.3	- 18.5	0	- 58.7	C 12
C 41	94.08	- 5.9	0	- 59.6	0	0	C 12, C 9, C 78
C 42	92.39	- 7.6	0	- 75.6	0	0	C 12, C 9, C 78
C 43	90.14	- 9.9	36.1	- 7.7	0	- 54.3	C 12
C 45	98.46	- 1.5	146	- 20.3	0	- 40.8	C 12
C 47	93	- 7	0.1	- 32.8	0	0	C 9, C 78
C 49	100	0	116.1	0	- 14.7	0	NA
C 491	89.51	- 10.5	208.4	- 1.8	0	- 39.8	C 12
C 50	90.27	- 9.7	0	0	0	- 60.1	C 12, C 23, C 3
C 51	89.48	- 10.5	18.7	- 32.5	0	- 54	C 12
C 52	92.06	- 7.9	0	0	0	0	C 12, C 23, C 9, C 78
C 53	95.52	- 4.5	112.6	- 0.6	0	- 26.7	C 12
C 54	92.09	- 7.9	138.1	0	0	- 41.5	C 12, C 23
C 58	94.12	- 5.9	124.6	- 51.4	0	- 38	C 12
C 59	97.95	- 2.1	281.6	0	0	- 10.7	C 12, C 23
C 60	98.3	- 1.7	155.2	0	0	- 67.6	C 12, C 23
C 61	98.03	- 2	0	- 25.6	0	0	C 12, C 9, C 78
C 62	87.67	- 12.3	8.3	- 34	0	- 65.3	C 12
C 63	95.2	- 4.8	78.7	- 3.7	0	- 43.4	C 12
C 65	92.21	- 7.8	0	0	0	- 32.8	C 12, C 23, C 3
C 67	98.23	- 1.8	9.7	0	0	0	C 23, C 9, C 78
C 69	96.36	- 3.6	74.5	0	0	- 34	C 12, C 23
C 7	87.15	- 12.9	22.9	0	0	0	C 23, C 9, C 78
C 70	90.8	- 9.2	45	0	0	0	C 12, C 23, C 9
C 71	87.48	- 12.5	0	- 9.9	0	0	C 12, C 9, C 78
C 72	99.82	- 0.2	80.6	- 76.1	0	0	C 9, C 78
C 77	96.24	- 3.8	56	0	0	- 39.4	C 12, C 23
C 78	100	0	0	0	0	0	NA
C 9	100	0	0	0	0	0	NA

Table 6: Efficiency data for Security in 2012

Building	Efficiency	Input				Output				Reference Set
		OS 1	OS 2	OS 3	OS 4	PR 1	PR 2	PC 1	PC 2	
C 1	88.89	- 11.1	- 11.1	- 11.1	- 11.1	139.8	- 27.5	0	- 28.4	C 12
C 10	90.33	- 9.7	- 9.7	- 9.7	- 9.7	0	- 50.3	0	0	C 3, C 65, C 69, C 37
C 11	90.26	- 9.7	- 9.7	- 9.7	- 9.7	0	- 71.5	0	- 20.5	C 12, C 3, C 37
C 12	100	0	0	0	0	0	0	0	0	NA
C 15	91.71	- 8.3	- 8.3	- 8.3	- 8.3	24.9	0	0	0	C 12, C 23, C 9, C 37
C 156	100	0	0	0	0	20.5	0	- 14.7	0	NA
C 16	88.28	- 11.7	- 11.7	- 11.7	- 11.7	50.6	- 57.8	0	- 12.9	C 37
C 18	91.75	- 8.3	- 8.3	- 8.3	- 16.6	33.8	0	0	- 15.2	C 12, C 23
C 19	100	0	0	0	0	198.2	- 56	0	- 53.3	NA
C 20	100	0	0	0	0	0	0	0	0	NA
C 21	99.19	- 0.8	- 0.8	- 0.8	- 0.8	11.7	0	0	0	C 23, C 69, C 35
C 23	100	0	0	0	0	0	0	0	0	NA
C 24	88.89	- 11.1	- 11.1	- 11.1	- 11.1	143.7	- 48.6	0	0	C 12, C 9, C 37
C 26	87.07	- 12.9	- 12.9	- 12.9	- 12.9	321.7	- 41.5	0	- 18.2	C 12, C 37
C 27	93	- 7	- 7	- 7	- 7	196.3	- 77	0	0	C 12, C 9, C 37
C 28	90.95	- 9	- 9	- 9	- 9	50.8	- 64.2	0	0	C 9, C 20, C 69
C 29	88.75	- 11.3	- 11.3	- 11.3	- 11.3	22.8	- 29.1	0	- 49.5	C 20, C 69
C 3	100	0	0	0	0	0	0	0	0	NA
C 30	100	0	0	0	0	44.2	0	0	0	NA
C 31	99.49	- 0.5	- 0.5	- 0.5	- 0.5	0	- 80.9	0	0	C 20, C 69, C 37, C 78
C 32	92.23	- 7.8	- 7.8	- 7.8	- 7.8	0	- 46.9	0	0	C 9, C 20, C 69, C 78
C 33	89.73	- 10.3	- 10.3	- 10.3	- 10.3	0	- 70.1	0	0	C 12, C 3, C 37, C 78
C 34	100	0	0	0	0	0	0	0	0	NA
C 35	100	0	0	0	0	0	0	0	0	NA
C 36	99.61	- 0.4	- 0.4	- 0.4	- 13.2	31.5	- 73.8	0	0	C 9, C 78
C 37	100	0	0	0	0	0	0	0	0	NA
C 38	100	0	0	0	0	0	0	0	0	NA
C 39	85.6	- 14.4	- 14.4	- 14.4	- 14.4	0	0	0	0	C 23, C 9, C 20, C 69, C 78
C 40	94.17	- 5.8	- 5.8	- 5.8	- 5.8	93	- 70.7	0	0	C 12, C 9, C 37
C 41	94.68	- 5.3	- 5.3	- 5.3	- 5.3	0	- 65.5	0	0	C 20, C 69, C 37, C 78
C 42	95.31	- 4.7	- 4.7	- 4.7	- 4.7	0	- 49.8	0	0	C 9, C 69, C 35, C 78
C 43	90.14	- 9.9	- 9.9	- 9.9	- 18.1	36.1	- 7.7	0	- 54.3	C 12
C 45	98.46	- 1.5	- 1.5	- 1.5	- 1.5	136	- 42	0	- 31.9	C 12, C 37
C 47	93	- 7	- 7	- 7	- 17.1	0.1	- 32.8	0	0	C 9, C 78
C 49	100	0	0	0	0	0	0	0	0	NA
C 491	89.51	- 10.5	- 10.5	- 10.5	- 10.5	208.4	- 1.8	0	- 39.8	C 12
C 50	90.27	- 9.7	- 9.7	- 9.7	- 30.1	0	0	0	- 60.1	C 12, C 23, C 3
C 51	98.09	- 1.9	- 1.9	- 1.9	- 1.9	0	- 63.6	0	- 45.6	C 65, C 69
C 52	92.06	- 7.9	- 7.9	- 7.9	- 9.1	0	0	0	0	C 12, C 23, C 9, C 78
C 53	95.52	- 4.5	- 4.5	- 4.5	- 4.5	84.4	- 49.4	0	0	C 12, C 9, C 37
C 54	92.09	- 7.9	- 7.9	- 7.9	- 7.9	125.9	- 28.7	0	- 30.2	C 12, C 37
C 58	96.46	- 3.5	- 3.5	- 3.5	- 3.5	26.3	- 46.5	0	- 2.3	C 20, C 69
C 59	97.95	- 2.1	- 2.1	- 2.1	- 5	281.6	0	0	- 10.7	C 12, C 23
C 60	99.08	- 0.9	- 0.9	- 0.9	- 0.9	39.9	0	0	- 46	C 23, C 20, C 69
C 61	98.03	- 2	- 2	- 2	- 26.1	0	- 25.6	0	0	C 12, C 9, C 78
C 62	87.67	- 12.3	- 12.3	- 12.3	- 26.9	8.3	- 34	0	- 65.3	C 12
C 63	96.4	- 3.6	- 3.6	- 3.6	- 3.6	0	0	0	- 6.1	C 23, C 20, C 69, C 37
C 65	100	0	0	0	0	0	0	0	0	NA
C 67	98.23	- 1.8	- 1.8	- 1.8	- 28.4	9.7	0	0	0	C 23, C 9, C 78
C 69	100	0	0	0	0	0	0	0	0	NA
C 7	87.15	- 12.9	- 12.9	- 12.9	- 27.3	22.9	0	0	0	C 23, C 9, C 78
C 70	90.8	- 9.2	- 9.2	- 9.2	- 9.2	0	0	0	0	C 23, C 9, C 20, C 69, C 78
C 71	87.48	- 12.5	- 12.5	- 12.5	- 27.3	0	- 9.9	0	0	C 12, C 9, C 78
C 72	99.82	- 0.2	- 0.2	- 0.2	- 13	80.6	- 76.1	0	0	C 9, C 78
C 77	96.24	- 3.8	- 3.8	- 3.8	- 3.8	10.4	- 44.8	0	0	C 12, C 9, C 37
C 78	100	0	0	0	0	0	0	0	0	NA
C 9	100	0	0	0	0	0	0	0	0	NA

Table 7: Efficiency data for Insurance in 2012

Building	Efficiency	Input		Output				Reference Set
		OI 1	OI 2	PR 1	PR 2	PC 1	PC 2	
C 1	97.2	- 2.8	- 2.8	0	- 22.9	0	0	C 27, C 77, C 60, C 11
C 10	47.83	- 52.2	- 52.2	0	0	0	- 10.8	C 30, C 3, C 60, C 11
C 11	100	0	0	0	0	0	0	NA
C 12	42.35	- 57.7	- 57.7	0	- 5.6	- 0.1	- 15.9	C 3, C 11
C 15	35.87	- 64.1	- 64.1	0	0	0	0	C 30, C 3, C 72, C 60, C 36
C 156	82.44	- 21.4	- 17.6	0	0	- 19.6	- 85.2	C 30, C 3
C 16	57.66	- 42.3	- 42.3	0	- 11.8	0	- 33.1	C 77, C 60, C 11
C 18	38.35	- 61.6	- 61.6	0	0	0	0	C 30, C 3, C 72, C 60, C 11
C 19	85.96	- 14	- 14	23.2	- 65.7	0	0	C 69, C 60, C 36
C 20	46.58	- 53.4	- 53.4	0	- 50.4	0	- 6	C 3, C 60, C 11
C 21	37.64	- 62.4	- 62.4	0	0	0	0	C 30, C 27, C 72, C 60, C 11
C 23	51.05	- 58.1	- 49	0	0	- 12.1	- 88.7	C 30, C 3
C 24	59.46	- 40.5	- 40.5	0	- 100	0	0	C 30, C 27, C 77, C 60
C 26	96.13	- 3.9	- 3.9	72.7	- 21.9	0	0	C 72, C 60, C 36
C 27	100	0	0	0	0	0	0	NA
C 28	51.55	- 48.5	- 48.5	17.7	- 42.5	0	0	C 72, C 60, C 36
C 29	57.34	- 42.7	- 42.7	0	- 100	0	- 17.7	C 30, C 77, C 60
C 3	100	0	0	0	0	0	0	NA
C 30	100	0	0	0	0	0	0	NA
C 31	85.5	- 14.5	- 14.5	0	- 63.1	0	0	C 3, C 72, C 60, C 11
C 32	52.7	- 47.3	- 47.3	0	- 58.3	0	0	C 3, C 69, C 60, C 36
C 33	49.48	- 50.5	- 50.5	0	- 29.5	0	0	C 3, C 72, C 52, C 11
C 34	100	0	0	0	0	0	0	NA
C 35	85.22	- 14.8	- 14.8	38.5	0	- 0.6	0	C 30, C 34, C 36
C 36	100	0	0	0	0	0	0	NA
C 37	88.89	- 11.1	- 11.1	0	0	0	- 61.1	C 30, C 3, C 60, C 11
C 38	100	0	0	0	0	0	0	NA
C 39	88.68	- 11.3	- 11.3	0	0	0	0	C 30, C 3, C 72, C 60, C 36
C 40	66.56	- 33.4	- 33.4	28	- 26.7	0	- 27.9	C 69, C 60
C 41	53.35	- 46.7	- 46.7	0	- 35.5	0	0	C 3, C 72, C 52, C 11
C 42	54.61	- 45.4	- 45.4	0	- 52.7	0	0	C 3, C 72, C 60, C 36
C 43	66.26	- 33.7	- 33.7	0	- 22.5	0	- 55.6	C 3, C 69, C 60
C 45	40.57	- 59.4	- 59.4	0	- 38.8	0	0	C 3, C 72, C 60, C 36
C 47	84.92	- 15.1	- 15.1	11.7	0	0	0	C 30, C 69, C 60, C 36
C 49	95.11	- 4.9	- 4.9	0	0	- 4.3	- 51.5	C 38, C 30, C 3
C 491	42.57	- 57.4	- 57.4	17.4	- 23.3	0	0	C 72, C 60, C 36
C 50	68.35	- 31.7	- 31.7	0	0	- 4.7	- 57.4	C 38, C 3, C 11
C 51	79.3	- 20.7	- 20.7	0	- 49	0	- 64	C 3, C 69, C 60
C 52	100	0	0	0	0	0	0	NA
C 53	64.05	- 35.9	- 35.9	0	- 24.6	0	0	C 3, C 72, C 60, C 36
C 54	32.78	- 67.2	- 67.2	0	0	0	0	C 30, C 27, C 77, C 60, C 11
C 58	47.59	- 52.4	- 52.4	0	- 53.8	0	0	C 27, C 77, C 60, C 11
C 59	65.62	- 34.4	- 34.4	21.7	0	0	0	C 30, C 27, C 72, C 60
C 60	100	0	0	0	0	0	0	NA
C 61	51.35	- 48.6	- 48.6	0	0	0	0	C 30, C 3, C 72, C 60, C 11
C 62	45.79	- 54.2	- 54.2	0	- 50.8	0	- 73.8	C 3, C 60, C 11
C 63	32.78	- 67.2	- 67.2	0	- 21.2	0	0	C 3, C 72, C 60, C 11
C 65	55.28	- 44.7	- 44.7	0	0	- 2.2	- 32.7	C 38, C 3, C 11
C 67	54.4	- 45.6	- 45.6	0	0	0	0	C 30, C 3, C 72, C 60, C 36
C 69	100	0	0	0	0	0	0	NA
C 7	80.83	- 19.2	- 19.2	0	0	- 2.3	0	C 30, C 34, C 72, C 52
C 70	46.49	- 53.5	- 53.5	4.6	0	0	0	C 30, C 69, C 60, C 36
C 71	69.91	- 30.1	- 30.1	0	0	0	0	C 30, C 3, C 72, C 52, C 11
C 72	100	0	0	0	0	0	0	NA
C 77	100	0	0	0	0	0	0	NA
C 78	78.34	- 21.7	- 21.7	0	- 72.2	- 2.5	0	C 3, C 34, C 36
C 9	70.86	- 29.1	- 29.1	4.6	0	0	0	C 30, C 72, C 60, C 36

Table 8: Efficiency data for Management and overall costs in 2012

Building	Efficiency	Input			Output				Reference Set
		OM 1	OM 2	OM 3	PR 1	PR 2	PC 1	PC 2	
C 1	88.89	- 29.7	- 11.1	- 29.7	139.8	- 27.5	0	- 28.4	C 12
C 10	87.67	- 35.6	- 12.3	- 26.9	18.4	0	0	- 38.6	C 12, C 23
C 11	88.17	- 38.2	- 11.8	- 33.9	12	- 32.1	0	- 38.9	C 12
C 12	100	0	0	0	0	0	0	0	NA
C 15	91.71	- 10.3	- 8.3	- 14	99.8	0	0	- 15.2	C 12, C 23
C 156	100	0	0	0	20.5	0	- 14.7	0	NA
C 16	88.28	- 36.1	- 11.7	- 31.6	89.3	0	0	- 69.5	C 12, C 23
C 18	91.75	- 9.6	- 8.3	- 32.8	33.8	0	0	- 15.2	C 12, C 23
C 19	100	0	0	0	198.2	- 56	0	- 53.3	NA
C 20	100	0	0	0	84.6	- 32.3	0	- 41.7	NA
C 21	95.52	- 11.6	- 4.5	- 10.4	95.9	0	0	- 26.7	C 12, C 23
C 23	100	0	0	0	0	0	0	0	NA
C 24	88.89	- 16.3	- 11.1	- 37.1	168.9	- 11.5	0	- 21.2	C 12
C 26	87.07	- 28.8	- 12.9	- 13.9	356.7	- 0.4	0	- 38.2	C 12
C 27	93	- 17.2	- 7	- 34.6	295.8	- 62.4	0	0	C 12, C 9
C 28	89.13	- 15.4	- 10.9	- 30.8	223.4	- 32.1	0	- 1.8	C 12
C 29	87.67	- 23	- 12.3	- 30.8	122.4	- 44	0	- 69.3	C 12
C 3	100	0	0	0	0	0	0	0	NA
C 30	100	0	0	0	172	0	- 14.7	0	NA
C 31	99.03	- 26.5	- 1	- 11.1	0	- 72.2	0	0	C 12, C 9, C 78
C 32	90.78	- 37.3	- 9.2	- 11.6	85.1	- 48.2	0	- 22.9	C 12
C 33	88.28	- 15.3	- 11.7	- 11.7	10.9	- 39.8	0	- 0.9	C 12
C 34	100	0	0	0	0	0	0	0	NA
C 35	100	0	0	0	0	0	0	0	NA
C 36	99.61	- 17.1	- 0.4	- 19.4	31.5	- 73.8	0	0	C 9, C 78
C 37	100	- 13.5	0	- 6.2	25.7	0	0	- 65	NA
C 38	100	0	0	0	88.7	0	- 14.7	0	NA
C 39	86.09	- 14	- 14.2	- 13.9	0	0	0	0	C 12, C 23, C 9, C 34
C 40	94.17	- 27.7	- 5.8	- 16.9	143.3	- 18.5	0	- 58.7	C 12
C 41	95.98	- 17.9	- 4	- 4	0	- 63.9	0	0	C 12, C 9, C 34, C 78
C 42	94.04	- 20.5	- 6.6	- 6	0	- 76.7	0	0	C 12, C 9, C 34
C 43	90.14	- 32.6	- 9.9	- 38.5	36.1	- 7.7	0	- 54.3	C 12
C 45	98.46	- 29.5	- 1.5	- 13.3	146	- 20.3	0	- 40.8	C 12
C 47	93	- 13.2	- 7	- 9.7	0.1	- 32.8	0	0	C 9, C 78
C 49	100	0	0	0	116.1	0	- 14.7	0	NA
C 491	89.51	- 28.2	- 10.5	- 25.4	208.4	- 1.8	0	- 39.8	C 12
C 50	90.27	- 21.5	- 9.7	- 28.7	0	0	0	- 60.1	C 12, C 23, C 3
C 51	89.48	- 21.6	- 10.5	- 31.8	18.7	- 32.5	0	- 54	C 12
C 52	93.05	- 7	- 7	- 28.5	0	0	0	0	C 12, C 23, C 9, C 35, C 78
C 53	95.52	- 30.2	- 4.5	- 34.9	112.6	- 0.6	0	- 26.7	C 12
C 54	92.09	- 14.2	- 7.9	- 13.7	138.1	0	0	- 41.5	C 12, C 23
C 58	94.12	- 23	- 5.9	- 23.1	124.6	- 51.4	0	- 38	C 12
C 59	97.95	- 28.3	- 2.1	- 27.6	281.6	0	0	- 10.7	C 12, C 23
C 60	98.3	- 27.2	- 1.7	- 20.5	155.2	0	0	- 67.6	C 12, C 23
C 61	98.03	- 11.9	- 2	- 29.5	0	- 25.6	0	0	C 12, C 9, C 78
C 62	87.67	- 14.1	- 12.3	- 26.9	8.3	- 34	0	- 65.3	C 12
C 63	95.2	- 20.2	- 4.8	- 20.7	78.7	- 3.7	0	- 43.4	C 12
C 65	93.55	- 18.7	- 6.4	- 6.4	0	0	- 6.7	- 6.5	C 12, C 23
C 67	98.23	- 17	- 1.8	- 21.9	9.7	0	0	0	C 23, C 9, C 78
C 69	96.36	- 21.6	- 3.6	- 34.3	74.5	0	0	- 34	C 12, C 23
C 7	87.7	- 12.3	- 12.3	- 18.5	14.1	0	0	0	C 23, C 9, C 35, C 78
C 70	90.8	- 25.1	- 9.2	- 28.3	45	0	0	0	C 12, C 23, C 9
C 71	87.48	- 28.8	- 12.5	- 37.2	0	- 9.9	0	0	C 12, C 9, C 78
C 72	99.82	- 14.6	- 0.2	- 10.9	80.6	- 76.1	0	0	C 9, C 78
C 77	96.24	- 32.7	- 3.8	- 24	56	0	0	- 39.4	C 12, C 23
C 78	100	0	0	0	0	0	0	0	NA
C 9	100	0	0	0	0	0	0	0	NA

Table 9: Efficiency data for Rent in 2012

Building	Efficiency	Input				Output				Reference Set
		OT 1	OT 2	OT 3	OT 6	PR 1	PR 2	PC 1	PC 2	
C 1	88.89	- 45.4	- 18.4	- 57.7	- 11.1	0	- 73.8	0	- 46.9	C 12, C 9
C 10	95.17	- 4.8	- 4.8	- 29.5	- 4.8	0	- 47.5	0	0	C 12, C 19, C 65, C 78, C 50
C 11	92.72	- 16.4	- 7.3	- 7.3	- 7.3	0	- 63.8	0	- 39.8	C 12, C 77, C 78, C 50
C 12	100	0	0	0	0	0	0	0	0	NA
C 15	91.71	- 20.7	- 33.2	- 46.5	- 8.3	0	0	0	- 34.7	C 12, C 23, C 9
C 156	100	0	0	0	0	0	0	0	0	NA
C 16	88.31	- 11.7	- 11.7	- 26.7	- 11.7	0	- 57.6	0	- 70.2	C 12, C 9, C 3, C 37
C 18	97.84	- 2.2	- 2.2	- 34.2	- 2.2	0	- 28.2	0	0	C 12, C 19, C 65, C 78, C 50
C 19	100	0	0	0	0	0	0	0	0	NA
C 20	100	- 14.2	- 11.9	0	0	0	- 71.7	0	- 54.2	NA
C 21	96.27	- 3.7	- 3.7	- 13.8	- 3.7	0	0	0	0	C 12, C 23, C 19, C 9, C 3, C 78
C 23	100	0	0	0	0	0	0	0	0	NA
C 24	88.89	- 23.8	- 37	- 29.1	- 11.1	0	- 69.6	0	- 42.7	C 12, C 9
C 26	90.41	- 9.6	- 27.7	- 9.6	- 9.6	35.1	- 9.7	0	- 62.6	C 59, C 35, C 40
C 27	97.95	- 2	- 2	- 44.5	- 2	77.7	- 24.2	0	0	C 19, C 59, C 58, C 35
C 28	89.13	- 66.3	- 11.5	- 51.4	- 10.9	6.7	- 77.6	0	- 29.9	C 9
C 29	89.15	- 28.4	- 10.9	- 10.9	- 10.9	21.9	- 33.7	0	- 86.4	C 19, C 61, C 78
C 3	100	0	0	0	0	0	0	0	0	NA
C 30	100	0	0	0	0	0	0	0	0	NA
C 31	99.92	- 24.6	- 0.1	- 0.1	- 0.1	0	- 63.3	0	0	C 12, C 19, C 9, C 61, C 78
C 32	92.92	- 7.1	- 29.4	- 32.6	- 7.1	0	- 80.8	0	- 46.4	C 9, C 3, C 37
C 33	89.8	- 19	- 18.8	- 10.2	- 10.2	0	- 47.2	0	- 27.5	C 12, C 3, C 61
C 34	100	- 28.8	- 23.6	- 16.5	0	0	0	- 7	0	NA
C 35	100	0	0	0	0	0	0	0	0	NA
C 36	100	0	0	0	0	0	0	0	0	NA
C 37	100	0	0	0	0	0	0	0	0	NA
C 38	100	- 21.6	- 24.3	0	0	0	0	- 2.1	0	NA
C 39	100	0	0	0	0	0	0	0	0	NA
C 40	100	0	0	0	0	0	0	0	0	NA
C 41	94.08	- 18.9	- 20.6	- 9.5	- 5.9	0	- 59.6	0	0	C 12, C 9, C 78
C 42	96.23	- 3.8	- 3.8	- 38	- 3.8	0	- 72.4	0	0	C 9, C 3, C 59, C 35, C 36
C 43	91.31	- 8.7	- 10.5	- 8.7	- 8.7	0	- 100	0	- 61.3	C 12, C 23, C 61, C 37
C 45	98.46	- 37.8	- 1.5	- 45.7	- 1.5	0	- 58.6	0	- 42.9	C 12, C 19, C 9
C 47	93	- 38.1	- 20.9	- 65.1	- 7	0.1	- 32.8	0	0	C 9, C 78
C 49	100	0	0	0	0	0	0	0	0	NA
C 491	91.62	- 29.3	- 8.4	- 8.4	- 8.4	108.8	- 15.6	0	- 73.6	C 19, C 61, C 78
C 50	100	0	0	0	0	0	0	0	0	NA
C 51	90.53	- 14	- 26.6	- 9.5	- 9.5	0	- 41.7	0	- 67.2	C 12, C 9, C 61
C 52	93.38	- 6.6	- 23.2	- 6.6	- 6.6	0	0	0	0	C 23, C 9, C 3, C 61, C 37, C 78
C 53	95.97	- 33.3	- 30.1	- 4	- 4	0	- 59.9	0	- 49.1	C 12, C 9, C 61
C 54	97.2	- 2.8	- 8.3	- 2.8	- 2.8	0	- 56	0	- 85.1	C 9, C 3, C 65, C 35
C 58	100	0	0	0	0	0	0	0	0	NA
C 59	100	0	0	0	0	0	0	0	0	NA
C 60	98.87	- 25	- 3.9	- 1.1	- 1.1	8.2	- 47.8	0	- 78.4	C 9, C 61
C 61	100	0	0	0	0	0	0	0	0	NA
C 62	91.92	- 8.1	- 8.1	- 28.7	- 8.1	0	- 46.5	0	- 70.4	C 12, C 19, C 3, C 65
C 63	95.2	- 12.1	- 32.4	- 6.7	- 4.8	0	- 58.8	0	- 55.2	C 12, C 9
C 65	100	0	0	0	0	0	0	0	0	NA
C 67	98.23	- 18.3	- 10.6	- 45.8	- 1.8	9.7	0	0	0	C 23, C 9, C 78
C 69	96.36	- 9.5	- 32.6	- 42.9	- 3.6	0	- 55.3	0	- 47.4	C 12, C 9
C 7	87.15	- 41.2	- 35.5	- 43.2	- 12.9	22.9	0	0	0	C 23, C 9, C 78
C 70	97.83	- 2.2	- 22.9	- 2.2	- 2.2	17.3	- 100	0	- 73.9	C 30, C 35, C 78
C 71	88.59	- 11.4	- 11.4	- 40.8	- 11.4	0	- 29.1	0	0	C 12, C 9, C 3, C 37, C 78
C 72	100	0	0	0	0	0	0	0	0	NA
C 77	100	0	0	0	0	0	0	0	0	NA
C 78	100	0	0	0	0	0	0	0	0	NA
C 9	100	0	0	0	0	0	0	0	0	NA

Table 10: Efficiency data for Occupation Cost and Leasing in 2012

Building	Efficiency	Input				Output				Reference Set
		OO 1	OO 2	OO 3	OO 4	PR 1	PR 2	PC 1	PC 2	
C 1	87.44	- 12.6	- 13.6	- 12.6	- 16	40.9	- 72.7	0	0	C 19, C 9, C 37
C 10	95.16	- 59.8	- 4.8	- 10.2	- 4.8	0	- 27.8	0	- 51.2	C 61, C 33, C 50
C 11	85.56	- 14.4	- 14.4	- 33.6	- 22.1	0	0	0	- 30.5	C 156, C 62, C 33, C 78
C 12	100	0	0	0	0	0	0	0	0	NA
C 15	78.99	- 39.3	- 21	- 24	- 21	17.3	0	0	- 45.4	C 30, C 59, C 61
C 156	100	0	0	0	0	0	0	0	0	NA
C 16	91.47	- 8.5	- 17	- 8.5	- 8.5	0.2	- 20.5	0	- 78.3	C 19, C 9, C 61
C 18	100	0	0	0	0	0	0	0	0	NA
C 19	100	0	0	0	0	0	0	0	0	NA
C 20	100	0	0	0	0	0	0	0	0	NA
C 21	96.33	- 38.8	- 3.7	- 3.7	- 3.7	20.6	0	0	- 56	C 30, C 9, C 59, C 61
C 23	100	0	0	0	0	0	0	0	0	NA
C 24	96.99	- 23.4	- 3	- 3	- 3	6.5	- 14.3	0	0	C 9, C 20, C 59, C 53
C 26	97.08	- 2.9	- 13.4	- 7.2	- 2.9	67	- 100	0	0	C 23, C 30, C 52
C 27	90.73	- 9.3	- 11.6	- 9.3	- 12.1	65.4	- 77.7	0	0	C 19, C 9, C 37
C 28	80.6	- 73.6	- 19.4	- 19.4	- 19.4	56.1	- 67.6	0	- 33.7	C 19, C 9, C 61
C 29	97.77	- 46.7	- 2.2	- 10.7	- 2.2	11.8	- 52.4	0	- 77.8	C 59, C 61
C 3	100	0	0	0	0	0	0	0	0	NA
C 30	100	0	0	0	0	0	0	0	0	NA
C 31	94.76	- 22.7	- 5.2	- 9.8	- 5.2	0	- 41.4	0	0	C 61, C 33, C 78, C 53
C 32	91.74	- 62.7	- 8.3	- 16.3	- 8.3	23.2	- 58.4	0	- 55	C 59, C 61
C 33	100	0	0	0	0	0	0	0	0	NA
C 34	100	0	0	0	0	0	0	0	0	NA
C 35	100	0	0	0	0	0	0	0	0	NA
C 36	100	0	0	0	0	0	0	0	0	NA
C 37	100	0	0	0	0	0	0	0	0	NA
C 38	100	0	0	- 7.7	- 10	0	0	0	0	NA
C 39	88.85	- 11.1	- 11.1	- 37.1	- 19.8	0	0	0	- 1	C 156, C 59, C 52, C 78
C 40	85.76	- 14.2	- 14.2	- 23	- 14.2	0	- 100	0	- 64.7	C 23, C 59, C 71, C 61
C 41	97.41	- 2.6	- 14.5	- 2.6	- 2.6	0	- 53.4	- 0.5	0	C 35, C 61, C 37, C 78
C 42	77.96	- 22	- 22	- 22	- 22	0	- 58.5	0	0	C 9, C 20, C 62, C 37, C 78, C 53
C 43	97.35	- 69.2	- 2.6	- 2.6	- 23.3	0	- 52.8	0	0	C 20, C 62, C 37, C 78
C 45	99.4	- 0.6	- 14.6	- 0.6	- 19.6	65.8	- 71.8	0	0	C 19, C 9, C 37
C 47	100	0	0	0	0	0	0	0	0	NA
C 49	100	0	0	- 35.3	- 27.1	116.1	0	- 14.7	0	NA
C 491	68.25	- 31.8	- 31.8	- 31.8	- 31.8	59.3	0	0	- 8	C 23, C 19, C 9, C 20, C 53
C 50	100	0	0	0	0	0	0	0	0	NA
C 51	100	0	0	- 2.1	- 22.9	0	0	0	- 75.6	NA
C 52	100	0	0	0	0	0	0	0	0	NA
C 53	100	0	0	0	0	0	0	0	0	NA
C 54	90.62	- 54.3	- 9.4	- 9.4	- 9.4	0.3	- 37.4	0	- 38.4	C 9, C 20, C 59
C 58	97.62	- 16.7	- 2.4	- 24.5	- 2.4	0	- 43	0	- 76.8	C 59, C 78, C 53
C 59	100	0	0	0	0	0	0	0	0	NA
C 60	77.58	- 22.4	- 22.4	- 27.8	- 22.4	32.4	- 35.5	0	- 80	C 9, C 47, C 61
C 61	100	0	0	0	0	0	0	0	0	NA
C 62	100	0	0	0	0	0	0	0	0	NA
C 63	87.12	- 29.9	- 12.9	- 12.9	- 21.4	0	- 1.1	0	0	C 19, C 20, C 34, C 37
C 65	100	0	0	0	0	0	0	0	0	NA
C 67	100	0	0	0	0	0	0	0	0	NA
C 69	84.19	- 58.9	- 15.8	- 20.7	- 15.8	9.8	- 16.5	0	- 59.7	C 59, C 61
C 7	74.76	- 46.9	- 25.2	- 25.2	- 25.2	0.4	0	0	0	C 30, C 9, C 35, C 61, C 78
C 70	90.58	- 9.4	- 9.4	- 9.4	- 30.1	0	- 100	0	0	C 23, C 9, C 59, C 52, C 37
C 71	100	0	0	0	0	0	0	0	0	NA
C 72	79.45	- 20.6	- 20.6	- 20.6	- 20.6	75.6	- 71.4	0	0	C 19, C 9, C 34, C 78, C 53
C 77	76.48	- 48.9	- 23.5	- 23.5	- 26.9	0	0	0	0	C 23, C 20, C 62, C 37, C 78
C 78	100	0	0	0	0	0	0	0	0	NA
C 9	100	0	0	0	0	0	0	0	0	NA

Table 11: Efficiency data for Debt in 2012

Building	Efficiency	Input			Output				Reference Set
		OD 1	OD 2	OD 3	PR 1	PR 2	PC 1	PC 2	
C 1	89.06	- 10.9	- 10.9	- 10.9	87.2	- 72.7	0	0	C 31, C 37, C 78
C 10	90.79	- 9.2	- 9.2	- 9.2	0	0	0	- 60.3	C 23, C 3, C 31
C 11	92.35	- 7.6	- 7.6	- 7.6	0	- 22.2	0	- 62.1	C 3, C 31
C 12	100	0	0	0	0	0	0	0	NA
C 15	91.71	- 8.3	- 8.3	- 8.3	64.5	0	0	0	C 12, C 23, C 9, C 37
C 156	100	0	0	0	0	0	0	0	NA
C 16	88.28	- 11.7	- 11.7	- 31.3	50.6	- 57.8	0	- 12.9	C 37
C 18	92	- 8	- 8	- 8	3.8	- 49.6	0	0	C 31, C 37, C 78
C 19	100	0	0	- 24.6	148.2	- 82.7	0	0	NA
C 20	100	0	0	- 19.2	60.4	- 69.3	0	0	NA
C 21	95.52	- 4.5	- 4.5	- 7	79.4	0	0	0	C 12, C 23, C 37
C 23	100	0	0	0	0	0	0	0	NA
C 24	89.1	- 10.9	- 10.9	- 10.9	109.2	- 66	0	0	C 31, C 37, C 78
C 26	87.07	- 12.9	- 12.9	- 20.3	301.9	- 52.6	0	0	C 12, C 37
C 27	93.17	- 6.8	- 6.8	- 6.8	187	- 81.3	0	0	C 9, C 37, C 78
C 28	89.13	- 10.9	- 10.9	- 10.9	93.9	- 74.2	0	0	C 12, C 9, C 37
C 29	87.67	- 12.3	- 12.3	- 12.3	76.9	- 80.5	0	- 12.3	C 37
C 3	100	0	0	0	0	0	0	0	NA
C 30	100	0	0	0	25.9	0	0	0	NA
C 31	100	0	0	0	0	0	0	0	NA
C 32	90.99	- 9	- 9	- 9	44.1	- 80.2	0	0	C 31, C 37, C 78
C 33	88.36	- 11.6	- 11.6	- 11.6	0	- 63.2	0	0	C 12, C 9, C 37, C 78
C 34	100	0	0	- 18.4	0	0	- 7	0	NA
C 35	100	0	0	0	0	0	0	0	NA
C 36	99.61	- 0.4	- 0.4	- 7.9	31.5	- 73.8	0	0	C 9, C 78
C 37	100	0	0	0	0	0	0	0	NA
C 38	100	0	0	0	56.6	0	0	0	NA
C 39	87.09	- 13.5	- 13.5	- 12.9	98.4	0	0	0	C 49, C 35, C 31
C 40	94.17	- 5.8	- 5.8	- 14.2	98.4	- 69.7	0	0	C 12, C 37
C 41	94.51	- 5.5	- 5.5	- 5.5	5	- 59.9	0	0	C 31, C 37, C 78
C 42	92.39	- 7.6	- 7.6	- 9.6	0	- 75.6	0	0	C 12, C 9, C 78
C 43	90.14	- 9.9	- 9.9	- 32.5	12.8	- 64.1	0	0	C 12, C 37
C 45	98.46	- 1.5	- 1.5	- 1.5	101.9	- 66.5	0	0	C 12, C 9, C 37
C 47	93.52	- 6.5	- 6.5	- 6.5	112	- 2	0	0	C 31, C 37, C 78
C 49	100	0	0	0	0	0	0	0	NA
C 491	89.51	- 10.5	- 10.5	- 18.8	169.7	- 54.3	0	0	C 12, C 37
C 50	90.92	- 9.1	- 9.1	- 9.1	0	0	0	- 61.1	C 12, C 23, C 3, C 37
C 51	92.61	- 7.4	- 7.4	- 7.4	0	- 8	0	- 70.2	C 3, C 31
C 52	92.19	- 7.8	- 7.8	- 7.8	0	0	0	0	C 12, C 23, C 9, C 37, C 78
C 53	95.52	- 4.5	- 4.5	- 7	94.8	- 43.9	0	0	C 12, C 37
C 54	92.09	- 7.9	- 7.9	- 17.3	107	- 52.4	0	0	C 12, C 37
C 58	94.12	- 5.9	- 5.9	- 13.8	97.7	- 76.8	0	0	C 12, C 37
C 59	98.04	- 2	- 2	- 2	143	- 62.3	0	0	C 9, C 37, C 78
C 60	98.3	- 1.7	- 1.7	- 23.5	103	- 53	0	- 7.5	C 37
C 61	98.12	- 1.9	- 1.9	- 1.9	0	- 34.8	0	0	C 12, C 9, C 37, C 78
C 62	89.01	- 11	- 11	- 11	0	- 66.3	0	- 58	C 12, C 3, C 37
C 63	95.31	- 4.7	- 4.7	- 4.7	40.6	- 64.9	0	0	C 31, C 37, C 78
C 65	92.21	- 7.8	- 7.8	- 20.1	0	0	0	- 32.8	C 12, C 23, C 3
C 67	98.23	- 1.8	- 1.8	- 5.2	9.7	0	0	0	C 23, C 9, C 78
C 69	96.52	- 3.5	- 3.5	- 3.5	36.6	- 61.8	0	0	C 31, C 37, C 78
C 7	87.31	- 12.7	- 12.7	- 12.7	70.1	0	0	0	C 23, C 9, C 37, C 78
C 70	90.8	- 9.2	- 9.2	- 9.2	45	0	0	0	C 12, C 23, C 9
C 71	87.66	- 12.3	- 12.3	- 12.3	0	- 34	0	0	C 12, C 9, C 37, C 78
C 72	99.86	- 0.1	- 0.1	- 0.1	97.4	- 75.6	0	0	C 9, C 37, C 78
C 77	97.32	- 2.7	- 2.7	- 2.7	16.5	0	0	- 57.2	C 49, C 31
C 78	100	0	0	0	0	0	0	0	NA
C 9	100	0	0	0	0	0	0	0	NA

Table 12: Efficiency data for Operational Characteristics in 2012

Building	Efficiency	Input			Output				Reference Set
		BO 1	BO 2	BO 3	PR 1	PR 2	PC 1	PC 2	
C 1	84.09	- 32.2	- 15.9	- 15.9	22.8	- 9.9	0	0	C 20, C 78, C 53
C 10	100	0	0	0	0	0	0	0	NA
C 11	90.44	- 9.6	- 9.6	- 9.6	0	- 26.5	- 4.8	- 56.4	C 3, C 10, C 31
C 12	100	0	0	0	0	0	0	0	NA
C 15	88.87	- 29.6	- 32.6	- 11.1	2.5	- 100	0	0	C 23, C 78
C 156	100	0	0	0	0	0	0	0	NA
C 16	95.42	- 35.5	- 4.6	- 4.6	0	0	0	- 51.4	C 12, C 23, C 20, C 53
C 18	82.02	- 18	- 18	- 18	0	- 100	0	0	C 12, C 23, C 10, C 37, C 78
C 19	99.71	- 13.6	- 0.3	- 0.3	58.4	- 39.2	0	- 22.9	C 20, C 53
C 20	100	0	0	0	0	0	0	0	NA
C 21	81.42	- 25.2	- 43.5	- 18.6	0.4	- 100	0	0	C 23, C 78
C 23	100	0	0	0	0	0	0	0	NA
C 24	89.8	- 10.2	- 10.2	- 10.2	99	- 100	0	- 43.2	C 23, C 31, C 53
C 26	69.83	- 66.1	- 30.2	- 30.2	134.5	- 100	0	0	C 23, C 20, C 78
C 27	87.06	- 12.9	- 12.9	- 12.9	208.5	- 100	0	- 4.5	C 23, C 31, C 53
C 28	73.03	- 54.8	- 27	- 27	66	- 100	0	0	C 23, C 20, C 78
C 29	83.04	- 17	- 17	- 17	30.5	- 100	0	- 66.1	C 23, C 31, C 53
C 3	100	0	0	0	0	0	0	0	NA
C 30	100	0	0	0	0	0	0	0	NA
C 31	100	0	0	0	0	0	0	0	NA
C 32	83.09	- 58.5	- 31	- 16.9	0	- 100	0	0	C 23, C 37, C 78
C 33	84.97	- 15	- 15	- 15	0	- 54.7	0	- 10.5	C 3, C 10, C 31, C 37
C 34	88.89	- 19.7	- 26.7	- 11.1	47.4	0	- 10.2	0	C 23, C 78
C 35	100	0	0	0	0	0	0	0	NA
C 36	100	0	0	0	0	0	0	0	NA
C 37	100	0	0	0	0	0	0	0	NA
C 38	100	0	0	0	0	0	0	0	NA
C 39	75.65	- 24.4	- 24.4	- 24.4	33.4	- 100	0	0	C 23, C 31, C 36, C 53
C 40	88.5	- 25.2	- 11.5	- 11.5	29.4	- 100	0	- 0.5	C 23, C 20
C 41	79.66	- 20.3	- 20.3	- 20.3	0	- 100	0	0	C 12, C 23, C 10, C 37, C 78
C 42	91.59	- 8.4	- 8.4	- 8.4	0	- 100	0	0	C 23, C 10, C 31, C 37, C 78
C 43	83.33	- 43.7	- 16.7	- 16.7	0	- 100	0	0	C 12, C 23, C 37, C 78
C 45	80.34	- 49.7	- 19.7	- 19.7	26.1	- 100	0	0	C 23, C 78
C 47	85.15	- 50.9	- 14.9	- 14.9	49.7	- 100	0	0	C 23, C 20, C 78
C 49	100	0	0	0	0	0	0	0	NA
C 491	77.05	- 62.6	- 38.3	- 22.9	58	- 100	0	0	C 23, C 78
C 50	86.77	- 13.2	- 13.2	- 13.2	0	0	0	- 65	C 12, C 23, C 3, C 10, C 37
C 51	84.36	- 15.6	- 15.6	- 15.6	0	- 69	0	- 35.9	C 3, C 10, C 31, C 37
C 52	94.11	- 5.9	- 5.9	- 5.9	3.6	0	0	0	C 12, C 23, C 35, C 78, C 53
C 53	100	0	0	0	0	0	0	0	NA
C 54	89.19	- 10.8	- 10.8	- 10.8	19.7	- 100	0	0	C 23, C 20, C 78, C 53
C 58	91.51	- 8.5	- 8.5	- 8.5	16	- 100	0	0	C 23, C 20, C 78, C 53
C 59	90.42	- 43.9	- 9.6	- 9.6	106.1	0	0	0	C 23, C 20, C 78, C 53
C 60	90.24	- 14.7	- 9.8	- 9.8	34.6	- 100	0	- 5.3	C 23, C 20
C 61	82.25	- 38.9	- 17.8	- 17.8	0	- 100	0	0	C 12, C 23, C 37, C 78
C 62	84.93	- 15.1	- 15.1	- 15.1	0	- 100	0	- 57.2	C 12, C 23, C 10, C 37
C 63	80.64	- 59.2	- 28.8	- 19.4	0	- 100	0	0	C 23, C 37, C 78
C 65	91.64	- 16.2	- 8.4	- 8.4	0	0	0	- 35.9	C 12, C 23, C 3, C 37
C 67	98.08	- 1.9	- 1.9	- 1.9	21.8	- 100	0	0	C 23, C 31, C 36, C 53
C 69	95.74	- 4.3	- 37.6	- 4.3	0	- 100	0	0	C 23, C 31, C 37, C 78
C 7	82	- 18	- 18	- 18	42.2	0	0	0	C 12, C 23, C 35, C 78, C 53
C 70	82.01	- 28.7	- 18	- 18	43.3	- 100	0	0	C 23, C 20, C 78
C 71	90.91	- 9.1	- 19	- 9.1	0	0	- 2.8	0	C 23, C 3, C 31, C 78
C 72	94.84	- 50	- 5.2	- 5.2	123.7	- 33.1	0	0	C 20, C 78, C 53
C 77	87.88	- 12.1	- 12.1	- 12.1	0	- 100	0	0	C 12, C 23, C 10, C 37, C 78
C 78	100	0	0	0	0	0	0	0	NA
C 9	94.43	- 5.6	- 5.6	- 5.6	40.2	- 100	0	0	C 23, C 36, C 78, C 53

Table 13: Efficiency data for Physical Characteristics in 2012

Building	Efficiency	Input		Output				Reference Set
		BP 1	BP 2	PR 1	PR 2	PC 1	PC 2	
C 1	41.48	- 79.1	- 58.5	0	- 71.8	0	- 66.1	C 67, C 11
C 10	74.34	- 25.7	- 25.7	0	0	0	- 21.7	C 12, C 156, C 18, C 11
C 11	100	0	0	0	0	0	0	NA
C 12	100	0	0	0	0	0	0	NA
C 15	69.43	- 66.6	- 30.6	0	0	0	- 54.2	C 38, C 67, C 11
C 156	100	0	0	0	0	0	0	NA
C 16	47.62	- 80.2	- 52.4	0	- 43.1	0	- 82.7	C 67, C 11
C 18	100	0	0	0	0	0	0	NA
C 19	45.68	- 90.4	- 54.3	0	- 84.8	0	- 80.3	C 67, C 11
C 20	70.97	- 29	- 29	0	- 100	0	- 60	C 23, C 18, C 67
C 21	44.94	- 71.8	- 55.1	0	0	0	- 59.7	C 38, C 67, C 11
C 23	100	0	0	0	0	0	0	NA
C 24	65.97	- 82.9	- 34	0	- 67.9	0	- 65.1	C 67, C 11
C 26	76.96	- 87.2	- 23	51	- 65.9	0	- 74.1	C 67
C 27	46.95	- 86.9	- 53.1	49.8	- 82.2	0	- 55	C 67
C 28	42.81	- 65.5	- 57.2	6.9	- 76.7	0	- 58.9	C 67
C 29	45.63	- 85.6	- 54.4	0	- 77.1	0	- 84.7	C 67, C 11
C 3	61.34	- 46.9	- 38.7	0	0	- 25.6	0	C 38, C 11, C 78
C 30	100	0	0	0	0	0	0	NA
C 31	76.09	- 23.9	- 23.9	0	- 58.9	0	0	C 18, C 67, C 11, C 78
C 32	56.12	- 78.5	- 43.9	0	- 75.1	0	- 55.3	C 67, C 11
C 33	78.42	- 36.9	- 21.6	0	- 12.6	- 3.1	0	C 11, C 78
C 34	100	0	0	0	0	0	0	NA
C 35	100	0	0	0	0	0	0	NA
C 36	53.73	- 46.3	- 46.3	18.3	- 77.4	0	0	C 67, C 35, C 78
C 37	76.15	- 23.8	- 23.8	0	0	0	- 59.6	C 38, C 18, C 67, C 11
C 38	100	0	0	0	0	0	0	NA
C 39	84.09	- 15.9	- 15.9	0	- 100	0	- 16.8	C 23, C 18, C 67
C 40	69.35	- 82.9	- 30.6	0	- 68.6	0	- 80.6	C 67, C 11
C 41	66.34	- 35.5	- 33.7	0	- 46.7	0	0	C 67, C 11, C 78
C 42	54.98	- 45	- 45	0	- 73.3	0	0	C 18, C 67, C 35, C 78
C 43	63.26	- 36.7	- 36.7	0	- 29.7	0	- 57.7	C 18, C 67, C 11
C 45	50.05	- 53.2	- 50	0	- 69.5	0	- 72.4	C 67, C 11
C 47	56.13	- 43.9	- 43.9	0	- 33.7	0	- 19.3	C 18, C 67, C 11
C 49	100	0	0	0	0	0	0	NA
C 491	67.38	- 89.4	- 32.6	2	- 66.3	0	- 74.8	C 67
C 50	99.71	- 9.8	- 0.3	0	0	- 15.1	- 25.2	C 38, C 11
C 51	54.56	- 54.2	- 45.4	0	- 23.2	0	- 40.2	C 67, C 11
C 52	98.71	- 26.3	- 1.3	0	0	0	0	C 38, C 67, C 11, C 78
C 53	80.79	- 82.7	- 19.2	0	- 57.9	0	- 62.4	C 67, C 11
C 54	71.77	- 28.2	- 28.2	0	- 100	0	0	C 23, C 49, C 67, C 35
C 58	83.82	- 40.5	- 16.2	0	- 80.3	0	- 69.4	C 67, C 11
C 59	82.34	- 88	- 17.7	26.2	- 63.1	0	- 62.6	C 67
C 60	94.1	- 87	- 5.9	0	- 49.4	0	- 85.2	C 67, C 11
C 61	85.52	- 14.5	- 14.5	0	0	0	0	C 38, C 18, C 67, C 11, C 78
C 62	68.4	- 35.3	- 31.6	0	- 6	- 3.3	- 45.1	C 11
C 63	86.27	- 13.7	- 13.7	0	- 100	0	- 25.9	C 23, C 18, C 67
C 65	97.08	- 54.9	- 2.9	0	0	- 17.9	0	C 38, C 11, C 78
C 67	100	0	0	0	0	0	0	NA
C 69	76.95	- 72.6	- 23	0	- 47.4	0	- 59.3	C 67, C 11
C 7	50.34	- 73.1	- 49.7	16.7	0	0	0	C 38, C 67, C 78
C 70	43.44	- 86.8	- 56.6	0	0	0	- 44	C 38, C 67, C 11
C 71	100	0	0	0	0	0	0	NA
C 72	71.24	- 28.8	- 28.8	68.8	- 78.7	0	0	C 67, C 35, C 78
C 77	58.73	- 56.8	- 41.3	0	- 7.8	0	- 56.9	C 67, C 11
C 78	100	0	0	0	0	0	0	NA
C 9	91.83	- 8.2	- 8.2	0	- 100	0	0	C 23, C 49, C 67, C 35

Appendix 2: Correlation Table for Measurable Average Metrics Data

	CR1	CR3	CR4	CR5	OR1	OR2	OR3	OR4	OC1	OC2	OE1	OW1	OG1	OS4	OI1	OI2	OM1	OM2	OM3	OT1	OT2	OT3	OO1	OO2	OO3	OO4	OD2	OD3	BO1	BO2	BO3	BP1	BP2	PR1	PR2	PC1	PC2
CR1	1.000																																				
CR3	0.127	1.000																																			
CR4	-0.009	0.082	1.000																																		
CR5	0.000	0.000	0.000	1.000																																	
OR1	-0.061	-0.021	-0.086	0.000	1.000																																
OR2	0.134	-0.278	0.064	0.000	0.355	1.000																															
OR3	-0.055	-0.307	-0.005	0.000	0.039	0.065	1.000																														
OR4	-0.109	-0.288	-0.407	0.000	0.228	0.135	0.147	1.000																													
OC1	0.265	-0.073	-0.196	0.000	-0.067	0.154	-0.047	0.170	1.000																												
OC2	0.063	-0.038	-0.018	0.000	-0.199	-0.024	0.072	0.167	0.077	1.000																											
OE1	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000																										
OW1	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000																									
OG1	-0.297	-0.082	-0.036	0.000	-0.031	-0.161	-0.041	0.163	-0.096	-0.160	0.000	0.000	1.000																								
OS4	-0.101	0.028	-0.206	0.000	0.111	0.177	-0.278	0.166	0.179	0.052	0.000	0.000	0.260	1.000																							
OI1	0.271	0.092	-0.138	0.000	-0.197	0.041	0.115	0.157	0.352	0.229	0.000	0.000	0.102	-0.074	1.000																						
OI2	0.021	-0.212	0.052	0.000	0.285	0.176	0.002	-0.056	-0.005	-0.125	0.000	0.000	0.148	0.015	-0.031	1.000																					
OM1	0.102	0.277	0.004	0.000	0.331	0.121	-0.061	-0.016	0.007	-0.168	0.000	0.000	0.049	0.212	-0.253	-0.174	1.000																				
OM2	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	1.000	0.000	0.000	0.000	0.000	0.000	1.000																			
OM3	-0.196	0.022	0.010	0.000	-0.023	0.108	-0.303	0.071	0.067	0.246	0.000	0.000	0.062	0.391	-0.248	-0.047	0.156	0.000	1.000																		
OT1	-0.189	-0.154	-0.095	0.000	0.101	0.385	0.030	0.297	-0.080	0.047	0.000	0.000	0.243	0.084	-0.068	0.059	0.119	0.000	0.045	1.000																	
OT2	-0.101	-0.040	-0.248	0.000	-0.143	-0.112	-0.094	0.245	-0.114	-0.071	0.000	0.000	0.067	0.053	0.076	-0.418	-0.096	0.000	0.071	0.039	1.000																
OT3	-0.088	-0.165	0.030	0.000	0.187	0.084	-0.051	0.093	-0.001	-0.003	0.000	0.000	0.214	0.151	-0.018	-0.329	0.072	0.000	0.018	0.082	0.084	1.000															
OO1	-0.105	-0.029	0.148	0.000	-0.114	-0.127	-0.064	-0.244	0.020	0.081	0.000	0.000	0.102	-0.239	0.180	0.096	0.058	0.000	-0.079	0.038	-0.120	-0.037	1.000														
OO2	0.043	0.188	0.279	0.000	-0.132	0.088	0.328	-0.164	-0.032	0.034	0.000	0.000	-0.134	-0.329	0.083	-0.176	0.121	0.000	-0.142	-0.143	0.031	-0.131	0.230	1.000													
OO3	0.197	0.036	0.008	0.000	-0.125	0.061	-0.094	-0.152	0.031	-0.282	0.000	0.000	0.080	-0.248	0.084	-0.100	0.075	0.000	0.049	0.006	0.093	0.069	0.242	0.243	1.000												
OO4	-0.331	0.148	-0.069	0.000	-0.141	-0.194	-0.021	0.051	-0.185	-0.128	0.000	0.000	0.109	-0.193	0.029	-0.190	0.125	0.000	-0.002	-0.117	0.227	-0.282	0.081	0.042	-0.035	1.000											
OD2	0.000	0.000	0.000	-1.000	0.000	0.000	0.000	0.000	0.000	0.000	-1.000	-1.000	0.000	0.000	0.000	0.000	0.000	-1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000										
OD3	0.422	0.410	-0.071	0.000	-0.022	-0.065	-0.169	-0.242	0.320	-0.090	0.000	0.000	-0.107	0.128	0.284	-0.012	-0.040	0.000	-0.152	-0.217	0.022	-0.187	-0.119	-0.119	-0.082	0.024	0.000	1.000									
BO1	0.156	0.377	0.167	0.000	-0.295	-0.108	-0.280	-0.128	0.059	-0.152	0.000	0.000	-0.086	0.192	0.086	-0.166	0.062	0.000	-0.113	-0.041	0.234	-0.257	-0.172	0.108	-0.170	0.211	0.000	0.292	1.000								
BO2	-0.194	-0.152	-0.070	0.000	-0.197	-0.058	0.282	0.269	0.152	0.044	0.000	0.000	0.133	-0.254	0.178	-0.159	-0.329	0.000	0.004	0.175	0.259	0.017	0.023	0.136	0.138	-0.011	0.000	-0.122	-0.087	1.000							
BO3	0.110	0.142	0.175	0.000	-0.092	0.126	-0.061	-0.082	-0.148	0.159	0.000	0.000	-0.135	0.227	0.044	0.134	-0.183	0.000	-0.098	0.165	-0.164	-0.288	-0.194	-0.115	-0.331	-0.055	0.000	0.043	0.504	0.030	1.000						
BP1	0.027	0.120	0.244	0.000	-0.099	-0.127	-0.136	-0.177	-0.300	0.184	0.000	0.000	-0.108	-0.311	-0.178	-0.258	-0.002	0.000	0.011	-0.095	0.230	-0.094	-0.057	0.065	0.023	0.199	0.000	-0.060	0.089	0.097	-0.006	1.000					
BP2	0.009	-0.129	0.012	0.000	-0.012	0.151	0.344	-0.271	0.072	0.180	0.000	0.000	-0.337	-0.199	-0.029	-0.123	0.018	0.000	-0.009	0.146	-0.199	0.002	0.068	0.196	-0.156	-0.198	0.000	-0.101	-0.193	-0.037	0.047	0.004	1.000				
PR1	-0.293	-0.301	-0.042	0.000	-0.164	0.055	0.152	0.232	0.025	0.145	0.000	0.000	0.147	-0.010	0.137	0.154	-0.088	0.000	0.045	0.168	0.141	0.059	0.354	0.015	0.174	0.014	0.000	-0.346	-0.125	0.262	-0.057	0.117	-0.056	1.000			
PR2	-0.193	0.024	0.110	0.000	0.099	-0.048	-0.201	-0.221	-0.382	0.191	0.000	0.000	0.034	0.017	-0.422	-0.092	0.019	0.000	0.032	0.175	-0.209	0.079	0.248	-0.201	-0.175	0.127	0.000	0.024	-0.149	-0.169	0.227	0.088	0.145	-0.200	1.000		
PC1	-0.115	0.209	-0.045	0.000	-0.021	-0.203	-0.386	-0.120	0.022	0.156	0.000	0.000	0.015	-0.057	0.029	0.070	-0.272	0.000	0.009	-0.231	0.066	-0.161	0.075	0.008	-0.110	0.058	0.000	0.061	0.039	-0.154	-0.018	0.393	0.001	0.171	0.033	1.000	
PC2	0.102	0.041	0.159	0.000	-0.027	-0.106	-0.087	-0.004	-0.167	0.200	0.000	0.000	0.038	0.017	0.041	-0.150	0.214	0.000	0.023	0.073	0.216	0.187	0.043	-0.088	-0.250	-0.124	0.000	-0.127	-0.055	-0.246	-0.042	0.367	0.154	0.081	0.045	0.172	1.000

Appendix 3: Average Analysis – CapEx

Capital Expenditures (CapEx)

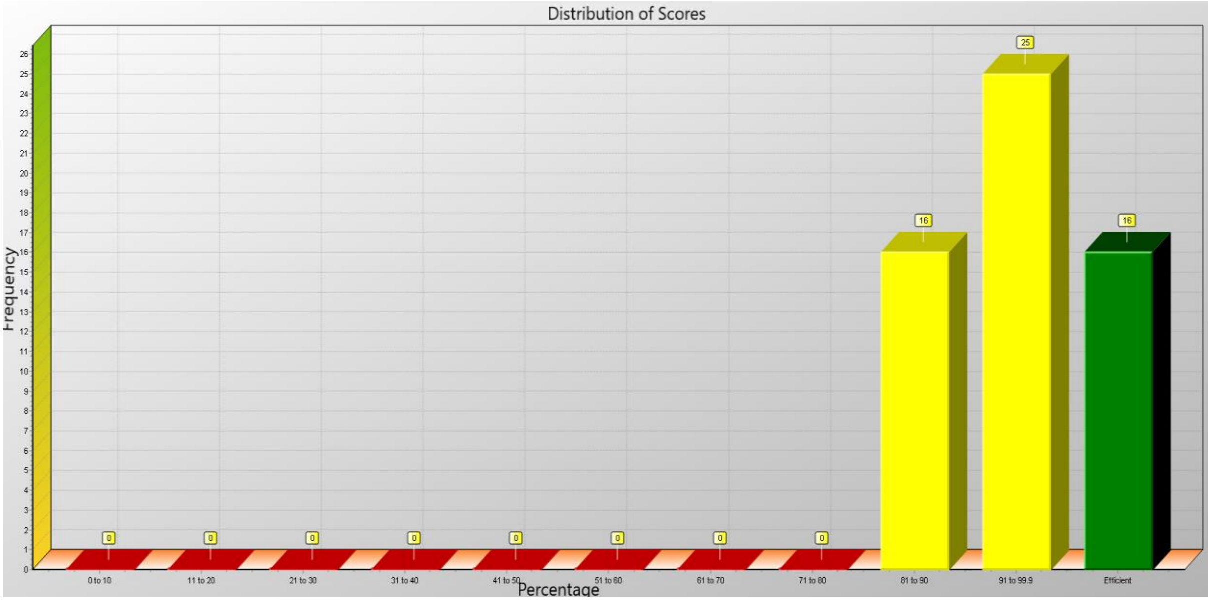

Figure 5. 12: Efficiency Distribution for Capital Expenditures (CapEx)

Table 5. 4: Efficiency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
100 %	100.0	0.0	100.0	100.0	0.0
91-100 %	95.21	2.38	91.06	99.37	8.31
81-90 %	87.66	1.86	83.79	90.62	6.83
< 81 %	-	-	-	-	-

Appendix 4: Average Analysis – Repair and maintenance

Repair and maintenance

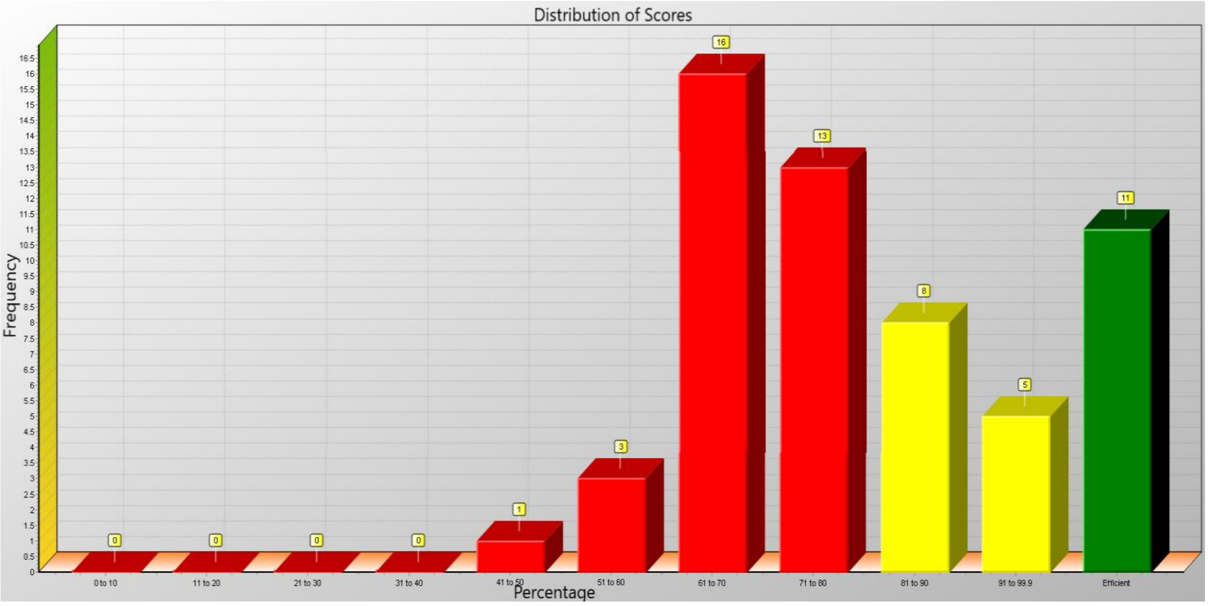

Figure 5. 13: Efficiency Distribution for Repair and maintenance

Table 5. 5: Efficiency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
100 %	100.0	0.0	100.0	100.0	0.0
91-100 %	96.18	2.54	92.79	99.07	6.28
81-90 %	84.55	1.66	82.6	88.04	5.44
< 81 %	68.88	7.48	50.89	80.38	29.49

Appendix 5: Average Analysis – Cleaning

Cleaning

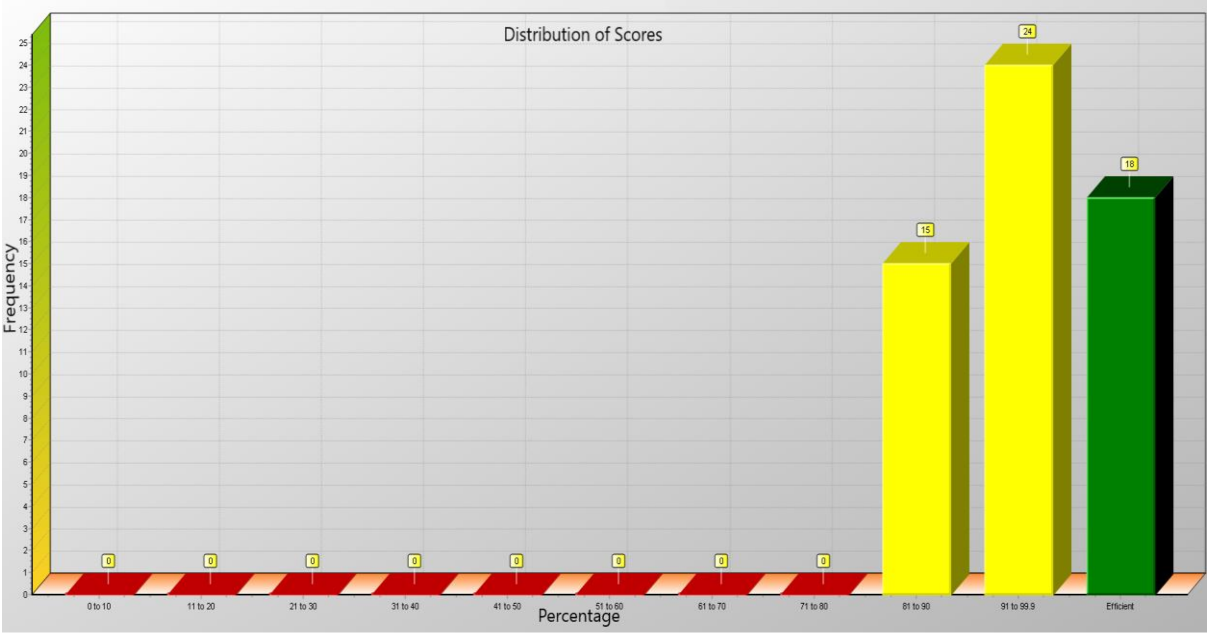

Figure 5. 14: Efficiency Distribution for Cleaning

Table 5. 6: Efficiency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
100 %	100.0	0.0	100.0	100.0	0.0
91-100 %	95.98	2.44	91.31	99.74	8.43
81-90 %	88.18	2.07	83.29	90.91	7.62
< 81 %	-	-	-	-	-

Appendix 6: Average Analysis – General Consumption

General Consumption

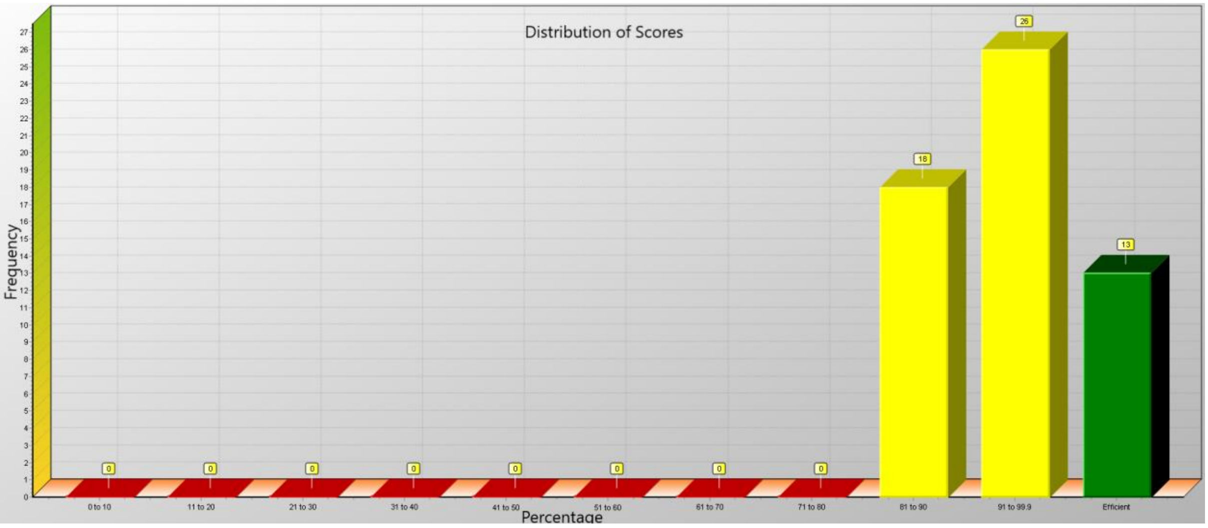

Figure 5. 15: Efficiency Distribution for General Consumption

Table 5. 7: Efficiency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
100 %	100.0	0.0	100.0	100.0	0.0
91-100 %	95.16	2.57	91.06	99.44	8.38
81-90 %	87.6	1.82	83.85	89.74	5.89
< 81 %	-	-	-	-	-

Appendix 7: Average Analysis – Churn

Churn

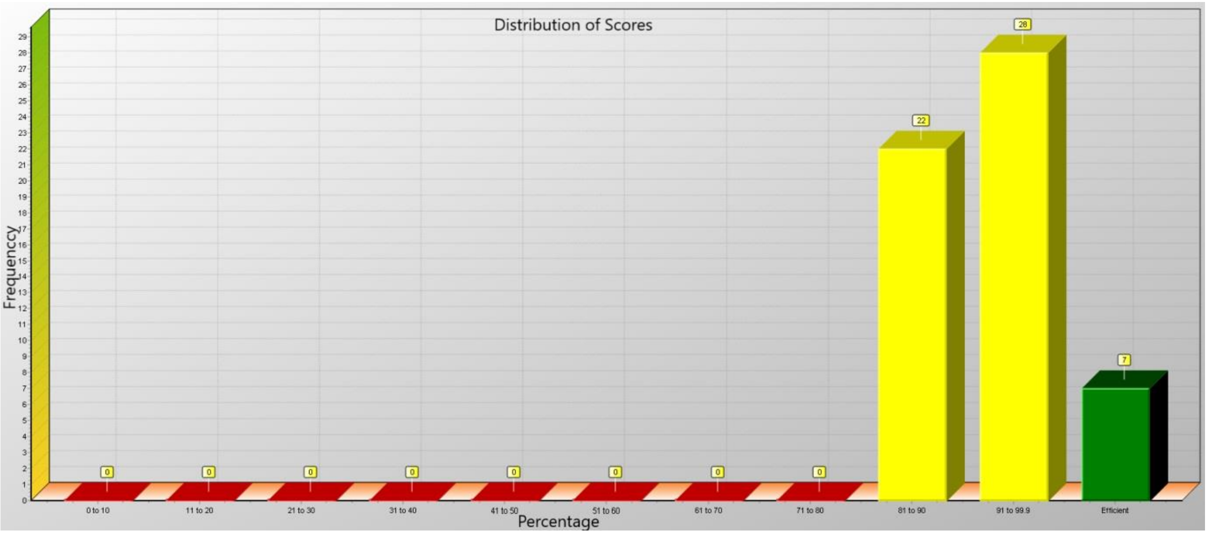

Figure 5. 16: Efficiency Distribution for Churn

Table 5. 8 Efficiency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
100 %	100.0	0.0	100.0	100.0	0.0
91-100 %	94.94	2.27	91.06	99.37	8.31
81-90 %	87.25	1.95	83.19	89.73	6.54
< 81 %	-	-	-	-	-

Appendix 8: Average Analysis – Security

Security

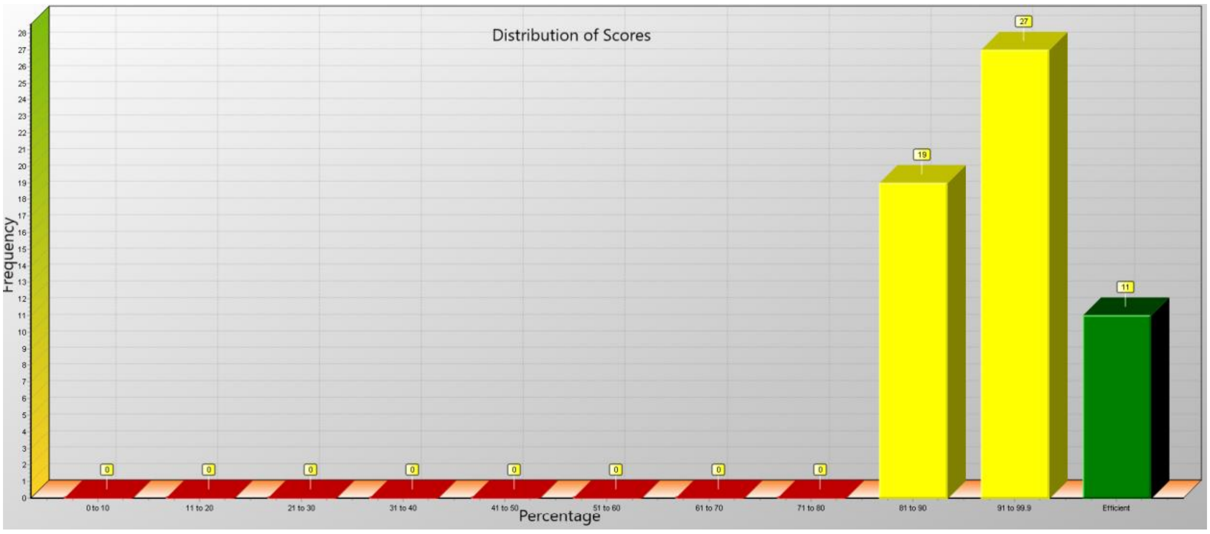

Figure 5. 17: Efficiency Distribution for Security

Table 5. 9: Efficiency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
100 %	100.0	0.0	100.0	100.0	0.0
91-100 %	95.25	2.34	91.12	99.37	8.25
81-90 %	87.39	1.87	83.29	89.73	6.44
< 81 %	-	-	-	-	-

Appendix 9: Average Analysis – Insurance

Insurance

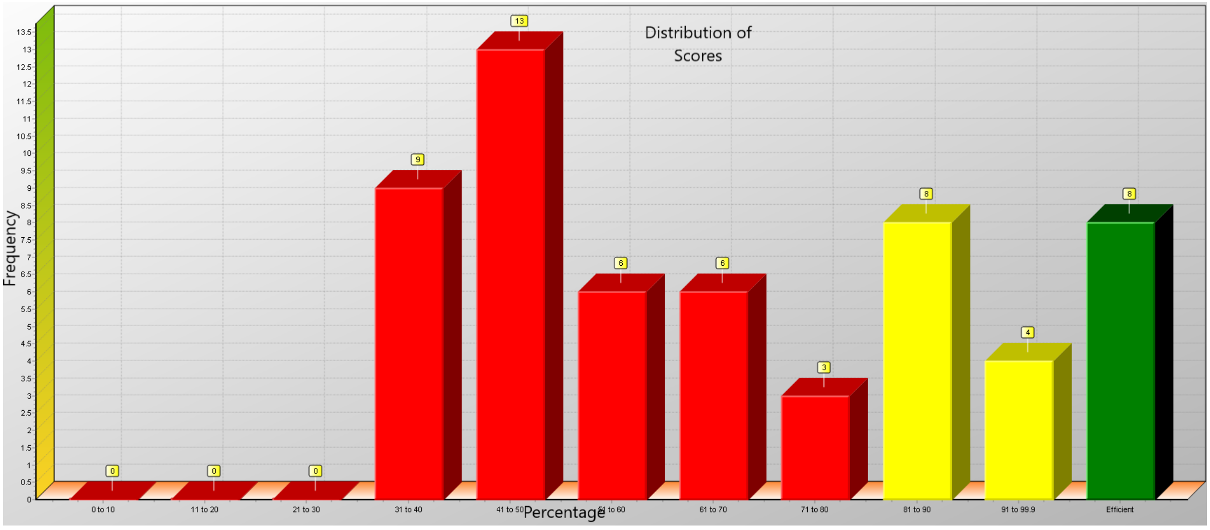

Figure 5. 18: Efficiency Distribution for Insurance

Table 5. 10: Efficiency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
100 %	100.0	0.0	100.0	100.0	0.0
91-100 %	95.46	2.76	92.93	99.76	6.83
81-90 %	85.36	2.79	82.1	89.13	7.03
< 81 %	50.14	12.24	31.91	75.91	44.0

Appendix 10 : Average Analysis – Management and overall costs

Management and overall costs

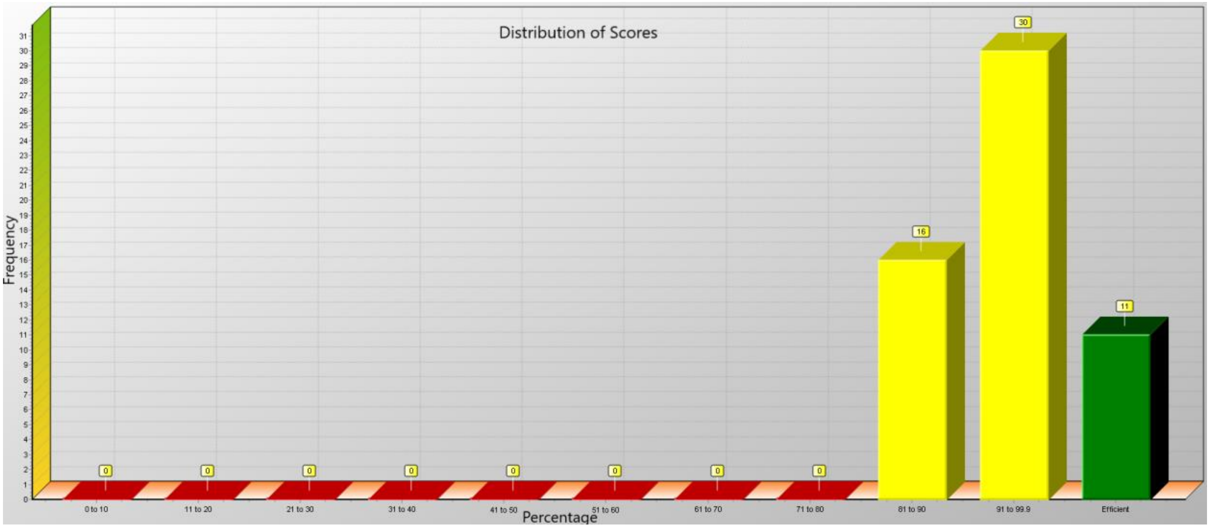

Figure 5. 19: Efficiency Distribution for Management and overall costs

Table 5. 11: Efficiency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
100 %	100.0	0.0	100.0	100.0	0.0
91-100 %	95.15	2.39	91.11	99.37	8.26
81-90 %	87.59	2.29	83.19	90.71	7.52
< 81 %	-	-	-	-	-

Appendix 11: Average Analysis – Rent

Rent

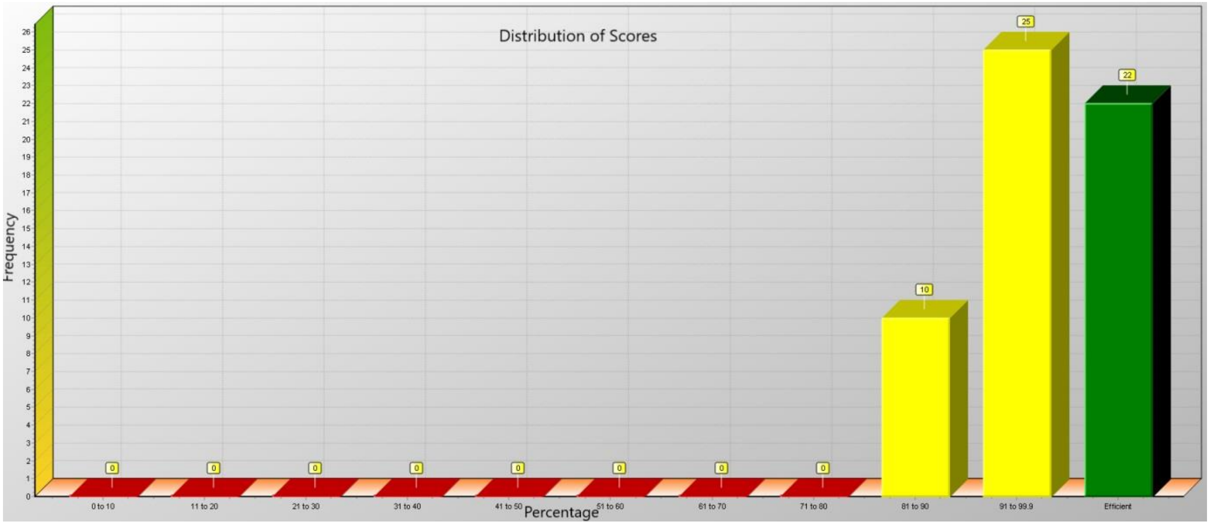

Figure 5. 20: Efficiency Distribution for Rent

Table 5. 12: Efficiency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
100 %	100.0	0.0	100.0	100.0	0.0
91-100 %	96.1	2.14	92.67	99.8	7.13
81-90 %	88.72	1.73	84.98	90.91	5.93
< 81 %	-	-	-	-	-

Appendix 12: Average Analysis – Occupation Cost and Leasing

Occupation Cost and Leasing

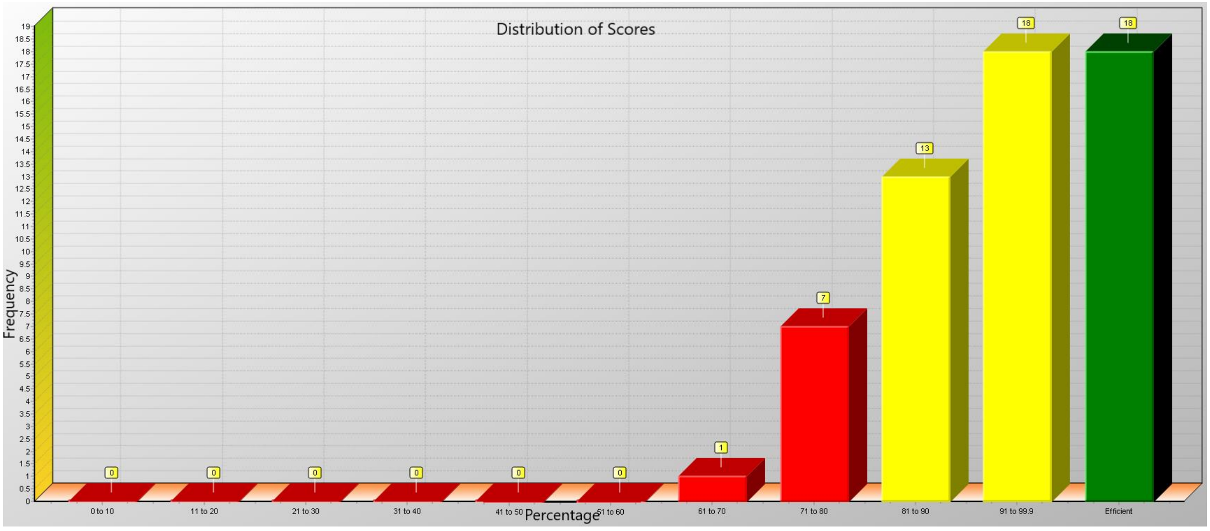

Figure 5. 21: Efficiency Distribution for Occupation Cost and Leasing

Table 5. 13: Efficiency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
100 %	100.0	0.0	100.0	100.0	0.0
91-100 %	95.15	2.7	91.58	99.62	8.04
81-90 %	86.68	2.72	81.12	90.95	9.83
< 81 %	74.81	3.44	68.12	78.9	10.78

Appendix 13: Average Analysis – Debt

Debt

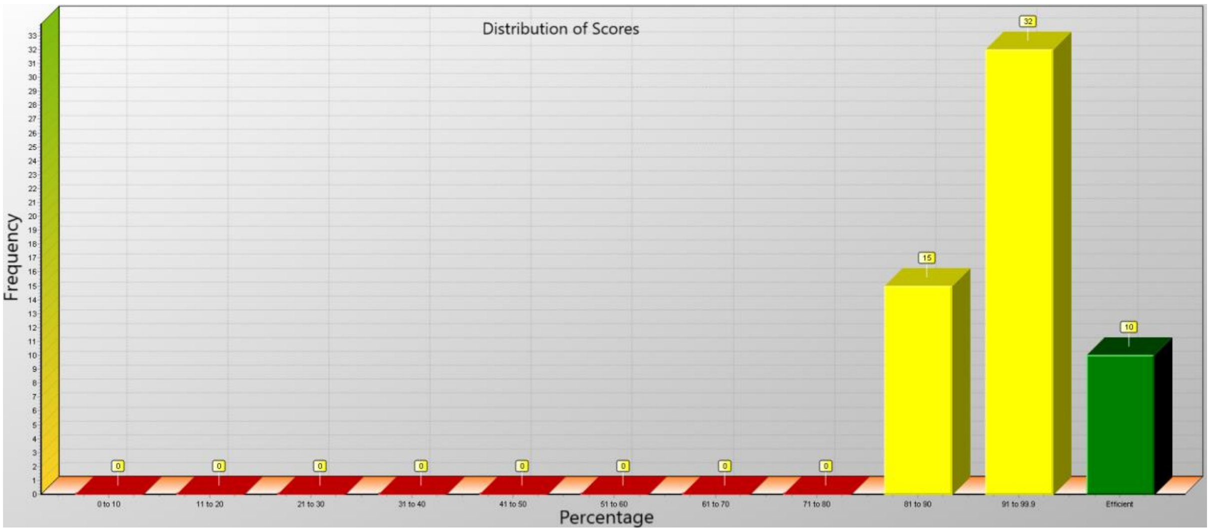

Figure 5. 22: Efficiency Distribution for Debt

Table 5. 14: Efficiency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
100 %	100.0	0.0	100.0	100.0	0.0
91-100 %	94.88	2.46	91.06	99.37	8.31
81-90 %	87.37	2.08	83.19	89.73	6.54
< 81 %	-	-	-	-	-

Appendix 14: Average Analysis – Operational Characteristics

Operational Characteristics

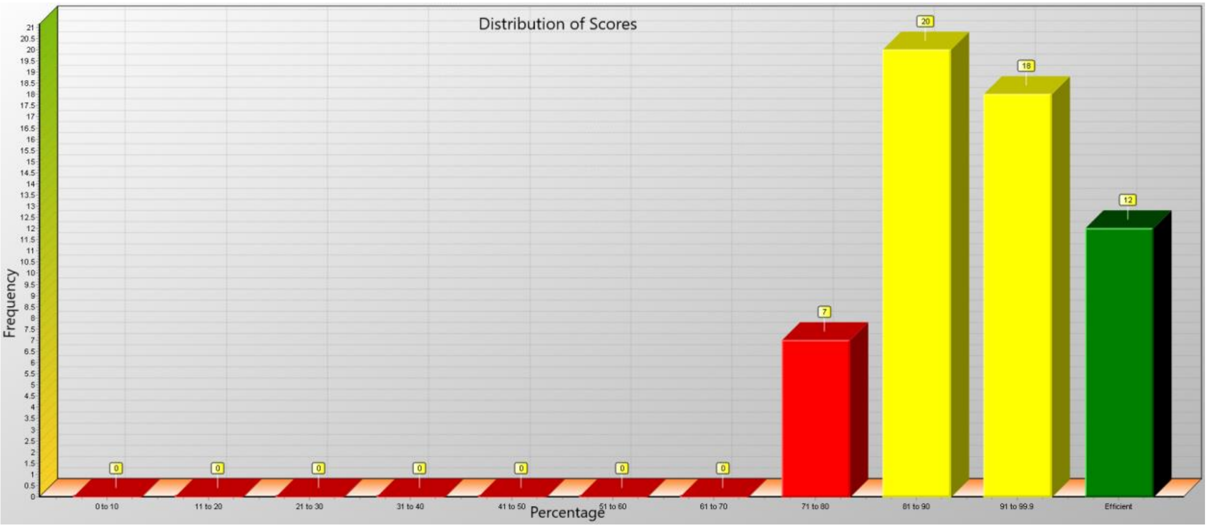

Figure 5. 23: Efficiency Distribution for Operational Characteristics

Table 5. 15: Efficiency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
100 %	100.0	0.0	100.0	100.0	0.0
91-100 %	94.88	2.51	91.68	99.82	8.14
81-90 %	86.13	2.73	81.81	90.87	9.06
< 81 %	78.3	2.36	73.34	80.45	7.11

Appendix 15: Average Analysis – Physical Characteristics

Physical Characteristics

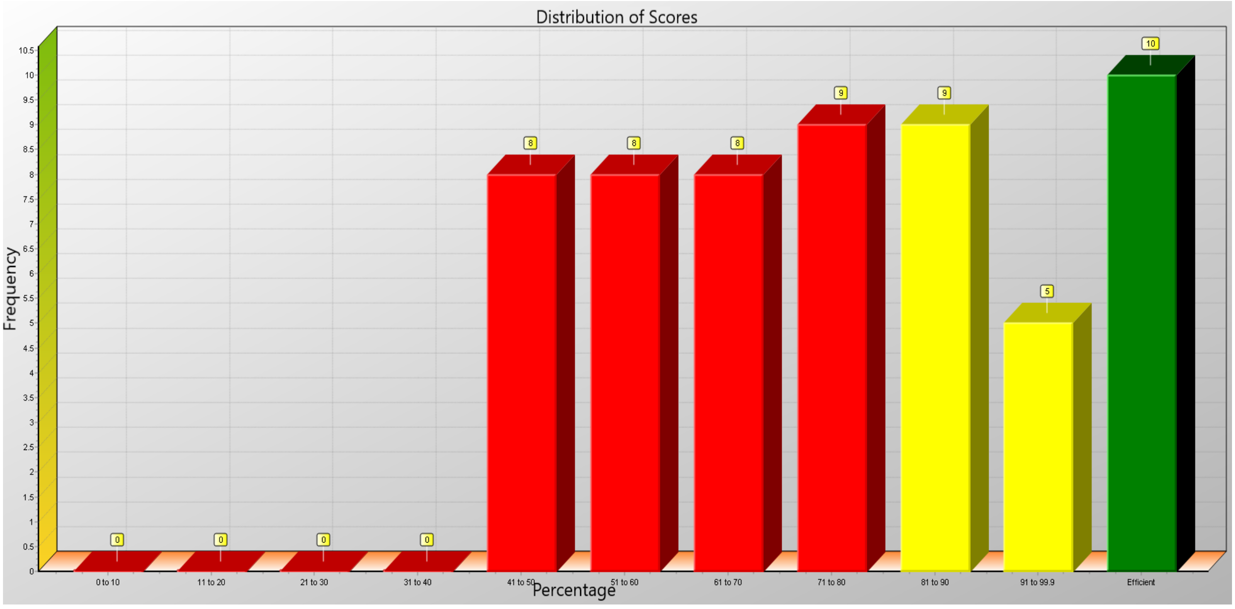

Figure 5. 24: Efficiency Distribution for Physical Characteristics

Table 5. 16: Efficiency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
100 %	100.0	0.0	100.0	100.0	0.0
91-100 %	96.34	1.77	94.18	98.77	4.59
81-90 %	85.83	2.51	82.76	89.86	7.1
< 81 %	61.26	12.07	42.45	80.75	38.3

Appendix 16: Total Potential Improvement – CapEx

Capital Expenditures (CapEx)

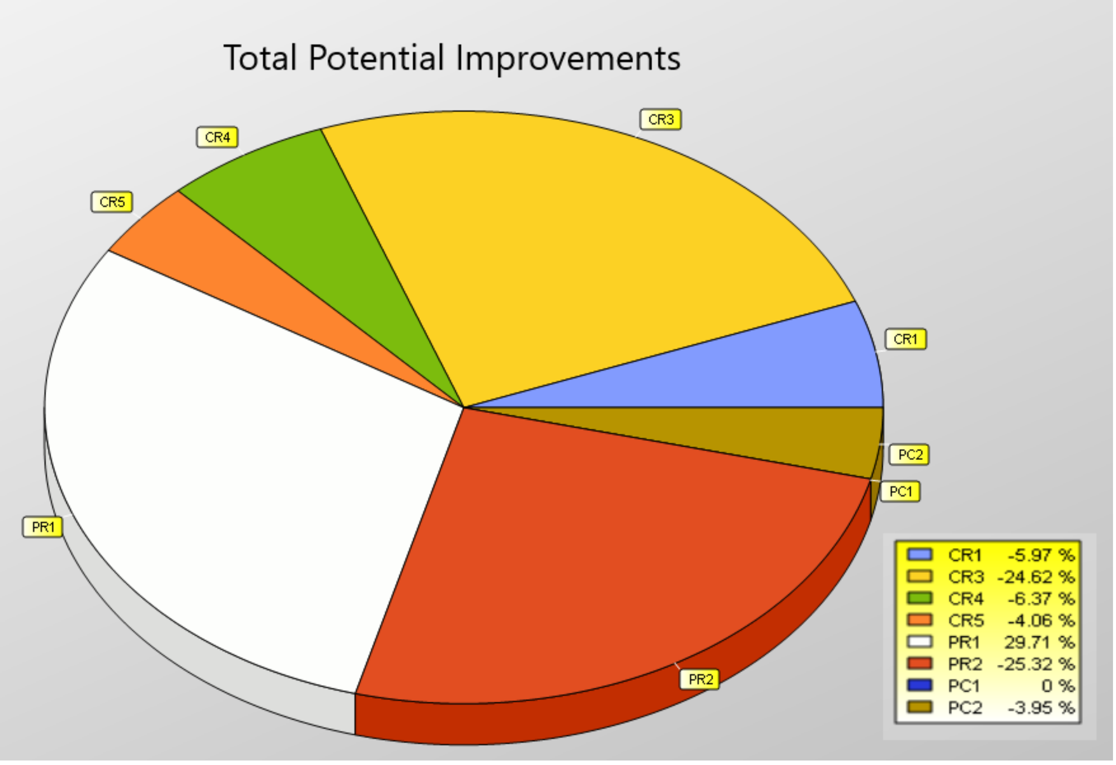

Figure 5. 25: Total Potential Improvement for Capital Expenditures (CapEx)

Table 5. 17: Total potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
CR 1	-5.23	4.74	-18.53	0.0	18.53
CR 3	-18.74	17.32	-74.57	0.0	74.57
CR 4	-5.57	7.65	-50.61	0.0	50.61
CR 5	-3.4	3.11	-12.71	0.0	12.71
PR 1	17.51	20.82	0.0	69.98	69.98
PR 2	-18.21	18.22	-66.5	0.0	66.5
PC 1	0.0	0.0	0.0	0.0	0.0
PC 2	-3.27	6.81	-28.41	0.0	28.41

Appendix 17: Total Potential Improvement – Repair and maintenance

Repair and maintenance

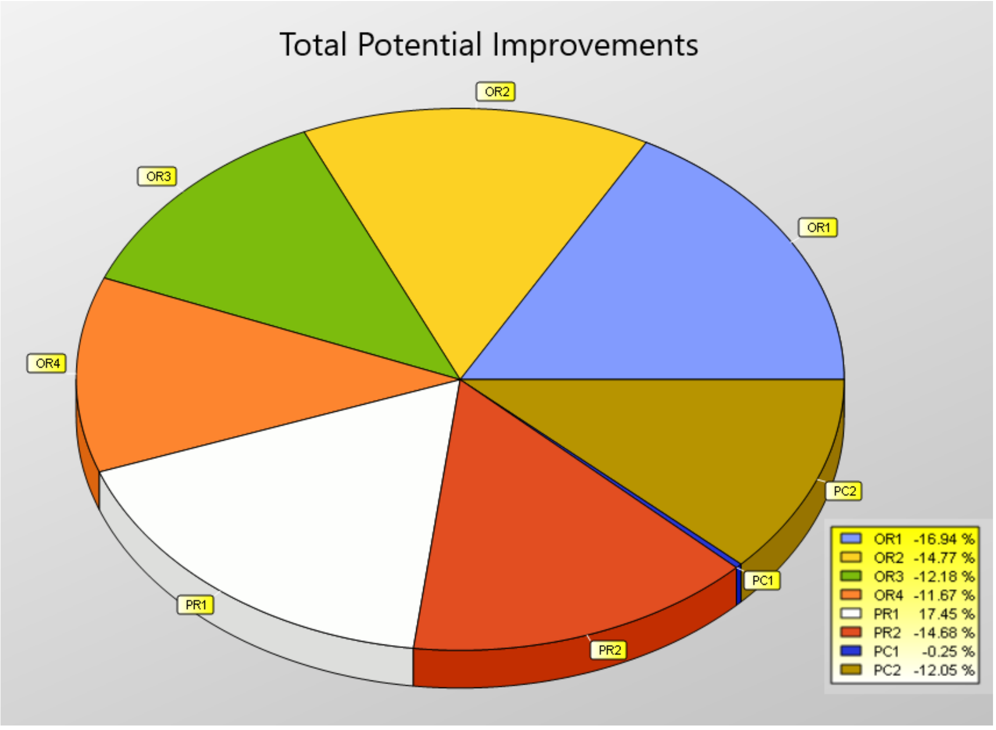

Figure 5. 26: Total Potential Improvement for Repair and maintenance

Table 5. 18: Total potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OR 1	-15.3	14.1	-78.4	0.0	78.4
OR 2	-12.3	9.08	-35.33	0.0	35.33
OR 3	-10.16	7.37	-23.34	0.0	23.34
OR 4	-9.74	7.16	-23.34	0.0	23.34
PR 1	12.57	16.02	0.0	49.96	49.96
PR 2	-11.09	15.21	-59.04	0.0	59.04
PC 1	-0.3	1.54	-11.03	0.0	11.03
PC 2	-9.23	14.08	-63.6	0.0	63.6

Appendix 18: Total Potential Improvement – Cleaning

Cleaning

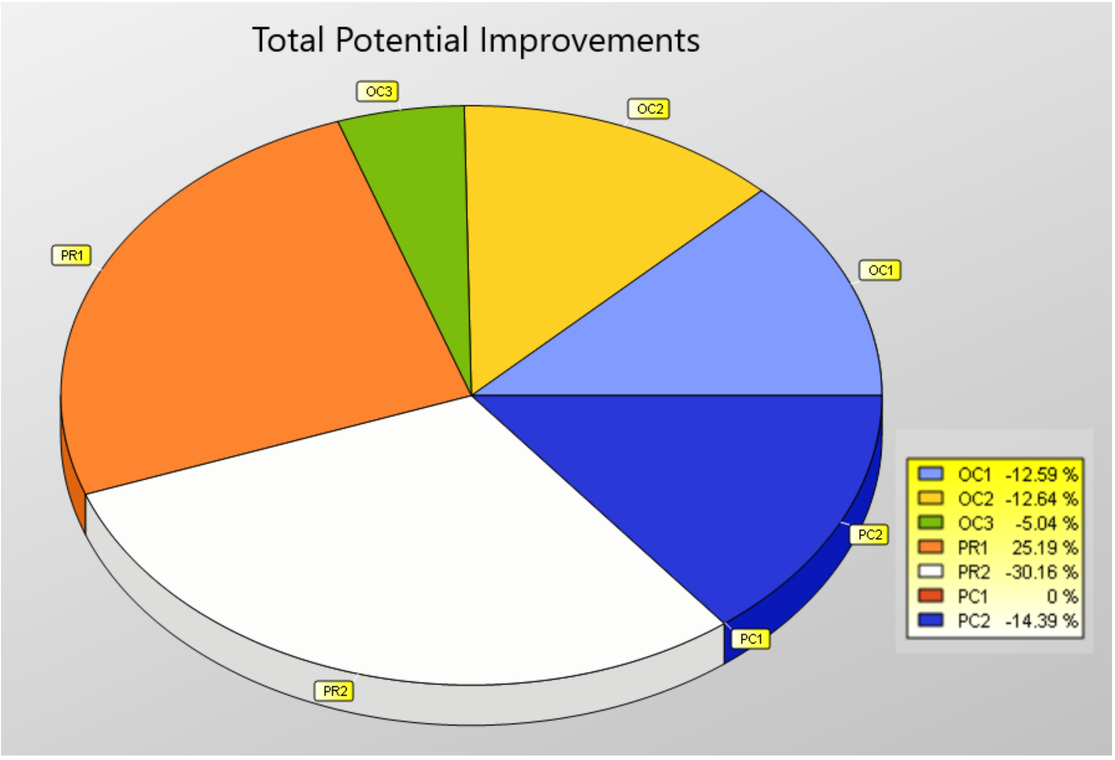

Figure 5. 27: Total Potential Improvement for Cleaning.

Table 5. 19: Total potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OC 1	-10.28	15.79	-77.78	0.0	77.78
OC 2	-10.49	14.41	-92.91	0.0	92.91
OC 3	-3.94	4.74	-26.21	0.0	26.21
PR 1	13.63	22.69	0.0	80.29	80.29
PR 2	-18.8	21.87	-77.0	0.0	77.0
PC 1	0.0	0.0	0.0	0.0	0.0
PC 2	-11.28	21.25	-93.32	0.0	93.32

Appendix 19: Total Potential Improvement – General Consumption

General Consumption

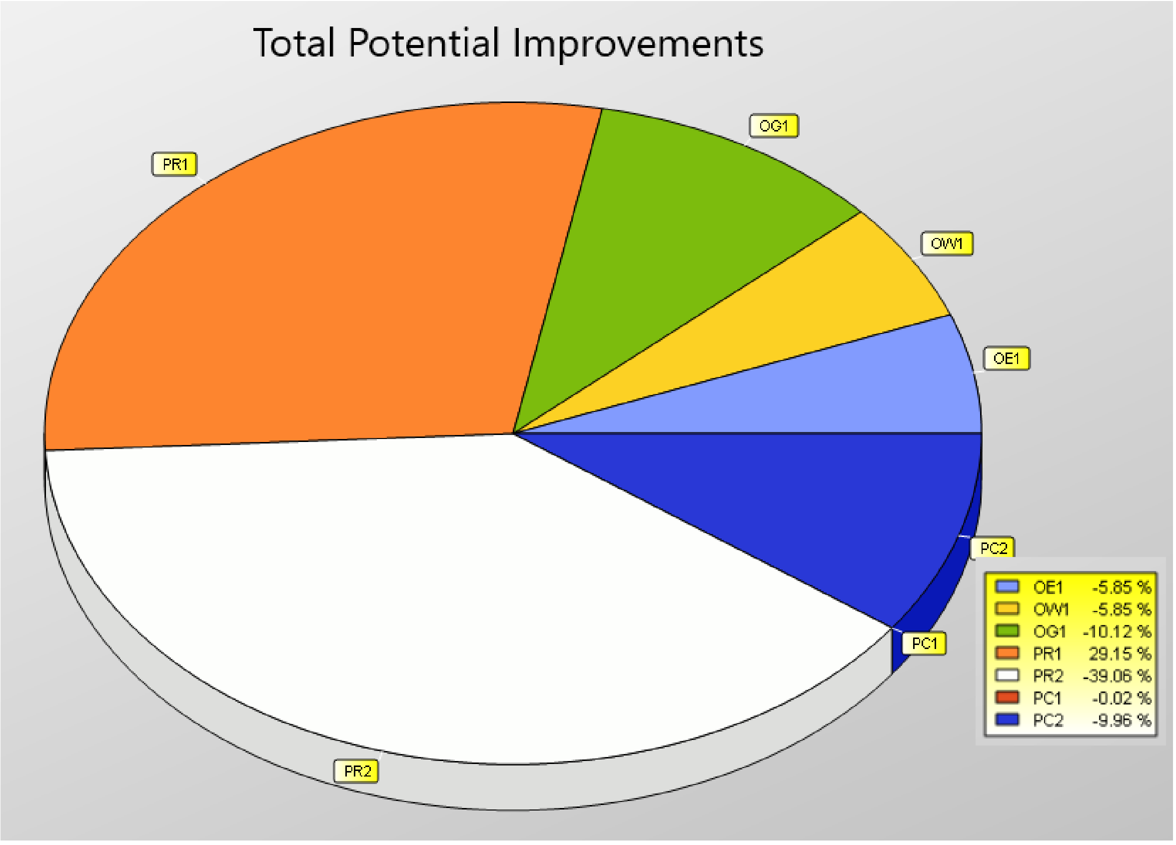

Figure 5. 28: Total Potential Improvement for General Consumption

Table 5. 20: Total potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OE 1	-4.99	4.34	-19.03	0.0	19.03
OW 1	-4.99	4.34	-19.03	0.0	19.03
OG 1	-8.15	8.82	-42.0	0.0	42.0
PR 1	19.67	24.79	0.0	78.95	78.95
PR 2	-29.61	27.02	-96.49	0.0	96.49
PC 1	-0.08	0.58	-4.4	0.0	4.4
PC 2	-9.71	21.37	-96.44	0.0	96.44

Appendix 20: Total Potential Improvement – Churn

Churn

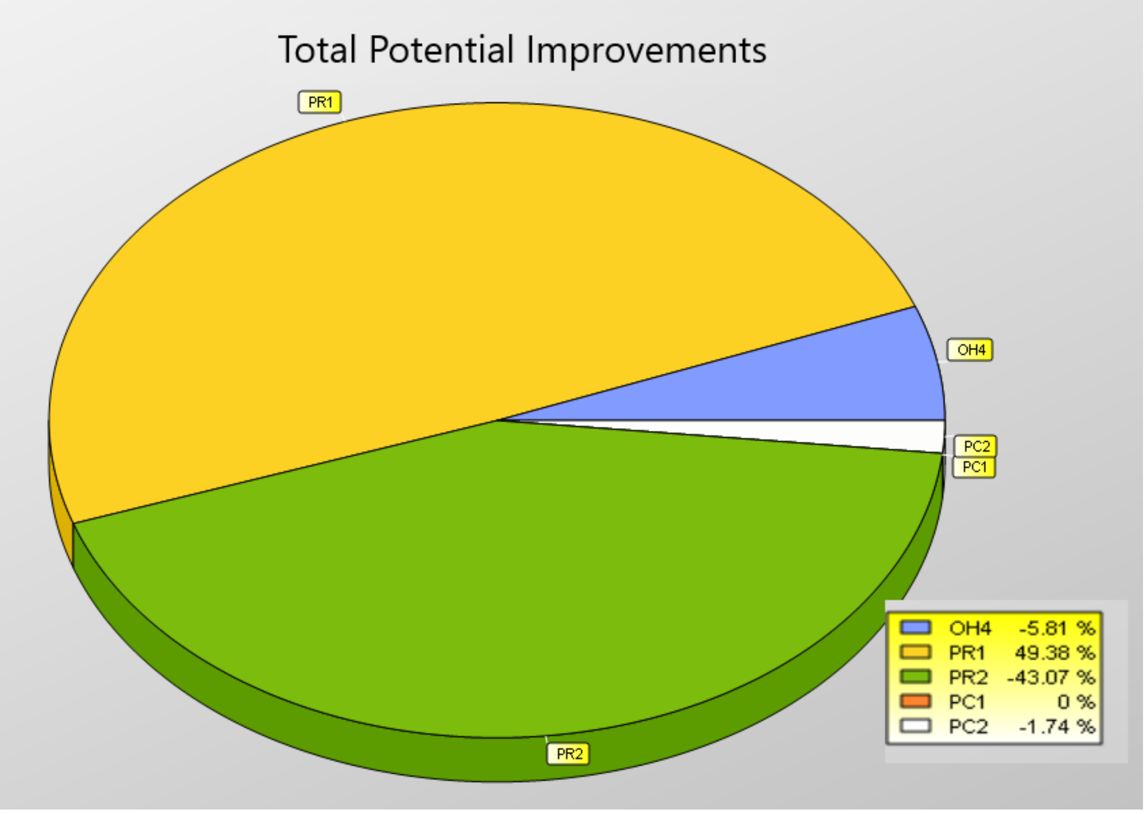

Figure 5. 29: Total Potential Improvement for Churn

Table 5. 21: Total potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OH 4	-6.65	5.82	-29.84	0.0	29.84
PR 1	36.91	30.17	0.0	93.97	93.97
PR 2	-41.45	28.81	-95.63	0.0	95.63
PC 1	0.0	0.0	0.0	0.0	0.0
PC 2	-2.71	10.3	-70.16	0.0	70.16

Appendix 21: Total Potential Improvement – Security

Security

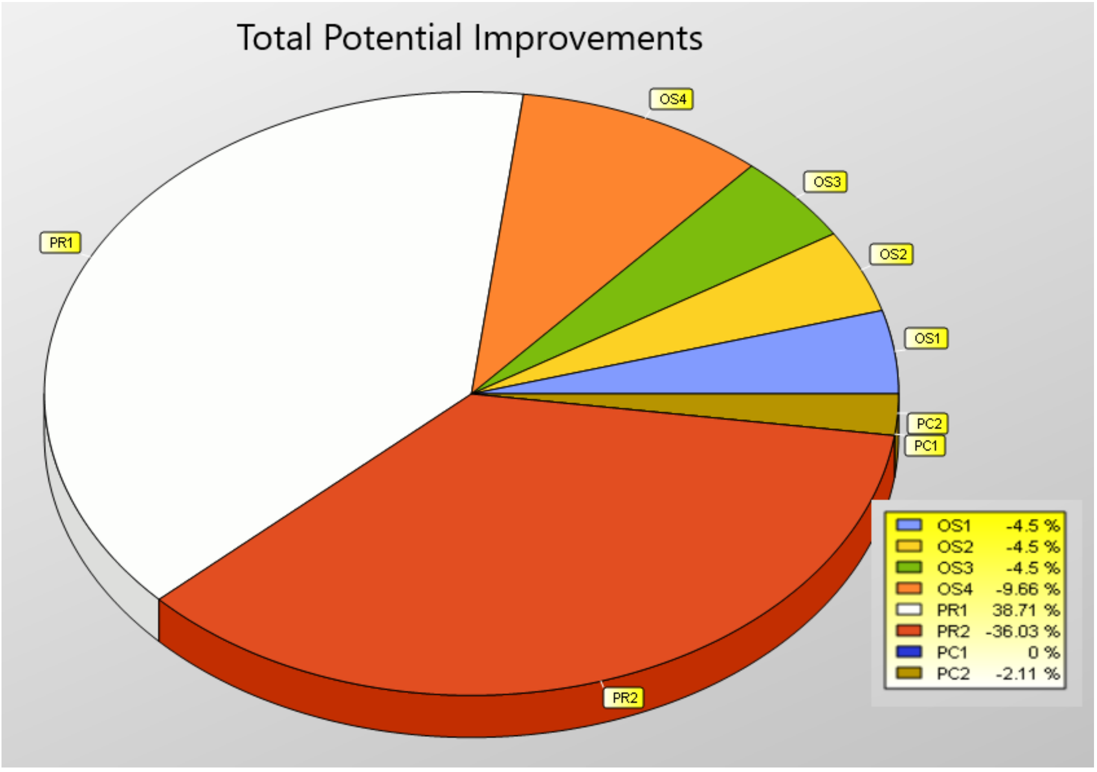

Figure 5. 30: Total Potential Improvement for Security

Table 5. 22: Total potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OS 1	-4.06	3.24	-10.81	0.0	10.81
OS 2	-4.06	3.24	-10.81	0.0	10.81
OS 3	-4.06	3.24	-10.81	0.0	10.81
OS 4	-8.57	8.46	-35.64	0.0	35.64
PR 1	27.4	24.47	0.0	69.86	69.86
PR 2	-30.92	22.31	-83.35	0.0	83.35
PC 1	0.0	0.0	0.0	0.0	0.0
PC 2	-1.64	5.43	-29.94	0.0	29.94

Appendix 22: Total Potential Improvement – Insurance

Insurance

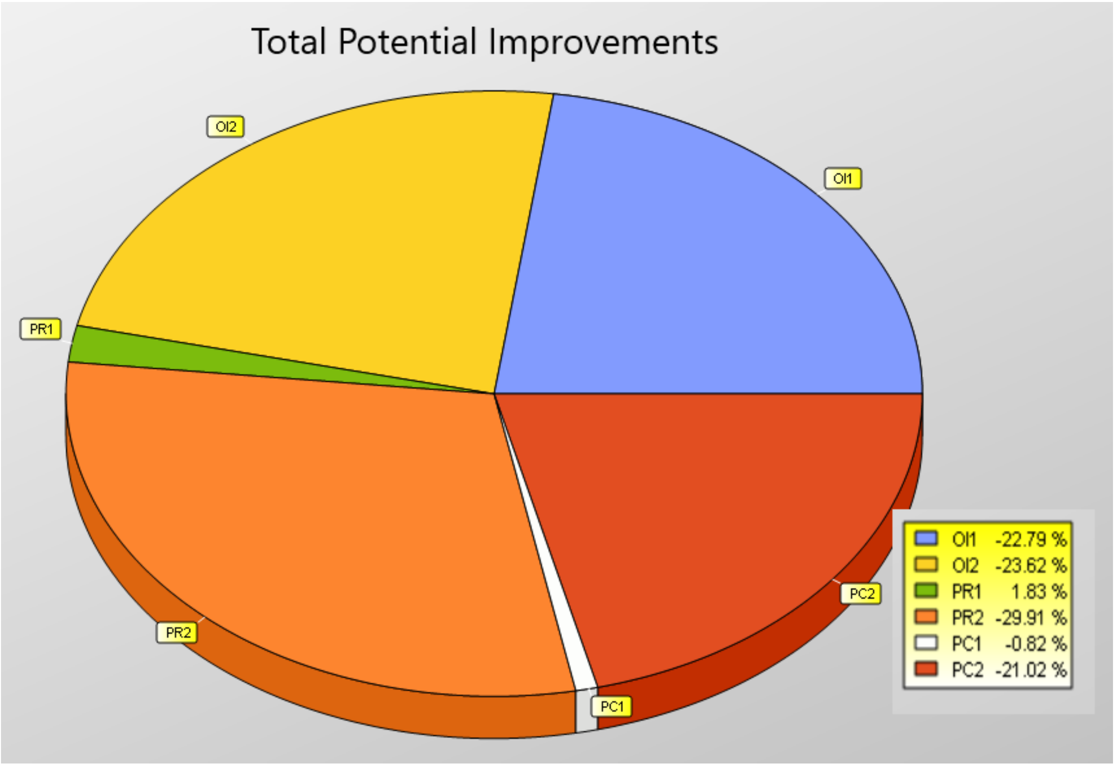

Figure 5. 31: Total Potential Improvement for Insurance

Table 5. 23: Total potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OI 1	-20.38	13.31	-47.75	0.0	47.75
OI 2	-21.27	13.75	-47.75	0.0	47.75
PR 1	1.97	5.87	0.0	26.5	26.5
PR 2	-24.42	20.27	-70.58	0.0	70.58
PC 1	-0.75	2.93	-17.82	0.0	17.82
PC 2	-17.18	19.95	-86.12	0.0	86.12

Appendix 23: Total Potential Improvement – Management and overall costs

Management and overall costs

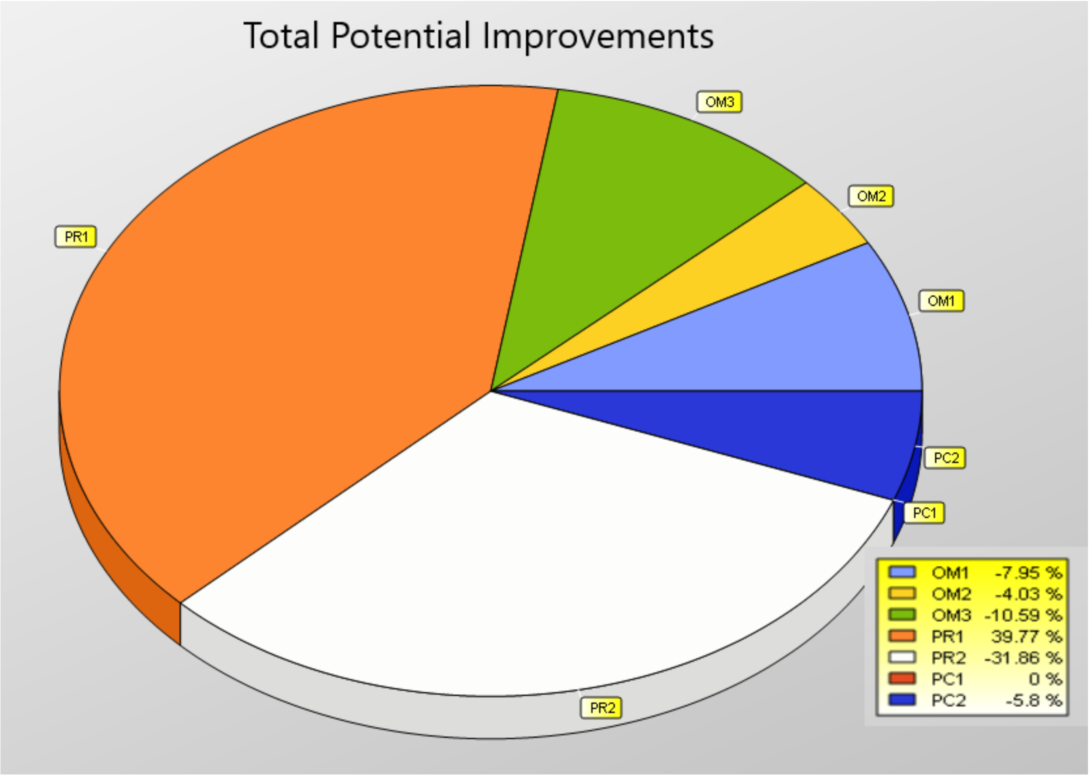

Figure 5. 32: Total Potential Improvement for Management and overall costs

Table 5. 24: Total potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OM 1	-6.99	5.91	-23.46	0.0	23.46
OM 2	-3.85	3.5	-14.87	0.0	14.87
OM 3	-9.8	8.45	-33.19	0.0	33.19
PR 1	26.49	26.46	0.0	88.19	88.19
PR 2	-26.26	22.51	-74.45	0.0	74.45
PC 1	0.0	0.0	0.0	0.0	0.0
PC 2	-7.31	17.75	-85.48	0.0	85.48

Appendix 24: Total Potential Improvement – Rent

Rent

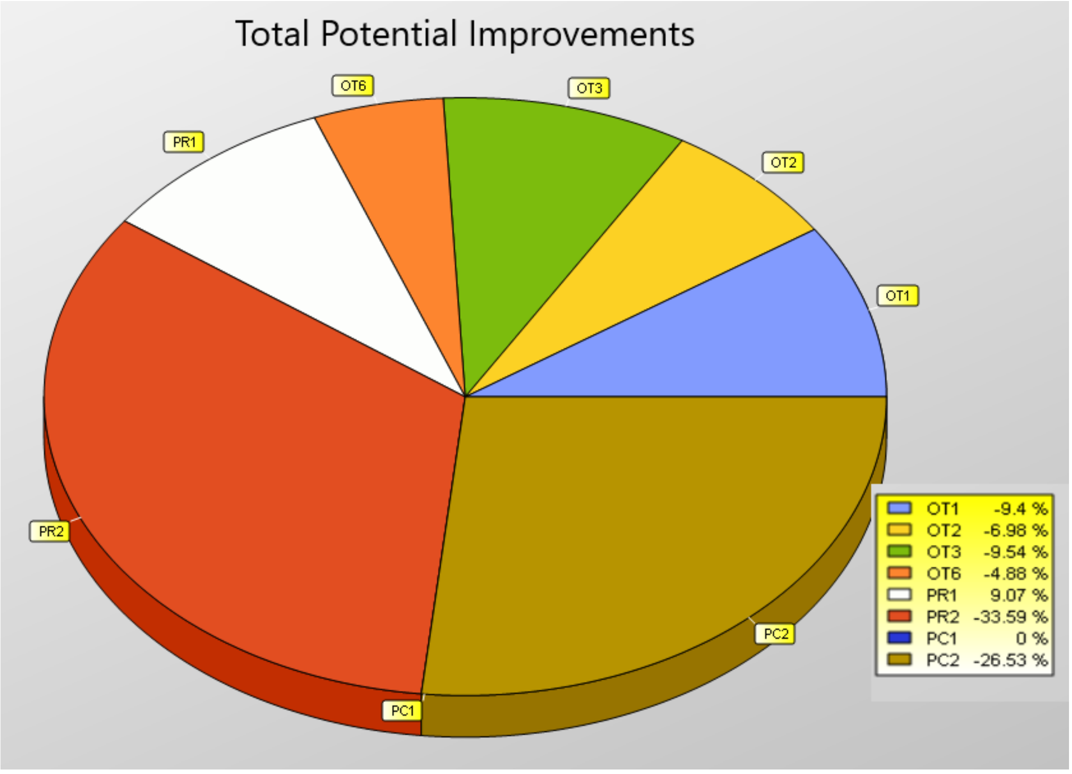

Figure 5. 33: Total Potential Improvement for Rent

Table 5. 25: Total potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OT 1	-5.74	7.15	-37.94	0.0	37.94
OT 2	-4.56	5.94	-33.02	0.0	33.02
OT 3	-6.58	9.48	-39.28	0.0	39.28
OT 6	-3.2	3.66	-15.74	0.0	15.74
PR 1	5.76	14.43	0.0	77.57	77.57
PR 2	-19.98	23.4	-76.33	0.0	76.33
PC 1	0.0	0.0	0.0	0.0	0.0
PC 2	-15.57	23.8	-92.21	0.0	92.21

Appendix 25: Total Potential Improvement – Occupation Cost and Leasing

Occupation Cost and Leasing

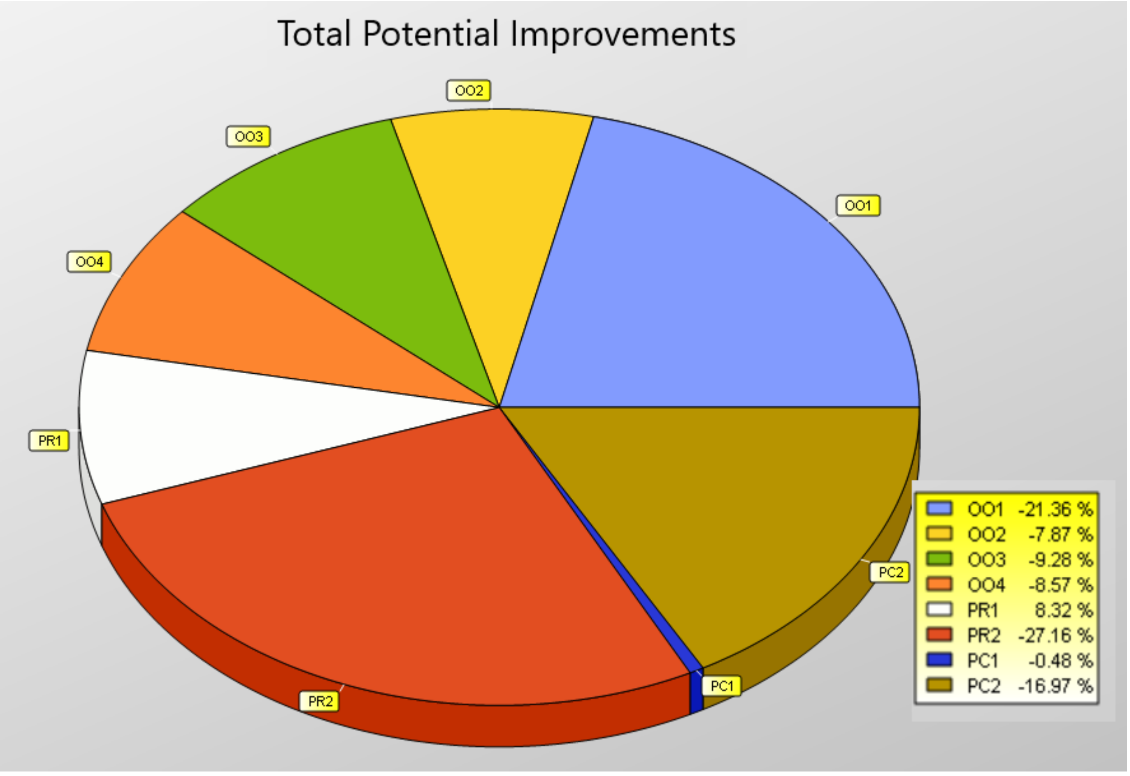

Figure 5. 34: Total Potential Improvement for Occupation Cost and Leasing

Table 5. 26: Total potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OO 1	-14.22	15.26	-49.82	0.0	49.82
OO 2	-5.34	5.09	-15.41	0.0	15.41
OO 3	-6.77	7.54	-39.27	0.0	39.27
OO 4	-6.27	7.24	-34.31	0.0	34.31
PR 1	5.74	14.87	0.0	71.54	71.54
PR 2	-19.3	20.62	-92.82	0.0	92.82
PC 1	-0.48	3.59	-27.33	0.0	27.33
PC 2	-10.31	14.39	-39.22	0.0	39.22

Appendix 26: Total Potential Improvement – Debt

Debt

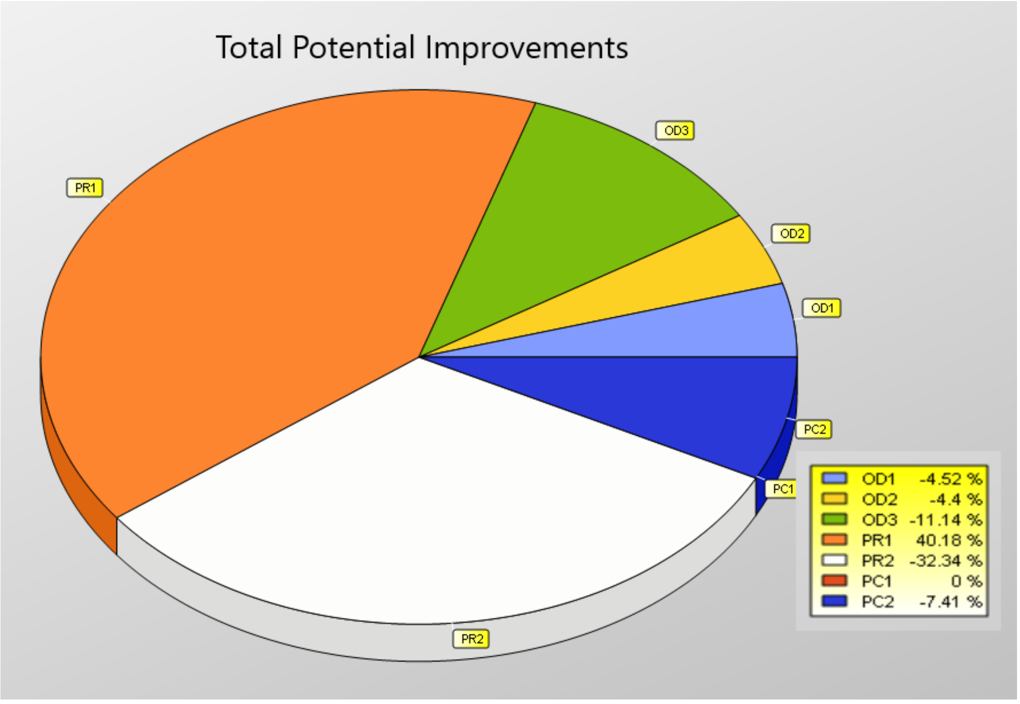

Figure 5. 35: Total Potential Improvement for Debt

Table 5. 27: Total potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OD 1	-4.3	3.46	-12.75	0.0	12.75
OD 2	-4.17	3.36	-12.62	0.0	12.62
OD 3	-10.47	10.05	-49.37	0.0	49.37
PR 1	26.97	24.69	0.0	67.37	67.37
PR 2	-27.49	23.77	-85.33	0.0	85.33
PC 1	0.0	0.0	0.0	0.0	0.0
PC 2	-9.06	21.83	-90.73	0.0	90.73

Appendix 27: Total Potential Improvement – Operational Characteristics

Operational Characteristics

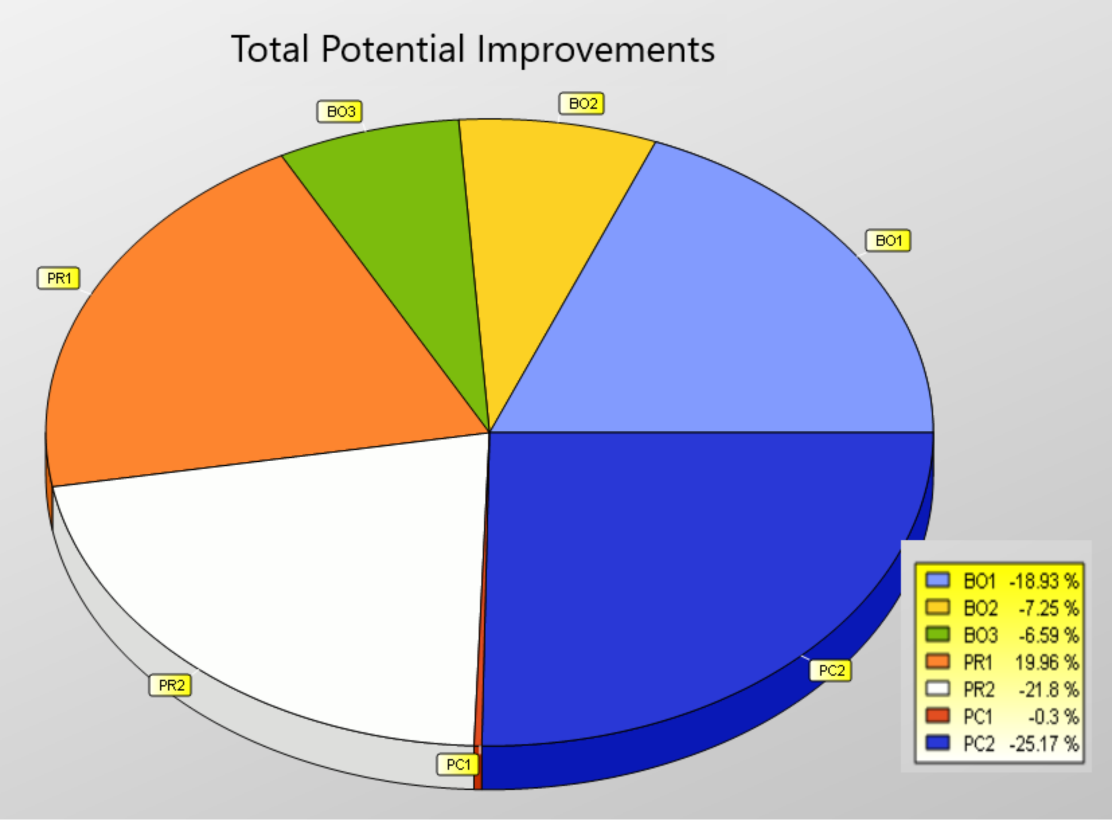

Figure 5. 36: Total Potential Improvement for Operational Characteristics

Table 5. 28: Total potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
BO 1	-16.17	14.84	-60.5	0.0	60.5
BO 2	-6.89	8.02	-52.26	0.0	52.26
BO 3	-5.96	5.36	-23.87	0.0	23.87
PR 1	13.39	19.01	0.0	71.45	71.45
PR 2	-16.51	19.27	-67.25	0.0	67.25
PC 1	-0.68	4.82	-36.7	0.0	36.7
PC 2	-19.35	18.53	-64.1	0.0	64.1

Appendix 28: Total Potential Improvement – Physical Characteristics

Physical Characteristics

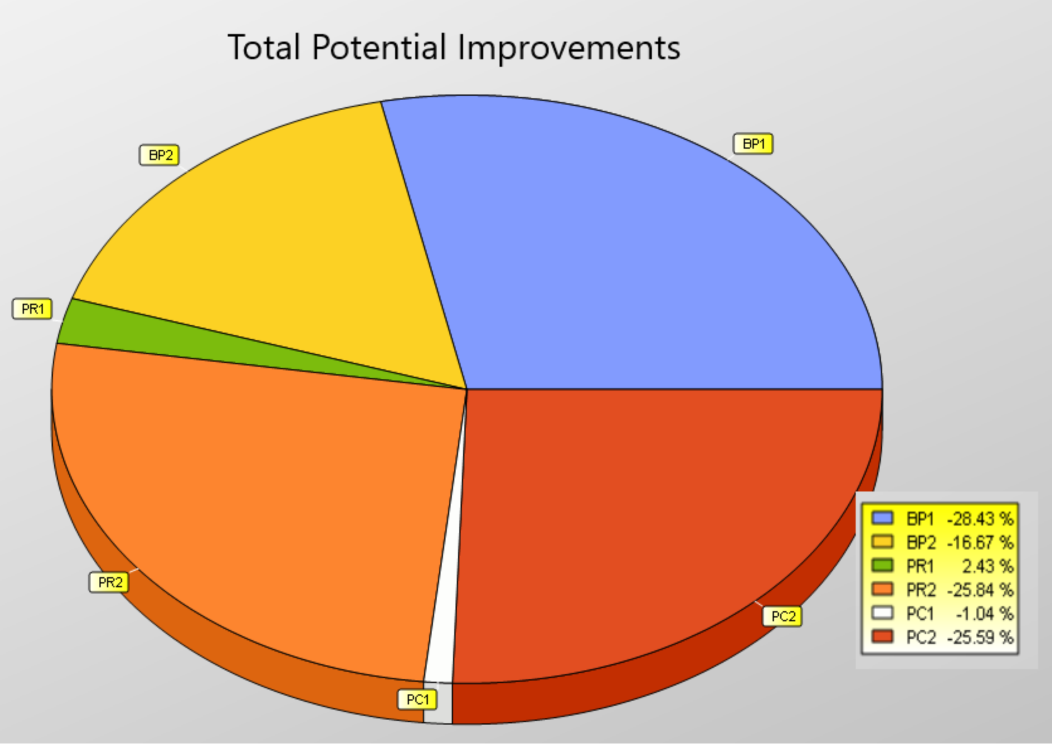

Figure 5. 37: Total Potential Improvement for Physical Characteristics

Table 5. 29: Total potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
BP 1	-24.2	17.95	-76.64	0.0	76.64
BP 2	-14.76	11.75	-48.54	0.0	48.54
PR 1	1.47	4.37	0.0	21.47	21.47
PR 2	-21.03	20.95	-82.17	0.0	82.17
PC 1	-1.32	4.62	-23.62	0.0	23.62
PC 2	-19.67	19.06	-69.23	0.0	69.23

Appendix 29: Input/Output Potential Improvement – CapEx

Capital Expenditures (CapEx)

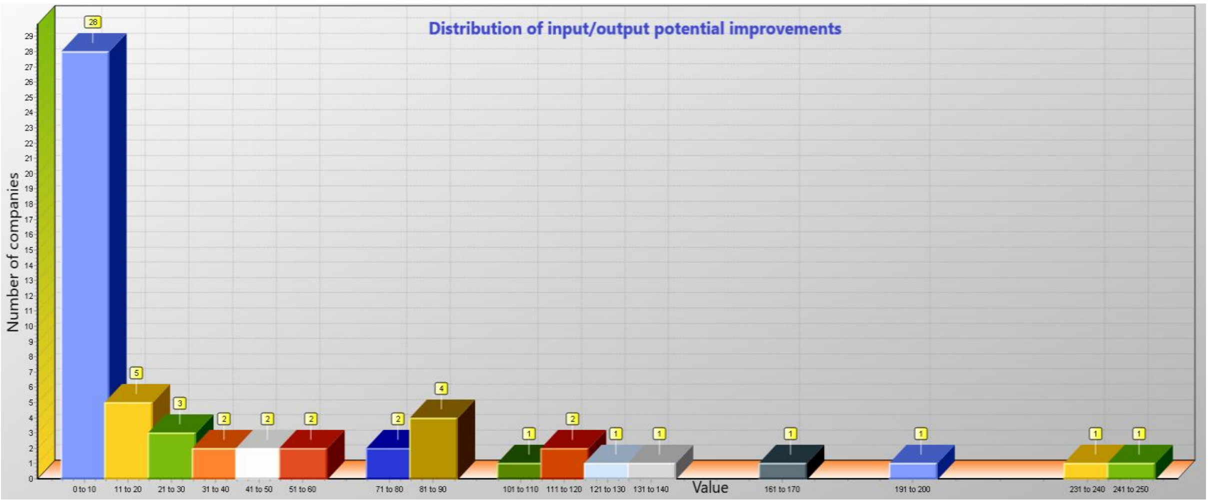

Figure 5. 38: Input/Output Potential Improvement for Capital Expenditures (CapEx)

Table 5. 30: Input/Output potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
CR 1	-8.4	6.54	-24.0	0.0	24.0
CR 3	-34.62	30.81	-82.6	0.0	82.6
CR 4	-8.95	8.56	-37.6	0.0	37.6
CR 5	-5.71	5.09	-16.2	0.0	16.2
PR 1	41.79	60.85	0.0	241.4	241.4
PR 2	-35.61	34.95	-92.3	0.0	92.3
PC 1	0.0	0.0	0.0	0.0	0.0
PC 2	-5.55	13.24	-70.2	0.0	70.2

Appendix 30: Input/Output Potential Improvement – Repair and maintenance

Repair and maintenance

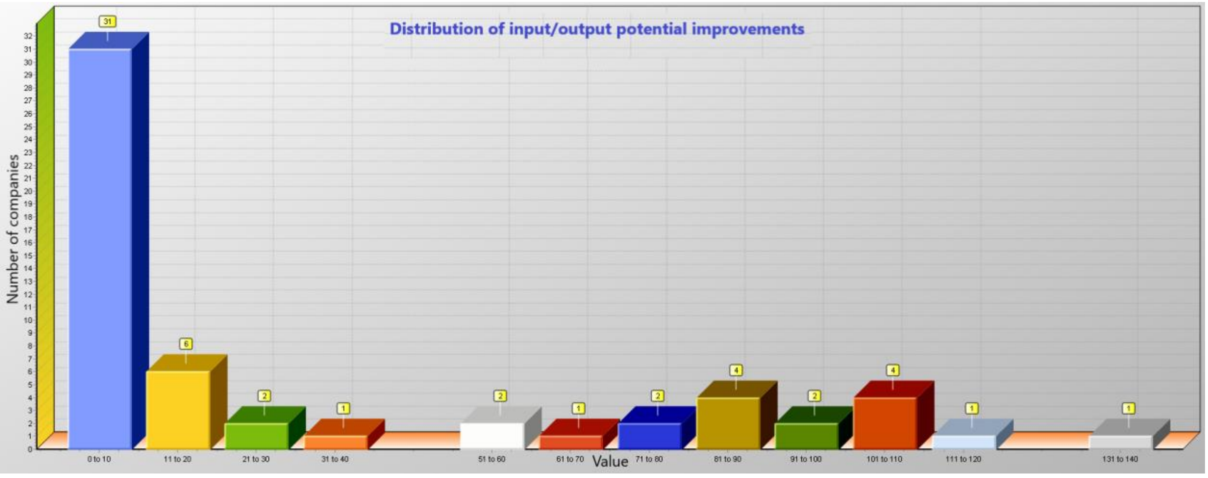

Figure 5. 39: Input/Output Potential Improvement for Repair and maintenance

Table 5. 31: Input/Output potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OR 1	-29.77	22.71	-96.9	0.0	96.9
OR 2	-25.96	18.87	-67.7	0.0	67.7
OR 3	-21.41	14.82	-49.1	0.0	49.1
OR 4	-20.52	14.42	-49.1	0.0	49.1
PR 1	30.68	41.03	0.0	132.3	132.3
PR 2	-25.81	34.99	-93.2	0.0	93.2
PC 1	-0.44	2.37	-17.4	0.0	17.4
PC 2	-21.18	30.37	-88.0	0.0	88.0

Appendix 31: Input/Output Potential Improvement – Cleaning

Cleaning

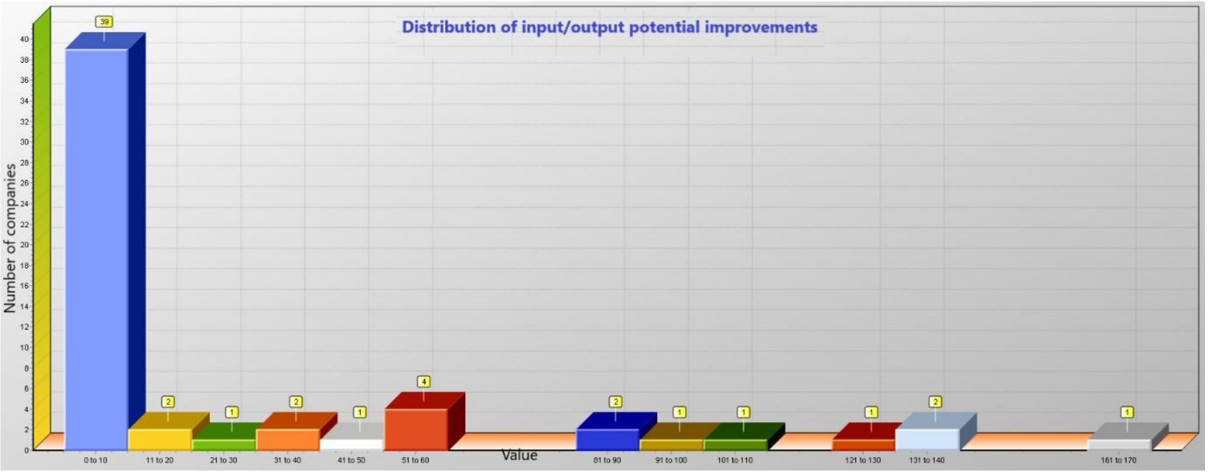

Figure 5. 40: Input/output Potential Improvement for Cleaning

Table 5. 32: Input/Output potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OC 1	-12.01	15.78	-59.0	0.0	59.0
OC 2	-12.05	11.63	-35.8	0.0	35.8
OC 3	-4.8	4.91	-16.7	0.0	16.7
PR 1	24.02	42.57	0.0	165.2	165.2
PR 2	-28.76	33.03	-89.3	0.0	89.3
PC 1	0.0	0.0	0.0	0.0	0.0
PC 2	-13.72	24.4	-85.4	0.0	85.4

Appendix 32: Input/Output Potential Improvement – General Consumption

General Consumption

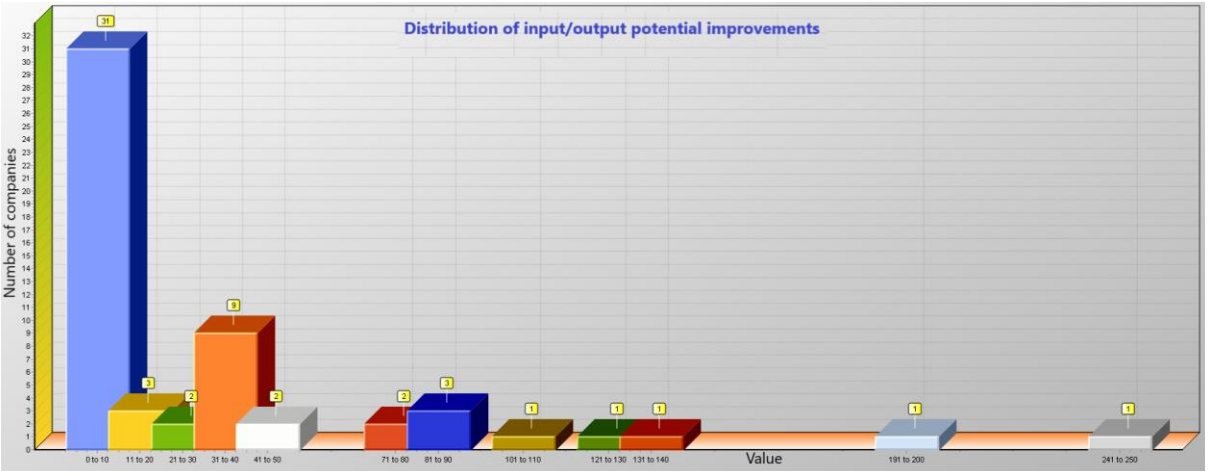

Figure 5. 41: Input/Output Potential Improvement for General Consumption

Table 5. 33: Input/Output potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OE 1	-6.13	5.09	-16.2	0.0	16.2
OW 1	-6.13	5.09	-16.2	0.0	16.2
OG 1	-10.6	11.34	-41.7	0.0	41.7
PR 1	30.54	49.35	0.0	241.4	241.4
PR 2	-40.92	35.57	-92.3	0.0	92.3
PC 1	-0.02	0.14	-1.1	0.0	1.1
PC 2	-10.44	20.93	-79.1	0.0	79.1

Appendix 33: Input/Output Potential Improvement – Churn

Churn

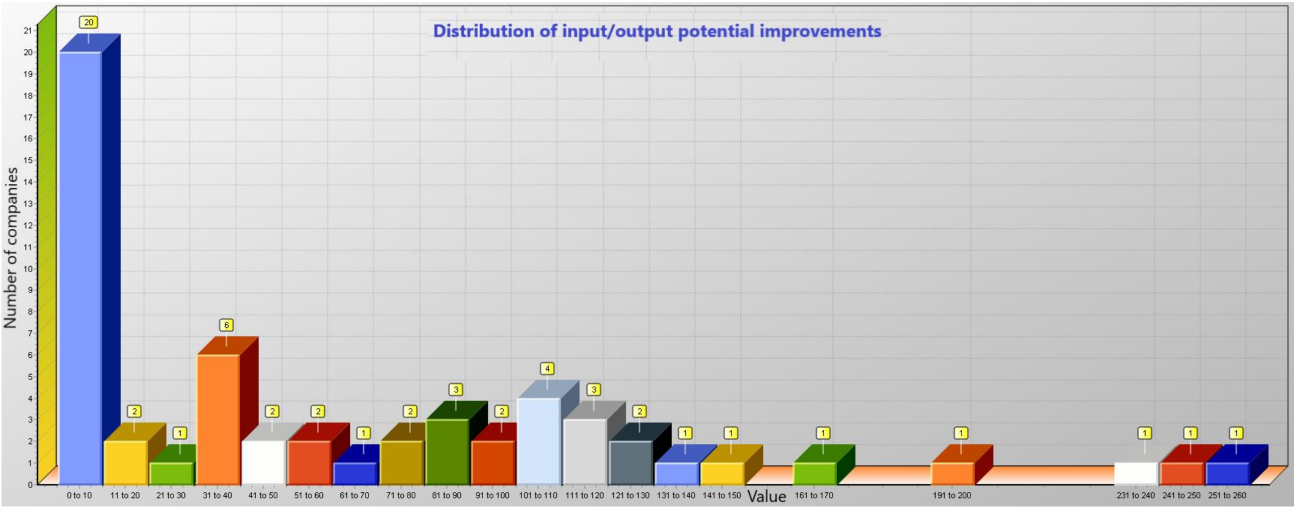

Figure 5. 42: Input/Output Potential Improvement for Churn

Table 5. 34: Input/Output potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OH 4	-7.41	4.95	-16.8	0.0	16.8
PR 1	62.97	66.91	0.0	257.0	257.0
PR 2	-54.92	32.25	-92.3	0.0	92.3
PC 1	0.0	0.0	0.0	0.0	0.0
PC 2	-2.22	6.68	-30.7	0.0	30.7

Appendix 34: Input/Output Potential Improvement – Security

Security

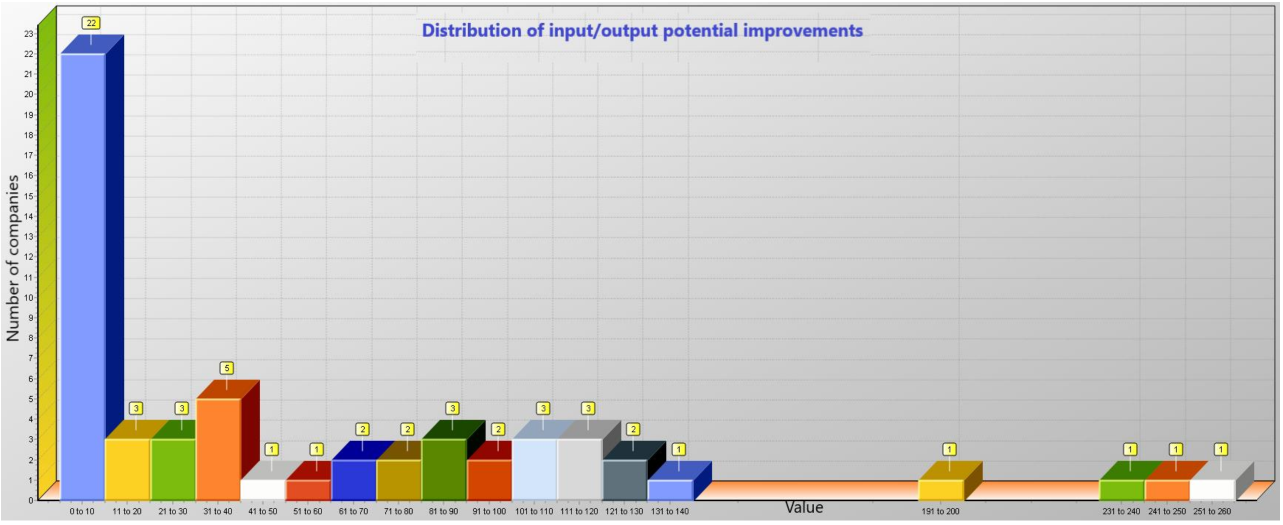

Figure 5. 43: Input/Output Potential Improvement for Security

Table 5. 35: Input/Output potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OS 1	-6.46	5.08	-16.7	0.0	16.7
OS 2	-6.46	5.08	-16.7	0.0	16.7
OS 3	-6.46	5.08	-16.7	0.0	16.7
OS 4	-13.85	12.02	-40.6	0.0	40.6
PR 1	55.53	65.22	0.0	257.0	257.0
PR 2	-51.68	33.73	-92.3	0.0	92.3
PC 1	0.0	0.0	0.0	0.0	0.0
PC 2	-3.02	9.82	-50.6	0.0	50.6

Appendix 35: Input/Output Potential Improvement – Insurance

Insurance

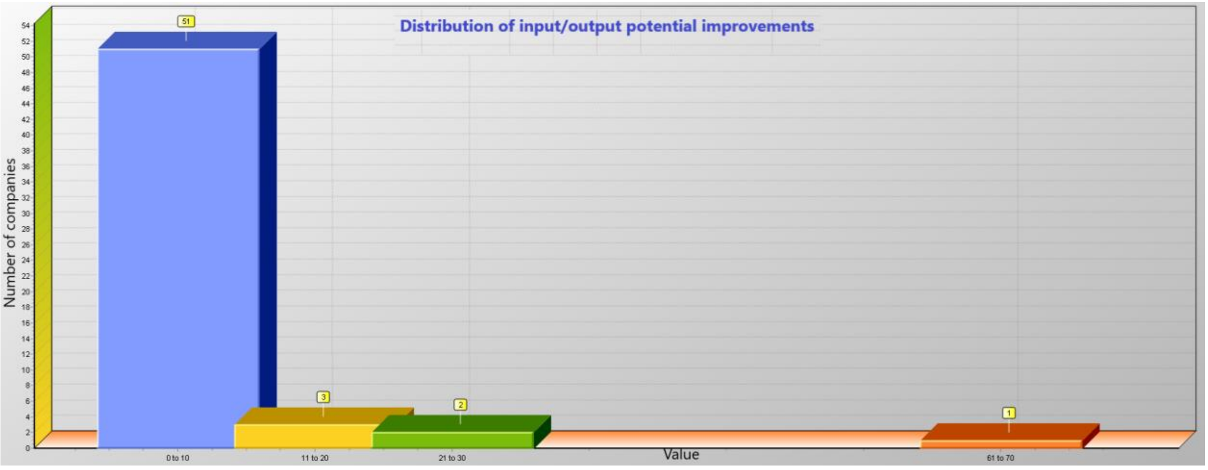

Figure 5. 44: Input/Output Potential Improvement for Insurance

Table 5. 36: Input/Output potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OI 1	-35.48	23.14	-68.1	0.0	68.1
OI 2	-36.77	23.43	-68.1	0.0	68.1
PR 1	2.85	9.6	0.0	62.2	62.2
PR 2	-46.57	38.75	-97.7	0.0	97.7
PC 1	-1.28	5.07	-32.0	0.0	32.0
PC 2	-32.72	36.05	-92.2	0.0	92.2

Appendix 36: Input/Output Potential Improvement – Management & costs

Management and overall costs

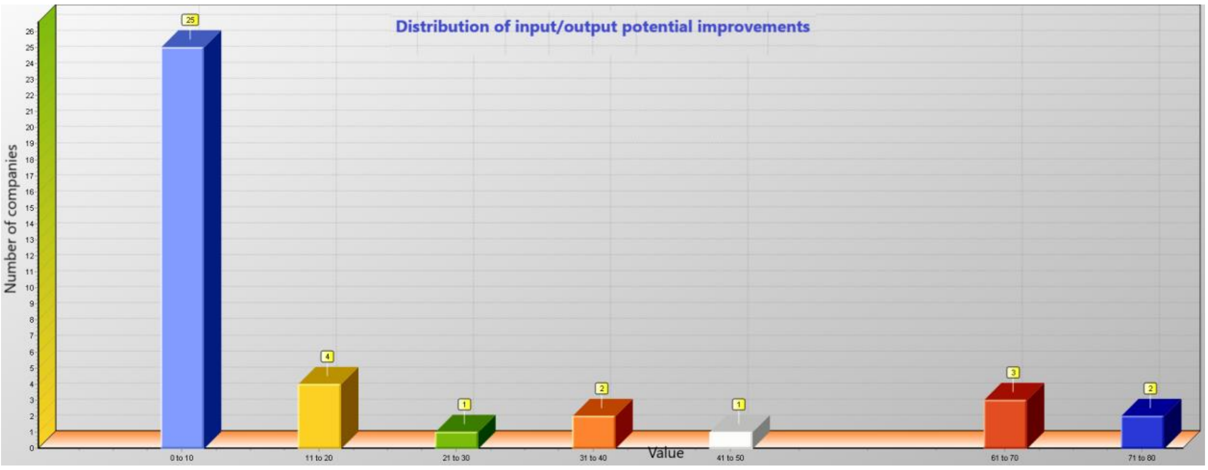

Figure 5. 45: Input/Output Potential Improvement for Management and overall costs

Table 5. 37: Input/Output potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OM 1	-11.61	9.55	-32.9	0.0	32.9
OM 2	-5.89	4.95	-16.8	0.0	16.8
OM 3	-15.48	11.94	-38.5	0.0	38.5
PR 1	58.11	73.09	0.0	316.0	316.0
PR 2	-46.55	35.91	-91.6	0.0	91.6
PC 1	0.0	0.0	0.0	0.0	0.0
PC 2	-8.47	18.94	-75.8	0.0	75.8

Appendix 37: Input/Output Potential Improvement – Rent

Rent

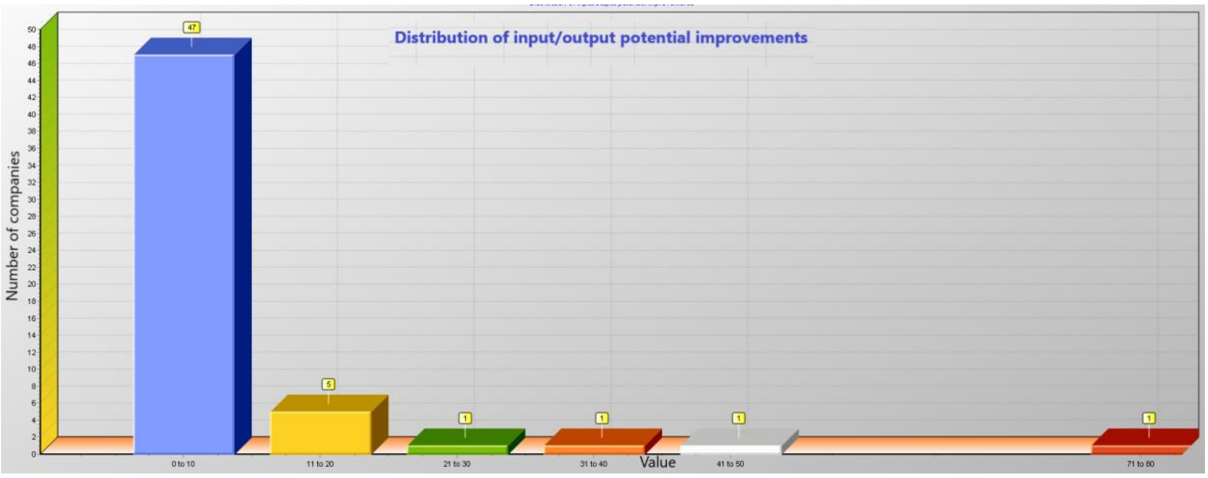

Figure 5. 46: Input/Output Potential Improvement for Rent

Table 5. 38: Input/Output potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OT 1	-7.1	9.61	-52.2	0.0	52.2
OT 2	-5.28	6.57	-29.3	0.0	29.3
OT 3	-7.2	10.16	-43.8	0.0	43.8
OT 6	-3.69	4.23	-15.0	0.0	15.0
PR 1	6.86	18.82	0.0	109.1	109.1
PR 2	-25.37	29.23	-83.2	0.0	83.2
PC 1	0.0	0.0	0.0	0.0	0.0
PC 2	-20.04	29.15	-89.8	0.0	89.8

Appendix 38: Input/Output Potential Improvement – Occupation Cost & Leasing

Occupation Cost and Leasing

Figure 5. 47: Input/Output Potential Improvement for Occupation Cost and Leasing

Table 5. 39: Input/Output potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OO 1	-23.62	27.09	-86.4	0.0	86.4
OO 2	-8.71	9.36	-31.9	0.0	31.9
OO 3	-10.26	10.59	-38.8	0.0	38.8
OO 4	-9.48	10.03	-33.9	0.0	33.9
PR 1	9.2	21.94	0.0	95.0	95.0
PR 2	-30.03	31.58	-93.7	0.0	93.7
PC 1	-0.53	3.96	-30.2	0.0	30.2
PC 2	-18.77	27.19	-89.7	0.0	89.7

Appendix 39: Input/Output Potential Improvement – Debt

Debt

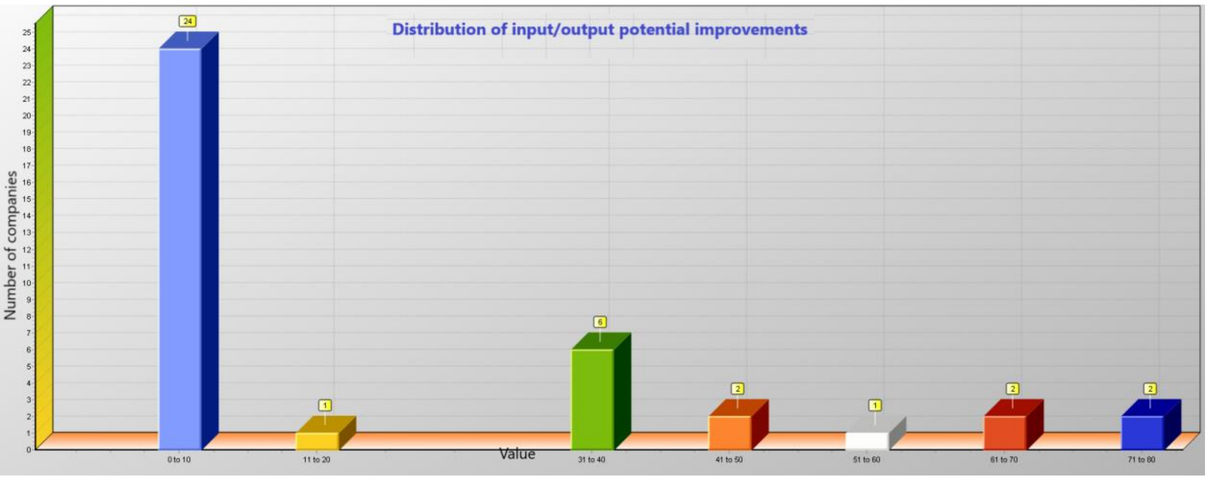

Figure 5. 48: Input/Output Potential Improvement for Debt

Table 5. 40: Input/Output potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
OD 1	-6.37	4.87	-16.8	0.0	16.8
OD 2	-6.2	4.78	-16.8	0.0	16.8
OD 3	-15.69	12.38	-41.7	0.0	41.7
PR 1	56.56	64.32	0.0	241.4	241.4
PR 2	-45.52	35.74	-92.3	0.0	92.3
PC 1	0.0	0.0	0.0	0.0	0.0
PC 2	-10.43	23.17	-79.9	0.0	79.9

Appendix 40: Input/Output Potential Improvement – Operational Characteristics

Operational Characteristics

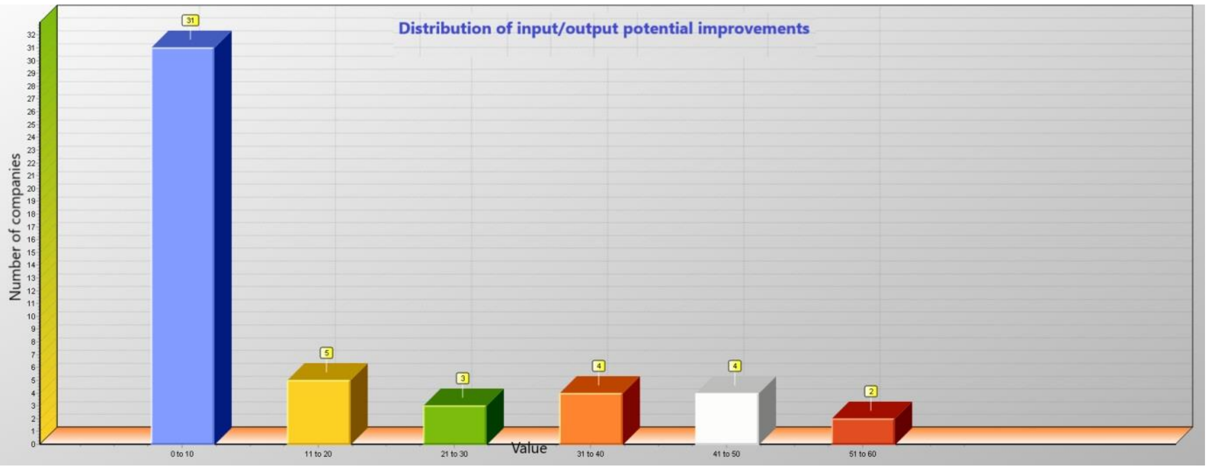

Figure 5. 49: Input/Output Potential Improvement for Operational Characteristics

Table 5. 41: Input/Output potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
BO 1	-26.29	23.81	-73.5	0.0	73.5
BO 2	-10.06	8.4	-37.3	0.0	37.3
BO 3	-9.15	7.43	-26.7	0.0	26.7
PR 1	27.72	43.42	0.0	208.8	208.8
PR 2	-30.27	32.91	-85.3	0.0	85.3
PC 1	-0.42	2.74	-20.7	0.0	20.7
PC 2	-34.94	32.71	-89.5	0.0	89.5

Appendix 41: Input/Output Potential Improvement – Physical Characteristics

Physical Characteristics

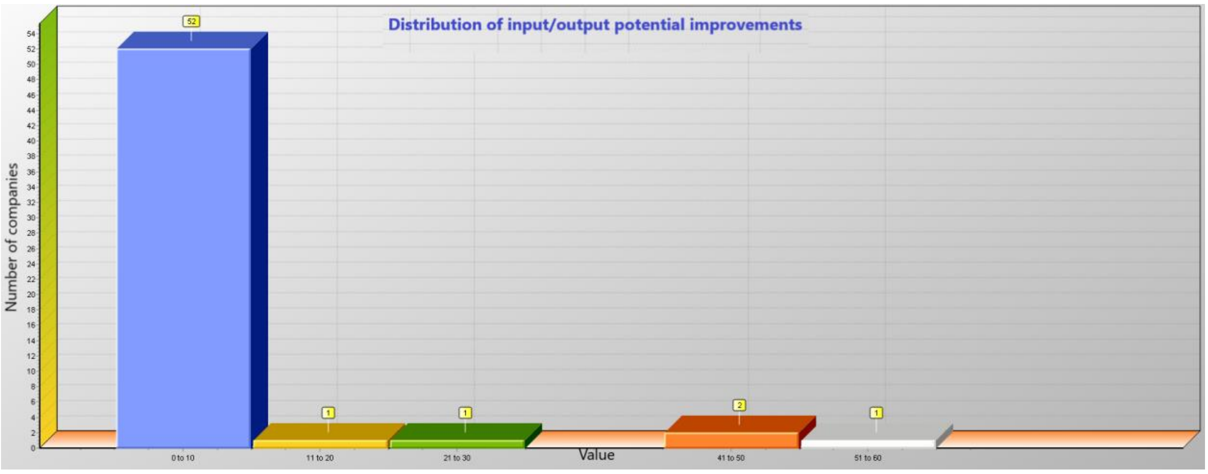

Figure 5. 50: Input/Output Potential Improvement for Physical Characteristics

Table 5. 42: Input/Output potential improvement statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
BP 1	-42.61	32.29	-90.0	0.0	90.0
BP 2	-24.99	19.05	-57.5	0.0	57.5
PR 1	3.65	11.7	0.0	52.6	52.6
PR 2	-38.74	35.19	-95.7	0.0	95.7
PC 1	-1.56	5.81	-31.3	0.0	31.3
PC 2	-38.35	34.35	-89.3	0.0	89.3

Appendix 42: Reference Frequency – CapEx

Capital Expenditures (CapEx)

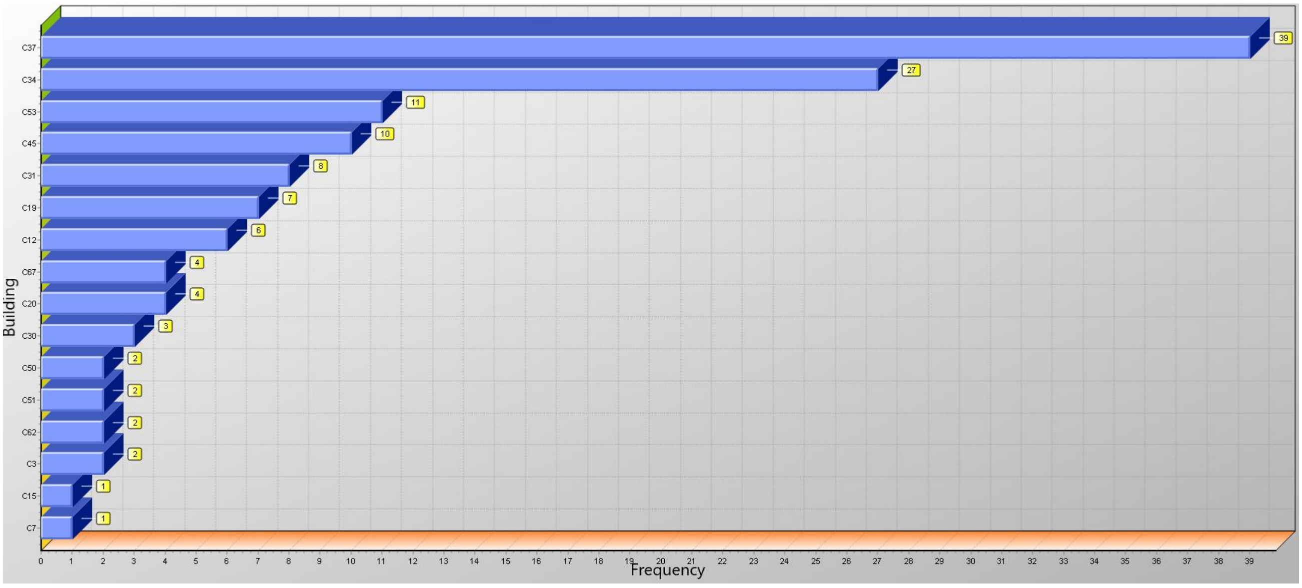

Figure 5. 51: Reference Frequency for Capital Expenditures (CapEx)

Table 5. 43: References frequency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
References	8.06	10.12	1	39	38
Peers	2.76	0.93	1	5	4

Appendix 43: Reference Frequency – Repair and maintenance

Repair and maintenance

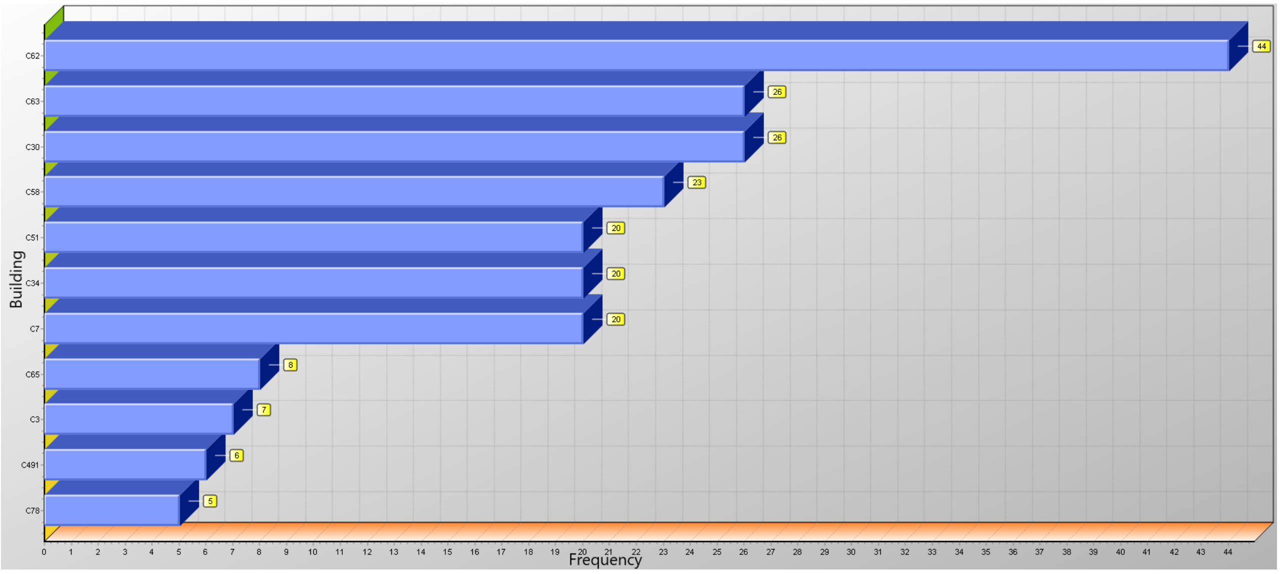

Figure 5. 52: Reference Frequency for Repair and maintenance

Table 5. 44: References frequency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
References	18.64	11.16	5	44	39
Peers	4.22	0.93	2	6	4

Appendix 44: Reference Frequency – Cleaning

Cleaning

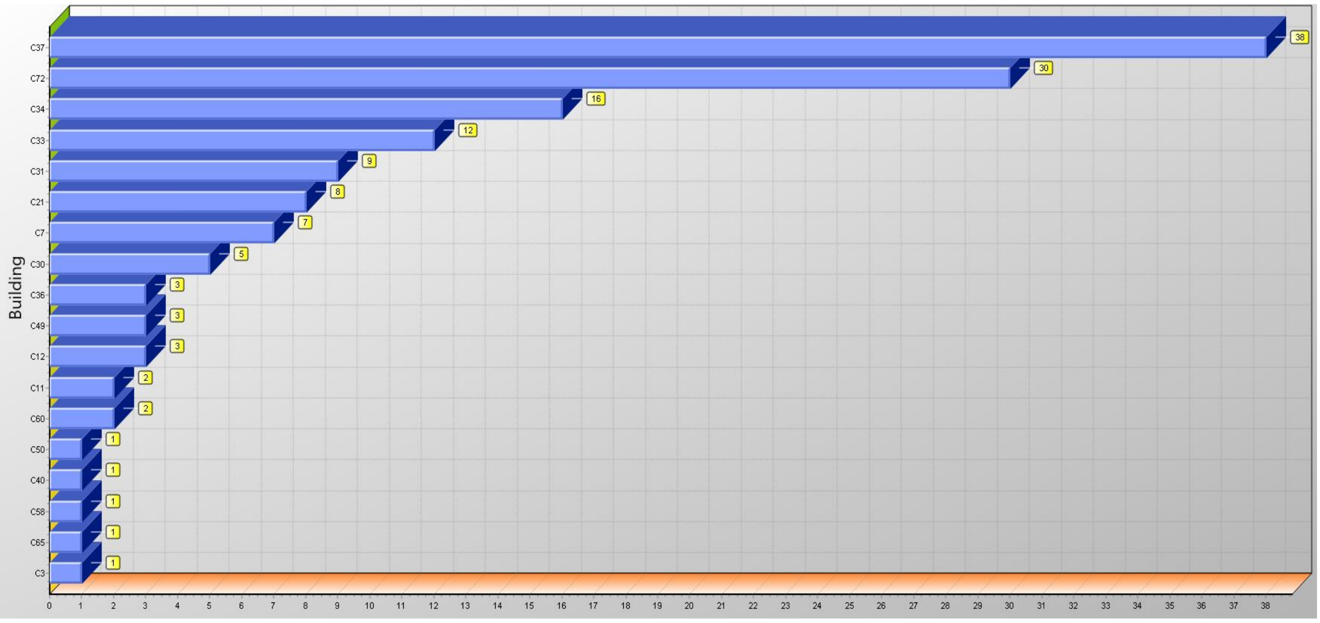

Figure 5. 53: Reference Frequency for Cleaning.

Table 5. 45: References frequency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
References	**7.94**	**10.18**	**1**	**38**	**37**
Peers	**3.21**	**1.04**	**1**	**5**	**4**

Appendix 45: Reference Frequency – General Consumption

General Consumption

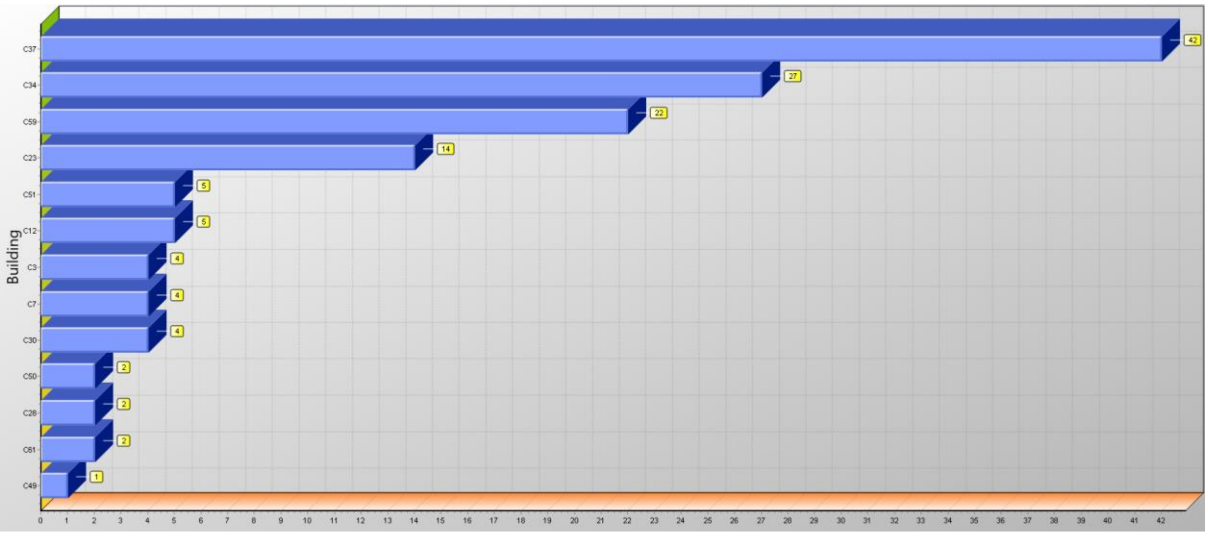

Figure 5. 54: Reference Frequency for General Consumption

Table 5. 46: References frequency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
References	**10.31**	**12.1**	**1**	**42**	**41**
Peers	**2.75**	**0.8**	**1**	**4**	**3**

Appendix 46: Reference Frequency – Churn

Churn

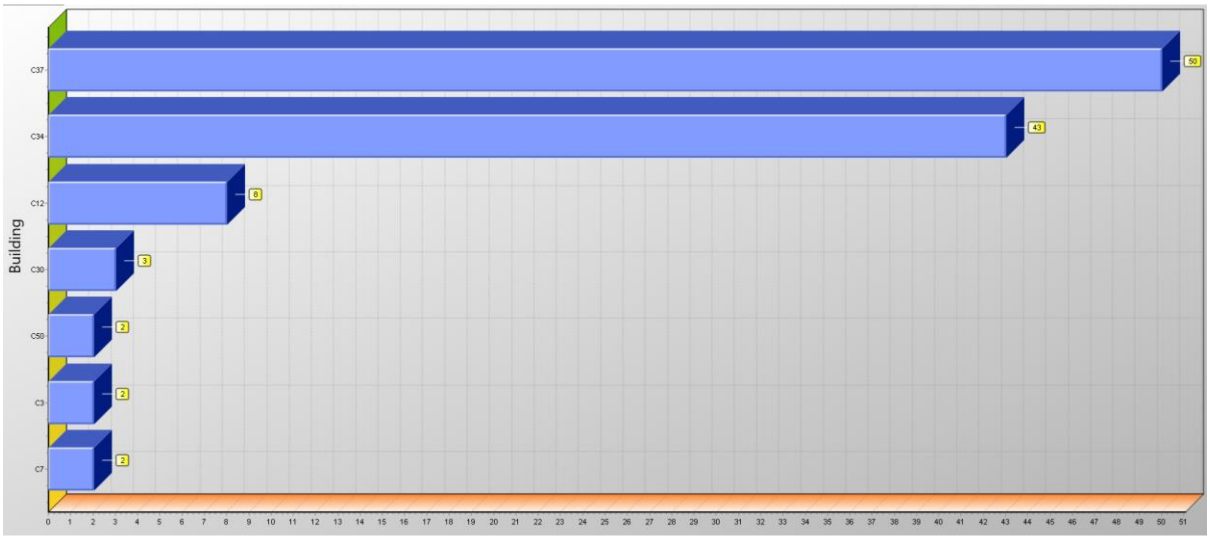

Figure 5. 55: Reference Frequency for Churn

Table 5. 47: References frequency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
References	**15.71**	**19.66**	**2**	**50**	**48**
Peers	**2.06**	**0.47**	**1**	**3**	**2**

Appendix 47: Reference Frequency – Security

Security

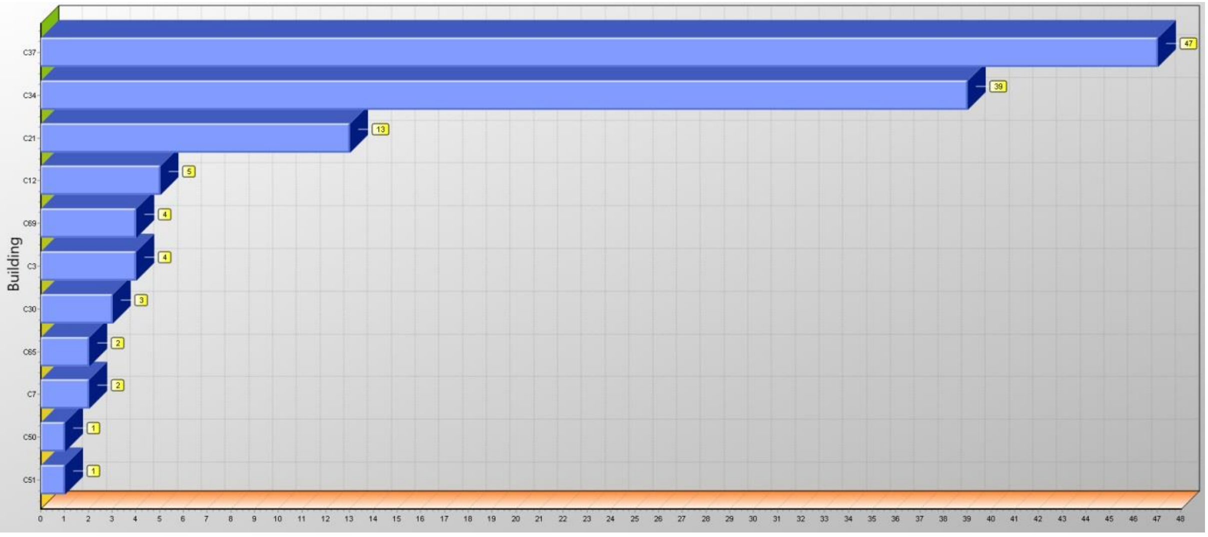

Figure 5. 56: Reference Frequency for Security

Table 5. 48: References frequency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
References	11.0	15.5	1	47	46
Peers	2.39	0.64	1	4	3

Appendix 48: Reference Frequency – Insurance

Insurance

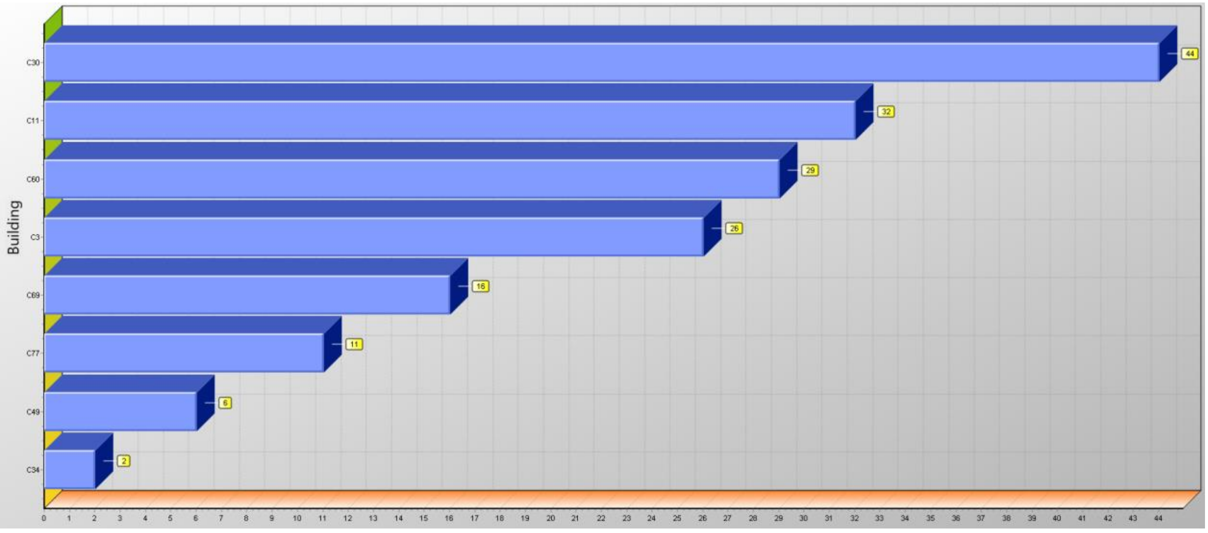

Figure 5. 57: Reference Frequency for Insurance

Table 5. 49: References frequency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
References	**20.75**	**13.46**	**2**	**44**	**42**
Peers	**3.22**	**0.65**	**2**	**4**	**2**

Appendix 49: Reference Frequency – Management and overall costs

Management and overall costs

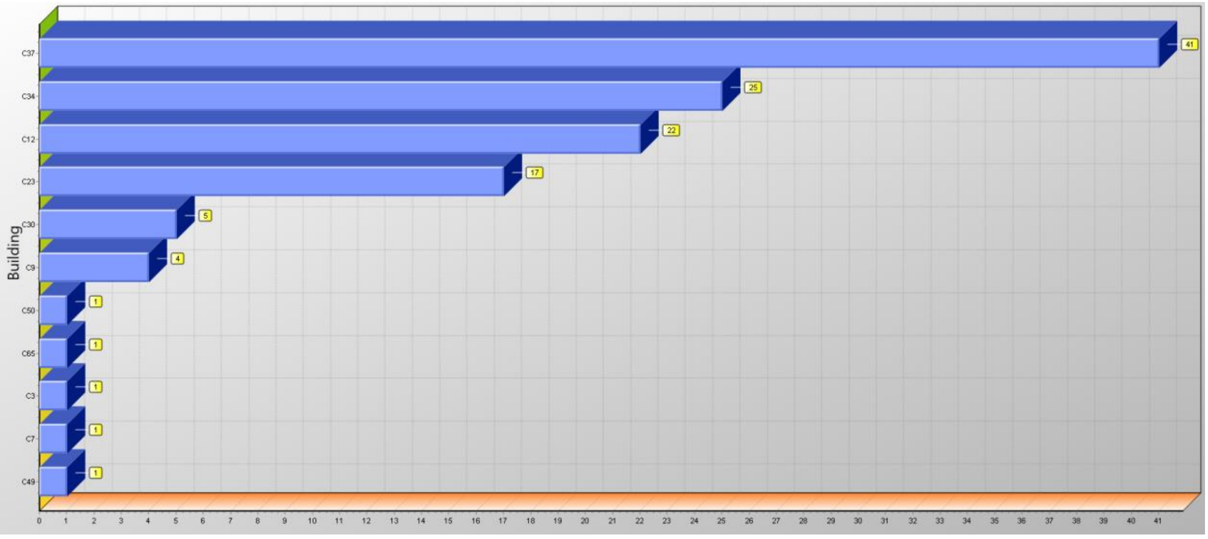

Figure 5. 58: Reference Frequency for Management and overall costs

Table 5. 50: References frequency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
References	**9.15**	**12.51**	**0**	**41**	**41**
Peers	**2.36**	**0.71**	**1**	**4**	**3**

Appendix 50: Reference Frequency – Rent

Rent

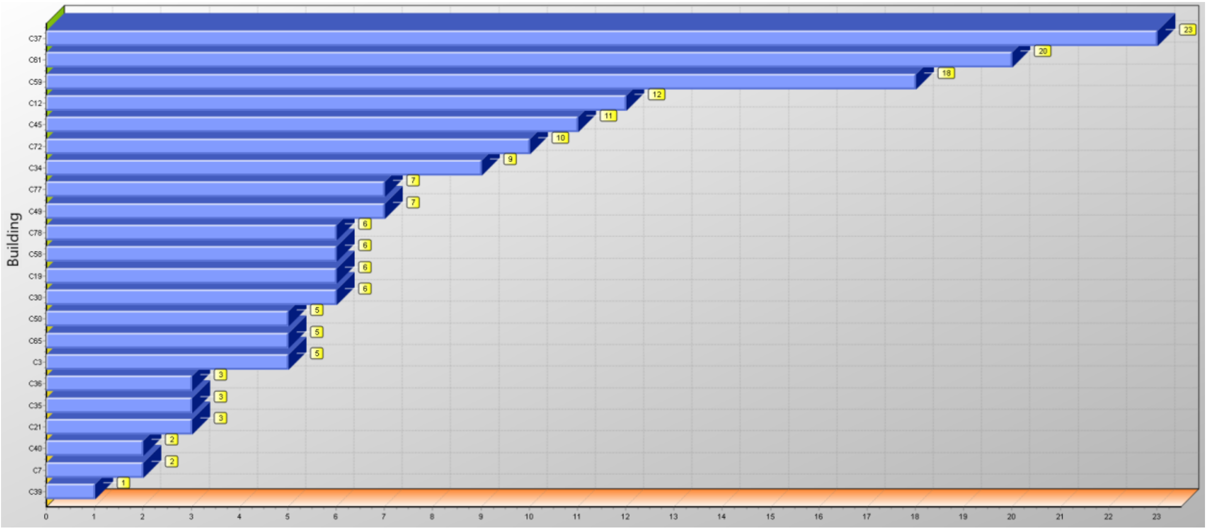

Figure 5. 59: Reference Frequency for Rent

Table 5. 51: References frequency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
References	7.73	5.79	1	23	22
Peers	4.23	1.07	2	6	4

Appendix 51: Reference Frequency – Occupation Cost and Leasing

Occupation Cost and Leasing

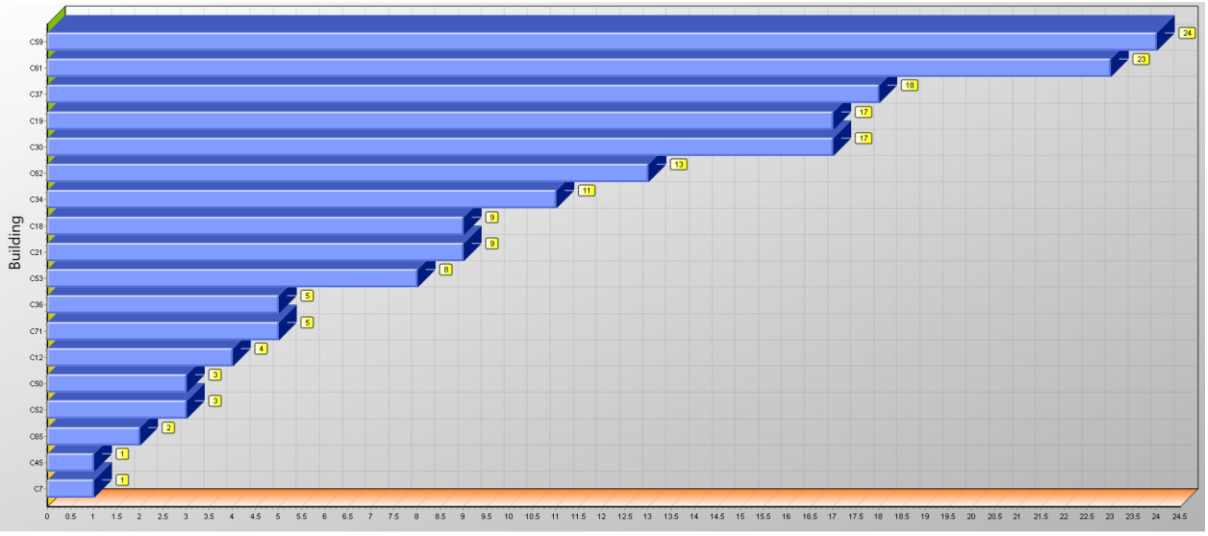

Figure 5. 60: Reference Frequency for Occupation Cost and Leasing

Table 5. 52: References frequency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
References	**9.61**	**7.27**	**1**	**24**	**23**
Peers	**3.97**	**0.89**	**2**	**6**	**4**

Appendix 52: Reference Frequency – Debt

Debt

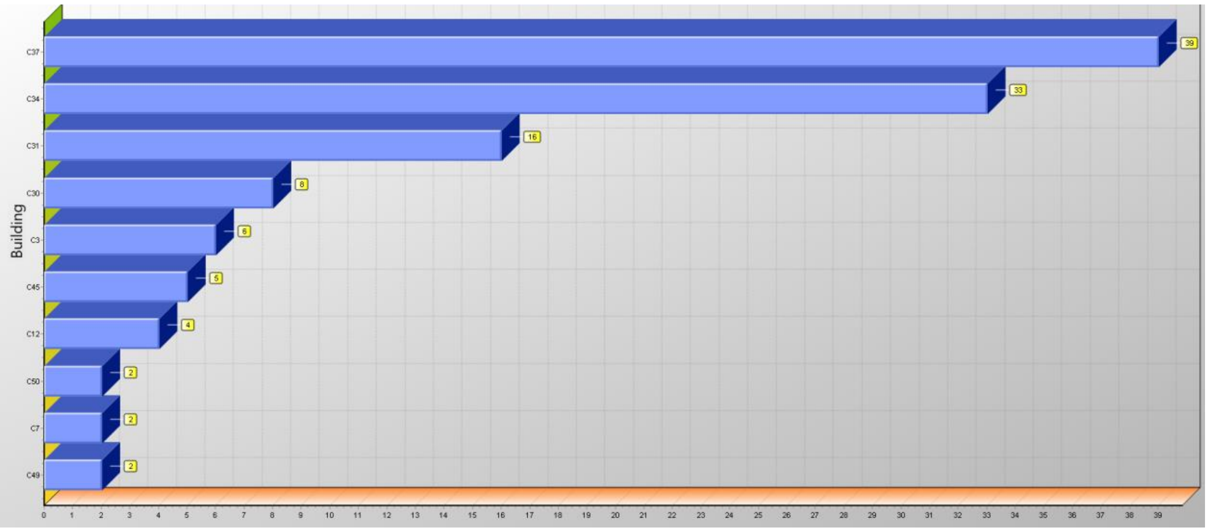

Figure 5. 61: Reference Frequency for Debt

Table 5. 53: References frequency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
References	**11.7**	**12.85**	**2**	**39**	**37**
Peers	**2.28**	**0.61**	**1**	**3**	**2**

Appendix 53: Reference Frequency – Operational Characteristics

Operational Characteristics

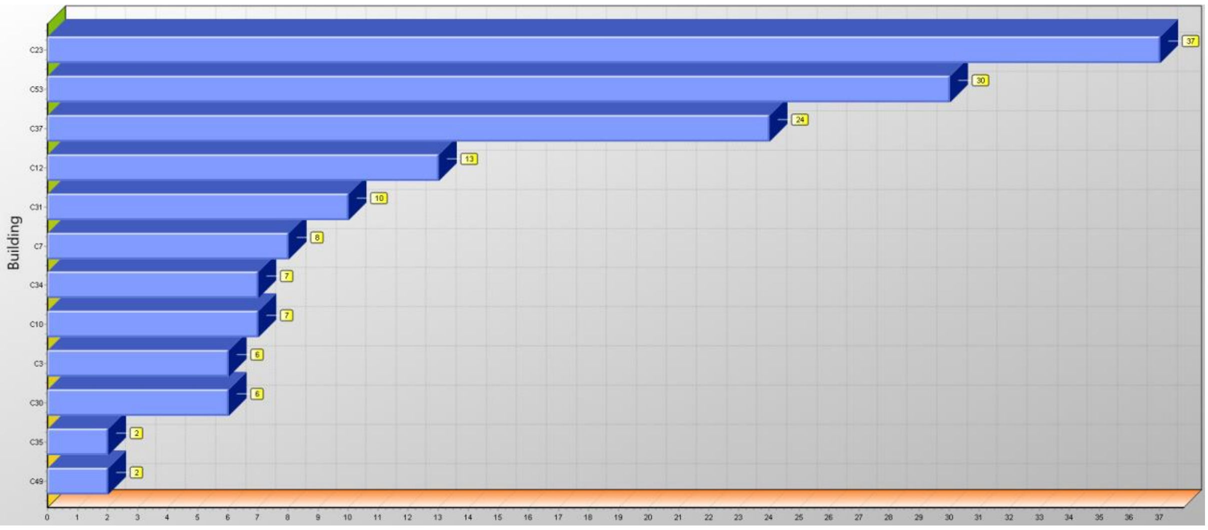

Figure 5. 62: Reference Frequency for Operational Characteristics

Table 5. 54: References frequency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
References	12.67	10.92	2	37	35
Peers	3.11	0.92	2	5	3

Appendix 54: Reference Frequency – Physical Characteristics

Physical Characteristics

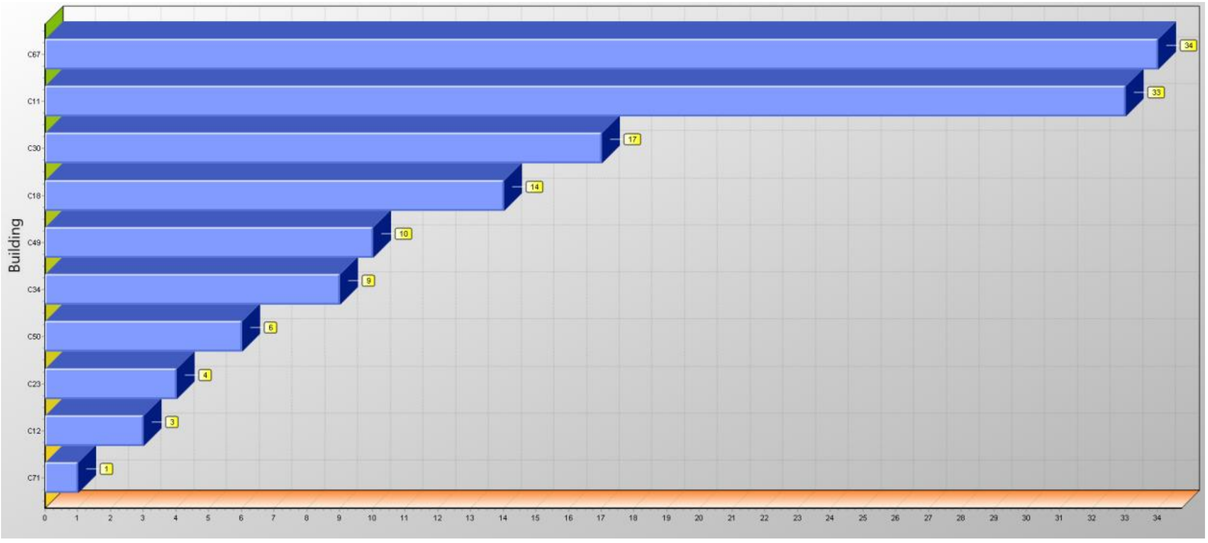

Figure 5. 63: Reference Frequency for Physical Characteristics

Table 5. 55: References frequency statistics for Physical Characteristics

Column	Average	SD	Min	Max	Range
References	13.1	11.21	1	34	33
Peers	2.57	0.98	1	4	3

Appendix 55: Details of Real Estate Buildings Used in the Study

C12								
Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3000	3000	3000	3000	3000
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	2649.29	2649.29	2649.29	2649.29	2649.29
	Utilization	Income /expected income provided its rented all the year round	CR4	0.84	0.84	0.84	0.81	0.74
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	9855	10220	10585	10950	11315
		Number of unplanned repairs	OR2	3942	5621	3704.75	2737.5	1697.25
		Percentage of planed maintance completed on time	OR3	0.9	0.9	0.9	0.9	0.9
		Percentage of unplanned repairs completed on time	OR4	0.9	0.9	0.9	0.9	0.9
	Cleaning	Number of cleaning employees	OC1	5	5	8	8	8
		Equipment and material cost	OC2	198600	198600	102000	102000	102000
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	900000	900000	937688.89	1092076.58	1050529.8
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	20	24	23	23	24
	Insurance	Building insurance fees	OI1	80000000	80000000	80000000	80000000	80000000
		Equipment insurance fees	OI2	235000	235000	235000	245000	245000
	Management and overall costs	Employees salaries	OM1	60000	68000	72000	80000	88000
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15	17	18	20	22
	Rent	Average Rent Per Building	OT1	26080902	26080902	26080902	28688992.2	28688992.2
		Rent per square meter	OT2	718.14	718.14	718.14	789.95	789.95
		Income per building	OT3	21857992.39	21857992.39	21857992.39	23217396.4	21322585.68
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	12	11	15	20	25
		Percentage of expiring leases	OO2	0.09	0.09	0.09	0.09	0.09
		Percentage of cash return	OO3	0.84	0.84	0.84	0.81	0.74
		Percentage of capitalization rate	OO4	0.8	0.8	0.8	0.77	0.71
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.1	0.1	0.1	0.1	0.1
Building Charastristics	Operational Charastristics	Available rentable area	BO1	36317.34	36317.34	36317.34	36317.34	36317.34
		Average Unit Cost Per Building	BO2	27.54	27.54	27.54	27.54	27.54
		Percentage of rentable area to gross area	BO3	0.96	0.96	0.96	0.96	0.96
	Physical Charastristics	Number of all units	BP1	165	165	165	165	165
		Average unit size	BP2	230	230	230	230	230
Performance	Rent	Rental Revenue	PR1	21857992.39	21857992.39	21857992.39	23217396.4	21322585.68
		Average rent lost due to vacant units	PR2	1320000	1210000	1650000	2200000	2750000
	Churn	Time to re-let	PC1	128	135	138	143	150
		Percentage of vacant units	PC2	0.07	0.07	0.09	0.12	0.15

C23								
Categories	**Sub-Categories**	**Metrics**	**Codes**	**2012**	**2013**	**2014**	**2015**	**2016**
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3500	3500	3500	3500	3500
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	5388.53	5388.53	5388.53	5388.53	5388.53
	Utilization	Income /expected income provided its rented all the year round	CR4	0.77	0.77	0.77	0.77	0.77
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	7194	8158	6895	6148	7562
		Number of unplanned repairs	OR2	2877	4486	2413	1537	1134
		Percentage of planed maintance completed on time	OR3	0.9	0.9	0.9	0.9	0.9
		Percentage of unplanned repairs completed on time	OR4	0.9	0.9	0.9	0.9	0.9
	Cleaning	Number of cleaning employees	OC1	3	3	6	6	6
		Equipment and material cost	OC2	198600	198600	102000	102000	102000
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	200000	200000	214118	229418	207342
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	15	16	15	17	15
	Insurance	Building insurance fees	OI1	80000000	80000000	80000000	80000000	80000000
		Equipment insurance fees	OI2	104326.82	104326.82	104326.82	104326.82	104326.82
	Management and overall costs	Employees salaries	OM1	60000	68000	72000	80000	88000
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15	17	18	20	22
	Rent	Average Rent Per Building	OT1	14529620	14529620	14529620	14529620	14529620
		Rent per square meter	OT2	1259.07	1259.07	1259.07	1259.07	1259.07
		Income per building	OT3	11180003	11180003	11180003	11180003	11180003
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	0	2	3	4	8
		Percentage of expiring leases	OO2	0.07	0.08	0.07	0.09	0.09
		Percentage of cash return	OO3	0.77	0.77	0.77	0.77	0.77
		Percentage of capitalization rate	OO4	0.7	0.7	0.7	0.7	0.7
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.1	0.1	0.1	0.1	0.1
Building Charastristics	Operational Charastristics	Available rentable area	BO1	11540	11540	11540	11540	11540
		Average Unit Cost Per Building	BO2	86.66	86.66	86.66	86.66	86.66
		Percentage of rentable area to gross area	BO3	0.78	0.78	0.78	0.78	0.78
	Physical Charastristics	Number of all units	BP1	48	48	48	48	48
		Average unit size	BP2	252.5	252.5	252.5	252.5	252.5
Performance	Rent	Rental Revenue	PR1	11180003	11180003	11180003	11180003	11180003
		Average rent lost due to vacant units	PR2	0	320000	480000	640000	1280000
	Churn	Time to re-let	PC1	128	135	138	143	150
		Percentage of vacant units	PC2	0	0.01	0.02	0.02	0.05

C49

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3000	3000	3000	3000	3000
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3165.33	3165.33	3165.33	3165.33	3165.33
	Utilization	Income /expected income provided its rented all the year round	CR4	1.19	1.19	1.19	1.19	1.17
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planned maintenance requests	OR1	5264	4825	5632	6205	5562
		Number of unplanned repairs	OR2	2105	2653	1971	1551	834
		Percentage of planed maintance completed on time	OR3	0.9	0.9	0.9	0.9	0.9
		Percentage of unplanned repairs completed on time	OR4	0.9	0.9	0.9	0.9	0.9
	Cleaning	Number of cleaning employees	OC1	3	3	3	3	3
		Equipment and material cost	OC2	198600	198600	102000	102000	102000
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	300000	300000	302698	355069	365711
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	15	15	15	15	15
	Insurance	Building insurance fees	OI1	22948640	22948640	22948640	22948640	22948640
		Equipment insurance fees	OI2	44181.62	44181.62	44181.62	44181.62	44181.62
	Management and overall costs	Employees salaries	OM1	60000	68000	72000	80000	88000
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15	17	18	20	22
	Rent	Average Rent Per Building	OT1	4358000	4358000	4358000	4358000	4358000
		Rent per square meter	OT2	601.1	601.1	601.1	601.1	601.1
		Income per building	OT3	5173296	5173296	5173296	5173296	5099870
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	0	0	0	0	8
		Percentage of expiring leases	OO2	0.07	0.08	0.07	0.09	0.09
		Percentage of cash return	OO3	1.19	1.19	1.19	1.19	1.17
		Percentage of capitalization rate	OO4	0.96	0.96	0.96	0.96	0.94
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.06	0.06	0.06	0.06	0.06
Building Charastristics	Operational Charastristics	Available rentable area	BO1	7250	7250	7250	7250	7250
		Average Unit Cost Per Building	BO2	137.93	137.93	137.93	137.93	137.93
		Percentage of rentable area to gross area	BO3	0.97	0.97	0.97	0.97	0.97
	Physical Charastristics	Number of all units	BP1	46	46	46	46	46
		Average unit size	BP2	151.33	151.33	151.33	151.33	151.33
Performance	Rent	Rental Revenue	PR1	5173296	5173296	5173296	5173296	5099870
		Average rent lost due to vacant units	PR2	0	0	0	0	720000
	Churn	Time to re-let	PC1	150	150	150	150	150
		Percentage of vacant units	PC2	0	0	0	0	0.05

C39

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3000	3000	3000	3000	3000
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	2941.83	2941.83	2941.83	2941.83	2941.83
	Utilization	Income /expected income provided its rented all the year round	CR4	1.05	1.05	1.05	1.05	1.05
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	5471	5236	4965	5456	5125
		Number of unplanned repairs	OR2	2188	2879	1737	1364	768
		Percentage of planed maintance completed on time	OR3	0.9	0.9	0.9	0.9	0.9
		Percentage of unplanned repairs completed on time	OR4	0.9	0.9	0.9	0.9	0.9
	Cleaning	Number of cleaning employees	OC1	3	3	3	3	3
		Equipment and material cost	OC2	198600	198600	102000	102000	102000
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	400000	400000	416070	460659	499317
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	15	15	15	15	15
	Insurance	Building insurance fees	OI1	33983980	33983980	33983980	33983980	33983980
		Equipment insurance fees	OI2	50181.82	50181.82	50181.82	50181.82	50181.82
	Management and overall costs	Employees salaries	OM1	60000	68000	72000	80000	88000
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15	17	18	20	22
	Rent	Average Rent Per Building	OT1	6545600	6545600	6545600	6545600	6545600
		Rent per square meter	OT2	566.62	566.62	566.62	566.62	566.62
		Income per building	OT3	6863435	6863435	6863435	6863435	6863435
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	4	6	7	5	20
		Percentage of expiring leases	OO2	0.06	0.09	0.07	0.08	0.07
		Percentage of cash return	OO3	1.05	1.05	1.05	1.05	1.05
		Percentage of capitalization rate	OO4	0.9	0.9	0.9	0.9	0.9
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.06	0.06	0.06	0.06	0.06
Building Charastristics	Operational Charastristics	Available rentable area	BO1	11552	11552	11552	11552	11552
		Average Unit Cost Per Building	BO2	86.57	86.57	86.57	86.57	86.57
		Percentage of rentable area to gross area	BO3	0.97	0.97	0.97	0.97	0.97
	Physical Charastristics	Number of all units	BP1	75	75	75	75	75
		Average unit size	BP2	152	152	152	152	152
Performance	Rent	Rental Revenue	PR1	6863435	6863435	6863435	6863435	6863435
		Average rent lost due to vacant units	PR2	340000	510000	595000	425000	1700000
	Churn	Time to re-let	PC1	150	150	150	150	150
		Percentage of vacant units	PC2	0.05	0.08	0.09	0.07	0.27

C38								
Categories	**Sub-Categories**	**Metrics**	**Codes**	**2012**	**2013**	**2014**	**2015**	**2016**
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3000	3000	3000	3000	3000
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	2515.85	2515.85	2515.85	2515.85	2515.85
	Utilization	Income /expected income provided its rented all the year round	CR4	0.83	0.83	0.83	0.83	0.83
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	6525	6412	6892	5963	6258
		Number of unplanned repairs	OR2	2610	3526	2412	1490	938
		Percentage of planed maintance completed on time	OR3	0.9	0.9	0.9	0.9	0.9
		Percentage of unplanned repairs completed on time	OR4	0.9	0.9	0.9	0.9	0.9
	Cleaning	Number of cleaning employees	OC1	3	3	3	3	3
		Equipment and material cost	OC2	198600	198600	102000	102000	102000
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	250000	250000	353229	258116	144949
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	12	12	12	12	12
	Insurance	Building insurance fees	OI1	20000000	20000000	20000000	20000000	20000000
		Equipment insurance fees	OI2	57931.82	57931.82	57931.82	57931.82	57931.82
	Management and overall costs	Employees salaries	OM1	60000	68000	72000	80000	88000
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15	17	18	20	22
	Rent	Average Rent Per Building	OT1	7181600	7181600	7181600	7181600	7181600
		Rent per square meter	OT2	903.39	903.39	903.39	903.39	903.39
		Income per building	OT3	5925186	5925186	5925186	5925186	5925186
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	0	4	6	6	8
		Percentage of expiring leases	OO2	0.06	0.09	0.07	0.08	0.07
		Percentage of cash return	OO3	0.83	0.83	0.83	0.83	0.83
		Percentage of capitalization rate	OO4	0.69	0.69	0.69	0.69	0.69
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.06	0.06	0.06	0.06	0.06
Building Charastristics	Operational Charastristics	Available rentable area	BO1	7949.6	7949.6	7949.6	7949.6	7949.6
		Average Unit Cost Per Building	BO2	125.79	125.79	125.79	125.79	125.79
		Percentage of rentable area to gross area	BO3	0.88	0.88	0.88	0.88	0.88
	Physical Charastristics	Number of all units	BP1	69	69	69	69	69
		Average unit size	BP2	116	116	116	116	116
Performance	Rent	Rental Revenue	PR1	5925186	5925186	5925186	5925186	5925186
		Average rent lost due to vacant units	PR2	0	400000	600000	600000	800000
	Churn	Time to re-let	PC1	150	150	150	150	150
		Percentage of vacant units	PC2	0	0.05	0.08	0.08	0.11

C30

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3000	3000	3000	3000	3000
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3058.1	3058.1	3058.1	3058.1	3058.1
	Utilization	Income /expected income provided its rented all the year round	CR4	0.71	0.71	0.71	0.71	0.71
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	463	421	356	268	360
		Number of unplanned repairs	OR2	185	231	124	67	54
		Percentage of planed maintance completed on time	OR3	0.9	0.9	0.9	0.9	0.9
		Percentage of unplanned repairs completed on time	OR4	0.9	0.9	0.9	0.9	0.9
	Cleaning	Number of cleaning employees	OC1	3	3	3	3	3
		Equipment and material cost	OC2	198600	198600	102000	102000	102000
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	310000	310000	310544	419523	427981
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	12	12	12	12	12
	Insurance	Building insurance fees	OI1	20000000	20000000	20000000	20000000	20000000
		Equipment insurance fees	OI2	38931.82	38931.82	38931.82	38931.82	38931.82
	Management and overall costs	Employees salaries	OM1	60000	68000	72000	80000	88000
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15	17	18	20	22
	Rent	Average Rent Per Building	OT1	5770000	5770000	5770000	5770000	5770000
		Rent per square meter	OT2	882.26	882.26	882.26	882.26	882.26
		Income per building	OT3	4110048	4110048	4110048	4110048	4110048
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	0	0	0	0	5
		Percentage of expiring leases	OO2	0.06	0.09	0.07	0.08	0.07
		Percentage of cash return	OO3	0.71	0.71	0.71	0.71	0.71
		Percentage of capitalization rate	OO4	0.54	0.54	0.54	0.54	0.54
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.06	0.06	0.06	0.06	0.06
Building Charastristics	Operational Charastristics	Available rentable area	BO1	6540	6540	6540	6540	6540
		Average Unit Cost Per Building	BO2	152.91	152.91	152.91	152.91	152.91
		Percentage of rentable area to gross area	BO3	0.98	0.98	0.98	0.98	0.98
	Physical Charastristics	Number of all units	BP1	52	52	52	52	52
		Average unit size	BP2	122	122	122	122	122
Performance	Rent	Rental Revenue	PR1	4110048	4110048	4110048	4110048	4110048
		Average rent lost due to vacant units	PR2	0	0	0	0	500000
	Churn	Time to re-let	PC1	150	150	150	150	150
		Percentage of vacant units	PC2	0	0	0	0	0.07

C156

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3000	3000	3000	3000	3000
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3214.77	3214.77	3214.77	3214.77	3214.77
	Utilization	Income /expected income provided its rented all the year round	CR4	0.87	0.87	0.87	0.87	0.87
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	5324	5058	4825	5565	5832
		Number of unplanned repairs	OR2	2129	2781	1688	1391	874
		Percentage of planed maintance completed on time	OR3	0.9	0.9	0.9	0.9	0.9
		Percentage of unplanned repairs completed on time	OR4	0.9	0.9	0.9	0.9	0.9
	Cleaning	Number of cleaning employees	OC1	3	3	3	3	3
		Equipment and material cost	OC2	198600	198600	102000	102000	102000
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	600000	600000	494815	687741	710092
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	15	15	15	15	15
	Insurance	Building insurance fees	OI1	38059202	38059202	38059202	38059202	38059202
		Equipment insurance fees	OI2	59925.82	59925.82	59925.82	59925.82	59925.82
	Management and overall costs	Employees salaries	OM1	60000	68000	72000	80000	88000
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15	17	18	20	22
	Rent	Average Rent Per Building	OT1	10713008	10713008	10713008	10713008	10713008
		Rent per square meter	OT2	904.9	904.9	904.9	904.9	904.9
		Income per building	OT3	9278057.15	9278057.15	9278057.15	9278057.15	9278057.15
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	0	4	6	7	10
		Percentage of expiring leases	OO2	0.06	0.09	0.07	0.08	0.07
		Percentage of cash return	OO3	0.87	0.87	0.87	0.87	0.87
		Percentage of capitalization rate	OO4	0.77	0.77	0.77	0.77	0.77
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.06	0.06	0.06	0.06	0.06
Building Charastristics	Operational Charastristics	Available rentable area	BO1	11838.84	11838.84	11838.84	11838.84	11838.84
		Average Unit Cost Per Building	BO2	84.47	84.47	84.47	84.47	84.47
		Percentage of rentable area to gross area	BO3	0.85	0.85	0.85	0.85	0.85
	Physical Charastristics	Number of all units	BP1	81	81	81	81	81
		Average unit size	BP2	145	145	145	145	145
Performance	Rent	Rental Revenue	PR1	9278057.15	9278057.15	9278057.15	9278057.15	9278057.15
		Average rent lost due to vacant units	PR2	0	340000	510000	595000	850000
	Churn	Time to re-let	PC1	150	150	150	150	150
		Percentage of vacant units	PC2	0	0.05	0.08	0.09	0.13

C19

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3000	3000	3000	3000	3000
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	1623.08	1623.08	1623.08	1623.08	1623.08
	Utilization	Income /expected income provided its rented all the year round	CR4	0.59	0.59	0.59	0.59	0.59
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	5356	5324	5856	4585	6256
		Number of unplanned repairs	OR2	2142	2928	2049	1146	938
		Percentage of planed maintance completed on time	OR3	0.9	0.9	0.9	0.9	0.9
		Percentage of unplanned repairs completed on time	OR4	0.9	0.9	0.9	0.9	0.9
	Cleaning	Number of cleaning employees	OC1	4	4	6	6	6
		Equipment and material cost	OC2	198600	198600	102000	102000	102000
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	400000	400000	396053	541113	527660
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	20	24	23	23	24
	Insurance	Building insurance fees	OI1	35000000	35000000	35000000	35000000	35000000
		Equipment insurance fees	OI2	50181.82	50181.82	50181.82	50181.82	50181.82
	Management and overall costs	Employees salaries	OM1	60000	68000	72000	80000	88000
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15	17	18	20	22
	Rent	Average Rent Per Building	OT1	12440000	12440000	12440000	12440000	12440000
		Rent per square meter	OT2	576.89	576.89	576.89	576.89	576.89
		Income per building	OT3	7329579	7329579	7329579	7329579	7329579
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	25	0	0	5	12
		Percentage of expiring leases	OO2	0.09	0.09	0.09	0.09	0.09
		Percentage of cash return	OO3	0.59	0.59	0.59	0.59	0.59
		Percentage of capitalization rate	OO4	0.51	0.51	0.51	0.51	0.51
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.1	0.1	0.1	0.1	0.1
Building Charastristics	Operational Charastristics	Available rentable area	BO1	21564	21564	21564	21564	21564
		Average Unit Cost Per Building	BO2	46.37	46.37	46.37	46.37	46.37
		Percentage of rentable area to gross area	BO3	0.86	0.86	0.86	0.86	0.86
	Physical Charastristics	Number of all units	BP1	844	844	844	844	844
		Average unit size	BP2	280	280	280	280	280
Performance	Rent	Rental Revenue	PR1	7329579	7329579	7329579	7329579	7329579
		Average rent lost due to vacant units	PR2	3000000	0	0	550000	1320000
	Churn	Time to re-let	PC1	128	135	138	143	150
		Percentage of vacant units	PC2	0.15	0	0	0.03	0.07

C9								
Categories	**Sub-Categories**	**Metrics**	**Codes**	**2012**	**2013**	**2014**	**2015**	**2016**
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3200	3200	3200	3200	3200
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	2690.96	2690.96	2690.96	2690.96	2690.96
	Utilization	Income /expected income provided its rented all the year round	CR4	0.69	0.69	0.69	0.69	0.69
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	7245	7958	7056	6852	7925
		Number of unplanned repairs	OR2	2898	4376	2469	1713	1188
		Percentage of planed maintance completed on time	OR3	0.9	0.9	0.9	0.9	0.9
		Percentage of unplanned repairs completed on time	OR4	0.9	0.9	0.9	0.9	0.9
	Cleaning	Number of cleaning employees	OC1	3	3	6	6	6
		Equipment and material cost	OC2	198600	198600	102000	102000	102000
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	400000	400000	421536	449658	397184
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	15	16	15	17	15
	Insurance	Building insurance fees	OI1	40000000	40000000	40000000	40000000	40000000
		Equipment insurance fees	OI2	87181.82	87181.82	87181.82	87181.82	87181.82
	Management and overall costs	Employees salaries	OM1	60000	68000	72000	80000	88000
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15	17	18	20	22
	Rent	Average Rent Per Building	OT1	10414320	10414320	10414320	10414320	10414320
		Rent per square meter	OT2	796.77	796.77	796.77	796.77	796.77
		Income per building	OT3	7214307.75	7214307.75	7214307.75	7214307.75	7214307.75
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	3	2	3	3	6
		Percentage of expiring leases	OO2	0.07	0.08	0.07	0.09	0.09
		Percentage of cash return	OO3	0.69	0.69	0.69	0.69	0.69
		Percentage of capitalization rate	OO4	0.6	0.6	0.6	0.6	0.6
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.1	0.1	0.1	0.1	0.1
Building Charastristics	Operational Charastristics	Available rentable area	BO1	13070.6	13070.6	13070.6	13070.6	13070.6
		Average Unit Cost Per Building	BO2	76.51	76.51	76.51	76.51	76.51
		Percentage of rentable area to gross area	BO3	0.88	0.88	0.88	0.88	0.88
	Physical Charastristics	Number of all units	BP1	65	65	65	65	65
		Average unit size	BP2	215	215	215	215	215
Performance	Rent	Rental Revenue	PR1	7214307.75	7214307.75	7214307.75	7214307.75	7214307.75
		Average rent lost due to vacant units	PR2	435000	290000	435000	435000	870000
	Churn	Time to re-let	PC1	128	135	138	143	150
		Percentage of vacant units	PC2	0.05	0.03	0.05	0.05	0.09

C20								
Categories	**Sub-Categories**	**Metrics**	**Codes**	**2012**	**2013**	**2014**	**2015**	**2016**
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3200	3200	3200	3200	3200
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	483.27	483.27	483.27	483.27	483.27
	Utilization	Income /expected income provided its rented all the year round	CR4	0.66	0.66	0.66	0.66	0.66
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	7458	7478	7356	7515	8145
		Number of unplanned repairs	OR2	2983	4112	2574	1878	1221
		Percentage of planed maintance completed on time	OR3	0.9	0.9	0.9	0.9	0.9
		Percentage of unplanned repairs completed on time	OR4	0.9	0.9	0.9	0.9	0.9
	Cleaning	Number of cleaning employees	OC1	3	3	6	6	6
		Equipment and material cost	OC2	198600	198600	102000	102000	102000
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	600000	600000	574056	686397	690608
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	15	16	15	17	15
	Insurance	Building insurance fees	OI1	60000000	60000000	60000000	60000000	60000000
		Equipment insurance fees	OI2	101977.82	101977.82	101977.82	101977.82	101977.82
	Management and overall costs	Employees salaries	OM1	60000	68000	72000	80000	88000
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15	17	18	20	22
	Rent	Average Rent Per Building	OT1	17913044	17913044	17913044	17913044	17913044
		Rent per square meter	OT2	876.65	876.65	876.65	876.65	876.65
		Income per building	OT3	11841267	11841267	11841267	11841267	11841267
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	15	10	8	7	8
		Percentage of expiring leases	OO2	0.07	0.08	0.07	0.09	0.09
		Percentage of cash return	OO3	0.66	0.66	0.66	0.66	0.66
		Percentage of capitalization rate	OO4	0.61	0.61	0.61	0.61	0.61
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.1	0.1	0.1	0.1	0.1
Building Charastristics	Operational Charastristics	Available rentable area	BO1	20433.63	20433.63	20433.63	20433.63	20433.63
		Average Unit Cost Per Building	BO2	48.94	48.94	48.94	48.94	48.94
		Percentage of rentable area to gross area	BO3	0.85	0.85	0.85	0.85	0.85
	Physical Charastristics	Number of all units	BP1	128	128	128	128	128
		Average unit size	BP2	230	230	230	230	230
Performance	Rent	Rental Revenue	PR1	11841267	11841267	11841267	11841267	11841267
		Average rent lost due to vacant units	PR2	1950000	1300000	1040000	910000	1040000
	Churn	Time to re-let	PC1	128	135	138	143	150
		Percentage of vacant units	PC2	0.12	0.08	0.06	0.05	0.06

C7								
Categories	**Sub-Categories**	**Metrics**	**Codes**	**2012**	**2013**	**2014**	**2015**	**2016**
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3190.89	3190.89	3190.89	3190.89	3190.89
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3581.99	3581.99	3581.99	3581.99	3581.99
	Utilization	Income /expected income provided its rented all the year round	CR4	0.79	0.79	0.79	0.8	0.77
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	11055.12	10842.16	11675.8	8414.14	11886.85
		Number of unplanned repairs	OR2	1993	2910	1738	986	689
		Percentage of planed maintance completed on time	OR3	5759.43	6143.39	5145.09	6373.77	5145.09
		Percentage of unplanned repairs completed on time	OR4	1066.87	954.57	912.46	1010.72	1066.87
	Cleaning	Number of cleaning employees	OC1	7	7	11	14	12
		Equipment and material cost	OC2	109589.96	109589.96	56284.87	56284.87	56284.87
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	372506	372506	404654	460222	297607
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	19	18	19	20	21
	Insurance	Building insurance fees	OI1	32148617.1	32148617.1	32148617.1	32148617.1	32148617.1
		Equipment insurance fees	OI2	168986.57	168986.57	168986.57	173927.91	171258.23
	Management and overall costs	Employees salaries	OM1	68123.91	77207.09	81748.68	90831.87	99915.06
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	18.44	21.28	22.7	24.82	27.66
	Rent	Average Rent Per Building	OT1	18611699.62	18611699.62	18611699.62	19864513.16	18390156.27
		Rent per square meter	OT2	961.55	961.55	961.55	983.65	1014.44
		Income per building	OT3	9154059.21	9154059.21	9154059.21	9053301.69	9112232.92
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	10.68	3.72	8.94	6.95	26.57
		Percentage of expiring leases	OO2	0.09	0.09	0.11	0.12	0.13
		Percentage of cash return	OO3	0.89	0.89	0.89	0.88	0.9
		Percentage of capitalization rate	OO4	0.81	0.81	0.81	0.79	0.75
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.08	0.08	0.08	0.08	0.08
Building Charastristics	Operational Charastristics	Available rentable area	BO1	18840.55	18840.55	18840.55	18840.55	18840.55
		Average Unit Cost Per Building	BO2	70.03	70.03	70.03	70.03	70.03
		Percentage of rentable area to gross area	BO3	0.96	0.96	0.96	0.96	0.96
	Physical Charastristics	Number of all units	BP1	569.4	569.4	569.4	569.4	569.4
		Average unit size	BP2	232.79	232.79	232.79	232.79	232.79
Performance	Rent	Rental Revenue	PR1	6404335.41	6404335.41	6404335.41	6393844.9	6450950.67
		Average rent lost due to vacant units	PR2	61451.03	88485.06	76464.79	76305.1	63231.77
	Churn	Time to re-let	PC1	149	152	154	152	175
		Percentage of vacant units	PC2	0.02	0.03	0.02	0.03	0.07

C3

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3015.41	3015.41	3015.41	3015.41	3015.41
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	2643.23	2643.23	2643.23	2643.23	2643.23
	Utilization	Income /expected income provided its rented all the year round	CR4	0.84	0.84	0.84	0.84	0.83
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	978	891	970	896	1189
		Number of unplanned repairs	OR2	1135	1484	856	601	409
		Percentage of planed maintance completed on time	OR3	4275.36	4624.36	4275.36	4624.36	4188.1
		Percentage of unplanned repairs completed on time	OR4	1	1	1	1	1
	Cleaning	Number of cleaning employees	OC1	4.5	4.5	4.5	4.5	9.01
		Equipment and material cost	OC2	170216.1	170216.1	87422.17	87422.17	87422.17
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	350845.26	350845.26	269109.36	390185.07	482186.93
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	14.21	15.79	14.21	15.79	17.37
	Insurance	Building insurance fees	OI1	43034667.67	43034667.67	43034667.67	43034667.67	43034667.67
		Equipment insurance fees	OI2	45456.33	45456.33	45456.33	45548.5	45946.28
	Management and overall costs	Employees salaries	OM1	63470.59	71933.33	76164.7	84627.45	93090.19
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	21	24	26	29	32
	Rent	Average Rent Per Building	OT1	5109948.82	5109948.82	5109948.82	4956245.38	4940550.87
		Rent per square meter	OT2	1146.74	1146.74	1146.74	1128.67	1164.19
		Income per building	OT3	9441906.32	9441906.32	9441906.32	9580283.18	9386946.62
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	12	14	25	18	24
		Percentage of expiring leases	OO2	0.09	0.15	0.1	0.13	0.09
		Percentage of cash return	OO3	1.19	1.19	1.19	1.2	1.14
		Percentage of capitalization rate	OO4	0.8	0.8	0.8	0.8	0.81
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.06	0.06	0.06	0.06	0.06
Building Charastristics	Operational Charastristics	Available rentable area	BO1	22196.25	22196.25	22196.25	22196.25	22196.25
		Average Unit Cost Per Building	BO2	151.36	151.36	151.36	151.36	151.36
		Percentage of rentable area to gross area	BO3	0.88	0.88	0.88	0.88	0.88
	Physical Charastristics	Number of all units	BP1	818.67	818.67	818.67	818.67	818.67
		Average unit size	BP2	268.59	268.59	268.59	268.59	268.59
Performance	Rent	Rental Revenue	PR1	22438225.76	22438225.76	22438225.76	22139495.05	22388083.13
		Average rent lost due to vacant units	PR2	942091.36	621736.06	1089924.9	971903.79	2324754.94
	Churn	Time to re-let	PC1	141.88	152.14	154.01	162.41	171.74
		Percentage of vacant units	PC2	0.04	0.01	0.04	0.05	0.06

C24

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3011.05	3011.05	3011.05	3011.05	3011.05
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	777.54	777.54	777.54	777.54	777.54
	Utilization	Income /expected income provided its rented all the year round	CR4	0.7	0.7	0.7	0.7	0.73
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	10385	11040	9794	11831	11797
		Number of unplanned repairs	OR2	3773	5266	3644	2382	1325
		Percentage of planed maintance completed on time	OR3	1	1	1	1	1
		Percentage of unplanned repairs completed on time	OR4	3352.67	3443.28	3216.75	3669.81	3941.65
	Cleaning	Number of cleaning employees	OC1	4	4	4	7	8
		Equipment and material cost	OC2	153611.59	153611.59	78894.17	78894.17	78894.17
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	219787.94	219787.94	196899.29	248007.81	237256.54
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	18.44	22.13	18.44	20.28	20.28
	Insurance	Building insurance fees	OI1	34093554.83	34093554.83	34093554.83	34093554.83	34093554.83
		Equipment insurance fees	OI2	162290.07	162290.07	162290.07	161534.81	159454.89
	Management and overall costs	Employees salaries	OM1	63738.99	72237.52	76486.78	84985.31	93483.85
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	21.2	22.96	24.73	28.26	30.03
	Rent	Average Rent Per Building	OT1	13287167.75	13287167.75	13287167.75	12664899.55	13960074.65
		Rent per square meter	OT2	1116.87	1116.87	1116.87	1100.15	1127.33
		Income per building	OT3	10184485.53	10184485.53	10184485.53	10050804.99	10097693.36
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	11	-1	10	4	27
		Percentage of expiring leases	OO2	0.06	0.08	0.06	0.08	0.07
		Percentage of cash return	OO3	0.63	0.63	0.63	0.63	0.61
		Percentage of capitalization rate	OO4	0.65	0.65	0.65	0.64	0.64
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.07	0.07	0.07	0.07	0.07
Building Charastristics	Operational Charastristics	Available rentable area	BO1	7507.61	7507.61	7507.61	7507.61	7507.61
		Average Unit Cost Per Building	BO2	122.12	122.12	122.12	122.12	122.12
		Percentage of rentable area to gross area	BO3	0.84	0.84	0.84	0.84	0.84
	Physical Charastristics	Number of all units	BP1	514.36	514.36	514.36	514.36	514.36
		Average unit size	BP2	172.84	172.84	172.84	172.84	172.84
Performance	Rent	Rental Revenue	PR1	7225131.78	7225131.78	7225131.78	7136514.84	7251432.67
		Average rent lost due to vacant units	PR2	1677818.58	1249205.44	2138612.61	737804.56	2482635.8
	Churn	Time to re-let	PC1	144	145	147	141	167
		Percentage of vacant units	PC2	0.1	0.06	0.06	0.11	0.13

C45

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3165.03	3165.03	3165.03	3165.03	3165.03
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3488.5	3488.5	3488.5	3488.5	3488.5
	Utilization	Income /expected income provided its rented all the year round	CR4	0.72	0.72	0.72	0.71	0.72
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	10415	9685	10044	10088	11060
		Number of unplanned repairs	OR2	4870	6288	5445	2858	1934
		Percentage of planed maintance completed on time	OR3	8563.85	9342.38	9212.62	8174.58	8304.34
		Percentage of unplanned repairs completed on time	OR4	1855.92	1985.4	1251.66	1963.82	2158.04
	Cleaning	Number of cleaning employees	OC1	6	6	11	9	7
		Equipment and material cost	OC2	186968.99	186968.99	96026.37	96026.37	96026.37
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	360965	360965	365597	461437	455773
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	19.2	21.26	19.2	21.26	20.57
	Insurance	Building insurance fees	OI1	64479527.82	64479527.82	64479527.82	64479527.82	64479527.82
		Equipment insurance fees	OI2	106976.38	106976.38	106976.38	107196.49	106323.14
	Management and overall costs	Employees salaries	OM1	83767.9	94936.94	100521.48	111690.53	122859.59
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	17.04	20.45	20.45	23.86	25.56
	Rent	Average Rent Per Building	OT1	20347472.76	20347472.76	20347472.76	20538557.17	20876893.97
		Rent per square meter	OT2	713.28	713.28	713.28	722.24	699.63
		Income per building	OT3	16097806.01	16097806.01	16097806.01	16190377.88	15985907.28
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	3	3	0	3	2
		Percentage of expiring leases	OO2	0.09	0.11	0.09	0.1	0.1
		Percentage of cash return	OO3	0.68	0.68	0.68	0.68	0.65
		Percentage of capitalization rate	OO4	0.74	0.74	0.74	0.74	0.72
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.08
		Percentage of tenants with unpaid rent	OD3	0.08	0.08	0.08	0.08	0.08
Building Charastristics	Operational Charastristics	Available rentable area	BO1	25109.67	25109.67	25109.67	25109.67	25109.67
		Average Unit Cost Per Building	BO2	107.58	107.58	107.58	107.58	107.58
		Percentage of rentable area to gross area	BO3	0.96	0.96	0.96	0.96	0.96
	Physical Charastristics	Number of all units	BP1	244.53	244.53	244.53	244.53	244.53
		Average unit size	BP2	253.01	253.01	253.01	253.01	253.01
Performance	Rent	Rental Revenue	PR1	8747775.15	8747775.15	8747775.15	8898421.93	8692520.83
		Average rent lost due to vacant units	PR2	1682024.23	1351266.53	2271744.5	1744192.31	589370.17
	Churn	Time to re-let	PC1	130	129	133	127	145
		Percentage of vacant units	PC2	0.12	0.15	0.08	0.06	0.05

C26								
Categories	**Sub-Categories**	**Metrics**	**Codes**	**2012**	**2013**	**2014**	**2015**	**2016**
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3405.06	3405.06	3405.06	3405.06	3405.06
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3742.81	3742.81	3742.81	3742.81	3742.81
	Utilization	Income /expected income provided its rented all the year round	CR4	0.71	0.71	0.71	0.72	0.68
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	5230	5559	5291	6054	4964
		Number of unplanned repairs	OR2	632	825	579	367	231
		Percentage of planed maintance completed on time	OR3	1	1	1	1	1
		Percentage of unplanned repairs completed on time	OR4	1	1	1	1	0.92
	Cleaning	Number of cleaning employees	OC1	6.39	6.39	9.59	6.39	6.39
		Equipment and material cost	OC2	124105.21	124105.21	63739.83	63739.83	63739.83
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	304452	304452	333098	354026	321568
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	18.5	21.14	18.5	18.5	18.5
	Insurance	Building insurance fees	OI1	22317994.87	22317994.87	22317994.87	22317994.87	22317994.87
		Equipment insurance fees	OI2	44279.73	44279.73	44279.73	45070.93	44653.37
	Management and overall costs	Employees salaries	OM1	73373.53	83156.66	88048.23	97831.37	107614.51
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15.17	17.5	18.67	21	23.33
	Rent	Average Rent Per Building	OT1	5869028.47	5869028.47	5869028.47	5768428.21	5717275.85
		Rent per square meter	OT2	1116.78	1116.78	1116.78	1093.67	1182.64
		Income per building	OT3	12926235.93	12926235.93	12926235.93	12713926.41	12871546.77
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	0	0	0	0	0
		Percentage of expiring leases	OO2	0.07	0.08	0.06	0.08	0.08
		Percentage of cash return	OO3	0.78	0.78	0.78	0.77	0.73
		Percentage of capitalization rate	OO4	0.63	0.63	0.63	0.64	0.61
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.08
		Percentage of tenants with unpaid rent	OD3	0.09	0.09	0.09	0.09	0.09
Building Charastristics	Operational Charastristics	Available rentable area	BO1	33870.32	33870.32	33870.32	33870.32	33870.32
		Average Unit Cost Per Building	BO2	107.66	107.66	107.66	107.66	107.66
		Percentage of rentable area to gross area	BO3	0.98	0.98	0.98	0.98	0.98
	Physical Charastristics	Number of all units	BP1	535.71	535.71	535.71	535.71	535.71
		Average unit size	BP2	144.67	144.67	144.67	144.67	144.67
Performance	Rent	Rental Revenue	PR1	4167216.72	4167216.72	4167216.72	4218894.67	4223097.06
		Average rent lost due to vacant units	PR2	1522133.16	2368911.51	769656.69	1729367.37	3948377.44
	Churn	Time to re-let	PC1	147	147	157	152	151
		Percentage of vacant units	PC2	0.13	0.18	0.19	0.09	0.22

C27

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3084.73	3084.73	3084.73	3084.73	3084.73
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3459.96	3459.96	3459.96	3459.96	3459.96
	Utilization	Income /expected income provided its rented all the year round	CR4	0.94	0.94	0.94	0.94	0.95
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	7604	7652	7950	8784	7943
		Number of unplanned repairs	OR2	1175	1742	1261	717	435
		Percentage of planed maintance completed on time	OR3	2682.46	2682.46	2280.09	1475.35	2481.28
		Percentage of unplanned repairs completed on time	OR4	1	1	1	1	1
	Cleaning	Number of cleaning employees	OC1	4	4	10	5	6
		Equipment and material cost	OC2	195645.85	195645.85	100482.77	100482.77	100482.77
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	700662	700662	716466	945592	648928
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	17	19	17	17	19
	Insurance	Building insurance fees	OI1	21963916.78	21963916.78	21963916.78	21963916.78	21963916.78
		Equipment insurance fees	OI2	65834.68	65834.68	65834.68	65928.95	66029.75
	Management and overall costs	Employees salaries	OM1	67417.38	76406.37	80900.87	89889.85	98878.83
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	21.34	24.09	25.47	28.22	31.66
	Rent	Average Rent Per Building	OT1	6180399.39	6180399.39	6180399.39	5866224	6292481.75
		Rent per square meter	OT2	708.81	708.81	708.81	728.66	699.03
		Income per building	OT3	22402149.46	22402149.46	22402149.46	22232458.62	22536401.04
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	9	3	10	16	21
		Percentage of expiring leases	OO2	0.08	0.11	0.09	0.11	0.08
		Percentage of cash return	OO3	0.68	0.68	0.68	0.69	0.66
		Percentage of capitalization rate	OO4	0.61	0.61	0.61	0.61	0.57
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.08	0.08	0.08	0.08	0.08
Building Charastristics	Operational Charastristics	Available rentable area	BO1	8832.66	8832.66	8832.66	8832.66	8832.66
		Average Unit Cost Per Building	BO2	117.16	117.16	117.16	117.16	117.16
		Percentage of rentable area to gross area	BO3	0.9	0.9	0.9	0.9	0.9
	Physical Charastristics	Number of all units	BP1	558.92	558.92	558.92	558.92	558.92
		Average unit size	BP2	253.28	253.28	253.28	253.28	253.28
Performance	Rent	Rental Revenue	PR1	4489047.68	4489047.68	4489047.68	4514774.51	4512428.34
		Average rent lost due to vacant units	PR2	2731465.17	2937327.94	3280723.47	2715836.86	11926222.18
	Churn	Time to re-let	PC1	137.63	144.69	144.69	145.57	155.28
		Percentage of vacant units	PC2	0.07	0.08	0.04	0.06	0.21

C16								
Categories	**Sub-Categories**	**Metrics**	**Codes**	**2012**	**2013**	**2014**	**2015**	**2016**
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3375.11	3375.11	3375.11	3375.11	3375.11
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3041.88	3041.88	3041.88	3041.88	3041.88
	Utilization	Income /expected income provided its rented all the year round	CR4	0.87	0.87	0.87	0.88	0.83
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	11020.52	11842.58	10095.33	11963.22	12505.1
		Number of unplanned repairs	OR2	3746	4956	2790	1786	1435
		Percentage of planed maintance completed on time	OR3	1	1	0.96	1	0.94
		Percentage of unplanned repairs completed on time	OR4	1	1	0.98	0.95	1
	Cleaning	Number of cleaning employees	OC1	5.12	5.12	5.12	2.56	7.68
		Equipment and material cost	OC2	163744.3	163744.3	84098.28	84098.28	84098.28
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	409576	409576	413045	479805	389712
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	16	16	15	15	18
	Insurance	Building insurance fees	OI1	34525684.5	34525684.5	34525684.5	34525684.5	34525684.5
		Equipment insurance fees	OI2	180612.83	180612.83	180612.83	180331.93	177429.84
	Management and overall costs	Employees salaries	OM1	82845.74	93891.84	99414.88	110460.98	121507.08
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	19.35	21.93	23.22	25.8	28.38
	Rent	Average Rent Per Building	OT1	13619688.08	13619688.08	13619688.08	14489927.26	14428836.79
		Rent per square meter	OT2	938.8	938.8	938.8	995.2	958.22
		Income per building	OT3	14304462.95	14304462.95	14304462.95	14869598.63	14451741.73
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	9.68	6.45	13.49	5.28	19.64
		Percentage of expiring leases	OO2	0.08	0.11	0.09	0.11	0.09
		Percentage of cash return	OO3	0.8	0.8	0.8	0.8	0.76
		Percentage of capitalization rate	OO4	0.52	0.52	0.52	0.51	0.52
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.09	0.09	0.09	0.09	0.09
Building Charastristics	Operational Charastristics	Available rentable area	BO1	23877.13	23877.13	23877.13	23877.13	23877.13
		Average Unit Cost Per Building	BO2	40.59	40.59	40.59	40.59	40.59
		Percentage of rentable area to gross area	BO3	0.8	0.8	0.8	0.8	0.8
	Physical Charastristics	Number of all units	BP1	789.59	789.59	789.59	789.59	789.59
		Average unit size	BP2	240.66	240.66	240.66	240.66	240.66
Performance	Rent	Rental Revenue	PR1	10195676.67	10195676.67	10195676.67	10043443.99	10144961.97
		Average rent lost due to vacant units	PR2	1233709.12	1189871.84	1222674.38	912100.79	1523827.62
	Churn	Time to re-let	PC1	145	154	156	167	157
		Percentage of vacant units	PC2	0.26	0.18	0.29	0.1	0.44

C21

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3348.73	3348.73	3348.73	3348.73	3348.73
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	1370.49	1370.49	1370.49	1370.49	1370.49
	Utilization	Income /expected income provided its rented all the year round	CR4	1.13	1.13	1.13	1.11	1.15
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	10028	9811	10690	9868	10994
		Number of unplanned repairs	OR2	3089	3761	2940	1673	1252
		Percentage of planed maintance completed on time	OR3	8247.49	8771.14	6807.45	6807.45	6414.71
		Percentage of unplanned repairs completed on time	OR4	1	1	1	1	1
	Cleaning	Number of cleaning employees	OC1	7	7	15	9	14
		Equipment and material cost	OC2	106813.27	106813.27	54858.78	54858.78	54858.78
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	305010	305010	307140	385918	317294
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	12	12	13	13	9
	Insurance	Building insurance fees	OI1	60360124.65	60360124.65	60360124.65	60360124.65	60360124.65
		Equipment insurance fees	OI2	201864.89	201864.89	201864.89	207073.86	206774.19
	Management and overall costs	Employees salaries	OM1	64811.78	73453.35	77774.14	86415.71	95057.28
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	16	19	20	22	24
	Rent	Average Rent Per Building	OT1	14177468.92	14177468.92	14177468.92	14557308.09	14204183
		Rent per square meter	OT2	656.87	656.87	656.87	637.88	668.47
		Income per building	OT3	11203391.59	11203391.59	11203391.59	11199690.83	11032995.87
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	10	5	12	15	1
		Percentage of expiring leases	OO2	0.07	0.09	0.06	0.08	0.07
		Percentage of cash return	OO3	0.92	0.92	0.92	0.92	0.88
		Percentage of capitalization rate	OO4	0.55	0.55	0.55	0.55	0.51
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.09	0.09	0.09	0.09	0.09
Building Charastristics	Operational Charastristics	Available rentable area	BO1	16818.28	16818.28	16818.28	16818.28	16818.28
		Average Unit Cost Per Building	BO2	148.71	148.71	148.71	148.71	148.71
		Percentage of rentable area to gross area	BO3	0.92	0.92	0.92	0.92	0.92
	Physical Charastristics	Number of all units	BP1	569.03	569.03	569.03	569.03	569.03
		Average unit size	BP2	275.54	275.54	275.54	275.54	275.54
Performance	Rent	Rental Revenue	PR1	10658984.16	10658984.16	10658984.16	10652984.33	10584484.39
		Average rent lost due to vacant units	PR2	304344.96	412581.46	180882.34	223404.5	756860.35
	Churn	Time to re-let	PC1	134	136	143	133	145
		Percentage of vacant units	PC2	0.1	0.16	0.13	0.11	-0.06

C65

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3200.28	3200.28	3200.28	3200.28	3200.28
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	4569.02	4569.02	4569.02	4569.02	4569.02
	Utilization	Income /expected income provided its rented all the year round	CR4	1.08	1.08	1.08	1.08	1.09
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	3362	2990	3227	3557	4281
		Number of unplanned repairs	OR2	1900	2748	1893	919	861
		Percentage of planed maintance completed on time	OR3	1540	1876.87	1395.62	1467.81	986.56
		Percentage of unplanned repairs completed on time	OR4	1	1	1	1	1
	Cleaning	Number of cleaning employees	OC1	5.09	5.09	5.09	2.55	10.19
		Equipment and material cost	OC2	147897.58	147897.58	75959.48	75959.48	75959.48
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	311122	311122	300639	375738	391373
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	12	12	12	13	12
	Insurance	Building insurance fees	OI1	62625000.83	62625000.83	62625000.83	62625000.83	62625000.83
		Equipment insurance fees	OI2	132137.84	132137.84	132137.84	133805.62	132897.59
	Management and overall costs	Employees salaries	OM1	69078.04	78288.44	82893.65	92104.05	101314.46
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15	17	18	20	22
	Rent	Average Rent Per Building	OT1	4759565.69	4759565.69	4759565.69	4855998.18	4584984.16
		Rent per square meter	OT2	785.19	785.19	785.19	767.86	810
		Income per building	OT3	6410559.95	6410559.95	6410559.95	6552478.41	6413738.59
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	18.94	20.06	20.61	13.93	42.9
		Percentage of expiring leases	OO2	0.09	0.13	0.09	0.13	0.13
		Percentage of cash return	OO3	0.83	0.83	0.83	0.83	0.82
		Percentage of capitalization rate	OO4	0.72	0.72	0.72	0.72	0.67
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.09	0.09	0.09	0.09	0.09
Building Charastristics	Operational Charastristics	Available rentable area	BO1	27666.28	27666.28	27666.28	27666.28	27666.28
		Average Unit Cost Per Building	BO2	125.52	125.52	125.52	125.52	125.52
		Percentage of rentable area to gross area	BO3	0.91	0.91	0.91	0.91	0.91
	Physical Charastristics	Number of all units	BP1	842.15	842.15	842.15	842.15	842.15
		Average unit size	BP2	146.66	146.66	146.66	146.66	146.66
Performance	Rent	Rental Revenue	PR1	20449113.93	20449113.93	20449113.93	20382847.27	20493980.65
		Average rent lost due to vacant units	PR2	590505.82	406859.54	941591.45	453945.38	834321.44
	Churn	Time to re-let	PC1	146.7	148.55	151.32	168.85	167.93
		Percentage of vacant units	PC2	0.08	0.09	0.08	0.02	0.17

C77								
Categories	**Sub-Categories**	**Metrics**	**Codes**	**2012**	**2013**	**2014**	**2015**	**2016**
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3173.22	3173.22	3173.22	3173.22	3173.22
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	2513.01	2513.01	2513.01	2513.01	2513.01
	Utilization	Income /expected income provided its rented all the year round	CR4	1.01	1.01	1.01	1	0.98
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	2600.62	2378.71	2336.74	2743.05	2934.23
		Number of unplanned repairs	OR2	3068	4357	2103	1932	1314
		Percentage of planed maintance completed on time	OR3	2826.64	2957.1	3522.43	2870.13	3000.59
		Percentage of unplanned repairs completed on time	OR4	0.91	0.85	1	0.84	0.78
	Cleaning	Number of cleaning employees	OC1	4	4	5	6	11
		Equipment and material cost	OC2	122100.53	122100.53	62710.24	62710.24	62710.24
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	631495	631495	725901	679238	724670
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	16	17	17	16	15
	Insurance	Building insurance fees	OI1	20040905.28	20040905.28	20040905.28	20040905.28	20040905.28
		Equipment insurance fees	OI2	209659.01	209659.01	209659.01	207793.4	211589.41
	Management and overall costs	Employees salaries	OM1	85832.37	97276.69	102998.84	114443.16	125887.48
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	19	22	23	26	28
	Rent	Average Rent Per Building	OT1	19722715.55	19722715.55	19722715.55	20293988.97	19578092.44
		Rent per square meter	OT2	669.6	669.6	669.6	681.54	671.47
		Income per building	OT3	5577466.46	5577466.46	5577466.46	5438028.94	5546493.04
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	23.36	21.13	7.79	27.25	-5.56
		Percentage of expiring leases	OO2	0.09	0.1	0.1	0.12	0.1
		Percentage of cash return	OO3	0.86	0.86	0.86	0.86	0.82
		Percentage of capitalization rate	OO4	0.85	0.85	0.85	0.83	0.83
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.06	0.06	0.06	0.06	0.06
Building Charastristics	Operational Charastristics	Available rentable area	BO1	19035.58	19035.58	19035.58	19035.58	19035.58
		Average Unit Cost Per Building	BO2	80.57	80.57	80.57	80.57	80.57
		Percentage of rentable area to gross area	BO3	0.91	0.91	0.91	0.91	0.91
	Physical Charastristics	Number of all units	BP1	518.52	518.52	518.52	518.52	518.52
		Average unit size	BP2	214.56	214.56	214.56	214.56	214.56
Performance	Rent	Rental Revenue	PR1	13486633.83	13486633.83	13486633.83	13605324.64	13560792.77
		Average rent lost due to vacant units	PR2	885119.62	1176869.42	924778.85	908742.43	1749863.99
	Churn	Time to re-let	PC1	133	135	143	148	135
		Percentage of vacant units	PC2	0.12	0.14	0.18	0.08	0.31

C18

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3113.28	3113.28	3113.28	3113.28	3113.28
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	1405.19	1405.19	1405.19	1405.19	1405.19
	Utilization	Income /expected income provided its rented all the year round	CR4	0.84	0.84	0.84	0.83	0.83
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	3787.87	3631.35	3716.78	4060.44	3533.8
		Number of unplanned repairs	OR2	1926	2510	1700	1310	694
		Percentage of planed maintance completed on time	OR3	1	1	1	1	0.89
		Percentage of unplanned repairs completed on time	OR4	3635.95	4085.34	3472.54	3104.86	3676.81
	Cleaning	Number of cleaning employees	OC1	8	8	14	12	13
		Equipment and material cost	OC2	177980.42	177980.42	91409.89	91409.89	91409.89
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	1082130.75	1082130.75	1016701.9	1135706.86	1243258
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	22	25	23	25	24
	Insurance	Building insurance fees	OI1	64498100.93	64498100.93	64498100.93	64498100.93	64498100.93
		Equipment insurance fees	OI2	230494.33	230494.33	230494.33	230954.41	232452.68
	Management and overall costs	Employees salaries	OM1	60864.13	68979.35	73036.96	81152.18	89267.39
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	20.47	22.59	24	26.83	29.65
	Rent	Average Rent Per Building	OT1	12363966.77	12363966.77	12363966.77	11969956.14	12028783.22
		Rent per square meter	OT2	644.13	644.13	644.13	659.6	647.62
		Income per building	OT3	14909404.63	14909404.63	14909404.63	15027594.45	14823285.44
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	13.05	15.84	20.04	18.64	10.72
		Percentage of expiring leases	OO2	0.07	0.09	0.07	0.07	0.07
		Percentage of cash return	OO3	0.67	0.67	0.67	0.67	0.64
		Percentage of capitalization rate	OO4	0.56	0.56	0.56	0.55	0.56
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.08
		Percentage of tenants with unpaid rent	OD3	0.07	0.07	0.07	0.07	0.07
Building Charastristics	Operational Charastristics	Available rentable area	BO1	18562.96	18562.96	18562.96	18562.96	18562.96
		Average Unit Cost Per Building	BO2	131.68	131.68	131.68	131.68	131.68
		Percentage of rentable area to gross area	BO3	0.92	0.92	0.92	0.92	0.92
	Physical Charastristics	Number of all units	BP1	101.59	101.59	101.59	101.59	101.59
		Average unit size	BP2	164.63	164.63	164.63	164.63	164.63
Performance	Rent	Rental Revenue	PR1	14986977.34	14986977.34	14986977.34	15053601.16	15065692.37
		Average rent lost due to vacant units	PR2	1109695.13	930751.98	926524.23	1088615.98	114532.41
	Churn	Time to re-let	PC1	139.51	138.59	145.93	133.08	171.63
		Percentage of vacant units	PC2	0.09	0.09	0.1	0.03	0.23

C59								
Categories	**Sub-Categories**	**Metrics**	**Codes**	**2012**	**2013**	**2014**	**2015**	**2016**
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3292.13	3292.13	3292.13	3292.13	3292.13
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	4880.26	4880.26	4880.26	4880.26	4880.26
	Utilization	Income /expected income provided its rented all the year round	CR4	1.05	1.05	1.05	1.05	0.99
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	6107	5601	6502	5912	6332
		Number of unplanned repairs	OR2	1425	2084	1212	981	539
		Percentage of planed maintance completed on time	OR3	1	0.96	0.92	0.96	0.98
		Percentage of unplanned repairs completed on time	OR4	684.64	570.53	722.67	722.67	798.74
	Cleaning	Number of cleaning employees	OC1	4	4	7	4	6
		Equipment and material cost	OC2	177503.57	177503.57	91164.98	91164.98	91164.98
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	260490	260490	286768	308976	292987
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	20.63	20.63	23.57	23.57	23.57
	Insurance	Building insurance fees	OI1	35763921.46	35763921.46	35763921.46	35763921.46	35763921.46
		Equipment insurance fees	OI2	90125.57	90125.57	90125.57	91525.73	91353.34
	Management and overall costs	Employees salaries	OM1	81933.12	92857.53	98319.74	109244.16	120168.58
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	20.28	22.93	24.69	27.34	29.98
	Rent	Average Rent Per Building	OT1	6450564.76	6450564.76	6450564.76	6517189.07	6427009.93
		Rent per square meter	OT2	813.75	813.75	813.75	860.06	837.07
		Income per building	OT3	11750089.3	11750089.3	11750089.3	11812445.74	11670471.87
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	5	6	3	3	4
		Percentage of expiring leases	OO2	0.06	0.07	0.07	0.08	0.05
		Percentage of cash return	OO3	0.7	0.7	0.7	0.71	0.7
		Percentage of capitalization rate	OO4	0.78	0.78	0.78	0.77	0.75
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.08	0.08	0.08	0.08	0.08
Building Charastristics	Operational Charastristics	Available rentable area	BO1	36197.57	36197.57	36197.57	36197.57	36197.57
		Average Unit Cost Per Building	BO2	55.46	55.46	55.46	55.46	55.46
		Percentage of rentable area to gross area	BO3	0.92	0.92	0.92	0.92	0.92
	Physical Charastristics	Number of all units	BP1	640.32	640.32	640.32	640.32	640.32
		Average unit size	BP2	152.09	152.09	152.09	152.09	152.09
Performance	Rent	Rental Revenue	PR1	5610622.87	5610622.87	5610622.87	5713281.83	5580515
		Average rent lost due to vacant units	PR2	1252374.38	1870703.74	1777048.44	1666876.96	1435497.2
	Churn	Time to re-let	PC1	130.68	132.34	132.34	133.18	134.84
		Percentage of vacant units	PC2	0.08	0.04	0.05	0.1	0.22

C71

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3001.09	3001.09	3001.09	3001.09	3001.09
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3151.29	3151.29	3151.29	3151.29	3151.29
	Utilization	Income /expected income provided its rented all the year round	CR4	0.78	0.78	0.78	0.77	0.8
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	9936	10435	11380	12130	11261
		Number of unplanned repairs	OR2	3242	4990	2878	1267	1434
		Percentage of planed maintance completed on time	OR3	0.98	0.89	0.76	1	0.98
		Percentage of unplanned repairs completed on time	OR4	1477.01	1269.71	1425.18	2072.99	1528.83
	Cleaning	Number of cleaning employees	OC1	6	6	9	8	9
		Equipment and material cost	OC2	121003.32	121003.32	62146.72	62146.72	62146.72
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	912532	912532	806760	983938	1453726
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	22	23	26	24	24
	Insurance	Building insurance fees	OI1	33381129.4	33381129.4	33381129.4	33381129.4	33381129.4
		Equipment insurance fees	OI2	190144.2	190144.2	190144.2	194631.72	192469.52
	Management and overall costs	Employees salaries	OM1	78089.95	88501.94	93707.94	104119.93	114531.92
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	21.97	24.61	26.37	29	31.64
	Rent	Average Rent Per Building	OT1	16702207.04	16702207.04	16702207.04	16362944.19	17306792.09
		Rent per square meter	OT2	888.24	888.24	888.24	908.59	882.78
		Income per building	OT3	20958311.1	20958311.1	20958311.1	21160952.44	20855671.49
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	3	2	3	2	0
		Percentage of expiring leases	OO2	0.06	0.08	0.07	0.08	0.07
		Percentage of cash return	OO3	0.86	0.86	0.86	0.85	0.8
		Percentage of capitalization rate	OO4	0.7	0.7	0.7	0.71	0.69
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.08	0.08	0.08	0.08	0.08
Building Charastristics	Operational Charastristics	Available rentable area	BO1	9948.99	9948.99	9948.99	9948.99	9948.99
		Average Unit Cost Per Building	BO2	137.6	137.6	137.6	137.6	137.6
		Percentage of rentable area to gross area	BO3	0.84	0.84	0.84	0.84	0.84
	Physical Charastristics	Number of all units	BP1	93.5	93.5	93.5	93.5	93.5
		Average unit size	BP2	185.73	185.73	185.73	185.73	185.73
Performance	Rent	Rental Revenue	PR1	14533418.48	14533418.48	14533418.48	14432565.65	14517243.8
		Average rent lost due to vacant units	PR2	1179116.98	1456579.68	1302647.34	943955.99	1264809.87
	Churn	Time to re-let	PC1	147	149	155	151	135
		Percentage of vacant units	PC2	0.04	0.02	0.03	0.02	0.05

C29

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3220.65	3220.65	3220.65	3220.65	3220.65
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3538.27	3538.27	3538.27	3538.27	3538.27
	Utilization	Income /expected income provided its rented all the year round	CR4	0.86	0.86	0.86	0.85	0.85
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	3847	3841	4111	4516	4277
		Number of unplanned repairs	OR2	1192	1815	1052	718	494
		Percentage of planed maintance completed on time	OR3	1	1	1	1	1
		Percentage of unplanned repairs completed on time	OR4	1	1	1	1	1
	Cleaning	Number of cleaning employees	OC1	3	3	2	2	2
		Equipment and material cost	OC2	176442.92	176442.92	90620.23	90620.23	90620.23
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	719879	719879	729846	888365	650077
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	14	16	16	15	14
	Insurance	Building insurance fees	OI1	34057112.18	34057112.18	34057112.18	34057112.18	34057112.18
		Equipment insurance fees	OI2	191328.82	191328.82	191328.82	196300.7	190300.29
	Management and overall costs	Employees salaries	OM1	68348.33	77461.44	82018	91131.11	100244.22
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	19	21	23	25	28
	Rent	Average Rent Per Building	OT1	18363813.94	18363813.94	18363813.94	18267874.46	18773322.74
		Rent per square meter	OT2	826.32	826.32	826.32	808.47	816.2
		Income per building	OT3	5604119.02	5604119.02	5604119.02	5649544.96	5657859.27
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	10.25	3.81	11.13	11.57	0.29
		Percentage of expiring leases	OO2	0.06	0.08	0.06	0.07	0.06
		Percentage of cash return	OO3	0.85	0.85	0.85	0.85	0.85
		Percentage of capitalization rate	OO4	0.58	0.58	0.58	0.57	0.58
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.08
		Percentage of tenants with unpaid rent	OD3	0.07	0.07	0.07	0.07	0.07
Building Charastristics	Operational Charastristics	Available rentable area	BO1	8995.9	8995.9	8995.9	8995.9	8995.9
		Average Unit Cost Per Building	BO2	80.94	80.94	80.94	80.94	80.94
		Percentage of rentable area to gross area	BO3	0.91	0.91	0.91	0.91	0.91
	Physical Charastristics	Number of all units	BP1	840.17	840.17	840.17	840.17	840.17
		Average unit size	BP2	247.92	247.92	247.92	247.92	247.92
Performance	Rent	Rental Revenue	PR1	8616109.94	8616109.94	8616109.94	8574895.49	8449379.84
		Average rent lost due to vacant units	PR2	2686460.12	1367270.05	4949082.09	2753689.25	5364518.88
	Churn	Time to re-let	PC1	146	154	155	176	141
		Percentage of vacant units	PC2	0.26	0.2	0.15	0.08	1.04

C10

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3112.1	3112.1	3112.1	3112.1	3112.1
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3625.88	3625.88	3625.88	3625.88	3625.88
	Utilization	Income /expected income provided its rented all the year round	CR4	0.9	0.9	0.9	0.89	0.93
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	10201	9827	9722	12684	10108
		Number of unplanned repairs	OR2	2496.81	3400.04	1981.04	1471.77	945.16
		Percentage of planed maintance completed on time	OR3	1	1	1	1	1
		Percentage of unplanned repairs completed on time	OR4	1	1	1	1	1
	Cleaning	Number of cleaning employees	OC1	5.58	5.58	13.94	11.16	11.16
		Equipment and material cost	OC2	163836.68	163836.68	84145.73	84145.73	84145.73
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	503771	503771	535083	574123	522940
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	15	17	16	17	18
	Insurance	Building insurance fees	OI1	46652010.08	46652010.08	46652010.08	46652010.08	46652010.08
		Equipment insurance fees	OI2	213231.52	213231.52	213231.52	212689	213291.08
	Management and overall costs	Employees salaries	OM1	81657.87	92545.6	97989.45	108877.17	119764.88
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	18	20	22	24	27
	Rent	Average Rent Per Building	OT1	13093841.2	13093841.2	13093841.2	13463224.27	12837577.59
		Rent per square meter	OT2	627.79	627.79	627.79	635.72	662.79
		Income per building	OT3	15469721.18	15469721.18	15469721.18	15087313.12	15391218.23
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	23	17	18	23	72
		Percentage of expiring leases	OO2	0.07	0.09	0.08	0.08	0.1
		Percentage of cash return	OO3	1.04	1.04	1.04	1.03	1.03
		Percentage of capitalization rate	OO4	0.6	0.6	0.6	0.59	0.57
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.06	0.06	0.06	0.06	0.06
Building Charastristics	Operational Charastristics	Available rentable area	BO1	9999.36	9999.36	9999.36	9999.36	9999.36
		Average Unit Cost Per Building	BO2	39.5	39.5	39.5	39.5	39.5
		Percentage of rentable area to gross area	BO3	0.83	0.83	0.83	0.83	0.83
	Physical Charastristics	Number of all units	BP1	250.65	250.65	250.65	250.65	250.65
		Average unit size	BP2	201.38	201.38	201.38	201.38	201.38
Performance	Rent	Rental Revenue	PR1	16187830.76	16187830.76	16187830.76	16924652.08	16192744.19
		Average rent lost due to vacant units	PR2	1184333.81	586384.14	1523830.73	960784.81	2153245.77
	Churn	Time to re-let	PC1	146	152	150	150	170
		Percentage of vacant units	PC2	0.13	0.08	0.11	0.11	0.16

C69

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3317.79	3317.79	3317.79	3317.79	3317.79
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	1733.68	1733.68	1733.68	1733.68	1733.68
	Utilization	Income /expected income provided its rented all the year round	CR4	1.04	1.04	1.04	1	1
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	2721	2474	3012	1183	2938
		Number of unplanned repairs	OR2	3232	4508	2507	1753	1413
		Percentage of planed maintance completed on time	OR3	1	1	1	0.98	1
		Percentage of unplanned repairs completed on time	OR4	1	1	1	0.91	1
	Cleaning	Number of cleaning employees	OC1	7	7	8	10	15
		Equipment and material cost	OC2	193396.38	193396.38	99327.41	99327.41	99327.41
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	751875	751875	797421	815310	749556
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	12	13	12	13	13
	Insurance	Building insurance fees	OI1	61911270.7	61911270.7	61911270.7	61911270.7	61911270.7
		Equipment insurance fees	OI2	41065.69	41065.69	41065.69	41204.54	41460.51
	Management and overall costs	Employees salaries	OM1	73752.93	83586.65	88503.52	98337.24	108170.96
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	22	24	26	29	32
	Rent	Average Rent Per Building	OT1	17143663.06	17143663.06	17143663.06	17924023.49	17507764.39
		Rent per square meter	OT2	1097.98	1097.98	1097.98	1128.97	1124.54
		Income per building	OT3	21144237.76	21144237.76	21144237.76	22063441.02	21057131.4
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	16	20	19	22	45
		Percentage of expiring leases	OO2	0.08	0.11	0.09	0.1	0.09
		Percentage of cash return	OO3	1.15	1.15	1.15	1.15	1.18
		Percentage of capitalization rate	OO4	0.65	0.65	0.65	0.65	0.63
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.07	0.07	0.07	0.07	0.07
Building Charastristics	Operational Charastristics	Available rentable area	BO1	12537.77	12537.77	12537.77	12537.77	12537.77
		Average Unit Cost Per Building	BO2	150.91	150.91	150.91	150.91	150.91
		Percentage of rentable area to gross area	BO3	0.8	0.8	0.8	0.8	0.8
	Physical Charastristics	Number of all units	BP1	700.57	700.57	700.57	700.57	700.57
		Average unit size	BP2	163.11	163.11	163.11	163.11	163.11
Performance	Rent	Rental Revenue	PR1	12072268.79	12072268.79	12072268.79	11953046.37	11896217.16
		Average rent lost due to vacant units	PR2	1334251.92	1301154.68	1005900.9	1395687.58	1162539.56
	Churn	Time to re-let	PC1	132.84	136.14	146.04	141.92	125.41
		Percentage of vacant units	PC2	0.11	0.08	0.19	0.09	0.29

C34

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3098.86	3098.86	3098.86	3098.86	3098.86
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	4062.63	4062.63	4062.63	4062.63	4062.63
	Utilization	Income /expected income provided its rented all the year round	CR4	0.78	0.78	0.78	0.76	0.78
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	6384	6058	5983	5009	6726
		Number of unplanned repairs	OR2	2512	3444	2492	1572	988
		Percentage of planed maintance completed on time	OR3	1	1	1	1	1
		Percentage of unplanned repairs completed on time	OR4	1688.36	1464.9	1241.44	1142.13	1787.67
	Cleaning	Number of cleaning employees	OC1	6	6	12	11	10
		Equipment and material cost	OC2	122555.27	122555.27	62943.8	62943.8	62943.8
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	656108	656108	646065	776689	759337
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	12	13	11	11	13
	Insurance	Building insurance fees	OI1	56489969.76	56489969.76	56489969.76	56489969.76	56489969.76
		Equipment insurance fees	OI2	171093.36	171093.36	171093.36	171729.4	171668.65
	Management and overall costs	Employees salaries	OM1	62130.22	70414.24	74556.26	82840.29	91124.32
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	16	18	19	22	24
	Rent	Average Rent Per Building	OT1	11863762.96	11863762.96	11863762.96	11888168.11	12795491.74
		Rent per square meter	OT2	932.23	932.23	932.23	974.06	974.18
		Income per building	OT3	5556289.3	5556289.3	5556289.3	5764936.74	5435768.35
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	6	8	2	5	-1
		Percentage of expiring leases	OO2	0.07	0.11	0.07	0.07	0.07
		Percentage of cash return	OO3	0.76	0.76	0.76	0.75	0.7
		Percentage of capitalization rate	OO4	0.96	0.96	0.96	0.96	0.99
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.09	0.09	0.09	0.09	0.09
Building Charastristics	Operational Charastristics	Available rentable area	BO1	35263.37	35263.37	35263.37	35263.37	35263.37
		Average Unit Cost Per Building	BO2	133.95	133.95	133.95	133.95	133.95
		Percentage of rentable area to gross area	BO3	0.9	0.9	0.9	0.9	0.9
	Physical Charastristics	Number of all units	BP1	760.25	760.25	760.25	760.25	760.25
		Average unit size	BP2	143.82	143.82	143.82	143.82	143.82
Performance	Rent	Rental Revenue	PR1	7527828.98	7527828.98	7527828.98	7537897.22	7581118.09
		Average rent lost due to vacant units	PR2	929690.59	1272231.81	1095172.69	372939.3	2689326.27
	Churn	Time to re-let	PC1	147	156	149	158	152
		Percentage of vacant units	PC2	0.01	0.01	0.02	0.01	-0.03

C58

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3186.45	3186.45	3186.45	3186.45	3186.45
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3201.59	3201.59	3201.59	3201.59	3201.59
	Utilization	Income /expected income provided its rented all the year round	CR4	0.94	0.94	0.94	0.94	0.93
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	7886	6543	7772	8385	7758
		Number of unplanned repairs	OR2	1103	1612	1060	715	481
		Percentage of planed maintance completed on time	OR3	1094.89	1379.28	1279.74	1094.89	1293.96
		Percentage of unplanned repairs completed on time	OR4	0.96	0.89	1	0.79	0.98
	Cleaning	Number of cleaning employees	OC1	3	3	3	5	4
		Equipment and material cost	OC2	112761.08	112761.08	57913.54	57913.54	57913.54
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	678413	678413	492714	780090	1125109
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	13	13	12	15	14
	Insurance	Building insurance fees	OI1	45864018.08	45864018.08	45864018.08	45864018.08	45864018.08
		Equipment insurance fees	OI2	176007.83	176007.83	176007.83	178992.97	176170.96
	Management and overall costs	Employees salaries	OM1	73315.01	83090.34	87978.01	97753.35	107528.68
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	18.35	21.28	22.75	24.95	27.15
	Rent	Average Rent Per Building	OT1	5993778.75	5993778.75	5993778.75	5983310.41	5902115.09
		Rent per square meter	OT2	676.16	676.16	676.16	662.07	689.21
		Income per building	OT3	13814344.96	13814344.96	13814344.96	13872329.96	13850839.29
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	16	7	21	11	21
		Percentage of expiring leases	OO2	0.06	0.07	0.07	0.09	0.08
		Percentage of cash return	OO3	0.93	0.93	0.93	0.93	0.88
		Percentage of capitalization rate	OO4	0.81	0.81	0.81	0.8	0.81
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.09	0.09	0.09	0.09	0.09
Building Charastristics	Operational Charastristics	Available rentable area	BO1	15024.71	15024.71	15024.71	15024.71	15024.71
		Average Unit Cost Per Building	BO2	71.66	71.66	71.66	71.66	71.66
		Percentage of rentable area to gross area	BO3	0.84	0.84	0.84	0.84	0.84
	Physical Charastristics	Number of all units	BP1	214.36	214.36	214.36	214.36	214.36
		Average unit size	BP2	144.84	144.84	144.84	144.84	144.84
Performance	Rent	Rental Revenue	PR1	9159066.31	9159066.31	9159066.31	9067793.4	9173571.09
		Average rent lost due to vacant units	PR2	2887850.67	2634113.98	4011293.52	2623053.52	3171898.45
	Churn	Time to re-let	PC1	136	143	139	139	148
		Percentage of vacant units	PC2	0.12	0.04	0.12	0.1	0.09

C47

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3096.45	3096.45	3096.45	3096.45	3096.45
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	4124.94	4124.94	4124.94	4124.94	4124.94
	Utilization	Income /expected income provided its rented all the year round	CR4	0.86	0.86	0.86	0.85	0.84
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	3506	3290	2820	3676	3761
		Number of unplanned repairs	OR2	633	926	463	346	217
		Percentage of planed maintance completed on time	OR3	1	1	1	1	1
		Percentage of unplanned repairs completed on time	OR4	810.08	825.66	965.87	841.24	1028.18
	Cleaning	Number of cleaning employees	OC1	5.52	5.52	5.52	11.04	2.76
		Equipment and material cost	OC2	115171.64	115171.64	59151.6	59151.6	59151.6
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	641651	641651	487824	835085	646904
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	17	20	16	18	17
	Insurance	Building insurance fees	OI1	51599803.98	51599803.98	51599803.98	51599803.98	51599803.98
		Equipment insurance fees	OI2	50879.07	50879.07	50879.07	51511.98	51536.81
	Management and overall costs	Employees salaries	OM1	66513.32	75381.76	79815.99	88684.43	97552.87
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15.9	17.89	19.21	21.2	23.19
	Rent	Average Rent Per Building	OT1	16247237.5	16247237.5	16247237.5	16004462.88	15674865.67
		Rent per square meter	OT2	917.88	917.88	917.88	929.71	954.81
		Income per building	OT3	18591594.12	18591594.12	18591594.12	18630423.26	18613681.65
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	2.59	2.13	4.98	2.92	5.71
		Percentage of expiring leases	OO2	0.07	0.11	0.07	0.1	0.09
		Percentage of cash return	OO3	0.88	0.88	0.88	0.87	0.88
		Percentage of capitalization rate	OO4	0.55	0.55	0.55	0.54	0.56
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.07	0.07	0.07	0.07	0.07
Building Charastristics	Operational Charastristics	Available rentable area	BO1	31845.53	31845.53	31845.53	31845.53	31845.53
		Average Unit Cost Per Building	BO2	93.91	93.91	93.91	93.91	93.91
		Percentage of rentable area to gross area	BO3	0.87	0.87	0.87	0.87	0.87
	Physical Charastristics	Number of all units	BP1	140.63	140.63	140.63	140.63	140.63
		Average unit size	BP2	211.98	211.98	211.98	211.98	211.98
Performance	Rent	Rental Revenue	PR1	7012699.48	7012699.48	7012699.48	6924780.99	6957022.8
		Average rent lost due to vacant units	PR2	750946.89	815278.53	772840.64	860558.76	-571720.1
	Churn	Time to re-let	PC1	138	144	146	149	172
		Percentage of vacant units	PC2	0.04	0.03	0.06	0.05	0.1

C42								
Categories	**Sub-Categories**	**Metrics**	**Codes**	**2012**	**2013**	**2014**	**2015**	**2016**
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3248.21	3248.21	3248.21	3248.21	3248.21
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	1965.59	1965.59	1965.59	1965.59	1965.59
	Utilization	Income /expected income provided its rented all the year round	CR4	0.68	0.68	0.68	0.69	0.68
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	2922	2775	2884	4045	2642
		Number of unplanned repairs	OR2	2029	2817	1833	1288	737
		Percentage of planed maintance completed on time	OR3	1	1	1	1	1
		Percentage of unplanned repairs completed on time	OR4	1	1	1	1	1
	Cleaning	Number of cleaning employees	OC1	7.65	7.65	22.96	15.31	15.31
		Equipment and material cost	OC2	149681.86	149681.86	76875.88	76875.88	76875.88
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	239914	239914	216673	290483	244805
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	13	14	15	16	15
	Insurance	Building insurance fees	OI1	60163239.72	60163239.72	60163239.72	60163239.72	60163239.72
		Equipment insurance fees	OI2	107212.24	107212.24	107212.24	108852.28	108001.46
	Management and overall costs	Employees salaries	OM1	70780.53	80217.94	84936.64	94374.05	103811.45
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15	18	19	21	23
	Rent	Average Rent Per Building	OT1	7225099.72	7225099.72	7225099.72	7164693.5	7130684.08
		Rent per square meter	OT2	915.46	915.46	915.46	913.66	970.38
		Income per building	OT3	13940970.12	13940970.12	13940970.12	14135100.9	14005809.6
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	15.17	20.4	21.45	20.4	23.02
		Percentage of expiring leases	OO2	0.08	0.08	0.08	0.08	0.1
		Percentage of cash return	OO3	0.86	0.86	0.86	0.86	0.81
		Percentage of capitalization rate	OO4	0.85	0.85	0.85	0.85	0.85
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.08
		Percentage of tenants with unpaid rent	OD3	0.1	0.1	0.1	0.1	0.1
Building Charastristics	Operational Charastristics	Available rentable area	BO1	16074.76	16074.76	16074.76	16074.76	16074.76
		Average Unit Cost Per Building	BO2	88.63	88.63	88.63	88.63	88.63
		Percentage of rentable area to gross area	BO3	0.81	0.81	0.81	0.81	0.81
	Physical Charastristics	Number of all units	BP1	182.21	182.21	182.21	182.21	182.21
		Average unit size	BP2	260.49	260.49	260.49	260.49	260.49
Performance	Rent	Rental Revenue	PR1	11036430.44	11036430.44	11036430.44	10993182.51	10902104.88
		Average rent lost due to vacant units	PR2	2723080.98	1568882.26	1857734.21	1937731.2	5068834.98
	Churn	Time to re-let	PC1	139	144	151	147	151
		Percentage of vacant units	PC2	0.04	0.03	0.03	0.05	0.09

C67

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3273.02	3273.02	3273.02	3273.02	3273.02
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	4236.22	4236.22	4236.22	4236.22	4236.22
	Utilization	Income /expected income provided its rented all the year round	CR4	0.61	0.61	0.61	0.61	0.62
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	8082	8529	8813	8723	8171
		Number of unplanned repairs	OR2	1777	2451	1906	1278	630
		Percentage of planed maintance completed on time	OR3	1	1	1	1	0.97
		Percentage of unplanned repairs completed on time	OR4	2420.09	2165.34	2101.65	2037.97	2802.21
	Cleaning	Number of cleaning employees	OC1	7	7	12	13	9
		Equipment and material cost	OC2	134954.06	134954.06	69311.75	69311.75	69311.75
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	569458	569458	579531	651008	688839
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	21	24	22	21	23
	Insurance	Building insurance fees	OI1	67472555.02	67472555.02	67472555.02	67472555.02	67472555.02
		Equipment insurance fees	OI2	121264.01	121264.01	121264.01	121024.43	121649.56
	Management and overall costs	Employees salaries	OM1	75972.42	86102.08	91166.91	101296.56	111426.22
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	20	23	24	27	30
	Rent	Average Rent Per Building	OT1	13486230.05	13486230.05	13486230.05	13448578.51	13426679.81
		Rent per square meter	OT2	840.82	840.82	840.82	830.42	833.44
		Income per building	OT3	12225836.83	12225836.83	12225836.83	12203739.17	12133592.63
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	5	5	11	5	6
		Percentage of expiring leases	OO2	0.07	0.07	0.07	0.08	0.09
		Percentage of cash return	OO3	1.17	1.17	1.17	1.17	1.11
		Percentage of capitalization rate	OO4	0.59	0.59	0.59	0.59	0.54
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.1	0.1	0.1	0.1	0.1
Building Charastristics	Operational Charastristics	Available rentable area	BO1	11998.36	11998.36	11998.36	11998.36	11998.36
		Average Unit Cost Per Building	BO2	80.54	80.54	80.54	80.54	80.54
		Percentage of rentable area to gross area	BO3	0.85	0.85	0.85	0.85	0.85
	Physical Charastristics	Number of all units	BP1	76.77	76.77	76.77	76.77	76.77
		Average unit size	BP2	124.93	124.93	124.93	124.93	124.93
Performance	Rent	Rental Revenue	PR1	7062658.72	7062658.72	7062658.72	7133279.42	6953534.18
		Average rent lost due to vacant units	PR2	462978.62	148689.77	577357.55	682419.12	856991.3
	Churn	Time to re-let	PC1	131	130	137	145	140
		Percentage of vacant units	PC2	0.03	0.01	0.02	0.03	0.07

C72								
Categories	**Sub-Categories**	**Metrics**	**Codes**	**2012**	**2013**	**2014**	**2015**	**2016**
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3213.57	3213.57	3213.57	3213.57	3213.57
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	2790.76	2790.76	2790.76	2790.76	2790.76
	Utilization	Income /expected income provided its rented all the year round	CR4	0.92	0.92	0.92	0.91	0.93
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	4001	4106	4241	3878	3817
		Number of unplanned repairs	OR2	1165	1593	907	557	429
		Percentage of planed maintance completed on time	OR3	1	1	1	1	1
		Percentage of unplanned repairs completed on time	OR4	1	1	1	1	1
	Cleaning	Number of cleaning employees	OC1	3	3	2	6	7
		Equipment and material cost	OC2	115966.52	115966.52	59559.86	59559.86	59559.86
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	587351	587351	689096	801495	592212
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	18	21	20	20	20
	Insurance	Building insurance fees	OI1	26244529.89	26244529.89	26244529.89	26244529.89	26244529.89
		Equipment insurance fees	OI2	124224.11	124224.11	124224.11	125741.55	121952.07
	Management and overall costs	Employees salaries	OM1	80672.59	91428.93	96807.1	107563.45	118319.79
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	19	21	22	25	28
	Rent	Average Rent Per Building	OT1	11831640.06	11831640.06	11831640.06	12262643.72	12302147.29
		Rent per square meter	OT2	906.75	906.75	906.75	928.87	899.79
		Income per building	OT3	5960104.94	5960104.94	5960104.94	6054473.79	5961678.86
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	16	21	20	9	49
		Percentage of expiring leases	OO2	0.09	0.08	0.1	0.11	0.09
		Percentage of cash return	OO3	0.93	0.93	0.93	0.92	0.96
		Percentage of capitalization rate	OO4	0.91	0.91	0.91	0.91	0.86
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.09	0.09	0.09	0.09	0.09
Building Charastristics	Operational Charastristics	Available rentable area	BO1	35686.89	35686.89	35686.89	35686.89	35686.89
		Average Unit Cost Per Building	BO2	64.94	64.94	64.94	64.94	64.94
		Percentage of rentable area to gross area	BO3	0.9	0.9	0.9	0.9	0.9
	Physical Charastristics	Number of all units	BP1	201.13	201.13	201.13	201.13	201.13
		Average unit size	BP2	185.67	185.67	185.67	185.67	185.67
Performance	Rent	Rental Revenue	PR1	4793495.42	4793495.42	4793495.42	5038355.25	4772606.02
		Average rent lost due to vacant units	PR2	2687146.26	2997934.23	2906781.87	3633712.99	5004873.12
	Churn	Time to re-let	PC1	129.72	128.11	139.39	125.69	145.84
		Percentage of vacant units	PC2	0.02	0.02	0.04	0.04	0.04

C54

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3270.98	3270.98	3270.98	3270.98	3270.98
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	2428.21	2428.21	2428.21	2428.21	2428.21
	Utilization	Income /expected income provided its rented all the year round	CR4	0.73	0.73	0.73	0.72	0.72
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	10083	10293	9356	8578	9955
		Number of unplanned repairs	OR2	3263	4716	3045	1859	1319
		Percentage of planed maintance completed on time	OR3	5410.8	5210.4	5878.39	6679.99	6212.39
		Percentage of unplanned repairs completed on time	OR4	0.91	0.96	1	1	0.72
	Cleaning	Number of cleaning employees	OC1	6	6	12	8	13
		Equipment and material cost	OC2	161029.64	161029.64	82704.04	82704.04	82704.04
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	225163	225163	275258	240378	331364
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	19	18	18	15	20
	Insurance	Building insurance fees	OI1	66108943.62	66108943.62	66108943.62	66108943.62	66108943.62
		Equipment insurance fees	OI2	192248.92	192248.92	192248.92	191480.18	192616.74
	Management and overall costs	Employees salaries	OM1	64401.76	72988.67	77282.12	85869.02	94455.92
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	16	18	19	21	23
	Rent	Average Rent Per Building	OT1	7265840.27	7265840.27	7265840.27	7426848.24	7657590.06
		Rent per square meter	OT2	847.5	847.5	847.5	867.5	826.54
		Income per building	OT3	6183072.91	6183072.91	6183072.91	6035939.14	6258688.11
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	18	14	3	4	51
		Percentage of expiring leases	OO2	0.07	0.09	0.07	0.12	0.09
		Percentage of cash return	OO3	0.69	0.69	0.69	0.69	0.71
		Percentage of capitalization rate	OO4	0.64	0.64	0.64	0.64	0.65
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.09	0.09	0.09	0.09	0.09
Building Charastristics	Operational Charastristics	Available rentable area	BO1	13709.47	13709.47	13709.47	13709.47	13709.47
		Average Unit Cost Per Building	BO2	48.38	48.38	48.38	48.38	48.38
		Percentage of rentable area to gross area	BO3	0.89	0.89	0.89	0.89	0.89
	Physical Charastristics	Number of all units	BP1	69.8	69.8	69.8	69.8	69.8
		Average unit size	BP2	278.71	278.71	278.71	278.71	278.71
Performance	Rent	Rental Revenue	PR1	8453972.72	8453972.72	8453972.72	8371830.6	8457419.12
		Average rent lost due to vacant units	PR2	1369204.32	2257955.71	1012709.89	1441308.64	627154.96
	Churn	Time to re-let	PC1	139	140	139	148	159
		Percentage of vacant units	PC2	0.13	0.15	0.07	0.12	0.18

C62

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3105.92	3105.92	3105.92	3105.92	3105.92
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	812.53	812.53	812.53	812.53	812.53
	Utilization	Income /expected income provided its rented all the year round	CR4	0.94	0.94	0.94	0.92	0.92
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	303.3	297.48	278.07	303.03	319.18
		Number of unplanned repairs	OR2	2952.63	4169.15	2351.78	1749.97	982.3
		Percentage of planed maintance completed on time	OR3	0.9	0.86	1	0.98	0.9
		Percentage of unplanned repairs completed on time	OR4	87.77	87.77	87.77	101.49	85.03
	Cleaning	Number of cleaning employees	OC1	5	5	7	7	10
		Equipment and material cost	OC2	192983.82	192983.82	99115.56	99115.56	99115.56
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	915070	915070	783687	999886	638682
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	24	25	25	25	23
	Insurance	Building insurance fees	OI1	72075548.52	72075548.52	72075548.52	72075548.52	72075548.52
		Equipment insurance fees	OI2	124812.23	124812.23	124812.23	121275.67	125101.09
	Management and overall costs	Employees salaries	OM1	61221.74	69384.64	73466.09	81628.99	89791.88
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	18	21	22	25	27
	Rent	Average Rent Per Building	OT1	14484487.27	14484487.27	14484487.27	14939328.4	14662820.58
		Rent per square meter	OT2	833.61	833.61	833.61	875.8	866.69
		Income per building	OT3	17387518.31	17387518.31	17387518.31	17509765.88	17215897.47
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	11	10	5	12	24
		Percentage of expiring leases	OO2	0.06	0.06	0.06	0.06	0.06
		Percentage of cash return	OO3	0.67	0.67	0.67	0.67	0.65
		Percentage of capitalization rate	OO4	0.73	0.73	0.73	0.72	0.69
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.08	0.08	0.08	0.08	0.08
Building Charastristics	Operational Charastristics	Available rentable area	BO1	29798.53	29798.53	29798.53	29798.53	29798.53
		Average Unit Cost Per Building	BO2	47.53	47.53	47.53	47.53	47.53
		Percentage of rentable area to gross area	BO3	0.96	0.96	0.96	0.96	0.96
	Physical Charastristics	Number of all units	BP1	500.9	500.9	500.9	500.9	500.9
		Average unit size	BP2	176.92	176.92	176.92	176.92	176.92
Performance	Rent	Rental Revenue	PR1	17697057.03	17697057.03	17697057.03	17944030.96	17632461.26
		Average rent lost due to vacant units	PR2	2280472	2861560.27	2138211.05	2824715.68	2440995.79
	Churn	Time to re-let	PC1	146	152	158	161	154
		Percentage of vacant units	PC2	0.23	0.15	0.18	0.13	0.35

C43

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3313.23	3313.23	3313.23	3313.23	3313.23
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	4945.3	4945.3	4945.3	4945.3	4945.3
	Utilization	Income /expected income provided its rented all the year round	CR4	0.8	0.8	0.8	0.81	0.84
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	6202	5841	5596	6346	6379
		Number of unplanned repairs	OR2	2039	3017	1640	1137	869
		Percentage of planed maintance completed on time	OR3	1	0.86	1	1	1
		Percentage of unplanned repairs completed on time	OR4	4990.05	4381.51	5842.01	5963.72	3894.67
	Cleaning	Number of cleaning employees	OC1	8	8	16	10	25
		Equipment and material cost	OC2	192825.46	192825.46	99034.21	99034.21	99034.21
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	590382	590382	734851	731082	827365
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	22	24	24	23	22
	Insurance	Building insurance fees	OI1	79391255.87	79391255.87	79391255.87	79391255.87	79391255.87
		Equipment insurance fees	OI2	61098.21	61098.21	61098.21	60899.76	60380.84
	Management and overall costs	Employees salaries	OM1	80259.69	90960.98	96311.63	107012.92	117714.21
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	22	25	26	29	32
	Rent	Average Rent Per Building	OT1	17196534.09	17196534.09	17196534.09	17065128.74	18019333
		Rent per square meter	OT2	1120.42	1120.42	1120.42	1120.45	1089.87
		Income per building	OT3	10417597.02	10417597.02	10417597.02	10545444.07	10410813.86
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	21	21	35	12	-6
		Percentage of expiring leases	OO2	0.07	0.07	0.08	0.08	0.08
		Percentage of cash return	OO3	0.64	0.64	0.64	0.64	0.64
		Percentage of capitalization rate	OO4	0.75	0.75	0.75	0.74	0.72
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.1	0.1	0.1	0.1	0.1
Building Charastristics	Operational Charastristics	Available rentable area	BO1	30757.88	30757.88	30757.88	30757.88	30757.88
		Average Unit Cost Per Building	BO2	102.2	102.2	102.2	102.2	102.2
		Percentage of rentable area to gross area	BO3	0.9	0.9	0.9	0.9	0.9
	Physical Charastristics	Number of all units	BP1	365.28	365.28	365.28	365.28	365.28
		Average unit size	BP2	196.75	196.75	196.75	196.75	196.75
Performance	Rent	Rental Revenue	PR1	14480664.3	14480664.3	14480664.3	15057037.97	14202306.81
		Average rent lost due to vacant units	PR2	1586988.3	749873.73	1266858.76	1199756.91	1654852.43
	Churn	Time to re-let	PC1	142	149	153	158	176
		Percentage of vacant units	PC2	0.17	0.14	0.21	0.1	0.74

C63

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3071.66	3071.66	3071.66	3071.66	3071.66
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3243.92	3243.92	3243.92	3243.92	3243.92
	Utilization	Income /expected income provided its rented all the year round	CR4	0.82	0.82	0.82	0.81	0.77
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	5363	5171	5283	5764	6301
		Number of unplanned repairs	OR2	336	474	302	238	135
		Percentage of planed maintance completed on time	OR3	2681.64	2681.64	2756.13	2830.62	2681.64
		Percentage of unplanned repairs completed on time	OR4	0.95	1	0.76	0.79	0.78
	Cleaning	Number of cleaning employees	OC1	3	3	6	3	8
		Equipment and material cost	OC2	120303.06	120303.06	61787.07	61787.07	61787.07
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	993422	993422	883892	1123480	1049726
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	14	17	13	16	16
	Insurance	Building insurance fees	OI1	74931778.56	74931778.56	74931778.56	74931778.56	74931778.56
		Equipment insurance fees	OI2	185266.25	185266.25	185266.25	185856.25	186077.93
	Management and overall costs	Employees salaries	OM1	71554.34	81094.92	85865.21	95405.79	104946.37
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	18	20	21	24	26
	Rent	Average Rent Per Building	OT1	17096751.76	17096751.76	17096751.76	16161603.98	17628516.68
		Rent per square meter	OT2	1084.46	1084.46	1084.46	1129.06	1119.75
		Income per building	OT3	12476546.82	12476546.82	12476546.82	12478727.92	12435452.85
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	19	10	30	27	50
		Percentage of expiring leases	OO2	0.08	0.1	0.08	0.1	0.1
		Percentage of cash return	OO3	0.72	0.72	0.72	0.73	0.66
		Percentage of capitalization rate	OO4	0.73	0.73	0.73	0.73	0.7
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.07	0.07	0.07	0.07	0.07
Building Charastristics	Operational Charastristics	Available rentable area	BO1	31505.17	31505.17	31505.17	31505.17	31505.17
		Average Unit Cost Per Building	BO2	128.24	128.24	128.24	128.24	128.24
		Percentage of rentable area to gross area	BO3	0.93	0.93	0.93	0.93	0.93
	Physical Charastristics	Number of all units	BP1	82.99	82.99	82.99	82.99	82.99
		Average unit size	BP2	225.64	225.64	225.64	225.64	225.64
Performance	Rent	Rental Revenue	PR1	11642741.86	11642741.86	11642741.86	12020486.16	11615958.78
		Average rent lost due to vacant units	PR2	1439822.47	859360.21	982418.19	581225.96	516228.25
	Churn	Time to re-let	PC1	134.46	136.14	143.71	146.23	136.98
		Percentage of vacant units	PC2	0.13	0.09	0.14	0.17	0.29

C35

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3325.71	3325.71	3325.71	3325.71	3325.71
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	2474.89	2474.89	2474.89	2474.89	2474.89
	Utilization	Income /expected income provided its rented all the year round	CR4	1.04	1.04	1.04	1.02	1.02
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	4751	5491	4044	4835	4595
		Number of unplanned repairs	OR2	2876	4131	2526	1169	1139
		Percentage of planed maintance completed on time	OR3	6613.33	5777.16	6385.28	5929.19	7601.52
		Percentage of unplanned repairs completed on time	OR4	1778.05	1778.05	1747.4	2636.43	1808.71
	Cleaning	Number of cleaning employees	OC1	4.23	4.23	6.35	6.35	6.35
		Equipment and material cost	OC2	197760.33	197760.33	101568.75	101568.75	101568.75
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	404745	404745	410154	560254	532420
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	12	13	12	14	13
	Insurance	Building insurance fees	OI1	69530735.76	69530735.76	69530735.76	69530735.76	69530735.76
		Equipment insurance fees	OI2	196758.41	196758.41	196758.41	196803.34	194321.55
	Management and overall costs	Employees salaries	OM1	60084.56	68095.84	72101.48	80112.76	88124.03
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	18	21	22	24	27
	Rent	Average Rent Per Building	OT1	4970379.52	4970379.52	4970379.52	4853483.78	5062742.94
		Rent per square meter	OT2	765.22	765.22	765.22	772.7	774.43
		Income per building	OT3	4696911.57	4696911.57	4696911.57	4823987.26	4716192.33
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	6	2	8	6	9
		Percentage of expiring leases	OO2	0.09	0.13	0.09	0.13	0.09
		Percentage of cash return	OO3	0.79	0.79	0.79	0.78	0.83
		Percentage of capitalization rate	OO4	0.75	0.75	0.75	0.75	0.69
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.07	0.07	0.07	0.07	0.07
Building Charastristics	Operational Charastristics	Available rentable area	BO1	14718.78	14718.78	14718.78	14718.78	14718.78
		Average Unit Cost Per Building	BO2	98.24	98.24	98.24	98.24	98.24
		Percentage of rentable area to gross area	BO3	0.92	0.92	0.92	0.92	0.92
	Physical Charastristics	Number of all units	BP1	86.15	86.15	86.15	86.15	86.15
		Average unit size	BP2	183.4	183.4	183.4	183.4	183.4
Performance	Rent	Rental Revenue	PR1	5630318.84	5630318.84	5630318.84	5604233.25	5576468.94
		Average rent lost due to vacant units	PR2	838707.64	1010884.9	496833.53	993722.16	1526179.29
	Churn	Time to re-let	PC1	139.4	140.27	154.99	151.53	154.12
		Percentage of vacant units	PC2	0.01	0.01	0.01	0.01	0

C491

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3004.94	3004.94	3004.94	3004.94	3004.94
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	4042.03	4042.03	4042.03	4042.03	4042.03
	Utilization	Income /expected income provided its rented all the year round	CR4	1.04	1.04	1.04	1.03	1.02
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	8061	8465	8241	4537	9723
		Number of unplanned repairs	OR2	2077	3021	1617	1069	737
		Percentage of planed maintance completed on time	OR3	1	1	1	1	1
		Percentage of unplanned repairs completed on time	OR4	277.46	250.1	308.72	320.45	246.2
	Cleaning	Number of cleaning employees	OC1	4.97	4.97	7.45	12.41	9.93
		Equipment and material cost	OC2	152919.36	152919.36	78538.64	78538.64	78538.64
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	1070456	1070456	759783	1352313	1112044
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	20	20	20	21	20
	Insurance	Building insurance fees	OI1	53069643.62	53069643.62	53069643.62	53069643.62	53069643.62
		Equipment insurance fees	OI2	98756.31	98756.31	98756.31	100513.25	98895.28
	Management and overall costs	Employees salaries	OM1	74834.7	84812.66	89801.64	99779.6	109757.56
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	18	20	21	24	26
	Rent	Average Rent Per Building	OT1	20746865.5	20746865.5	20746865.5	20395438.93	20597407.23
		Rent per square meter	OT2	1013.13	1013.13	1013.13	1010.34	1044.33
		Income per building	OT3	4846714.43	4846714.43	4846714.43	4855443.33	4784762.49
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	18	9	-4	23	34
		Percentage of expiring leases	OO2	0.09	0.12	0.09	0.1	0.1
		Percentage of cash return	OO3	0.87	0.87	0.87	0.87	0.8
		Percentage of capitalization rate	OO4	0.85	0.85	0.85	0.86	0.89
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.09	0.09	0.09	0.09	0.09
Building Charastristics	Operational Charastristics	Available rentable area	BO1	30750.93	30750.93	30750.93	30750.93	30750.93
		Average Unit Cost Per Building	BO2	127.3	127.3	127.3	127.3	127.3
		Percentage of rentable area to gross area	BO3	0.91	0.91	0.91	0.91	0.91
	Physical Charastristics	Number of all units	BP1	661.48	661.48	661.48	661.48	661.48
		Average unit size	BP2	169.86	169.86	169.86	169.86	169.86
Performance	Rent	Rental Revenue	PR1	6344429.99	6344429.99	6344429.99	6112071	6268304.61
		Average rent lost due to vacant units	PR2	1501796.7	2044493.93	2221719.8	1142975.73	5816944.92
	Churn	Time to re-let	PC1	143	141	151	155	170
		Percentage of vacant units	PC2	0.13	0.03	0.07	0.22	0.05

C40

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3203.59	3203.59	3203.59	3203.59	3203.59
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3609.28	3609.28	3609.28	3609.28	3609.28
	Utilization	Income /expected income provided its rented all the year round	CR4	1.06	1.06	1.06	1.06	1.04
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	8812	8881	9924	8737	11797
		Number of unplanned repairs	OR2	3741	5093	3125	2119	1450
		Percentage of planed maintance completed on time	OR3	1	0.92	1	1	1
		Percentage of unplanned repairs completed on time	OR4	1137.29	1137.29	1246.64	1268.51	1181.03
	Cleaning	Number of cleaning employees	OC1	3	3	2	5	1
		Equipment and material cost	OC2	109751.79	109751.79	56367.99	56367.99	56367.99
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	795235.55	795235.55	845825.71	909209.64	810137.5
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	16.18	18.21	18.21	18.21	18.21
	Insurance	Building insurance fees	OI1	75927722.07	75927722.07	75927722.07	75927722.07	75927722.07
		Equipment insurance fees	OI2	60413.32	60413.32	60413.32	59570.31	62063.99
	Management and overall costs	Employees salaries	OM1	78120.48	88536.54	93744.57	104160.64	114576.7
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	17	19	20	22	24
	Rent	Average Rent Per Building	OT1	4669696.94	4669696.94	4669696.94	4808318.81	4714762.04
		Rent per square meter	OT2	1213.53	1213.53	1213.53	1196.09	1247.6
		Income per building	OT3	21623668.63	21623668.63	21623668.63	22189599.47	21810051.56
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	4.96	4.79	8.21	2.39	10.77
		Percentage of expiring leases	OO2	0.07	0.09	0.09	0.12	0.09
		Percentage of cash return	OO3	0.97	0.97	0.97	0.97	0.95
		Percentage of capitalization rate	OO4	0.87	0.87	0.87	0.87	0.87
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.08	0.08	0.08	0.08	0.08
Building Charastristics	Operational Charastristics	Available rentable area	BO1	22063.86	22063.86	22063.86	22063.86	22063.86
		Average Unit Cost Per Building	BO2	65.24	65.24	65.24	65.24	65.24
		Percentage of rentable area to gross area	BO3	0.88	0.88	0.88	0.88	0.88
	Physical Charastristics	Number of all units	BP1	653.62	653.62	653.62	653.62	653.62
		Average unit size	BP2	174.68	174.68	174.68	174.68	174.68
Performance	Rent	Rental Revenue	PR1	8458675.79	8458675.79	8458675.79	8327655.84	8395610.57
		Average rent lost due to vacant units	PR2	1719401.38	301115.76	1031572.92	1411006.1	-103659.27
	Churn	Time to re-let	PC1	135.93	136.78	144.43	147.83	157.17
		Percentage of vacant units	PC2	0.18	0.25	0.13	0.26	0.6

C61

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3315.43	3315.43	3315.43	3315.43	3315.43
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3002.86	3002.86	3002.86	3002.86	3002.86
	Utilization	Income /expected income provided its rented all the year round	CR4	0.79	0.79	0.79	0.79	0.87
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	2716.58	2750.97	3101.03	2115.89	3097.48
		Number of unplanned repairs	OR2	5283.77	6874.41	4636.51	3971.18	2243.32
		Percentage of planed maintance completed on time	OR3	0.95	1	0.94	0.88	1
		Percentage of unplanned repairs completed on time	OR4	1	1	1	0.57	1
	Cleaning	Number of cleaning employees	OC1	7	7	15	5	10
		Equipment and material cost	OC2	143317.29	143317.29	73607.07	73607.07	73607.07
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	408054	408054	563037	454674	514258
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	23.63	21.94	25.32	25.32	24.47
	Insurance	Building insurance fees	OI1	58378095.95	58378095.95	58378095.95	58378095.95	58378095.95
		Equipment insurance fees	OI2	191237.33	191237.33	191237.33	189214.1	195900.44
	Management and overall costs	Employees salaries	OM1	69569.01	78844.88	83482.81	92758.68	102034.55
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	21.62	24.33	26.13	28.83	31.53
	Rent	Average Rent Per Building	OT1	16220768.64	16220768.64	16220768.64	16774617.53	17369310.32
		Rent per square meter	OT2	1069.1	1069.1	1069.1	1069.61	1071.2
		Income per building	OT3	4812495.98	4812495.98	4812495.98	4808897.71	4835372.4
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	7	1	6	0	14
		Percentage of expiring leases	OO2	0.07	0.1	0.07	0.08	0.08
		Percentage of cash return	OO3	0.97	0.97	0.97	0.98	0.94
		Percentage of capitalization rate	OO4	0.51	0.51	0.51	0.5	0.5
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.09	0.09	0.09	0.09	0.09
Building Charastristics	Operational Charastristics	Available rentable area	BO1	32880.49	32880.49	32880.49	32880.49	32880.49
		Average Unit Cost Per Building	BO2	125.3	125.3	125.3	125.3	125.3
		Percentage of rentable area to gross area	BO3	0.98	0.98	0.98	0.98	0.98
	Physical Charastristics	Number of all units	BP1	167.89	167.89	167.89	167.89	167.89
		Average unit size	BP2	198.46	198.46	198.46	198.46	198.46
Performance	Rent	Rental Revenue	PR1	15024569.23	15024569.23	15024569.23	14969443.83	15280001.78
		Average rent lost due to vacant units	PR2	1071259	922551.11	738001.68	688582.2	139162.04
	Churn	Time to re-let	PC1	131	132	144	137	130
		Percentage of vacant units	PC2	0.04	0.04	0.05	0.03	0.04

C70								
Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3222.82	3222.82	3222.82	3222.82	3222.82
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3703.81	3703.81	3703.81	3703.81	3703.81
	Utilization	Income /expected income provided its rented all the year round	CR4	0.71	0.71	0.71	0.71	0.67
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	1394	1448	1133	1403	1282
		Number of unplanned repairs	OR2	390	504	352	189	133
		Percentage of planed maintance completed on time	OR3	3304.59	3110.2	3771.12	3887.75	3887.75
		Percentage of unplanned repairs completed on time	OR4	1	1	1	1	1
	Cleaning	Number of cleaning employees	OC1	5	5	10	8	4
		Equipment and material cost	OC2	194025.8	194025.8	99650.71	99650.71	99650.71
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	661663	661663	564651	860253	958350
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	15	17	16	17	16
	Insurance	Building insurance fees	OI1	70265151.7	70265151.7	70265151.7	70265151.7	70265151.7
		Equipment insurance fees	OI2	88365.46	88365.46	88365.46	88575.38	89204.34
	Management and overall costs	Employees salaries	OM1	72734.35	82432.26	87281.22	96979.13	106677.05
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	19	21	23	25	28
	Rent	Average Rent Per Building	OT1	11643562.97	11643562.97	11643562.97	11498102.55	11306108.76
		Rent per square meter	OT2	900.74	900.74	900.74	927.97	904.49
		Income per building	OT3	4385664.88	4385664.88	4385664.88	4306725.91	4317796.07
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	3	2	2	1	7
		Percentage of expiring leases	OO2	0.07	0.07	0.08	0.08	0.07
		Percentage of cash return	OO3	0.7	0.7	0.7	0.68	0.71
		Percentage of capitalization rate	OO4	0.81	0.81	0.81	0.81	0.82
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.1	0.1	0.1	0.1	0.1
Building Charastristics	Operational Charastristics	Available rentable area	BO1	19560	19560	19560	19560	19560
		Average Unit Cost Per Building	BO2	94.08	94.08	94.08	94.08	94.08
		Percentage of rentable area to gross area	BO3	0.88	0.88	0.88	0.88	0.88
	Physical Charastristics	Number of all units	BP1	643.61	643.61	643.61	643.61	643.61
		Average unit size	BP2	267.85	267.85	267.85	267.85	267.85
Performance	Rent	Rental Revenue	PR1	7156615.8	7156615.8	7156615.8	7116490.67	7126867.92
		Average rent lost due to vacant units	PR2	499193.28	284558.48	618572.3	584997.65	1526436.98
	Churn	Time to re-let	PC1	140.97	149.21	158.37	162.94	136.4
		Percentage of vacant units	PC2	0.06	0.05	0.08	0.04	0.11

C51

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3070.08	3070.08	3070.08	3070.08	3070.08
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	2756.49	2756.49	2756.49	2756.49	2756.49
	Utilization	Income /expected income provided its rented all the year round	CR4	0.64	0.64	0.64	0.62	0.62
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	6011	5625	5473	7102	5652
		Number of unplanned repairs	OR2	1735	2286	1314	747	645
		Percentage of planed maintance completed on time	OR3	926.07	1049.54	987.8	946.65	802.59
		Percentage of unplanned repairs completed on time	OR4	3523.56	3987.19	4265.36	5192.62	3987.19
	Cleaning	Number of cleaning employees	OC1	3	3	5	4	2
		Equipment and material cost	OC2	191034.8	191034.8	98114.55	98114.55	98114.55
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	204041.89	204041.89	257853.48	245187.87	180912.08
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	12	13	14	13	12
	Insurance	Building insurance fees	OI1	58810742.05	58810742.05	58810742.05	58810742.05	58810742.05
		Equipment insurance fees	OI2	52564.46	52564.46	52564.46	53127.96	52850.91
	Management and overall costs	Employees salaries	OM1	68446.17	77572.34	82135.41	91261.57	100387.71
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	19.67	21.64	23.61	25.57	29.51
	Rent	Average Rent Per Building	OT1	21987339.7	21987339.7	21987339.7	22591111.78	21962182.83
		Rent per square meter	OT2	1106.89	1106.89	1106.89	1145.83	1044.16
		Income per building	OT3	13029122.49	13029122.49	13029122.49	13232484.83	12939278.34
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	19.14	18.85	21.17	20.01	-17.98
		Percentage of expiring leases	OO2	0.06	0.09	0.06	0.08	0.06
		Percentage of cash return	OO3	0.79	0.79	0.79	0.78	0.75
		Percentage of capitalization rate	OO4	0.96	0.96	0.96	0.96	0.96
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.06	0.06	0.06	0.06	0.06
Building Charastristics	Operational Charastristics	Available rentable area	BO1	16792.41	16792.41	16792.41	16792.41	16792.41
		Average Unit Cost Per Building	BO2	132.19	132.19	132.19	132.19	132.19
		Percentage of rentable area to gross area	BO3	0.91	0.91	0.91	0.91	0.91
	Physical Charastristics	Number of all units	BP1	650.2	650.2	650.2	650.2	650.2
		Average unit size	BP2	218.03	218.03	218.03	218.03	218.03
Performance	Rent	Rental Revenue	PR1	16479009.29	16479009.29	16479009.29	16666452.63	16458291.91
		Average rent lost due to vacant units	PR2	2185214.86	1165607.06	1565888.4	1604781.34	4041003.3
	Churn	Time to re-let	PC1	143.05	145.85	144.92	143.05	141.18
		Percentage of vacant units	PC2	0.17	0.19	0.34	0.15	0.13

C31

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3061.09	3061.09	3061.09	3061.09	3061.09
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	1429.1	1429.1	1429.1	1429.1	1429.1
	Utilization	Income /expected income provided its rented all the year round	CR4	0.69	0.69	0.69	0.68	0.68
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	9865	10299	10829	7619	8386
		Number of unplanned repairs	OR2	4237	5679	3717	2708	1667
		Percentage of planed maintance completed on time	OR3	6318.8	5917.6	6218.5	8525.36	7622.68
		Percentage of unplanned repairs completed on time	OR4	4415.96	4577.52	4308.26	3554.31	3662.02
	Cleaning	Number of cleaning employees	OC1	4	4	4	6	4
		Equipment and material cost	OC2	123009.44	123009.44	63177.05	63177.05	63177.05
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	1021394.17	1021394.17	842041.56	1131238.54	1361468.1
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	16	15	17	17	18
	Insurance	Building insurance fees	OI1	39616205.22	39616205.22	39616205.22	39616205.22	39616205.22
		Equipment insurance fees	OI2	76295.21	76295.21	76295.21	76888.36	76873.59
	Management and overall costs	Employees salaries	OM1	82297.09	93270.03	98756.5	109729.46	120702.4
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	16.97	19.4	20.61	23.04	25.46
	Rent	Average Rent Per Building	OT1	25223693.59	25223693.59	25223693.59	23931945.22	25599439.16
		Rent per square meter	OT2	865.37	865.37	865.37	873.2	894.67
		Income per building	OT3	11673605.85	11673605.85	11673605.85	12054555.94	11653695.22
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	24	13	15	26	24
		Percentage of expiring leases	OO2	0.07	0.09	0.07	0.09	0.07
		Percentage of cash return	OO3	0.95	0.95	0.95	0.95	1
		Percentage of capitalization rate	OO4	0.79	0.79	0.79	0.79	0.79
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.06	0.06	0.06	0.06	0.06
Building Charastristics	Operational Charastristics	Available rentable area	BO1	7420.91	7420.91	7420.91	7420.91	7420.91
		Average Unit Cost Per Building	BO2	123.52	123.52	123.52	123.52	123.52
		Percentage of rentable area to gross area	BO3	0.84	0.84	0.84	0.84	0.84
	Physical Charastristics	Number of all units	BP1	277.98	277.98	277.98	277.98	277.98
		Average unit size	BP2	204.76	204.76	204.76	204.76	204.76
Performance	Rent	Rental Revenue	PR1	16143235.48	16143235.48	16143235.48	16426431.38	16028376.27
		Average rent lost due to vacant units	PR2	2854359.2	3004849.85	1219110.57	2129247.64	5717988
	Churn	Time to re-let	PC1	129.43	128.41	137.59	143.7	146.76
		Percentage of vacant units	PC2	0.05	0.05	0.05	0.07	-0.02

C52

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3043.52	3043.52	3043.52	3043.52	3043.52
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	2411.9	2411.9	2411.9	2411.9	2411.9
	Utilization	Income /expected income provided its rented all the year round	CR4	0.82	0.82	0.82	0.82	0.8
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	8003	8188	10343	8330	7954
		Number of unplanned repairs	OR2	2740	3252	2308	1994	877
		Percentage of planed maintance completed on time	OR3	0.95	1	0.69	0.72	0.91
		Percentage of unplanned repairs completed on time	OR4	2580.79	2895.53	2423.43	2297.54	2738.16
	Cleaning	Number of cleaning employees	OC1	5	5	8	6	7
		Equipment and material cost	OC2	125310.42	125310.42	64358.83	64358.83	64358.83
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	713586	713586	706298	841657	1119066
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	18	19	19	19	19
	Insurance	Building insurance fees	OI1	23358764.95	23358764.95	23358764.95	23358764.95	23358764.95
		Equipment insurance fees	OI2	215970.37	215970.37	215970.37	216980.35	213543.26
	Management and overall costs	Employees salaries	OM1	65982.29	74779.93	79178.75	87976.39	96774.03
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	21.99	25.51	26.39	29.91	32.55
	Rent	Average Rent Per Building	OT1	14916986.99	14916986.99	14916986.99	16321302.59	15054194.41
		Rent per square meter	OT2	1104.64	1104.64	1104.64	1121.31	1091.92
		Income per building	OT3	8172476.54	8172476.54	8172476.54	8303494.22	8146177.01
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	0	0	0	0	2
		Percentage of expiring leases	OO2	0.06	0.09	0.06	0.08	0.08
		Percentage of cash return	OO3	0.86	0.86	0.86	0.86	0.85
		Percentage of capitalization rate	OO4	0.9	0.9	0.9	0.9	0.88
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.08	0.08	0.08	0.08	0.08
Building Charastristics	Operational Charastristics	Available rentable area	BO1	27827.8	27827.8	27827.8	27827.8	27827.8
		Average Unit Cost Per Building	BO2	59.84	59.84	59.84	59.84	59.84
		Percentage of rentable area to gross area	BO3	0.89	0.89	0.89	0.89	0.89
	Physical Charastristics	Number of all units	BP1	421.39	421.39	421.39	421.39	421.39
		Average unit size	BP2	130.62	130.62	130.62	130.62	130.62
Performance	Rent	Rental Revenue	PR1	13502241.65	13502241.65	13502241.65	13827552.19	13488594.71
		Average rent lost due to vacant units	PR2	702665.14	621046.88	494785.28	738232.93	2138000.54
	Churn	Time to re-let	PC1	141	146	155	161	163
		Percentage of vacant units	PC2	0.02	0.01	0.02	0.01	0.11

C1

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3153.69	3153.69	3153.69	3153.69	3153.69
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	2367.58	2367.58	2367.58	2367.58	2367.58
	Utilization	Income /expected income provided its rented all the year round	CR4	0.96	0.96	0.96	0.95	0.95
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	9316	8763	9687	7621	9133
		Number of unplanned repairs	OR2	4327	6011	4001	2786	1763
		Percentage of planed maintance completed on time	OR3	0.95	0.84	0.9	0.86	1
		Percentage of unplanned repairs completed on time	OR4	1	0.98	0.87	1	0.89
	Cleaning	Number of cleaning employees	OC1	5	5	8	3	7
		Equipment and material cost	OC2	125949.43	125949.43	64687.02	64687.02	64687.02
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	535245	535245	445935	642047	640529
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	20	22	21	22	24
	Insurance	Building insurance fees	OI1	21232040.43	21232040.43	21232040.43	21232040.43	21232040.43
		Equipment insurance fees	OI2	82454.96	82454.96	82454.96	82592.18	83496.67
	Management and overall costs	Employees salaries	OM1	75825.39	85935.45	90990.47	101100.52	111210.58
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	18.97	23.19	23.19	27.4	29.51
	Rent	Average Rent Per Building	OT1	20274612.69	20274612.69	20274612.69	20645277.07	21360327.55
		Rent per square meter	OT2	856.81	856.81	856.81	824.2	886.8
		Income per building	OT3	19168320.05	19168320.05	19168320.05	18846271.73	19000172.03
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	5	6	6	6	9
		Percentage of expiring leases	OO2	0.08	0.08	0.08	0.08	0.08
		Percentage of cash return	OO3	0.69	0.69	0.69	0.69	0.67
		Percentage of capitalization rate	OO4	0.63	0.63	0.63	0.63	0.61
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.07	0.07	0.07	0.07	0.07
Building Charastristics	Operational Charastristics	Available rentable area	BO1	20447.22	20447.22	20447.22	20447.22	20447.22
		Average Unit Cost Per Building	BO2	44.49	44.49	44.49	44.49	44.49
		Percentage of rentable area to gross area	BO3	0.92	0.92	0.92	0.92	0.92
	Physical Charastristics	Number of all units	BP1	516.06	516.06	516.06	516.06	516.06
		Average unit size	BP2	275.82	275.82	275.82	275.82	275.82
Performance	Rent	Rental Revenue	PR1	8102750.97	8102750.97	8102750.97	8164632.17	8121467.15
		Average rent lost due to vacant units	PR2	2048320.22	1376491.65	2883318.42	2441721.47	4481691.77
	Churn	Time to re-let	PC1	144	152	141	144	152
		Percentage of vacant units	PC2	0.11	0.17	0.19	0.09	0.1

C28

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3171.33	3171.33	3171.33	3171.33	3171.33
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3987.29	3987.29	3987.29	3987.29	3987.29
	Utilization	Income /expected income provided its rented all the year round	CR4	1.12	1.12	1.12	1.12	1.14
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	3157	3063	2991	2847	3251
		Number of unplanned repairs	OR2	4694	6491	3897	2538	1852
		Percentage of planed maintance completed on time	OR3	1	1	1	1	1
		Percentage of unplanned repairs completed on time	OR4	1	1	1	1	1
	Cleaning	Number of cleaning employees	OC1	7.68	7.68	7.68	0	7.68
		Equipment and material cost	OC2	165573.88	165573.88	85037.94	85037.94	85037.94
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	169028.18	169028.18	132842.61	174796.03	162413.63
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	13.35	16.02	13.35	13.35	12.02
	Insurance	Building insurance fees	OI1	46373884.87	46373884.87	46373884.87	46373884.87	46373884.87
		Equipment insurance fees	OI2	92969.42	92969.42	92969.42	93308.47	91490.31
	Management and overall costs	Employees salaries	OM1	63195.57	71621.64	75834.69	84260.75	92686.84
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	19.33	20.82	22.3	25.28	28.25
	Rent	Average Rent Per Building	OT1	27584460.97	27584460.97	27584460.97	27936601.82	28542885.18
		Rent per square meter	OT2	802.64	802.64	802.64	762.08	841.61
		Income per building	OT3	13235974.91	13235974.91	13235974.91	13131736.89	13173475.87
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	22.07	32.73	12.18	8.37	-6.09
		Percentage of expiring leases	OO2	0.08	0.09	0.09	0.1	0.11
		Percentage of cash return	OO3	0.89	0.89	0.89	0.89	0.86
		Percentage of capitalization rate	OO4	0.62	0.62	0.62	0.61	0.59
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.09	0.09	0.09	0.09	0.09
Building Charastristics	Operational Charastristics	Available rentable area	BO1	27407.46	27407.46	27407.46	27407.46	27407.46
		Average Unit Cost Per Building	BO2	107.43	107.43	107.43	107.43	107.43
		Percentage of rentable area to gross area	BO3	0.96	0.96	0.96	0.96	0.96
	Physical Charastristics	Number of all units	BP1	203.11	203.11	203.11	203.11	203.11
		Average unit size	BP2	266.19	266.19	266.19	266.19	266.19
Performance	Rent	Rental Revenue	PR1	6023870.29	6023870.29	6023870.29	6030791.02	6031066.69
		Average rent lost due to vacant units	PR2	2180993.07	2334812.65	1389019.45	2498412.84	7677768.69
	Churn	Time to re-let	PC1	143.61	140.76	134.1	141.71	142.66
		Percentage of vacant units	PC2	0.08	0.07	0.09	0.1	0.06

C15								
Categories	**Sub-Categories**	**Metrics**	**Codes**	**2012**	**2013**	**2014**	**2015**	**2016**
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3404.47	3404.47	3404.47	3404.47	3404.47
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3084.19	3084.19	3084.19	3084.19	3084.19
	Utilization	Income /expected income provided its rented all the year round	CR4	0.63	0.63	0.63	0.63	0.66
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	1981	2052	1909	1904	1981
		Number of unplanned repairs	OR2	2651	3849	2063	1649	931
		Percentage of planed maintance completed on time	OR3	3597.15	3340.21	3597.15	2740.69	4624.91
		Percentage of unplanned repairs completed on time	OR4	1742.45	1560.94	1923.95	2178.06	1742.45
	Cleaning	Number of cleaning employees	OC1	7.56	7.56	7.56	11.34	3.78
		Equipment and material cost	OC2	128601.38	128601.38	66049.05	66049.05	66049.05
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	959518	959518	789162	1126146	1080279
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	16	17	17	17	17
	Insurance	Building insurance fees	OI1	76463188.7	76463188.7	76463188.7	76463188.7	76463188.7
		Equipment insurance fees	OI2	116992.47	116992.47	116992.47	116221.3	115470.58
	Management and overall costs	Employees salaries	OM1	61317.82	69493.53	73581.39	81757.1	89932.81
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	16	18	19	22	24
	Rent	Average Rent Per Building	OT1	16646248.5	16646248.5	16646248.5	16327375.89	16780980.5
		Rent per square meter	OT2	1065.88	1065.88	1065.88	1071.61	1027.88
		Income per building	OT3	18756244.92	18756244.92	18756244.92	19052551.31	18416571.33
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	10	11	12	12	23
		Percentage of expiring leases	OO2	0.08	0.11	0.09	0.11	0.08
		Percentage of cash return	OO3	1.11	1.11	1.11	1.11	1.11
		Percentage of capitalization rate	OO4	0.69	0.69	0.69	0.68	0.69
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.09	0.09	0.09	0.09	0.09
Building Charastristics	Operational Charastristics	Available rentable area	BO1	17548.15	17548.15	17548.15	17548.15	17548.15
		Average Unit Cost Per Building	BO2	120.14	120.14	120.14	120.14	120.14
		Percentage of rentable area to gross area	BO3	0.81	0.81	0.81	0.81	0.81
	Physical Charastristics	Number of all units	BP1	447.02	447.02	447.02	447.02	447.02
		Average unit size	BP2	171.1	171.1	171.1	171.1	171.1
Performance	Rent	Rental Revenue	PR1	10033703.17	10033703.17	10033703.17	10597403.32	9964321.64
		Average rent lost due to vacant units	PR2	197134.36	216981.55	-1878.11	226598.69	441100.34
	Churn	Time to re-let	PC1	139.57	139.57	142.9	157.3	141.79
		Percentage of vacant units	PC2	0.09	0.05	0.08	0.06	0.13

C41

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3397.14	3397.14	3397.14	3397.14	3397.14
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	1140.85	1140.85	1140.85	1140.85	1140.85
	Utilization	Income /expected income provided its rented all the year round	CR4	0.74	0.74	0.74	0.75	0.76
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	10558	10064	12380	9527	9149
		Number of unplanned repairs	OR2	3950	5345	3463	1862	1419
		Percentage of planed maintance completed on time	OR3	1	1	1	1	1
		Percentage of unplanned repairs completed on time	OR4	4553.41	4831.06	5164.24	5552.94	5552.94
	Cleaning	Number of cleaning employees	OC1	7	7	9	5	11
		Equipment and material cost	OC2	177813.99	177813.99	91324.4	91324.4	91324.4
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	602440	602440	694453	790704	611788
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	15.79	15.79	17	18.82	17
	Insurance	Building insurance fees	OI1	57811833.21	57811833.21	57811833.21	57811833.21	57811833.21
		Equipment insurance fees	OI2	190531.74	190531.74	190531.74	192258.37	191252.62
	Management and overall costs	Employees salaries	OM1	71149.75	80636.38	85379.7	94866.33	104352.96
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15.29	17.84	19.11	20.39	22.93
	Rent	Average Rent Per Building	OT1	21408579.95	21408579.95	21408579.95	22723722.49	22213462.36
		Rent per square meter	OT2	853.79	853.79	853.79	848.59	891.25
		Income per building	OT3	13693486.7	13693486.7	13693486.7	13718563.38	13618257.14
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	8	8	3	13	-3
		Percentage of expiring leases	OO2	0.08	0.09	0.08	0.09	0.08
		Percentage of cash return	OO3	0.92	0.92	0.92	0.92	0.95
		Percentage of capitalization rate	OO4	0.56	0.56	0.56	0.55	0.53
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.07	0.07	0.07	0.07	0.07
Building Charastristics	Operational Charastristics	Available rentable area	BO1	25763.96	25763.96	25763.96	25763.96	25763.96
		Average Unit Cost Per Building	BO2	109.31	109.31	109.31	109.31	109.31
		Percentage of rentable area to gross area	BO3	0.98	0.98	0.98	0.98	0.98
	Physical Charastristics	Number of all units	BP1	421.84	421.84	421.84	421.84	421.84
		Average unit size	BP2	191.9	191.9	191.9	191.9	191.9
Performance	Rent	Rental Revenue	PR1	13779801.95	13779801.95	13779801.95	13654033.66	13632147.95
		Average rent lost due to vacant units	PR2	2256180	2095342.59	1713227.15	2127635.4	788344.8
	Churn	Time to re-let	PC1	137	142	139	144	155
		Percentage of vacant units	PC2	0.03	0.03	0.02	0.01	0.07

C33

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3116.1	3116.1	3116.1	3116.1	3116.1
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3389.39	3389.39	3389.39	3389.39	3389.39
	Utilization	Income /expected income provided its rented all the year round	CR4	0.91	0.91	0.91	0.89	0.91
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	8457.43	8073.39	8992.12	8509.77	8267.18
		Number of unplanned repairs	OR2	1824.56	2564.5	1591.42	947.17	774.07
		Percentage of planed maintance completed on time	OR3	2019.8	2075.13	2241.15	2766.85	2351.82
		Percentage of unplanned repairs completed on time	OR4	1	1	1	0.91	1
	Cleaning	Number of cleaning employees	OC1	0	0	0	0	1
		Equipment and material cost	OC2	177496.48	177496.48	91161.34	91161.34	91161.34
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	843359	843359	785574	864652	1020555
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	17	19	18	18	20
	Insurance	Building insurance fees	OI1	47333012.89	47333012.89	47333012.89	47333012.89	47333012.89
		Equipment insurance fees	OI2	233058.37	233058.37	233058.37	232853.16	234279.63
	Management and overall costs	Employees salaries	OM1	62518.8	70854.64	75022.56	83358.4	91694.24
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15	18	19	21	23
	Rent	Average Rent Per Building	OT1	22817045.88	22817045.88	22817045.88	23874939.97	22279843.32
		Rent per square meter	OT2	980.15	980.15	980.15	971.56	973.94
		Income per building	OT3	14439593.76	14439593.76	14439593.76	13883363.53	14364514.59
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	22	25	27	33	11
		Percentage of expiring leases	OO2	0.06	0.09	0.06	0.08	0.07
		Percentage of cash return	OO3	0.8	0.8	0.8	0.78	0.74
		Percentage of capitalization rate	OO4	0.7	0.7	0.7	0.7	0.71
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.09	0.09	0.09	0.09	0.09
Building Charastristics	Operational Charastristics	Available rentable area	BO1	15258.58	15258.58	15258.58	15258.58	15258.58
		Average Unit Cost Per Building	BO2	105.65	105.65	105.65	105.65	105.65
		Percentage of rentable area to gross area	BO3	0.96	0.96	0.96	0.96	0.96
	Physical Charastristics	Number of all units	BP1	517.18	517.18	517.18	517.18	517.18
		Average unit size	BP2	156.22	156.22	156.22	156.22	156.22
Performance	Rent	Rental Revenue	PR1	17392839.91	17392839.91	17392839.91	17302813.24	17610170.77
		Average rent lost due to vacant units	PR2	2484139.53	2192580.99	1781560.12	2765633.06	11757198.03
	Churn	Time to re-let	PC1	145	149	150	157	134
		Percentage of vacant units	PC2	0.08	0.14	0.11	0.04	0.04

C37

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3017.19	3017.19	3017.19	3017.19	3017.19
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	787.92	787.92	787.92	787.92	787.92
	Utilization	Income /expected income provided its rented all the year round	CR4	0.93	0.93	0.93	0.93	0.91
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	4130	4102	4244	3671	3696
		Number of unplanned repairs	OR2	1221	1582	1106	722	509
		Percentage of planed maintance completed on time	OR3	9510.33	8170.85	9510.33	12457.2	10046.13
		Percentage of unplanned repairs completed on time	OR4	4267.16	4267.16	3840.45	5120.6	4267.16
	Cleaning	Number of cleaning employees	OC1	6	6	5	7	9
		Equipment and material cost	OC2	159788.48	159788.48	82066.59	82066.59	82066.59
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	684205	684205	826097	714637	750532
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	16	16	17	16	17
	Insurance	Building insurance fees	OI1	34303508.25	34303508.25	34303508.25	34303508.25	34303508.25
		Equipment insurance fees	OI2	90274.6	90274.6	90274.6	89095.07	90877.6
	Management and overall costs	Employees salaries	OM1	69387.82	78639.52	83265.38	92517.09	101768.8
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	16	18	19	22	24
	Rent	Average Rent Per Building	OT1	17368045.27	17368045.27	17368045.27	16962942.13	17079049.81
		Rent per square meter	OT2	1224.44	1224.44	1224.44	1252.84	1263.07
		Income per building	OT3	18505352.68	18505352.68	18505352.68	19000271.24	18403546.05
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	2	2	2	1	1
		Percentage of expiring leases	OO2	0.08	0.09	0.09	0.1	0.09
		Percentage of cash return	OO3	0.69	0.69	0.69	0.71	0.72
		Percentage of capitalization rate	OO4	0.61	0.61	0.61	0.62	0.6
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.07	0.07	0.07	0.07	0.07
Building Charastristics	Operational Charastristics	Available rentable area	BO1	16663.86	16663.86	16663.86	16663.86	16663.86
		Average Unit Cost Per Building	BO2	136.66	136.66	136.66	136.66	136.66
		Percentage of rentable area to gross area	BO3	0.81	0.81	0.81	0.81	0.81
	Physical Charastristics	Number of all units	BP1	353.16	353.16	353.16	353.16	353.16
		Average unit size	BP2	188.34	188.34	188.34	188.34	188.34
Performance	Rent	Rental Revenue	PR1	17389110.34	17389110.34	17389110.34	17971718.34	17235659.12
		Average rent lost due to vacant units	PR2	459155.7	441996.63	452891.58	235905.38	-4267.26
	Churn	Time to re-let	PC1	128	132	131	119	138
		Percentage of vacant units	PC2	0.2	0.19	0.2	0.17	0.31

C60								
Categories	**Sub-Categories**	**Metrics**	**Codes**	**2012**	**2013**	**2014**	**2015**	**2016**
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3229.6	3229.6	3229.6	3229.6	3229.6
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3775.47	3775.47	3775.47	3775.47	3775.47
	Utilization	Income /expected income provided its rented all the year round	CR4	0.9	0.9	0.9	0.89	0.91
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	4947	5378	5314	4672	4869
		Number of unplanned repairs	OR2	1091	1585	957	559	482
		Percentage of planed maintance completed on time	OR3	2267.83	1879.06	2073.45	2753.8	2462.22
		Percentage of unplanned repairs completed on time	OR4	3517.55	3604.4	3647.83	4342.65	3734.68
	Cleaning	Number of cleaning employees	OC1	3	3	4	5	5
		Equipment and material cost	OC2	119414.57	119414.57	61330.75	61330.75	61330.75
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	363854	363854	393848	453116	500918
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	14.35	14.35	14.35	16.4	14.35
	Insurance	Building insurance fees	OI1	23291229.42	23291229.42	23291229.42	23291229.42	23291229.42
		Equipment insurance fees	OI2	42201.45	42201.45	42201.45	42247.67	41899.24
	Management and overall costs	Employees salaries	OM1	80966.44	91761.96	97159.72	107955.25	118750.77
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	18.55	20.69	22.12	24.97	27.11
	Rent	Average Rent Per Building	OT1	15679659.84	15679659.84	15679659.84	15629879.72	15780762.4
		Rent per square meter	OT2	891.4	891.4	891.4	913.17	889.51
		Income per building	OT3	6600121.61	6600121.61	6600121.61	6756151.16	6564713.29
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	6.45	4.63	4.91	3.79	8.97
		Percentage of expiring leases	OO2	0.09	0.13	0.1	0.11	0.12
		Percentage of cash return	OO3	1.16	1.16	1.16	1.18	1.11
		Percentage of capitalization rate	OO4	0.71	0.71	0.71	0.71	0.68
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.08
		Percentage of tenants with unpaid rent	OD3	0.09	0.09	0.09	0.09	0.09
Building Charastristics	Operational Charastristics	Available rentable area	BO1	18719.67	18719.67	18719.67	18719.67	18719.67
		Average Unit Cost Per Building	BO2	72.64	72.64	72.64	72.64	72.64
		Percentage of rentable area to gross area	BO3	0.89	0.89	0.89	0.89	0.89
	Physical Charastristics	Number of all units	BP1	826.12	826.12	826.12	826.12	826.12
		Average unit size	BP2	134.19	134.19	134.19	134.19	134.19
Performance	Rent	Rental Revenue	PR1	8420136.75	8420136.75	8420136.75	8556337.98	8415087.32
		Average rent lost due to vacant units	PR2	993397.23	949094.54	726025.78	1554373.54	2297946.25
	Churn	Time to re-let	PC1	130.22	134.47	142.13	134.47	137.02
		Percentage of vacant units	PC2	0.22	0.09	0.16	0.12	0.72

C11

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3261.38	3261.38	3261.38	3261.38	3261.38
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	3288.64	3288.64	3288.64	3288.64	3288.64
	Utilization	Income /expected income provided its rented all the year round	CR4	0.69	0.69	0.69	0.68	0.67
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	10019	10198	10081	10239	10644
		Number of unplanned repairs	OR2	3411	4702	2781	1528	1504
		Percentage of planed maintance completed on time	OR3	1	1	1	0.87	0.9
		Percentage of unplanned repairs completed on time	OR4	109.81	111.58	120.44	134.61	85.01
	Cleaning	Number of cleaning employees	OC1	3.38	3.38	6.76	3.38	5.07
		Equipment and material cost	OC2	115554.32	115554.32	59348.14	59348.14	59348.14
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	885591	885591	895150	1025633	789269
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	16	15	16	16	16
	Insurance	Building insurance fees	OI1	20472751.97	20472751.97	20472751.97	20472751.97	20472751.97
		Equipment insurance fees	OI2	120837.99	120837.99	120837.99	121086.06	123428.8
	Management and overall costs	Employees salaries	OM1	85651.94	97072.19	102782.33	114202.58	125622.84
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	20	23	24	27	30
	Rent	Average Rent Per Building	OT1	21564533.39	21564533.39	21564533.39	21903162.76	22822507.93
		Rent per square meter	OT2	672.49	672.49	672.49	652.55	696.35
		Income per building	OT3	13530165.68	13530165.68	13530165.68	13787493.95	13540392.63
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	14	15	11	13	4
		Percentage of expiring leases	OO2	0.07	0.11	0.08	0.1	0.11
		Percentage of cash return	OO3	1.03	1.03	1.03	1.02	0.99
		Percentage of capitalization rate	OO4	0.95	0.95	0.95	0.95	0.94
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.06	0.06	0.06	0.06	0.06
Building Charastristics	Operational Charastristics	Available rentable area	BO1	12197.24	12197.24	12197.24	12197.24	12197.24
		Average Unit Cost Per Building	BO2	117.46	117.46	117.46	117.46	117.46
		Percentage of rentable area to gross area	BO3	0.92	0.92	0.92	0.92	0.92
	Physical Charastristics	Number of all units	BP1	315.16	315.16	315.16	315.16	315.16
		Average unit size	BP2	117.64	117.64	117.64	117.64	117.64
Performance	Rent	Rental Revenue	PR1	17203142.21	17203142.21	17203142.21	17839897.37	17180200.38
		Average rent lost due to vacant units	PR2	2204968.17	1424400.67	1911317.88	1905014.63	5789934.17
	Churn	Time to re-let	PC1	145.18	145.18	154.54	154.54	156.89
		Percentage of vacant units	PC2	0.13	0.12	0.12	0.12	0.56

C36

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3077.13	3077.13	3077.13	3077.13	3077.13
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	2117.66	2117.66	2117.66	2117.66	2117.66
	Utilization	Income /expected income provided its rented all the year round	CR4	0.92	0.92	0.92	0.92	0.94
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	5063	4923	5038	5698	5108
		Number of unplanned repairs	OR2	2544	3688	2569	1367	1060
		Percentage of planed maintance completed on time	OR3	1	0.89	1	1	1
		Percentage of unplanned repairs completed on time	OR4	1356.06	1304.88	1100.2	1407.23	1049.02
	Cleaning	Number of cleaning employees	OC1	7.62	7.62	15.23	7.62	7.62
		Equipment and material cost	OC2	126031.16	126031.16	64729	64729	64729
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	944975	944975	1096807	1018654	957785
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	18	17	18	18	19
	Insurance	Building insurance fees	OI1	56917627.15	56917627.15	56917627.15	56917627.15	56917627.15
		Equipment insurance fees	OI2	50143.34	50143.34	50143.34	50453.34	50093.36
	Management and overall costs	Employees salaries	OM1	82944.33	94003.56	99533.18	110592.44	121651.68
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	20.96	20.96	24.45	27.94	27.94
	Rent	Average Rent Per Building	OT1	10112388.31	10112388.31	10112388.31	10436646.3	9736383.74
		Rent per square meter	OT2	1194.14	1194.14	1194.14	1226.64	1276.91
		Income per building	OT3	7172901.28	7172901.28	7172901.28	7315234.39	7165445.44
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	22	20	13	18	31
		Percentage of expiring leases	OO2	0.06	0.05	0.06	0.06	0.08
		Percentage of cash return	OO3	0.97	0.97	0.97	0.97	0.94
		Percentage of capitalization rate	OO4	0.94	0.94	0.94	0.93	0.96
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.1	0.1	0.1	0.1	0.1
Building Charastristics	Operational Charastristics	Available rentable area	BO1	13826.73	13826.73	13826.73	13826.73	13826.73
		Average Unit Cost Per Building	BO2	88.12	88.12	88.12	88.12	88.12
		Percentage of rentable area to gross area	BO3	0.84	0.84	0.84	0.84	0.84
	Physical Charastristics	Number of all units	BP1	237.94	237.94	237.94	237.94	237.94
		Average unit size	BP2	250.16	250.16	250.16	250.16	250.16
Performance	Rent	Rental Revenue	PR1	6576850.27	6576850.27	6576850.27	6665788.44	6608510.06
		Average rent lost due to vacant units	PR2	2458880.76	1455675.59	1240688.83	2215966	8022014.01
	Churn	Time to re-let	PC1	130	134	135	137	144
		Percentage of vacant units	PC2	0.02	0.01	0.01	0.01	0.02

C78

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3216.27	3216.27	3216.27	3216.27	3216.27
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	4418.31	4418.31	4418.31	4418.31	4418.31
	Utilization	Income /expected income provided its rented all the year round	CR4	0.98	0.98	0.98	0.97	0.96
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	4836	4925	5295	5558	5453
		Number of unplanned repairs	OR2	1855	2765	1475	1335	848
		Percentage of planed maintance completed on time	OR3	6873.06	6707.44	6459.02	4388.82	5548.13
		Percentage of unplanned repairs completed on time	OR4	699.83	608.55	684.62	623.76	562.91
	Cleaning	Number of cleaning employees	OC1	4	4	5	7	3
		Equipment and material cost	OC2	168630.78	168630.78	86607.95	86607.95	86607.95
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	772926	772926	703084	913292	755233
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	16.82	17.46	18.11	16.17	16.82
	Insurance	Building insurance fees	OI1	78850655.84	78850655.84	78850655.84	78850655.84	78850655.84
		Equipment insurance fees	OI2	218515.6	218515.6	218515.6	222703.32	219379.1
	Management and overall costs	Employees salaries	OM1	83958.09	95152.51	100749.73	111944.13	123138.55
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	20.19	21.74	23.3	26.4	29.51
	Rent	Average Rent Per Building	OT1	14998654.29	14998654.29	14998654.29	15270581.31	14406450.18
		Rent per square meter	OT2	613.46	613.46	613.46	595.6	618.97
		Income per building	OT3	4531611.88	4531611.88	4531611.88	4498296	4552716.13
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	24	33	20	25	59
		Percentage of expiring leases	OO2	0.06	0.07	0.07	0.08	0.06
		Percentage of cash return	OO3	0.87	0.87	0.87	0.87	0.82
		Percentage of capitalization rate	OO4	0.9	0.9	0.9	0.9	0.88
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.08
		Percentage of tenants with unpaid rent	OD3	0.08	0.08	0.08	0.08	0.08
Building Charastristics	Operational Charastristics	Available rentable area	BO1	28322.68	28322.68	28322.68	28322.68	28322.68
		Average Unit Cost Per Building	BO2	98.17	98.17	98.17	98.17	98.17
		Percentage of rentable area to gross area	BO3	0.8	0.8	0.8	0.8	0.8
	Physical Charastristics	Number of all units	BP1	353.5	353.5	353.5	353.5	353.5
		Average unit size	BP2	147.75	147.75	147.75	147.75	147.75
Performance	Rent	Rental Revenue	PR1	11097742.48	11097742.48	11097742.48	11032531.28	11301850.38
		Average rent lost due to vacant units	PR2	2975221.12	3443586.4	2618047.59	4187448.24	5584451.03
	Churn	Time to re-let	PC1	132.03	130.99	141.39	165.3	153.86
		Percentage of vacant units	PC2	0.01	0.01	0.01	0.01	0.02

C53

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3115.91	3115.91	3115.91	3115.91	3115.91
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	2104.88	2104.88	2104.88	2104.88	2104.88
	Utilization	Income /expected income provided its rented all the year round	CR4	0.6	0.6	0.6	0.6	0.62
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	7324	8219	8240	6341	7545
		Number of unplanned repairs	OR2	583	761	595	347	246
		Percentage of planed maintance completed on time	OR3	0.93	0.8	0.62	1	1
		Percentage of unplanned repairs completed on time	OR4	1	1	1	1	1
	Cleaning	Number of cleaning employees	OC1	6	6	11	12	11
		Equipment and material cost	OC2	122916.69	122916.69	63129.42	63129.42	63129.42
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	600980	600980	576790	694948	525761
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	17.9	18.57	17.9	17.9	16.58
	Insurance	Building insurance fees	OI1	42523549.98	42523549.98	42523549.98	42523549.98	42523549.98
		Equipment insurance fees	OI2	67172.77	67172.77	67172.77	67948.6	68111.48
	Management and overall costs	Employees salaries	OM1	82102.69	93049.72	98523.23	109470.26	120417.27
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	22	25	27	30	33
	Rent	Average Rent Per Building	OT1	18871441.22	18871441.22	18871441.22	18148736.03	19393923.76
		Rent per square meter	OT2	1160.15	1160.15	1160.15	1161.3	1144.35
		Income per building	OT3	8129579.95	8129579.95	8129579.95	8062094.42	7957206.91
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	11	9	18	10	0
		Percentage of expiring leases	OO2	0.06	0.07	0.07	0.08	0.07
		Percentage of cash return	OO3	0.64	0.64	0.64	0.63	0.63
		Percentage of capitalization rate	OO4	0.77	0.77	0.77	0.77	0.76
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.09	0.09	0.09	0.09	0.09
Building Charastristics	Operational Charastristics	Available rentable area	BO1	8036.63	8036.63	8036.63	8036.63	8036.63
		Average Unit Cost Per Building	BO2	29.46	29.46	29.46	29.46	29.46
		Percentage of rentable area to gross area	BO3	0.86	0.86	0.86	0.86	0.86
	Physical Charastristics	Number of all units	BP1	814.09	814.09	814.09	814.09	814.09
		Average unit size	BP2	152.81	152.81	152.81	152.81	152.81
Performance	Rent	Rental Revenue	PR1	9819985.14	9819985.14	9819985.14	9693560.83	9802217.79
		Average rent lost due to vacant units	PR2	1390728.52	1030202.55	1138831.07	1098304.9	3389768.66
	Churn	Time to re-let	PC1	134	136	136	133	140
		Percentage of vacant units	PC2	0.1	0.05	0.05	0.09	0.17

C32

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3031.32	3031.32	3031.32	3031.32	3031.32
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	1363.6	1363.6	1363.6	1363.6	1363.6
	Utilization	Income /expected income provided its rented all the year round	CR4	0.81	0.81	0.81	0.8	0.78
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	9591	9626	8584	9536	11168
		Number of unplanned repairs	OR2	944	1094	671	465	345
		Percentage of planed maintance completed on time	OR3	1	1	0.96	1	1
		Percentage of unplanned repairs completed on time	OR4	1	1	1	1	1
	Cleaning	Number of cleaning employees	OC1	4	4	3	7	6
		Equipment and material cost	OC2	196006.01	196006.01	100667.75	100667.75	100667.75
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	799658	799658	637129	958960	943356
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	13.77	15.3	15.3	16.82	13.77
	Insurance	Building insurance fees	OI1	70498150.17	70498150.17	70498150.17	70498150.17	70498150.17
		Equipment insurance fees	OI2	75998.06	75998.06	75998.06	77220.87	75556.59
	Management and overall costs	Employees salaries	OM1	86815.49	98390.88	104178.58	115753.97	127329.38
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	15.41	17.19	18.38	20.75	22.53
	Rent	Average Rent Per Building	OT1	9673149.66	9673149.66	9673149.66	9773675.07	9903757.15
		Rent per square meter	OT2	1197.32	1197.32	1197.32	1169.94	1223.37
		Income per building	OT3	11796209.79	11796209.79	11796209.79	11675958.81	11714568.3
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	17	7	14	11	-24
		Percentage of expiring leases	OO2	0.07	0.1	0.07	0.08	0.09
		Percentage of cash return	OO3	1.05	1.05	1.05	1.04	1.05
		Percentage of capitalization rate	OO4	0.54	0.54	0.54	0.54	0.52
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.07	0.07	0.07	0.07	0.07
Building Charastristics	Operational Charastristics	Available rentable area	BO1	30000.75	30000.75	30000.75	30000.75	30000.75
		Average Unit Cost Per Building	BO2	122.24	122.24	122.24	122.24	122.24
		Percentage of rentable area to gross area	BO3	0.86	0.86	0.86	0.86	0.86
	Physical Charastristics	Number of all units	BP1	769.72	769.72	769.72	769.72	769.72
		Average unit size	BP2	210.17	210.17	210.17	210.17	210.17
Performance	Rent	Rental Revenue	PR1	10718373.85	10718373.85	10718373.85	10678604.31	10649381.2
		Average rent lost due to vacant units	PR2	2806728.02	2653727.6	2538724.1	4664692.48	1388986.65
	Churn	Time to re-let	PC1	141	139	139	156	125
		Percentage of vacant units	PC2	0.1	0.09	0.05	0.06	0.33

C50

Categories	Sub-Categories	Metrics	Codes	2012	2013	2014	2015	2016
Capital Expenditures (CapEx)	Cost	Cost per square meter	CR1	3024.86	3024.86	3024.86	3024.86	3024.86
	Global Cost	Cost per square meter(total cost/ total rentable area)	CR3	2637.02	2637.02	2637.02	2637.02	2637.02
	Utilization	Income /expected income provided its rented all the year round	CR4	0.91	0.91	0.91	0.9	0.87
	Availability	rented time / (rented time + under maintenance + marketing time)	CR5	0.96	0.96	0.96	0.96	0.96
Operational Expenditures (OpEx)	Repair and maintenance	Number of planed maintenance requests	OR1	5106	5838	5383	4947	5609
		Number of unplanned repairs	OR2	2112	2910	1881	1393	753
		Percentage of planed maintance completed on time	OR3	1	1	0.88	1	1
		Percentage of unplanned repairs completed on time	OR4	3173.38	2810.71	3218.72	3173.38	3218.72
	Cleaning	Number of cleaning employees	OC1	0	0	0	0	0
		Equipment and material cost	OC2	173060.82	173060.82	88883.2	88883.2	88883.2
		Number of cleaning activities	OC3	365	365	365	365	365
	Energy	Cost of kilowatt per hour	OE1	13	14	15	21	26.8
	Water	Cost per meter cube	OW1	2	2.2	2.2	5.95	7.84
	General Consumption	Electricity and Water for General Services	OG1	296530	296530	311642	382892	429736
	Churn	Percentage of new tenancies	OH4	0.2	0.2	0.2	0.2	0.2
	Security	Number of security officers	OS1	1	1	1	1	1
		Number of security teams	OS2	1	1	1	1	1
		Security equipment cost	OS3	3000	3000	3000	3000	3000
		Number of security incidents per tenant	OS4	22.88	28.6	22.88	22.88	22.88
	Insurance	Building insurance fees	OI1	45489626.47	45489626.47	45489626.47	45489626.47	45489626.47
		Equipment insurance fees	OI2	130900.88	130900.88	130900.88	133033.62	131984.55
	Management and overall costs	Employees salaries	OM1	70588.49	80000.29	84706.19	94117.99	103529.79
		Management fee per tenancy	OM2	0.02	0.02	0.02	0.02	0.02
		Number of management team member	OM3	22	25	26	29	32
	Rent	Average Rent Per Building	OT1	10440122.96	10440122.96	10440122.96	10632296.41	10393416.64
		Rent per square meter	OT2	619.03	619.03	619.03	640.6	601.69
		Income per building	OT3	10899142.87	10899142.87	10899142.87	10558086.29	10771509.81
		Percentage of rent collection rate	OT6	1	1	1	1	1
	Occupation Cost and Leasing	Number of vacant units	OO1	2	2	1	2	0
		Percentage of expiring leases	OO2	0.08	0.1	0.08	0.08	0.09
		Percentage of cash return	OO3	1.18	1.18	1.18	1.18	1.13
		Percentage of capitalization rate	OO4	0.65	0.65	0.65	0.65	0.67
	Debt	Length of time in rent debts	OD1	30	30	30	30	30
		Percentage of overdue rent	OD2	0.09	0.09	0.09	0.09	0.09
		Percentage of tenants with unpaid rent	OD3	0.08	0.08	0.08	0.08	0.08
Building Charastristics	Operational Charastristics	Available rentable area	BO1	21550.65	21550.65	21550.65	21550.65	21550.65
		Average Unit Cost Per Building	BO2	135.17	135.17	135.17	135.17	135.17
		Percentage of rentable area to gross area	BO3	0.96	0.96	0.96	0.96	0.96
	Physical Charastristics	Number of all units	BP1	404.87	404.87	404.87	404.87	404.87
		Average unit size	BP2	136.73	136.73	136.73	136.73	136.73
Performance	Rent	Rental Revenue	PR1	19937655.07	19937655.07	19937655.07	20394931.64	19853953.86
		Average rent lost due to vacant units	PR2	392926.76	219303.68	323019.46	422778.81	486419.02
	Churn	Time to re-let	PC1	147.52	147.52	150.43	159.16	167.9
		Percentage of vacant units	PC2	0.15	0.07	0.21	0.15	0.22