

Statement of aim

Economics



Statement of Aim Topic: The impact of a monopoly firm on consumer choice in the electricity distribution industry. Aim: How does the lack of competition in the local energy sector affects consumer choice and consumer

satisfaction. Objectives The objective of this internal assessment is to: *

Analyze the contribution of JPS to the Jamaican economy * Determine the

strategies used by JPS in their service delivery to meet consumer demand *

Identify and evaluate the type of market structure in which JPS operates

Introduction The Jamaica Public Service (JPS) is considered as the sole distributor of electricity in Jamaica. It has inherited a tradition dating back to 1892 when Jamaica first received electricity. This as a result placed Jamaica in the forefront of technological advancement, as it was only thirteen years after an American scientist Thomas Edison had invented the electric lamp. In that year the first electricity service in the island was supplied by the Jamaica Electric Light Company which eventually became Jamaica Light and Power Company. In 1897, another company, the West India Electric Company, established an office at 151 Orange Street. Afterwards they built the hydroelectric plant on the Rio Cobre River at Bog Walk. Early in 1907, a severe earthquake destroyed a section of Kingston, disrupting city life and public services. Following this, West India Electric leased the property and businesses of Jamaica Light and Power Company and integrated the Gold Street Station into Bog Walk supply system which resulted in a significant improvement in the service available to customers. In this time several towns had their own electric companies but through a process of consolidation, buy- outs, amalgamations, Jamaica Public Service emerged and was registered in 1923. At the time, JPS had 3928 customers which are far from today's customer base of over 585000. The company was granted

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an all island franchise in 1966 and today remains the sole supplier of electricity. The nature of the ownership of JPS has changed several times throughout our history. The company started as a private company, owned by foreign shareholders. In 1970, the government of Jamaica acquired controlling interest. In 2001, ownership of JPS returned to private hands when Mirant Corporation, a US based energy service provider acquired 80% of the company, with the government retaining almost 20%. The remainder, amount to less than 1%, is owned by small group of shareholders. In 2007, Mirant sold its majority shares to Marubeni Caribbean Power Holdings (MCPH)Inc, a subsidiary of Marubeni Corporation in Japan. In early 2009 Abu Dhabi National Energy Company of the United Arab Emirates, joined Marubeni as co-owner of JPS. Majority of the shares are therefore held by Marubeni TAQA Caribbean. However the government didn't sell its 20% stock subsequent to this. The purpose of the internal assessment is to examine the Jamaica Public Service as a monopoly and how it affects the consumers'satisfaction. It will also indicate the different pricing strategies and production methods used by the company in order to maintain efficiency, i. e. how resources are allocated. Also, the market structure will be evaluated as well as measures the JPS Company have implemented to satisfy the needs of its consumers. In addition, the contributions to both the environment and the Jamaican economy. There will also be an in depth investigation on the operations used to supply the customers with electricity.

Methodology In conducting the research on JPS as a monopoly firm and how it affects consumer's choice/satisfaction. The different methods were used by the researcher in order to gather relevant data. To access primary data interviews were conducted while reports were pursued for secondary data.

The data collected by the researcher derived from a randomly selected sample of the employees at JPS. Both primary and secondary sources were used in data collection. This sample consisted of 15 people, 12 of which are customers of their services which were given questionnaires relevant to the research topic; the remaining 3 are employees whom will be interviewed. Interviews and questionnaires are considered to be primary sources. The different secondary sources of information which were used are: journal articles, the internet, texts books, pamphlets etc. After the process of data collection was completed, the researchers analyzed the data based on the objectives of the research. The findings were presented using diagrams and other practical forms of presentation. The research to be precise was conducted on October 22, 2011 for one and a half hour. Each interview lasted for 30 minutes with Ricardo Renalls — VP Customer Operations while the questionnaires were issued on October 23, 2011 to the consumers of JPS' services.

Description The Jamaica Public Service Ltd is an integrated electric utility firm and the sole distributor of electricity in Jamaica. It is engaged in the generation, transmission and distribution of electricity, and also purchases power from five independent power producers whom are considered as indirect competition; the Government Electrical Inspectorate (GEI), Jamaica Energy Partners (JEP), Jamaica Private Power Company (JPPC), Wigton Wind Farm and JAMALCO. JPS owns and operates 28 generating plants, 54 substations and approximately 14000 kilometers of transmission and distribution lines. The Jamaica Public Service is known to be a long term development of Jamaica that goes beyond provision of electricity, to include investment in programmes for sustainable development in the communities which it serves. In pursuing the objective of social responsibilities, the

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Jamaica Public Service sponsors educational programmes, community projects and sports initiatives across the island. Electricity is produced through various technologies used by JPS such as steam (oil fired), combustion gas turbines, combined cycle, diesel, hydroelectric and wind which are made possible by the four main power plants operating in Jamaica. By introducing these technologies the company can now achieve production efficiency where the firm is said to be operating at maximum output at minimum cost per unit of output. The firm is assumed to be making allocative choices concerning how much of each input factor to use and how much output to produce, given the cost (purchase price) of each factor, the selling price of the output, and the technological determinants represented by the production function. A decision frame in which one or more inputs are held constant may be used; for example, capital may be assumed to be fixed (constant) in the short run, and labor and possibly other inputs such as raw materials and outsourced power variable, while in the long run, the quantities of both capital and the other factors that may be chosen by the firm are variable. In the long run, the firm may even have a choice of technologies, represented by various possible production functions. The steam generation units are the foundation units of JPS' generating system, and are often referred to as base load units. In this process steam is generated using industrial process applications by the Jamaica Public Service Ltd. Hydro Power is another known technology used by JPS in producing electricity throughout the country. This is a process by which power is generated by harnessing the stream flow of a river and is using its potential energy due to the difference in height between its level and the centre of the turbine. The hydro turbine will then convert the potential energy of the water

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to mechanical energy. As it relates to electricity, JPS also uses the modern technology of wind power. As a part of the commitment to support the development of renewable energy, JPS made a power purchase agreement with Wigton Wind Farm Ltd whom uses the windmills to generate power as wind blows them. The power purchase agreement made by JPS will allow them to produce electricity using a cheaper means of production which will allow them to offer services at a lower cost to consumers. This farm is advantageously placed on the hills of Manchester due to the windy conditions it experiences at times. JPS also uses gas turbines to produce additional energy through the use of gas turbine engines. These are normally used when electricity use tends to be at its peak in the days due to the expensive oil it uses. In trying to adapt to the latest technologies in society and improve efficiency, JPS has introduced the combined cycle technology which is recognized internationally as one of the most advanced and efficient means of generating electricity. This technology allows for greater efficiency of conversion, hence, it utilizes less fuel to generate each unit of electricity relative to the company's other generating units. This as a result benefits JPS and customers because of the reduced costs. Figure 1 The diagram for a monopoly is generally considered to be the same in the short run as well as the long run. Profit Maximization occurs where $MR = MC$. Therefore equilibrium is at Q_m, P_m . Features of this diagram * There are barriers to entry in Monopoly. The Jamaica Public Service is a price maker. The electricity distribution industry demand curve is the same as the JPS' demand curve. * Profits are maximized at output where $MR = MC$. This means they set a price greater than MC which is allocatively inefficient. * In this diagram the firm makes supernormal profits because AR is greater than AC. The Jamaica

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Public Service (JPS) is believed to be operating in a monopoly market structure because it is the only firm in Jamaica that supplies electricity. The demand curve for their services is considered to be relatively inelastic, allowing them to exercise their monopolistic power and restrict the quantity, causing prices to rise substantially. Consumers will either have to comply with their price or go without electricity. The behavior of JPS' demand curve is distinct from the demand curve under indirect competition from firms such as the Jamaica Independent Power Producers, Wigton Wind Farm and so on. But the supply curve of the firm is similar to that of a competitive firm. Supply is governed by technical conditions of production. Figure 2 JPS is the sole supplier in the industry and, as a result, they can take the market demand curve as its own demand curve. JPS therefore faces a downward sloping AR curve with a MR curve with twice the gradient of AR. The firm is a price maker and has some power over the setting of price or output. It cannot, however, charge a price that the consumers in the market will not bear. In this sense, the position and the elasticity of the demand curve acts as a constraint on the pricing behavior of the firm. Assuming that the firm aims to maximize profits (where $MR = MC$) it is established that a short run equilibrium as shown in Figure #1. The profit-maximizing output can be sold at price P_1 above the average cost AC at output Q_1 . The firm is making abnormal " monopoly" profits (or economic profits) shown between ATC_1 and P_1 . The area beneath ATC_1 shows the total cost of producing output Q_m . Total costs equals average total cost multiplied by the output. Figure 3 A change in demand will cause a change in price, output and profits. In the example above, there is an increase in the market demand for JPS. The demand curve shifts out from AR_1 to AR_2 causing a parallel outward shift in

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their marginal revenue curve (MR1 shifts to MR2). We assume that the firm continues to operate with the same cost curves. At the new profit maximizing equilibrium the firm increases production and raises price. Total monopoly profits have increased. The gain in profits compared to the original price and output is shown between $Q_1...Q_2$ as well as $P_1...P_2$.

Analysis The Jamaica Public Service Ltd is the only firm in the electric utility industry, making it a monopoly firm. JPS is known to be a price setter since there is no form of competition in the industry. The company has the ability to choose what rates to charge for their distribution of electricity throughout the entire country. However, they are still constrained by the demand curve in that, having decided on price, they must allow the demand curve to determine quantity. As JPS rises the price of their services there will be a fall in the quantity demanded for their services. For JPS to achieve Pareto efficiency there needs to be efficient production, efficient consumption and an efficient production structure of resources. Efficient production occurs when there is no possibility to produce more of one commodity without reducing the output of another. Efficient consumption is when all commodities have been allocated to consumers and there is no way to increase satisfaction without increasing the number of goods available. Efficient production structure refers to a condition in which producing more of one good reduces the production of another good. JPS has highly contributed to the pollution of its environs through emissions when generating electricity for the public, this way the firm is able to achieve profit maximization thus being Pareto efficient. This is often seen as a threat to human life as well as plants as it is not considered healthy. The Jamaica Public Service Ltd has been able to produce and distribute electricity in the most efficient manner through the <https://assignbuster.com/statement-of-aim/>

use of technology. In producing electricity the firm uses steam generation, combustion gas turbine, combined cycle, hydroelectric and wind which were successful methods. The electricity is then generated to consumers where rates are charged based on how much is used over a specific period of time. During the time of consumption of electricity by the consumers, there is an electric meter to record how much is being used up, hence, allowing the price to be calculated easily and more reasonable. Over the years The Jamaica Public Service has implemented measures in order to achieve customer satisfaction. In keeping with their efforts to provide superior customer service, JPS has introduced a more personalized service facility for its large commercial and industrial customers. The Company has appointed three Key Account Managers, whose responsibility is to provide individualized, responsive, and comprehensive service to assigned corporate clients to ensure maximum customer satisfaction. These accounts include the company's largest energy users and chain accounts that have complex operations and unique business needs. Under the programme, Key Accounts no longer need to liaise with the various divisions and departments within JPS, as the Key Account Manager (KAM) acts as the single point of contact with the Company. Each KAM is charged with getting to know his customers' business, anticipating their needs, investigating queries, coordinating responses to their questions and concerns, creating customer-specific action plans, and developing specific recommendations to improve customer satisfaction. Key Account Services include: * Single point of contact/coordination for new connections and service upgrades. * Energy efficiency advice on blueprints and energy use analyses. * Energy management training and sensitization sessions for key staffers. * Billing

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analyses, rate comparisons and technical investigations. * Power quality monitoring and power factor correction support. The direct contact provided by the Key Account Manager will ensure that large customers are kept abreast of JPS' operations, plans, and programmes that may affect them.

Figure 4 If JPS produce in their industry with very high fixed costs, consumers can benefit from a large firm which can exploit economies of scale.

Economies of scale lead to lower long run average costs and therefore give the potential of lower prices. In terms of the demand for electricity from JPS by the consumers are affected by various factors. Demand refers to the power that is required of the system at any point in time. Some of these factors which affect the demand for electricity are: population growth, household income, weather conditions, and activities of the productive sector, the state of the Jamaican economy and the lifestyle of the consumers. According to JPS, the demand for electricity varies at different times of the day. In Jamaica the demand is said to be at its peak between 6:30pm and 9:30pm. During this time JPS will increase the power of electricity generated in order to support and therefore will be efficient in doing so.

Although JPS is a monopoly firm its supply of electricity is influenced by other determinants than price which are the prices of other energy sources (solar, wind etc). Other determinants are as follows: the price of producing electricity to supply the country with, the prices of the factors of production and also the state of the technology they use to supply electricity. Evaluation Over the years JPS has been considered to be one of the best corporate citizen in the Jamaican society. They play a critical role in the development of the Jamaican economy; this role extends beyond providing electricity to the public and includes support for organizations involved in the country's

economic development. The Jamaica Public Service pays the amount of tax levied to them and thus contributing to the economic growth. JPS has a workforce of approximately 1600 workers which had contributed to our rising rates of unemployment in the country. These workers as a result have to pay taxes to the government as they earn (PAYE). This tax paid will help to develop educational and health facilities in Jamaica. The Jamaica Public Service Ltd has invested heavily in the development of the youth in the country. This investment contributes to the educational system. Such educational programmes includes: early childhood nutritional support programme through which they provide approximately 15, 000 preschoolers with breakfast/lunch daily to help them to make the most of their learning opportunities. The JPS science and technology expo held in collaboration with the scientific research council and the Association of Science Teachers of Jamaica is one of their major projects. The expo is open to students from primary through to tertiary level and gives students the opportunity to display their scientific innovations and inventions. The Jamaica Public Service Ltd also renovated the University of Technology electrical engineering laboratories and others. JPS also invested in sports primarily at the community level is one of the many ways in which they contribute to the development of the Jamaican young people and the community life they share. They sponsor sports such as football, netball, basketball etc. in terms of health as it relates to JPS, they are active participants in creating a society of individuals who are physically, mentally, and emotionally healthy. JPS primary contribution to the health sector includes regular donations to the Burn unit at the University Hospital of the West Indies, as well as ongoing support of the Spanish Town Hospital in ST. Catherine. The Jamaica Public

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Service Ltd is committed to being a good steward of the environment. The company has made environmental management one of its highest priorities, with a commitment to comply with all applicable environmental laws and regulations and they also promote cost-effective energy management programmes among employees and customers. JPS environmental policy is based on the principle of responsible business practices. The company's primary objective is to conduct its operations in a manner contributing to sustainable development, ensuring that it meets the needs of the present generation without compromising the quality of life for future generations. In order to protect and develop the environment through the use of resources JPS engages in the following operations: environmental remediation, emissions management, oil spill and industrial waste management, the renewal of renewable energy. In terms of customer complaints the Jamaica Public Service created a website where customers can visit in order to inform the company about their problem(s). The complaint will be then passed to the Legal Division to be resolved. If the complaint is still unable to be amicably resolved, it will be escalated. Otherwise customers can call the company in order to satisfy their needs. The Jamaica Public Service (JPS) has always had problems in keeping the prices of their services low due to the high cost of productions. However they estimated the cost of electricity generation when using a cheaper fuel in Jamaica. In particular, JPS examine the option of using LNG as a fuel, on the basis this is the option currently being pursued. In effect, the prices charged by The Jamaica Public Service from residential customers will be reduced and the method will also lower the energy cost for industrial firms. They base their assumptions on the OUR's Generation Expansion Plan 2010, which recommends the

commissioning of three NGCC units of 120MW each in 2014, and another 120MW unit in 2016, and also recommends that JPS's existing oil-fired units are no longer dispatched regularly, but kept in reserve in case of emergency. In addition, it can be assumed that JPS would convert its existing combined cycle plant located at Bogue ('Bogue plant') to use LNG as fuel, using cost estimates from JPS. The Office of Utilities Regulation was created by the parliament in order to ensure stability in the utilities industry as well as to optimize the satisfaction of consumers. The role of the OUR is to contribute to national development by creating an environment for the efficient delivery of utility services to the customers while ensuring that service providers have the opportunity to make a reasonable return on investment, as a result of this The Jamaica Public Service is in control to an extent due to the fact that they have to follow the rules of the OUR. This way the firm is not able to abuse the consumers in terms of setting the price for their services which affects their monopoly characteristic of being a "price setter" because of the OUR's intervention. Due to the plan for the use of the LNG fuel to supply electricity to the public, JPS will now be able to offer their services at a lower price due to the reduction in the cost of production. According to the theory of demand there will be an increase in the demand for JPS services because of the reduction in the price levels charged by the firm. As a result JPS will be able to retain their competitive edge in the electricity distribution industry. Table 1 below demonstrates how we calculate the Long-Run Marginal Cost (LRMC) and Short-Run Marginal Cost (SRMC) of new NGCC capacity. A key component of the LRMC is the capital-related charge which depends on the required rate of return in electricity generation projects. The firm uses a discount rate of 11.95 percent, based on the OUR's estimation of the

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Weighted Average Cost of Capital for the electricity sector in 2009. The figures for the NGCC plant are based on figures provided in the OUR's 2010 Generation Expansion Plan. The estimates for capital cost and fixed operation and maintenance cost do not appear to be market-specific for Jamaica (given local duties, taxes and construction costs), and therefore are likely to be lower than the actual cost of commissioning and operating a NGCC plant in Jamaica. However, these figures should provide a sense of the order of magnitude for the LRMC and SRMC of a NGCC plant in Jamaica. It is known by many that The Jamaica Public Service will follow the OUR's approach of using constant real prices. Average price of natural gas for the period 2010-2029* (a) | US\$/MMBtu | 8.96 | Plant heat rate** (b) | MMBtu/kWh | 0.007255 | Installed capacity (c) | kW | 120,000 | Unit capital cost*** (d) | US\$/kW | 1,317 | Fixed O&M costs (e) | US\$/kW/month | 1.07 | Variable O&M cost (f) | US\$/kWh | 0.00253 | Lifetime (g) | Years | 25 | Availability**** (h) | % | 90 | Typical output per year (j = c*h) | kWh/kW/year | 7,873.20 | Total capacity cost (k = c*d) | US\$ | 158,040,000 | Annualized capital cost (l) | US\$/year | 20,080,225 | Annual fixed O&M cost (m = e*c*12) | US\$/year | 1,540,800 | Typical annual output (n = c*j) | kWh/year | 944,784,000 | Capital cost recovery factor (o = l/n) | US\$/kWh | 0.021 | O&M cost per kWh (p) | US\$/kWh | 0.002 | LNG cost per kWh (q) | US\$/kWh | 0.065 | LRMC (= o+p+q+f) | US\$/kWh | 0.09 | SRMC (f+q) | US\$/kWh | 0.07

| Table 1 *Derived from projected LNG prices over the period 2010-2029 (from the Generation Expansion Plan), and adding US\$2.5/MMBtu for freight and transport charges to the plant **Converted from a heat rate of 7,654kJ/kWh using a conversion factor of 1,055 MJ per MMBtu ***Includes interest during construction, but is unlikely to include local duties, taxes and

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construction costs. ****Assuming a forced outage rate of 3 percent and 26 planned outage days Source: Office of Utilities Regulation (2010), Generation Expansion Plan 2010. Recommendation * Improve efficiency of fuel conversion for energy generation, giving consideration to clean technologies to minimize pollution. Gas is also to be considered as a replacement fuel. * Increase workers motivation which will eventually lead to greater levels of productivity. * Set objectives that will serve as a guide for the company in order for them to achieve their vision statement. * Continue supporting the community as well as the government to improve the economic well being of the country. * Due to the benefits from economies of scale, the company can drop their prices in order to satisfy consumers. * The firm should develop an alternative energy source. Conclusion The Jamaica Public Service is the sole distributor of electricity in Jamaica thus making them a firm operating in a monopoly market structure. Market power sets monopolies apart from competitive firms. Market power is the ability of a firm to affect the market price. A firm in a competitive market doesn't have the ability to affect the market price since it holds a small share of the market and can easily be undercut by another firm. A monopoly exists when there is a single firm in an industry; it can change output to directly affect the market price. To profit maximize, a monopoly will choose to produce where $MR = MC$. This makes sense: a monopoly will continue to produce additional units of output as long as the revenue from each additional unit is greater than the cost of each additional unit, once additional unit costs more than it can generate in revenue, the monopoly will stop producing. JPS has a number of characteristics being a monopoly firm such as: Barriers to Entry and Exit JPS is generally assured of being the ONLY firm in a market because of assorted

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barriers to entry. Some of the key barriers to entry are:

(1) government license (2) resource ownership, (3) patents and copyrights, (4) high start-up cost, and (5) decreasing average total cost. Single Supplier

The single seller, of course, is a direct contrast to perfect competition, which has a large number of sellers. The most important aspect of being a single

seller is that the monopoly seller is the market. The market demand for a good is the demand for the output produced by the monopoly. This makes

monopoly a price maker, rather than a price taker. Unique Product/service

JPS supplies a unique service to the public which is electricity making them the only producers of this service. There are no close substitutes for this

service and so this enhances the profitability of the firm. Limitations * In the

process of this research there was a difficulty in evaluating the sources in order to obtain relevant information because of the abundance of

information. * Relating the data collected to the statement of aim was seen as a challenge by the researcher. Appendices Questionnaire for customers:

1. How would you describe the quality of the services offered by JPS? Good

Satisfactory Poor 2. Do you think that JPS is a negative contributor to the

Jamaican economy? Yes No To an extent 3. If yes state why do you think so?

4. Do you think that JPS should be assigned a competitor by the

government? Yes No 5. If yes why? 6. JPS is known for high levels of air

pollution through emissions. Have you witnessed any attempts by JPS to curb pollution in Jamaica? Yes No 7. If yes give examples of such acts. 8. Would

you describe the rates charged on electricity by JPS fair? Yes No 9. How JPS

does contribute to the communities in Jamaica? Interview for employers of

JPS: 1. In which market structure is JPS currently operating in? Monopoly

Oligopoly Monopolistic competition Perfect competition 2. How would you

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describe this type of market structure? 3. How do JPS allocate its resources in order to reach the profit maximization level? 4. Describe how JPS contributes to the Jamaican economy through tax and employment. 5. Is JPS currently experiencing economies of scale? Yes No 6. Describe this situation if yes in terms of benefits. Bibliography * Sloman, J. Economics, 6th Edition, Prince Hall, 2006 * Hosein, R., and Gookool, R. Cape Economics Study Guide Unit1, Caribbean Examination Council, 2007. * The Jamaica Public Service, (n. d.) Operations of JPS January 18, 2012 from <http://www.jpSCO.com/> * Anderton, A. Economics, 4th Edition, Causeway Press