Spring 2018

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Abstract

As national medical expenditures increase in Japan, due to the country's aging society, the

Japanese pharmaceutical industry is under pressure to act as a good corporate citizen. This

analysis examines factors related to Corporate Social Responsibility (CSR) in Japanese

pharmaceutical companies. Following an exploration of the literature on CSR, a theoretical

model is presented, where larger pharmaceutical companies with more owners and

international stakeholders are more likely to engage in CSR activities. This model is tested

in the context of CSR reporting, and results support the notion that more owners and

international stakeholders are both positively related to CSR reporting in Japanese

pharmaceutical companies.

1. Introduction

The objective of this analysis is to offer an analysis of factors related to the Corporate Social

Responsibility (CSR) reporting activities of Japanese pharmaceutical companies. The

Cabinet Office of the Government of Japan (2016) reports that 26.7 percent of the total

Japanese population was over 65 years old in 2015. In addition, Yamada (2015) argues that

the significant growth of Japan's aging population has caused a steady increase in

government medical expenditures, which exceeded 40 trillion yen in 2015. As the national

expense of drugs increases in Japan's aging society, the Japanese pharmaceutical industry is

becoming one of the highest-profile industries. Also, in 2015, CEO Martin Shkreli, of the

American pharmaceutical company Turing Pharmaceuticals, raised the price of the drug

Daraprim, which is used by some AIDS and transplant patients, from $13.50 to $750 a pill

after his company obtained the manufacturing license for the drug. As pharmaceutical

companies become more prominent due to rising demand for drugs in Japan, there is an

increasing awareness about the need to prevent Japanese pharmaceutical companies from

engaging in unethical behaviors, such as those exhibited by Turing Pharmaceuticals. The

importance of ensuring good corporate citizenship in this context is illustrated by an

increasing degree of political, economic, socio-cultural, technological, environmental, and

legal pressures from the government, consumers, and other pharmaceutical industry

stakeholders in Japan. Beyond, the societal benefits of pharmaceutical company CSR, these

firms are more likely to be viewed as legitimate if they are behaving in a responsible

manner. Hence, exploring the factors associated with pharmaceutical company CSR, as

measured by CSR reporting is relevant from both policy and firm strategy perspectives.

To achieve the objective of this analysis, this article is divided into several sections.

First, selected and relevant definitions of Corporate Social Responsibility (CSR) will be

introduced. Next, a number of selected and relevant factors associated with CSR activities

will be identified. Third, the macro-external environment of the Japanese pharmaceutical

industry and the competitive environment of the Japanese pharmaceutical industry will be

described. Fourth, a model of the factors associated with CSR specifically in Japanese

pharmaceutical companies will be presented along with hypotheses. And finally, an

empirical analysis will test these hypotheses and the results will be discussed.

2. Background

2.1 Definition of CSR

Researchers have recently focused their attention on corporate social responsibility (CSR)

because of a growing social awareness of the issue and pressure on companies to behave in

a socially responsible manner. For example, as most researchers who study CSR do, Villagra

(2016) mentions that the degree of communicated CSR actions has a clear influence on stakeholders' perceptions and the value of an organization. Thus, CSR has an impact on corporate existence. Kamal (2015) claims that an increased level of globalization has urged corporate entities to engage in CSR activities aimed not only at local stakeholders but also at global stakeholders such as foreign citizens, governments, and non-governmental organizations (NGO). In addition to considering the intensified impact of stakeholders, some researchers focus on CSR's relationship with stockholders' wealth. Specifically, Zakir (2016) conducted research on the association between CSR activities and stock returns, while Friedman (2002) has been opposed to increased social pressure for CSR because it does not focus on maximizing shareholders' profit.

Table 1: Selected and relevant definitions of Corporate Social Responsibility

Authors (Year)	Definition
Carroll (1979)	"the social responsibility of business encompasses the economic, legal, ethical, and discretionary expectations that society has of organizations at a given point in time"
Castelo and Lima, (2006) as cited in Gras-Gil, (2016)	"ethical and moral aspects about corporate decision-making and behavior and, as such, addresses complex issues like environmental protection, human resources management, health and safety at work, local community relations, and relationships with suppliers and customers"
European Commission (2001)	"a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis"
Nascimento et al., (2008) as cited in Cohen, (2017)	"the company´s initiatives that benefit society and corporations, by considering factors such as economy, education, environment, health, transportation, housing, local activity and government"
Freeman (2007)	"Business is about how customers, suppliers, employees, financiers (stockholders, bondholders, banks, etc.), communities, and managers interact and create value."
Yılmaz (2016)	"doing business in ways to ensure minimal negative impacts on stakeholders while undertaking initiatives in various domains aimed at contributing to the community and the environment"
Barin Cruz and Boehe, (2008) as cited in Rosolen, (2016)	"integrated strategic, ethical, social, and environmental concerns, on a voluntary basis, in business operations and in companies' interaction with their stakeholders"
Villagra (2016)	"the necessity of reconciling corporate development with ethical, social, and environmental aspects"
Zakir (2016)	"the legal, economic, ethical and charitable expectations of society from an organization"
Blowfield and Murray (2008)	"CSR is the proposition that companies are responsible not only for maximizing profits, but also for recognizing the needs of such stakeholders as employees, customers, demographic groups and even the regions they serve"
Friedman (2002)	"In [a free economy] there is one and only one social responsibility of business—to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game"
Kamal (2015)	"to balance their operations with the concerns of internal and external stakeholders such as employees, customers, suppliers and business partners, labor unions, local communities, non-governmental organizations and governments"

Authors have offered many definitions of CSR, as illustrated by a sample of 12

definitions by researchers from Asia, Africa, Europe, South America, and North America

presented in table 1. All the definitions commonly emphasize benefiting stakeholder(s) in

defining CSR. Among the types of stakeholders, "customers" were the most frequently listed in the definitions. Also, the three terms most commonly used in the definitions are social/society, ethical, and environmental/environment. Except for Friedman's (2002) definition, all researchers have defined CSR by factoring it into a well-dedicated relationship with customers, the ethics of a corporation, enhancement of welfare of society and environmental protection involvement. While a non-monetary aspect of CSR was highly emphasized in many definitions, the term economic/economy was also frequently used. Some researchers such as Zakir (2016) and Carroll (1979) have indicated economic activity as a vital element of CSR.

Friedman's explanation of CSR is unique in that it focuses on maximizing a company's bottom line and shareholder wealth (2002), while other definitions state the importance of the equilibrium of business development and the welfare of both internal and external stakeholders. Another difference among definitions is the geographic area in which CSR should be concentrated. Freeman (2007), Nascimento et al. (2008) and Yılmaz (2016) have all focused on a corporation's responsibility to serve local community and government. On the other hand, Kamal (2015) also stressed the corporation's contribution to NGOs and foreign governments.

Through interpretation of the global definition, or definitions, of CSR, the commonly emphasized factor appears to be ethical commitment to the enrichment of all stakeholders while succeeding in business operations and development. Hence, it is reasonable to conclude that the definition of CSR is to be a moral entity, which constantly uses the best business practices to promote the welfare of all stakeholders while achieving economic efficiency and productivity of its operations.

2.2. Factors related to CSR

In addition to having various definitions, authors have also identified various factors associated with CSR as illustrated in Table2. Udayasankar (2008) argues that the size of a firm can be a determinant of its CSR participation. She focuses on firm size, resource access and scale of operation and concludes that medium-sized companies are the least CSR minded while both small and large firms are more likely to participate in CSR activities. Therefore, there is a U-shaped relationship between firm size and CSR participation. McGuire et al. (1988) insist that the level of CSR commitment is positively related to a company's financial performance, evaluated by stock returns and accounting-based measures. They point out that a firm experiencing lower profitability will be less motivated to act in a socially and environmentally responsible manner while robust financial performance positively affects CSR policy and the actions of a company. Knudsen (2015) claims that religious and cultural traditions surrounding a corporation are an important factor for its ethics and philanthropic actions. When the interests of a certain religion and its respective norms is dominant for the business practice, a corporation is more likely to take the initiative in charitable giving for social well-being. Cedillo et al. (2014) mention that when a multinational enterprise (MNE) provokes a conflict and suffers from a firm's adverse reputation, the MNE is more likely to reinforce its existing CSR policy and disclose it to the public.

Table 2: Selected and relevant factors related to CSR

Authors (Year)	Factor
Udayasankar (2008)	argues for a U-shaped relationship between size (X) and CSR participation (Y).
McGuire et al., (1988)	

Knudsen (2015)	CSR commitment is related to financial performance/profitability of a company.
Cedillo et al. (2014)	religious factors are correlated with philanthropic activities by a corporation.
Jamali et al. (2008)	CSR policy of Multinational enterprises (MNEs) is correlated with conflicts caused by their business practices.
Kim et al. (2014)	a salient two-way relationship between Corporate governance and CSR.
Jingchen (2012)	a mutual relationship between CSR behaviors and investment activities.
del Mar Miras Rodriguez et al. (2016)	there is a link between CSR engagement and the harmonious society.
Campbell (2007)	board size and reference shareholders (having a majority of voting right) have a positive relationship with CSR reporting practices.
	moderate level of competition tends to elicit CSR activity while high or low level of competition has a negative relationship with CSR engagement. Also, being monitored by NGOs and other independent organizations is correlated with more socially responsible behaviors of a company.
Robin (1992)	a company in high profile industries is related to higher levels of CSR disclosure.
Chih et al. (2010)	firms in countries with higher quality management schools, higher cooperative employer-employee relations, and a better macroeconomic environment are related to CSR orientation.
Fligstein (2001)	institutionalized dialogue with external stakeholders has a positive relationship with CSR policy and activities

Jamali et al. (2008) maintain that Corporate Governance (CG) functions as a pillar for a maintainable CSR orientation. Thus, a firm with CG supported by strategic leadership, effective internal governance mechanisms, and ensured accountability for internal stakeholders is more likely to commit to genuine and long-term CSR activities. Kim et al. (2014) found a significant relationship between firm investments and CSR activities of a firm. They also note that type of strategic investments is related to the areas of CSR activities engaged by a firm. Specifically, a firm's short-term and exploitative investments

have a positive correlation with CSR activities, particularly related to human resources, the

environment, sustainable business behavior for customers and suppliers and community

involvement, whereas long-term and explorative investment indicates a positive

relationship with CSR activities, particularly related to human rights and a negative

relationship with CG. Jingchen (2012) contends that the central belief of a harmonious

society is that taking care of the community as a part of an extended family of sorts is

positively related to a firm's objective, which is to cooperate with each other to prioritize

the welfare of the society as a whole over merely operating lawfully and economically.

Alternatively, del Mar Miras Rodriguez et al. (2016) found that both the number of board

directors and the existence of a reference shareholder, which owns a majority of the voting

rights within a company, have a significantly positive relationship with the complexity of

CSR disclosure practices, which enhances the credibility and quality of the disclosures.

Campbell (2007) points to a curvilinear relationship between levels of competition and CSR

activities of a company. Corporations are less likely to take a socially responsible action

while facing either too much or too little competition, whereas moderate levels of

competition have a positive relationship with CSR activities. Campbell also contends that

corporations will engage in greater levels of social responsibility when there are more

private organizations such as NGOs keeping them in check.

Additionally, Robin (1992) identified a positive and significant relationship between

companies being in high profile industries, (i.e., concentrated, with high consumer visibility

and a high level of political risk) such as the automobile and oil industries, and a higher

levels of CSR disclosure. Chih et al. (2010) found that corporations in countries with more

professionalized business education environments assessed by the Quality of Management

Schools Index are more likely to be socially responsible. Moreover, their study also showed that a more cooperative employer-employee relationship motivates firms to commit to CSR activities. Additionally, Chih and colleagues (2010) find that the macroeconomic environment evaluated by inflation rate (INF), the industry production index rate (IPI), and consumer confidence index (CCI) affects the degree of CSR activities. Specifically, the healthier the macroeconomic situation in terms of INF, IPI and CCI, the more a company takes an initiative in CSR actions, and vice versa. Fligstein (2001) offers that when a corporation as a whole belongs to industrial or employee associations and interacts with not only internal stakeholders but also external stakeholders, they are more likely to take all stakeholders' concerns into account in their corporate policy, which results in more socially responsible actions of a company.

2.3. The macro-environment of the Japanese pharmaceutical industry

There are a number of macro-external factors that are relevant to the Japanese pharmaceutical industry, as illustrated in Table 3. In terms of political factors, Yamada (2015) argues that the Japanese government's price ceiling of medicine is a political force surrounding the Japanese pharmaceutical industry. He explains that the growth of Japan's aging population has caused a steady increase in medical expenses paid by the government, which has surpassed 40 trillion yen. This increase in national health expenditures is a factor contributing to Japan's national budget deficit, and this has resulted in pressure to reduce drug costs. The government has lowered the standard prices for medicines, and this has negatively affected sales in Japan's pharmaceutical industry as a whole within the Japanese market, while in foreign markets, some firms, such as Takeda Pharmaceutical

Company, have achieved stable or increasing sales. Yamada also observes that the Japanese

government promotes the supply of generic drugs, which are medicines with expired

patents that have been manufactured and sold by other companies. Generic medicines are

effective for pharmaceutical companies since they can greatly reduce costs. For example,

generics do not entail the same R&D expenses as new drugs do. Therefore, generics are

generally sold at lower prices, and government support and increasing substitution of

generics can help to cut national medical expenditures. On the other hand, the sales of

pharmaceutical companies, which have invested heavily in developing new drugs, can be

undercut by generic manufacturers. This situation has reduced the incentive for Japanese

pharmaceutical companies to invest time and money into R&D and the development of new

drugs.

Table 3: The macro-external environment of the Japanese pharmaceutical industry

Political
- Japanese government focuses on lowering price of medicine and promotion of generic drugs due to high medical costs (Yamene, 2015)

Economic

- The trade deficit in medicine is steadily increasing as the amount of imports grows every year (Ministry of Health, Labor and Welfare of Japan, 2013)
- Intensified competition due to generic medicine (Omoto and Kudo, 2016)
- Market entry and increasing market share of foreign companies (Okada, 2012)
- From 2008 to 2014, foreign sales increased, while in domestic sales were flat (Ministry of Health, Labor and Welfare of Japan, 2015)
- Increase in M&A activity and growth of merged firms (Maeda, 2017)

Socio-cultural
- 26.7% of total Japanese population was over 65 in 2015 (Cabinet Office, Government of Japan, 2016)

Technology
- International R&D has a positive relationship with the patent output of Japanese pharmaceutical companies (Penner-Hahn and Shaver, 2004)
- Strategic alliance between university and pharmaceutical companies (Nikkei, 2015)

Environmental
- As political and societal interest of environmental business practice increases, 73 pharmaceutical firms belonging to Japan Pharmaceuticals Manufacture Association (JPMA), which sets environmental objectives (Japan Pharmaceuticals Manufacture Association, 2016)

Legal
- Revision of patent: enforcement of substance patent in 1976 (Kosaka, 2012)
- Enforcement of Market Expansion Reprising law (Okada, 2012)

In terms of economic factors, the Ministry of Health, Labor and Welfare of Japan (2013) reported a trade deficit of 1.62 trillion yen in 2012. From 2000 to 2012, imports have quadrupled. Omoto and Kudo (2016) discuss the long lasting intense competition of the industry due to changes in the environment surrounding Japanese pharmaceutical companies. Although the pharmaceutical industry has been associated with high and stable profits over time, Omoto and Kudo point to the decrease in sales of Japanese pharmaceutical companies. These authors offer that the decreasing profit rate of pharmaceutical companies is highly associated with the increased market share of generics, which was 54.4 percent in 2015. Moreover, the government has announced a new objective for generics to occupy over 80 percent of market by 2020. Japanese pharmaceutical companies are also required to exhibit higher quality and safety in

medicines while competing against generics and complying with the government's falling

price ceiling on drugs. In addition to competition intensified by generics, Okada (2012)

offers a warning about the market entry of foreign pharmaceutical companies and the

increase of their market share. Many Japanese pharmaceutical companies are no longer

earning the highest sales in the domestic market. For instance, Pfizer, an American

company that also happens to be the world's highest selling pharmaceutical corporation,

surpassed Takeda Pharmaceutical Company, Daiichi Sankyo Company, and

MitsubishiTanabe Pharma in 2011. Among the top 10 highest earning pharmaceutical

companies in the Japanese market in 2011, six of them were foreign enterprises. Okada

explains that the leading strength of foreign pharmaceutical companies is a higher number

of new drugs compared to Japanese pharmaceutical companies. As the Japanese

government's promotion of generics stifles incentive for the R&D of Japanese

pharmaceutical companies for new drugs, Japanese pharmaceutical companies cannot

compete against foreign companies with a large amount of capital for new drug

development. Moreover, in 2010, following a request from the drug associations of Japan,

the U.S., and Europe, the Japanese government has implemented a pricing premium for new

drugs. Many new drugs aiming for the pricing premium are manufactured by foreign firms,

and thus have been associated with increased earnings of foreign firms. Okuda infers that

the level of competition with the industry will increase due to the continuous growth of

foreign pharmaceutical companies with plentiful capital and R&D in the Japanese market.

Contrary to the decrease in sales of Japanese pharmaceutical companies in the domestic

market, the Ministry of Health, Labor and Welfare of Japan (2015) reported favorable sales

performance of Japanese pharmaceutical companies in foreign markets. In 2008, total sales

of Japanese pharmaceutical companies were 29,555 billion yen, and in 2014, it increased to 40,520 billion yen. As foreign markets seem more attractive, Maeda (2017) points to the increase in M&A of Japanese pharmaceutical companies and merged companies' growth. From 2005 to 2008, eight pharmaceutical companies were established through M&A. For instance, in 2005, Yamanouchi Pharma and Fujusawa Pharmaceutical Corporation merged into Astellas Pharma, which has specialized in the development of new drugs. Astellas Pharma also sold their subsidiary to Daiichi Sankyo, which was established in 2005 through an M&A between Sankyo and Daiichi Pharma. In 2010, Astellas Pharma also acquired an American company, OSI Pharmaceuticals. The profits of Astellas Pharma in 2016 surpassed Takeda Pharmaceutical Company, which was the largest Japanese pharmaceutical company, and the company is predicted to continue growing.

In terms of demographic factors, the Cabinet Office of the Government of Japan (2016) estimated the percentage of those who were age 65 or older to be 26.7 percent of the total population in 2015. The average lifespan of a Japanese citizen is extending every year and is estimated at 84 years for males and 91 years for females. As Japan continues to have the oldest population in the world, the government's national medical spending is likely to continue to grow steadily.

In terms of technology factors influencing the Japanese pharmaceutical industry, Penner-Hahn and Shaver (2004) have found a correlation between international R&D and increased levels of patent output for Japanese pharmaceutical companies when the firms are equipped with research capability in underlying technologies before expanding globally. The Nikkei (2015) states that the Japan Agency for Medical Research and Development has established a consortium, which promotes alliances between

pharmaceutical companies, universities, and public research institutions. The purpose of the alliances is to invent new drugs for cancers, heart diseases, Alzheimer, and so on. Pharmaceutical companies offer chemical compounds while universities and public research centers provide proteins associated with various diseases and then research and utilize chemical compounds which work the best for the proteins, as substances for new drugs. Pharmaceutical companies which offer qualified compounds obtain first refusal rights for the development of new drugs and commercialization through the consortium.

Additionally, political and societal interest in eco-friendly business practices is increasing universally, and the Japanese pharmaceutical industry has been subject to this trend as well. In response, the Japan Pharmaceuticals Manufacture Association (JPMA) was formed. JPMA (2016) includes 73 pharmaceutical firms, which have agreed to achieve three main environmental objectives: reduction of CO_2 emission, industrial wastes disposal, and hazardous air pollutants.

Next, the regulations and laws, which affect the Japanese pharmaceutical industry, have changed over time. Kosaka (2012) notes that prior to 1976, there was only a process patent for medicines, which only offered protection for the manufacturing method of a medicine. However, a patent law revision in 1976 implemented a substance patent, which protects the use of active ingredients registered in the chemical formula and the name of a chemical substance. Kosaka found that after the enactment of this substance patent, R&D expenditures of Japanese pharmaceutical companies grew significantly. Okada (2012) remarks that along with the pricing premium mentioned above, the Japanese government has also enforced another regulation, called Market Expansion Reprising. This regulation functions as a price adjustment for medicines that are oversold. If the actual annual sales of

a drug exceed 150 billion yen, or twice anticipated annual sales, the company needs to

lower the price of the drug by at least 25%. Some products of Japanese pharmaceutical

companies have been subject to this rule, and again this causes a reduction of sales and

capital required for R&D expenditures for new drug development.

2.4 The competitive environment of the Japanese pharmaceutical industry

In addition to describing the macro-external environment surrounding Japanese

pharmaceutical companies, it is also useful to consider elements of a competitive

environment in this research context, as illustrated in Table 4. In terms of the threat of new

entrants to the Japanese pharmaceutical industry, Ono et al. (2015) points to high barriers

to entry in the industry due to numerous operating costs. Although profit margins on drugs

tend to be high due to low manufacturing cost, a period of R&D (from initiation of R&D to

permission for commercialization) for a new drug generally takes between 9 to 17 years.

Additionally, there is an extremely low rate of successful development for new drugs, and

including failed drugs, the average R&D expenditures for an ingredient are estimated to be

100 billion yen. On the other hand, it takes only 3 to 4 years for a pharmaceutical company

to commercialize a generic drug since the clinical tests and examination for a generic are

more simplified. R&D expenses for generic drugs are relatively inexpensive compared to

new drugs, but they still cost tens of millions of yen. Kusano (2012) notes the increasing

amount of foreign pharmaceutical companies that have succeeded in market entry. Foreign

pharmaceutical companies used to be hesitant to participate in Japan's market since in

addition to the high R&D cost, there were numerous costs to facilitate a clinical trial and

pass strict government examination for commercialization. However, a pricing premium

for a new drug, increased demand for medicines due to the aging population, and the

reduction of medical expenses in foreign governments' budgets incentivized foreign

pharmaceutical companies to engage in market expansion in Japan. Moreover, in Japan,

unlike other countries, there used to be an issue with "drug lag", which occurred when

Japan's government was taking a longer period of time to offer permission for the

commercialization of a drug already sold abroad. However, the Japanese government has

solved most drug lag issues, and this has encouraged the market entry of foreign

companies. As foreign mega-pharmaceutical companies, such as Pfizer, operate in Japan, 75

percent of the new drugs in Japan are developed by foreign companies. This effectively

allowed Pfizer to achieve the highest sales in Japan's market, as Pfizer primarily earns

capital from a pricing premium on new drugs.

Table 4: Japanese pharmaceutical companies in Porter's five-forces framework

Treat of new entrants to the industry
- High start-up cost and R&D expenses (Ono et al., 2015)
- Successful market entry of foreign pharmaceutical companies (Kusano, 2012)

Threats of substitute products
- Established intellectual property system and an extension of the life of a patent (Office of Pharmaceutical Industry Research, 2009)
- Rapid increase of generic drugs (Nakanome, 2010)

Bargaining power of customers
- The amplified relationship with wholesalers, whose numbers are decreasing (Koike, 2015)
- Biannual price standardization by Japanese government (Iiyama, 2012)

Bargaining power of suppliers
- Increased importance of outsourcing clinical studies (Office of Pharmaceutical Industry Research, 2014)

Rivalry among current competitors in the industry
- Decrease in the number of domestic pharmaceutical companies and increase in degree of market concentration (Japan Pharmaceuticals Manufacturing Association, 2015)
- Stagflation of revenue growth rate in domestic market (Maeda, 2017)
- Brand loyalty constructed on brand-name drugs (Ono et al., 2015)
- Key domestic companies are diversified (Nagao, 2017)

In terms of threats from substitute products, the Office of Pharmaceutical Industry

Research (2009) notes that both Japan's established intellectual property law, and the

extended life of a patent, grants a pharmaceutical company monopolistic manufacturing and sales rights over a drug. Although Japan's patent duration used to be 15 years after patent was requested, a revision of the patent law in 1995 has changed it to 20 years and also permitted an extension for a period of time. Contrary to the monopolistic power of a pharmaceutical company through a patent, Nakanome (2010) claims that the Japanese pharmaceutical industry is no longer securing a high profit margin of patented drugs. Around the year 2010, as the patents for a number of major drugs expired, there was a large increase in cheaper generic medicines introduced into the market. As generics create cost-efficiency for pharmaceutical companies and receive the government's support for their sales, the pharmaceutical industry has been experiencing lower earnings.

In terms of the bargaining power of customers, Koike (2015) points to the amplified importance of relationships with drug wholesalers as supply chain partners. The number of wholesalers decreased from more than 300 in 1989 to a mere 79 in 2015 due to lower gross margins. However, 97 percent of Japanese medicines are distributed to the market through drug wholesalers who facilitate logistics, conduct price negotiations with customers, do sales promotion, and deal with reverse channels for returned drugs on behalf of pharmaceutical companies. As wholesalers support pharmaceutical companies' operations, there is an enhanced need for pharmaceutical companies to communicate with their wholesalers and prioritize a close relationship them. In addition, as Iiyama (2012) remarks, the Japanese pharmaceutical industry's most important customer is the Japanese government, which spends tens of trillions of yen on medical expenditures. As the Japanese government sets the price of drugs biannually, they have absolute bargaining power over the price of drugs. Although the government prices drugs based on a market price, Iiyama

(2012) points to the difficulty in appropriate pricing due to difficulty in finding a market price. Generally, in purchasing commodities and groceries, the price is described in terms of a unit price. On the other hand, limited free competition in the Japanese pharmaceutical industry prohibits the calculation of a unit price for a drug. The government determines the price that hospitals and pharmacies can charge, so hospitals and pharmacies gain profit by maximizing the difference between cost of goods and the price they charge patients. On the other hand, pharmaceutical companies do not want to discount their drugs for wholesalers since it will decrease their profit margins. Wholesalers, who are intermediaries between hospitals, pharmacies and pharmaceutical companies, experience low revenues due to the conflicting interests of their suppliers and their customers and also excessive competition among other wholesalers. These three members, all within the same supply chain, have been making unique transactions for medicines over time. One of the most unique transactions was the purchase of drugs in bulk, the calculation of all items that medical institutions buy based on a standard price for drugs, and the determination of discount rates and the price of a sum of all items that medical institutes purchase from wholesalers rather than deciding a unit price. Because of this method of transaction, a market price for a single unit becomes difficult to find. Iiyama (2012) concludes that the government's market research, which affects the revision of a standard price for a drug, loses any chance to find an accurate market price.

In terms of the bargaining power of suppliers, the Office of Pharmaceutical Industry Research (2015) points to the increasing importance of outsourcing clinical studies. Among R&D activities for new drugs, clinical studies take time and incur the greatest costs. Therefore, pharmaceutical companies focus on how effectively they implement clinical

studies, which leads to the successful development of new drugs. Clinical studies utilizing

Contract Research Organizations (CRO) started abroad in the late 1970's, and currently

there are thousands of CRO companies in the U.S. and Europe. In Japan, CRO started in the

early 1990's, and sales from Japan's CRO association has been increasing. In recent years,

there are some pharmaceutical companies that outsource all operations associated with

clinical studies to CROs, which function as alliance partners to enhance the quality and

efficiency of clinical studies. As there is increasing demand for CROs, CROs' relationships

with pharmaceutical companies have transitioned from regular suppliers to alliance

partners. In order to achieve true efficiency, pharmaceutical companies need to trust and

cooperate with CRO, more than before.

In terms of rivalry among current competitors in the industry, the Japanese

Pharmaceuticals Manufacture Industry (2015) indicated a drastic decrease in the number

of Japanese pharmaceutical companies. While in 1975, the Japanese pharmaceutical

industry had a total of 1,359 companies, in 2012 the number has dropped to 349. Also, the

degree of market concentration in the industry has increased greatly as the market

concentration ratio of the top five companies increased from 18.8 percent to 43.5 percent

during the period from 1993 to 2008. Maeda (2017) points out that the revision of drug

prices and the prevalence of generics in the domestic market caused the sales of the main

domestic pharmaceutical companies in Japan's market to fall by 1.9 percent in March 2017.

Stagflation of market growth for Japanese pharmaceutical companies will accelerate rivalry

among the industry. Ono et al. (2015) claims that some physicians, patients, and

pharmacists prefer brand-named drugs to generics. And along the same lines, the Central

Social Insurance Medical Council (2015) conducted survey research for the usage rate of

generics in Japan, and found that about 60 percent of Japanese physicians indicated hesitation their hesitance to prescribe generics to their patients and expressed their suspicion of the quality of generics. Specifically, 30 percent of the study's participants stated that a lack of information about both the side effects and examination data of generics lead to their hesitation. Also, 20 percent of the survey respondents showed little trust in a stable supply for generics, as many generics companies engage in production of many kinds of generics but in smaller quantities. In a study of patients, 49.3 percent of patients who participated stressed that it is the important for generics to have the same effects as originals, indicating that patients emphasize quality more than the price of generics, as only 12 percent of patients stressed cheaper prices of generics. A similar study conducted in pharmacies found that 70 percent of drugs prescribed were generics. The most frequently cited reason for prescribing brand-named drugs (60 percent) was patients' rejection of purchasing generics. Moreover, 44.4 percent of those filling brand-named prescriptions did so out of concerns about quality while 26.3 percent pointed to the issue of constant supply. In addition to doctors, pharmacists also indicated little confidence in the credibility of generics (Central Social Insurance Medical Council, 2015). At the same time, Nagao (2017) notes that there is significant product diversification among key Japanese pharmaceutical companies.

There are two big segments of pharmaceutical companies: full-time companies, which refer to firms solely focusing on pharmaceuticals, and part-time companies, which refer to firms in the pharmaceutical industry and also another industry (or multiple other industries). Examples of full time companies include Takeda Pharmaceutical Company, Taisho Pharmaceutical, Sawai Pharmaceutical Company, Daiichi Sankyo, and Astellas

Pharma. Alternatively, examples of part-time companies include FUJIFILM Pharmaceuticals, Japan Tabaco Pharma, and Kyowa Hakko Kirin Company. In the full time segment, there are also two subdivisions: new drug companies, where firms are highly engaged in R&D for new drugs, and generic companies, where firms focus on manufacturing generic drugs. Examples of new drug companies include Takeda Pharmaceutical Company, Astellas Pharma, and Taisho Pharmaceutical, while an example of a generic company is Sawai Pharmaceutical Company. Moreover, there are two subdivisions in the new drug company segment: a wide area type, where companies manufacture medicines for all kinds of diseases, and a limited area type where companies that specialize in certain areas. Examples of a wide area type include Takeda Pharmaceutical Company and Astellas Pharma, while Taisho Pharmaceutical is an example of a limited area type. Finally, there is a segment called "hybrid" companies which commit to the development of both new drugs and generics. Examples of hybrid companies include Eizai, Daiichi Sankyo, and MitsubishiTanabe Pharma. Major Japanese pharmaceutical companies try to obtain competitive advantages through market segmentation and effective positioning within the industry, and overall, this industry analysis suggests a moderate-to-high level of competitive intensity within the Japanese pharmaceutical industry.

3. Theoretical model of Factors related to CSR in Japanese pharmaceutical companies

After covering relevant ideas from the broader literature of factors related to CSR, and offering an overview of the Japanese pharmaceutical industry, it is possible to develop a theoretical model of the key factors related to CSR specifically in Japanese pharmaceutical companies. However, before describing the model, it is important to note that there are some factors that are not relevant to CSR activities in the context of the Japanese pharmaceutical industry. First of all, Knudson (2015) argued for a positive relationship between religiousness and philanthropic activities by corporations. Yet, as most Japanese pharmaceutical companies are separated from religious practice, it is difficult and potentially meaningless to try to identify an association between religiousness of individual pharmaceutical companies and their CSR activities. Additionally, Chih et al. (2010) notes a positive relationship between CSR activities and firms in countries with higher quality management schools, higher cooperative employer-employee relations, and a better macroeconomic environment. Yet, because this study focuses on Japanese pharmaceutical industry, these national factors should affect all the relevant pharmaceutical firms in the same way, making these factors irrelevant to the model. Similarly, Robin (1992) claims that a company in high profile industries should have higher levels of CSR disclosure, but this analysis is pharmaceutical industry-specific (i.e., within a single industry), meaning that industry differences are irrelevant for the model. Also, Campbell (2007) argues that different levels of industry competition can be a factor in CSR activities. Once again, since companies in the Japanese pharmaceutical industry experience the same level of competition most of the time, this factor is also excluded from the model. And finally, Jingchen (2012) points to a link between harmony in a society and CSR engagement.

However, since all companies which this analysis focuses on are Japanese, this construct was not included in the model.

Now, after excluding irrelevant factors, it is possible to introduce CSR factors relevant to Japanese pharmaceutical companies and offer hypotheses. First, Udayasankar (2008) noted a U-shape relationship between company size and CSR participation. As firm size is measured by resource access and scale of operation, Udayasankar concluded that medium-sized companies are least CSR minded compared to both small and large firms. However, in the context of Japanese pharmaceutical firms, drug development and production are extremely capital intensive, so there are not many "small" firms in this industry in Japan. Hence, following Udayasankar's (2008) reasoning, one could expect a positive association between size and CSR reporting in Japanese pharmaceutical firms that are typically medium, or large in size. Hence, the first hypothesis in this analysis is as follows:

Hypothesis 1: Firm size has a positive relationship with level of CSR engagement as represented by CSR reporting by Japanese pharmaceutical companies.

del Mar Miras Rodriguez et al. (2016) claim that total shareholders, which have voting rights, has a positive relationship with CSR reporting practices. Specifically, as the number of shareholders increases, firms will need to satisfy a greater number of stakeholders through signaling legitimacy. Consistent with this idea, the second hypothesis in this model of CSR in Japanese pharmaceutical companies focuses specifically on the total number of owners, or shareholders, and anticipates a positive relationship.

Hypothesis 2: Total number of shareholders has a positive relationship with level of CSR engagement as represented by CSR reporting by Japanese pharmaceutical companies.

And finally, Fligstein (2001) notes that institutionalized dialogue with even more external stakeholders is related to socially responsible actions of companies. Additionally, Cedillo et al. (2014) argue that when MNEs provoke conflict, they are more likely to reinforce their existing CSR policies and disclose them to the public. At the same time, Campbell (2007) claims that having a strong relationship with, and being monitored by, NGOs is correlated with more socially responsible behaviors of companies. And finally, Kim et al. (2014) mention a significant relationship between firm investments (both exploitative and explorative) and CSR activities of a firm. Taken together, these ideas suggest that Japanese pharmaceuticals that are more multinational, should engage more actively in CSR activities, as illustrated in the third and final hypothesis in this model.

Hypothesis 3: Mutinationality, in terms of interactions with foreign customer stakeholders and foreign owner stakeholders, has a positive relationship with CSR engagement as represented by CSR reporting by Japanese pharmaceutical companies.

Taken together, these hypotheses offer the relationships illustrated in the theoretical model presented in figure 1 below. Importantly, these factors appear to be most relevant in the context of Japanese pharmaceutical industry, and can inform a nomological net of relationships in this unique context.

Figure 1 Factors related to CSR in Japanese pharmaceutical companies
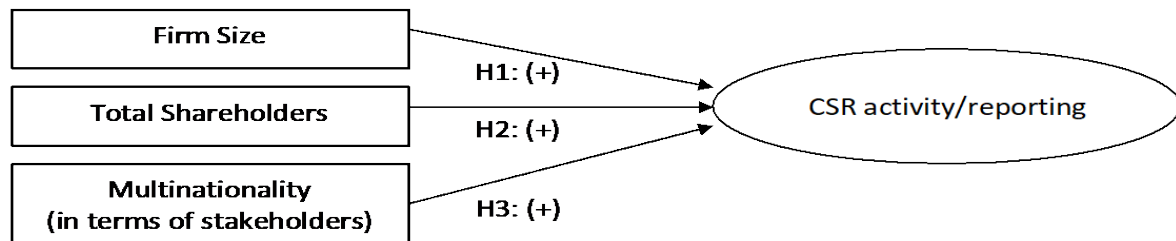
4. Data and Methodology

4.1. Sample

For this analysis, yearly data on Japanese firms in the pharmaceutical industry was collected from Toyo Keizai's well-regarded quarterly Japan Company Handbook (Kaisha Sikiho) reference publication. This data source has been used by a number of international business scholars in the past (e.g., Powell & Lim, 2017; Nakamura et al., 2001; Beamish & Inkpen, 1998), and is viewed as being very accurate. Additionally, data on CSR reporting was coded using annual company reports. The final sample includes yearly observations from 1996 through 2016 for an unbalanced panel with 879 firm-year observations.

4.2. Variables

4.2.1. Dependent variable

CSR reporting was operationalized with a binary outcome variable. If a Japanese pharmaceutical firm published CSR reporting within its annual report or in a separate report, it was coded as CSR within (1). If the company did not report any CSR, this was also

27

indicated by the lack of a value in this variable (0). Also, a second dependent binary variable was coded, where if a Japanese pharmaceutical firm published an entirely separate CSR report, it was coded as Separate CSR (1). Alternatively, if a Japanese pharmaceutical firm did not publish an entirely separate CSR report, it was coded as no separate CSR report (0).

4.2.2. Independent variables

Firm size: Following previous studies (Lang & Johnson, 1994; Powell, & Lim, 2017; Wahab et al., 2011), firm size was measured by total number of employees at a Japanese pharmaceutical firm, which is unconsolidated. However, this variable was skewed, so the logarithm of the total number of a firm's employees in a firm year was used, to satisfy the assumption that independent variables are normally distributed.

Total shareholders: As with firm size, the total number of shareholders (Amihud, Mendelson and Uno, 1999) in firms resulted in a skewed distribution. Hence, in the current analysis, total shareholders are operationalized as the logarithm of the total number of shareholders.

Multinationality: Multinationality has been operationalized in a number of ways by international researchers. The most commonly used measures are the ratio of foreign sales to total sales (Gomes & Ramaswamy, 1999; Grant, 1987), the number of countries in which a firm has subsidiaries (Tallman & Li, 1996), and the ratio of foreign assets to total assets (Daniels and Bracker, 1989; Ramaswamy, 1995). Due to availability of consistent, appropriate data for the study, overseas sales ratio (Contractor, Kumar and Kundu, 2007) was adopted as one measure of multinationality. Annabarjula and Beldona (2008) argue

that ownership is another way of identifying how multinational a firm is. Ownership refers to the extent to which a firm owns value-generating assets abroad, as well as the extent to which institutions and individuals abroad own a firm. As a measure of the degree of foreign ownership, the percentage of foreign shareholders was adopted. In summary, to measure the multinationality of Japanese pharmaceutical companies, the overseas sales ratio and the foreign shareholders ratio were adopted, and both of these measures reflect stakeholder relationships that are relevant to the earlier theoretical discussion leading to hypothesis 3.

4.2.3. Control variables

In addition to the independent variables described above, a control variable for research and development intensity (R&D Intensity) was included in each model. R&D intensity was calculated as the ratio of total R&D expenditures to total sales for a focal firm in a given year (Greve, 2003; Padgett and Galan, 2010). It was important to control for this variable because pharmaceutical firms can generate new drugs to sell through internal development, development through alliances, licensing, or acquisitions. In cases where firms develop new drugs internally or through alliances, R&D expenditures will be higher and firms' organizational architecture will include resources devoted to innovation. Potentially, these differences could influence the degree to which the firm prioritizes social responsibility initiatives in some unforeseen way. Hence, it is important to control for this variable, even without a clear expectation on any directionality in its potential relationship with CSR reporting activities. In addition to R&D intensity, it is possible that other firm-level factors could relate to CSR reporting. To account for this potential unobserved

variance, all of the models in this analysis also include dummy variables for each firm, effectively creating fixed-effects models

4.3. Analysis

Logistic regression models were employed to test the three hypotheses. Table 5 presents descriptive statistics for each of the variables in this analysis, as well as a correlation matrix. To assess the threat of multicollinearity, variance inflation factors (VIFs) were calculated using pooled regression analysis versions of the models. The resulting VIFs are all below the commonly used threshold of 4 (O'Brien, 2007), suggesting that muticollinearity is not a cause for concern in this analysis. Hypothesis testing was conducted using the following logistic regression equations:

Model 1:

$$\ln\left(\frac{P_{CSR\ reporting}}{1 - P_{CSR\ reporting}}\right) =$$

$$\propto +(b_1 * R\&D\ Intensity) + (b_2 * Size) + (b_3 * Shareholders)$$

$$+ (b_4 * Overseas\ Sales\ Ratio) + (b_{5*}Foreign\ Owners) \ldots$$

$$+ dummy\ variables\ for\ firms$$

Model 2:

$$\ln\left(\frac{P_{Separate\ CSR\ report}}{1 - P_{Separate\ CSR\ report}}\right) =$$

$$\propto +(b_1 * R\&D\ Intensity) + (b_2 * Size) + (b_3 * Shareholders)$$

$$+ (b_4 * Overseas\ Sales\ Ratio) + (b_{5*}Foreign\ Owners) \ldots$$

$$+ dummy\ variables\ for\ firms$$

Table 5: Descriptive statistics and correlation matrix

Variable	Min	Max	Mean	S.d.	Vif	1	2	3	4	5	6
1. CSR within	0	1	0.47	0.49	-	-					
2. Separate CSR	0	1	0.35	0.47	-	0.79	-				
3. Size	2.07	10.38	6.84	0.67	1.48	0.41	0.27	-			
4. R&D Intensity	0	6442	39.11	237.96	1.06	-0.10	-0.08	-0.22	-		
5. Shareholders	3.98	12.68	9.08	1.05	1.66	0.33	0.23	0.44	0.00	-	
6. Overseas Sales Ratio	0	100	11.58	18.52	1.36	0.16	0.09	0.03	0.05	0.44	-
7. Foreign Owners	0	76.60	16.18	15.79	1.26	0.38	0.28	0.32	-0.01	0.34	0.30

5. Results

To test the hypotheses in this analysis, two models were ran, as presented in table 6. The first model uses CSR within an annual report or in a separate report as the outcome. The second model uses SCR reporting in an entirely different report as an outcome. For the R&D intensity control variable, resulting estimates were not significant in either model 1 or model 2, so there is no evidence of a relationship in this context. Similarly, size does not result in significant estimates in either model, so hypothesis 1 is not supported in this context. This result is surprising, but could potentially be explained by low levels of variance in the sizes of firms in the sample. That is, Japanese pharmaceutical firms are mostly large firms, so there may not be enough variation in this independent variable to truly assess its relationship with CSR reporting. Next, the number of shareholders is not significant in model 1, but it is significant in model 2. That is, the number of shareholders is positively related to the issuing of a separate CSR report (p<0.01). Specifically, if the logarithm of the total number of shareholders increases by one, there appears to be a 163 percent increase in the odds that a firm will issue a separate CSR report. This result supports hypothesis 2. Next, the overseas sales ratio variable results in a positive and significant estimate in model 1 (p<0.01), but not model 2. This suggests that overseas sales is associated with CSR reporting in all its forms collectively, but not if we limit it to entirely

separate CSR reports. Specifically, if the percentage of foreign sales increases by 1, the odds

of some CSR reporting will increase by 15 percent. Or, we can say that a one percent

increase in foreign ownership may relate to a 36 percent increase in the odds of some type

of CSR reporting, and a 24 percent increase in the odds of a separate CSR report. These

results on the foreign sales ratio and foreign owners ratio lead to support for hypothesis 3.

Table 6: Factors related to CSR reporting (logistic regression models)

	Hypotheses	**1** **y= CSR Reporting within Annual Report or Separate Report**	**2** **y=Separate CSR Annual Report**
Intercept		-14.58**	-13.49***
		(5.35)	(3.86)
R&D intensity		-0.00	0.06†
		(0.01)	(0.03)
Size	H1(+)	-0.76†	-0.49†
		(0.44)	(0.28)
Shareholders	H2 (+)	0.72†	0.97**
		(0.38)	(0.30)
Overseas Sales Ratio	H3 (+)	0.14***	-0.00
		(0.03)	(0.01)
Foreign Owners	H3 (+)	0.31***	0.22***
		(0.03)	(0.02)
Firm dummies		Yes	Yes
n		873	878
χ^2		821.47***	640.81***
Df		65	65
McFadden R^2		67.93%	55.98%
Cox R^2		60.93%	51.76%
Nagelkerke R^2		81.31%	71.09%

†,*, **, and ***, significant at p<0.10, 0.05, 0.01, 0.001 respectively

6. Conclusion

This analysis has sought to identify key factors associated with CSR engagement, or

at least CSR reporting, in Japanese pharmaceutical firms. To pursue this research objective,

a theoretical model was developed using selected and relevant constructs from the broader

literature on CSR. Additionally, data were collected and logistic regression models were

utilized to test three hypotheses. Empirical results in this analysis suggest a positive

relationship between the number of shareholders and issuing a separate CSR report by Japanese pharmaceutical companies. Also, overseas sales ratio is positively related to CSR reporting in all its forms collectively, but not if we limit it to separate CSR reports. There also appears to be a positive association between the ratio of foreign shareholders and CSR reporting in all its forms and CSR reporting in an entirely separate CSR report. However, relationship between size and CSR reporting was found in this analysis.

As the Japanese pharmaceutical industry plays a more significant role in Japan's society and has more stakeholders, there is a growing importance for Japanese pharmaceutical companies to act in a socially responsible manner, rather than simply acting as economic and legal entities. The biggest indirect customers of the Japanese pharmaceutical industry, the Japanese government, can also benefit from this model. Specifically, the CSR engagement of Japanese pharmaceutical companies can benefit society as a whole, and especially the Japanese government's constituency. And finally, as with all research, there are limitations to this study. In particular, the theoretical model in this analysis was tested in a very specific empirical context, meaning that it is not possible to make broad generalizations of the findings to other contexts and industries. Also, potentially there are other factors that have not been included in the broader literature, and therefore, those factors were not identified in the above literature review and were not included in the model.

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