

The influence of open access on the higher education publishing industry. A five forces model analysis.

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ABSTRACT

Open access is shaking up the publishing industry since readers can access open access journals freely on the internet without having to pay subscription fees. The goal of this thesis is to research how the stakeholders in the higher education publishing industry are influenced by open access in terms of their positions in the industry. In order to see what influence open access has on the industry, the focus in this research is on the interest parties who are confronted with open access. In order to see how the different interest parties in the industry are influenced, the research is framed into the five forces model of Porter. Qualitative literature research including stakeholders combined with open access was used writing this thesis. Whether or not the five forces model was influenced by open access looking at this literature was decided upon by identifying the relevant information in the articles with different factors which would determine the change for a specific force. The result is that open access had most influence on the forces; rivalry, bargaining power of suppliers and bargaining power of buyers. First, in the open access situation, buyers and suppliers can now easily get around publishers. But the rivalry in the industry remains high since there are still a few major publishers competing among the greatest market share. Second, buyers increased their power by highly concentrate themselves in the industry. Third, the power of suppliers depend on which business models they use, since there evolved different business models for open access.

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Keywords

Open access publishing, five forces model

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1. INTRODUCTION

It seems like the traditional model of scholarly publishing is being threatened by an active movement in the existing higher education publishing industry. This movement, open access, is said to have great advantages for certain stakeholders in the publishing industry. The number of articles and journals published open access is dramatically increasing every year (Harnad, S. & Brody, T. 2004; Laakso, M. et al. 2011). The advantages open access encounters for the industry are due to the increase in accessibility and so impact of the articles and so of the journals. Open access is defined in the literature as; "making scientific publications accessible for every internet user" (Suber, P. 2003). This differs from the traditional model in the industry in which the publishers buy the work or get it for free from the authors, then edit it themselves and sell it to the readers.

By removing the barriers of entrance for accessing scholarly work, every internet user can freely access the work. There are a lot of sources available about open access in the publishing industry. Even Elsevier, one of the biggest supplier in the world, has certain projects to stimulate open access, like the ownership of the ChemWeb and Chemistry Reprint Server (Suber, P. 2002). This indicates that it is an important development in the publishing industry. Open access also raises a lot of questions in the practical field. For example, there are still costs when publishing open access articles, which need to be paid by someone different than the reader who always was paying part of those costs (Rudnick, H. et al. 1995). As a solution for this, different business models entered the industry; like the APC business model where suppliers pay for publishing their work, or the self-repository model where publishers are not even part of the publishing process anymore. Also the librarians are still cautious about open access, since they still see a lot of barriers in terms of costs and their roles in the publishing industry when all information is freely available on the internet (Bailey, 2005 and Mercer, H. 2011). Those studies indicate that open access might have huge consequences for certain stakeholders in the publishing industry. Therefore it is important to look at the perspectives of those stakeholders, since they are the ones which in practice need to adopt open access.

This paper will examine open access in the higher education publishing industry, with a focus on the relevant stakeholders, through the theoretical application of Porter's "five forces" model. This model is the most referenced strategic management model (Narayanan & Fahey, 2005) and since the five forces model is a tool for analyzing an industry, it is useful for analyzing the open access trend as it affects the higher education publishing industry. The five forces analysis has already proven its success in different industries and is said to be a helpful tool to lead stakeholders to understand current market trends, therefore it could also be applicable for the publishing industry explaining the open access trend (Pringle & Huisman, 2011 and Blair & Buesseler 1998). The model consists of five forces bargaining power of suppliers/buyers, threat of new entrants/substitutes and rivalry in the market. Looking at how this trend influences the five forces model might help to explain how the industry changes in terms of the power-relations of the stakeholders and the threats and opportunities it will create in the industry. The identification of the five forces in the industry is based upon 2 studies, by Ware & Maybe 2015 and Russell & McGuigan 2012, which give a strategic analysis of the publishing industry. The main stakeholders in the industry examined in the studies by creating a publishing cycle are; publishers, editors, readers, librarians and authors, mainly from research and scientific centers. The publishers, authors and editors are the suppliers of the academic journals and librarians and readers are the buyers of those

journals. The industry is growing every year since the number of articles published increases.

The main question which will be tackled in this research is; "how are the different forces in the higher education publishing industry influenced by open access?" the supporting sub questions are; "how can the forces in the industry be identified and what are their positions in the market?" and "What are the factors that might cause the changing forces due to open access?". Identifying the forces will be done looking at the "traditional academic publishing industry" without the influence of open access and for the second research question will be compared to the "open access academic publishing industry" to discover possible changes within the five forces model due to open access. For the first research question a non-systematic literature review will be used identifying and positioning the traditional academic publishing industry. For the open access academic publishing industry a qualitative research method will be used.

2. STAKEHOLDER ANALYSIS BASED ON LITERATURE REVIEW

For answering the first research question "how can the forces in the industry be identified and what are their positions in the market?", a non-systematic literature review will serve as research methodology using three articles overviewing the publishing industry; Ware, M. & Mabe, M. 2015, Russell, R.D. & McGuigan, G.S. 2008 and Joseph, R.P. 2010. This literature review will give an overview of the publishing industry before there was any influence of open access on the industry and so will describe the "traditional five forces model". Identifying the stakeholders in the "traditional model" and positioning them in terms of bargaining power and threats is necessary for answering the second research question, since this is about the changes from the traditional to the open access model. Also the development of the theoretical five forces model will be included (Porter, M.E. 1985). Ware, M. & Mabe, M. 2015 gives an overview of scientific and academic journal publishing. It is mainly focused on the power publishers have over the buyers and suppliers in the industry, since those parties are both dependent on the products delivered by the publishers. Both buyers (readers, libraries, universities) and suppliers (authors) have no influence on for example product prices which is all set by the publishers. Russell, R.D. & McGuigan, G.S. 2008 mentions all the five forces in the industry, with the focus on the great profits from the powerful publishers forming the rivalry in the market. The journal publishing cycle in this study contains the following participants; academic journal publishers, academic libraries, the readers (faculty, scholars and students) and the authors. Joseph, R.P. 2010 includes a five forces model of the publishing industry with the most relevant forces in the industry being; publishers, authors, librarians, readers and editors.

The five forces model of Porter consists of the forces; bargaining power of the suppliers, bargaining power of buyers, threat of new entrants, threat of new substitutes and rivalry in the market. The collective strength of those forces determines the ultimate profit potential in an industry and is extremely important for the formulation of a strategy for a certain industry (Porter, M.E. 1979). The bargaining power of suppliers is the power suppliers can have over the participants in an industry. A supplier group can be powerful if the group is for example concentrated or if their products are differentiated and cannot be substituted. The bargaining power of the buyers is about buyers decreasing prices, increasing quality or buyer concentration in the industry. A buyer group can be powerful if for example the group is concentrated and purchase in high volumes or if they can easily switch to

another product. The threat of new entrants means new competitors wanting to enter the market and the seriousness of the threat is dependent on the barriers there are to enter the market. Examples of such barriers are; the degree of regulation in the market or the size of investment that is required. Those barriers make the threat of new entrants low, since they will cause less entrants. The threat of substitutes is big if something can be substituted by offering a more attractive price-performance tradeoff. The rivalry in the market is about the firms or organizations competing with each-other. Factors that might increase the rivalry are for example; the relative market share of the different firms/organizations, the number of competitors in the market or the industry growth (Porter, M.E. 1979). How the five forces model of the publishing industry looks like is mentioned in all the three studies. The bargaining power of suppliers is about the authors and researchers who are supplying the information in the academic journals. The bargaining power of buyers in this industry is positioned by the individual readers, libraries and universities buying subscription to the journals to make them available for their students. The rivalry in the publishing industry is formed by the publishers competing for publication of the highest reputation articles and obtain a high market share by having many contracts with libraries or universities who are buying in large volumes to get a discount

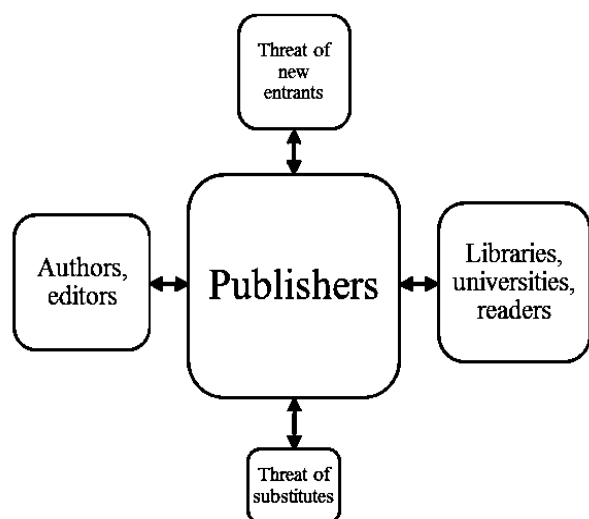


Figure 1. The five forces model of the traditional industry

* The size of the shape matches the degree of power a force has in the industry from the publishers. There are several factors which determine the forces in the industry in terms of for example high/low rivalry in the industry (Porter, M.E. 1979). Those factors help to identify and explain why a certain force is having power or is forming a threat.

2.1 Bargaining power of suppliers

The major suppliers in the publishing industry are the authors and researchers, who are supplying written information and research bundled in articles to the publishers and so have the supplying role based on the three articles. But also editors and reviewers can be seen as some kind of suppliers of the information, since they ensure the quality and finalizing of the journals. Their bargaining power in the industry is determined by certain factors mentioned in the three articles. First of all, the authors and researchers are dependent on the publishers, since those publishers are the distribution channel which they need for publishing their work. Especially since it is important for authors

and researchers to publish their work in a prestigious journal in order to ensure their reputation (Ware, M. & Mabe, M. 2015 pp. 70). Secondly, the high profit-seeking publishers see authors/researchers as a disturbing factor in their profit-making and the unequal profit-sharing visualize that publishers have more power over suppliers than the other way around. Publishers are keeping most of the profit for themselves, but suppliers have no choice but to accept it since they need those publishers to supply their products to the market. Authors and researchers only get a small bit for their hard work creating all those articles, whereas publishers are found to be extravagant in their spending and the profit they keep for themselves (Joseph, R.P. 2010:9). Since the articles/journals are all unique and differentiated products, authors can be said to have minimized bargaining power in the industry as their work cannot be substituted by other products and so publishers cannot switch easily to another author for the same product (Russell and McGuigan, 2008). But this does not change the fact that they are dependent on the publishers to make a success of their work (Joseph, R.P. 2010:9). Thirdly, overall the degree of concentration among the authors is not high as they are operating mostly alone or with a little group of researchers, which is called co-authorship (Ware, M. & Mabe, M., 2015 pp. 36-40). Imaginable is that a single author does not have any bargaining over the major powerful publishers with their great market share. Publishers and buyers are very important to the suppliers, since those make sure that their work is getting a certain reputation and is distributed by using it for their own research. All the above indicates that the bargaining power of suppliers in the initial industry is minimal, since authors and researchers are not concentrated at all and have no choice but to distribute their publications via the powerful publishers and only get a small fraction of the profit. The only factor that could give them a little power is the uniqueness of their products which cannot be substituted by products from other suppliers.

2.2 Rivalry

The rivalry in the industry is formed by the publishers competing with each other. Large publishers report strong growth in article submissions and in online usage, reflecting continuing growth in the market demand for research products (Russell, R.D. and McGuigan, G.S. 2008). Publishers are argued to be one of the most important stakeholders in the industry (Ware, M. & Mabe, M. 2015 pp.17; Russell, R.D. and McGuigan, G.S. 2008; Joseph, R.P. 2010; Solomon & Björk 2012, Larriere et al. 2015). There are several factors determining the degree of rivalry described in the three articles. Firstly, publishers cover a wide role of activities concerning the publication of journals and are having a uniquely powerful position in the publishing industry due to the high concentration. The publishers are highly concentrated due to a few major publishers with the top ten publishers accounting for approximately 43% of the total revenue (Van Orsdel & Born, 2007). So the major publishers, with the biggest three being Elsevier, Wiley and Springer, gain extraordinary high revenues and are highly profit-driven which makes them competitive by nature (Russell, R.D. and McGuigan, G.S. 2008). The journal demand is inelastic and this explains “how publishers can persistently increase the price of journals with little resistance on the part of either faculty or the academic library” (Russell, R.D. and McGuigan, G.S. 2008). Publishers are said to add little value to the publishing process, but since for example the biggest three publishers contain the most prestigious journals with the largest circulations and are highly concentrated in terms of market share, they remain the most powerful in the industry. Also because of the contracts they have with suppliers and their differentiated products, it is hard for suppliers and buyers to switch to different publishers which make them even more powerful. On the

contrary, the rivalry in the industry is attenuated since there is little direct competition between the individual journals of the publishers, because of the product differentiation (Russell, R.D. and McGuigan, G.S. 2008). The journals published are so specialized that it is not possible for the publishers to compete with each other on grounds of the products they publish. Universities pay for the editorial costs sometimes and publishers do not have to pay costs for acquiring the articles from authors and researchers which makes that they also cannot compete on cost level with other publishers, which makes the rivalry even lower (Russell, R.D. and McGuigan, G.S. 2008). So publishers are the most powerful force in the industry with their bargaining over the buyers and suppliers, the high concentration and profit-making, but rivalry in this industry is attenuated since the products are highly differentiated and therefore publishers cannot compete directly with each-other.

2.3 Bargaining power of buyers

The buyers in the publishing industry are the buyers and also readers of the academic journals and articles, which are mostly libraries or universities and rarely individuals (Ware, M. & Mabe, M. 2015, pp. 20). Resulting from the three articles, there are three different factors at stake here which determine whether the bargaining of the buyers is high or low in the publishing industry. First of all, libraries and universities rely on the products offered by the publishers. Most libraries/universities have contracts with those publishers in order to get a discount since they purchase subscription journals in very high volumes, but librarians restrict themselves with those contracts since only a few publishers accept a cancellation of the contract (Ware, M. & Mabe, M. 2015 pp. 23 & Joseph, R.P. 2010 pp.10) This indicates that they are highly attached to those publishers with contracts and cannot switch publishers easily. Also the prices are set by the publishers and buyers have no influence changing those prices, since they are bonded to those contracts and cannot switch to another cheaper alternative publisher (Russell, R.D. and McGuigan, G.S. 2008). Secondly, also because of the high product differentiation among the publishers' products, buyers are not able to switch publishers that easily. This product differentiation is "on the basis of academic specialization and reputation, and therefore academic libraries cannot substitute one journal for another and meet the specialized needs of faculty scholars and other patrons" (Russell, R.D. and McGuigan, G.S. 2008). Thirdly, libraries and educational institutions are mostly fragmented in the industry, which means that they are poorly concentrated and cannot form a powerful force together. There are suggested strategies to form consortia or alliances among libraries, but those are not prevalent yet (Russell, R.D. and McGuigan, G.S. 2008). So, buyers do not have much bargaining power in the industry, since they are left with no choice, but to buy what is available at a price that is dictated by the powerful publishers enjoying monopoly over those buyers (Joseph, R.P. 2010 pp.10).

2.4 Threat of new entrants

The threat of new entrants does not influence the publishing industry that much. There are different factors determining the barriers or opportunities to enter the market based on the three articles. First of all, in the previous section the concentration of the major publishers in the industry is explained. Because those major publishers contain the prestigious journals, the right distribution channels and the largest circulations they have the greatest market share by setting up contracts with different libraries and universities who purchase their journals in high volumes (Russell, R.D. and McGuigan, G.S. 2008). The former

makes it for new publishers very hard to enter the market because they have no change to keep up with those major publishers in the industry. Secondly, the reputation of a journal is very important for suppliers to decide publishing their article by a certain publisher. When first entering the market, it is impossible to create and publish journals with a high reputation as they are still unknown and have low impact in the industry. Thirdly, there are no economies of scale present for the publishers and also a certain degree of expertise is required for the editorial tasks, which makes it hard for new publishers to cover the editorial and publication costs and work on good quality products (Joseph, R.P. 2010 pp.8 & Russell, R.D. and McGuigan, G.S. 2008). The barriers to enter the market are high for new publishers because of the highly concentrated major publishers, the required reputation and expertise and the absent economies of scale.

2.5 Threat of substitutes

There is a threat of substitutes present in the publishing industry in terms of a substitute for the subscription journal currently offered by the publishers. The substitute for the subscription model of scientific academic journals is the open access model. The open access journals are different from the subscription journals, since they are freely available for everyone and so can be seen as a threat for the subscription model where buyers have to pay for accessing the information. So there is an attractive price-performance trade-off, since the open access journals are also containing scientific information, but for free. Although it seems like this is a better price-performance trade-off, it is not sure yet if the open access journals will also become high reputation journals with a high impact factor.

3. RESEARCH METHOD OPEN ACCESS

For this research, literature documents will serve as data. The reason for this is that this research is a continuation of existing literature and a lot is already written about open access. It is valuable to use those already written documents since it contains data that can be used to research the five forces model in the industry. To obtain the dataset needed for answering the research question, the LISTA database will be used provided by EBSCOHOST which is a leading provider in online resources. Since the database contains 700 journals/books/reports within the librarianship and information sciences field, it is a representative database for the research question which investigates this specific field. The database covers a time period until March 2016. The key search term which will be used in the database is "open access publishing" which results in 2688 articles. This search term excludes all the biomedical articles about open access, since open access is also used as a term in biology as a type of surgery. This search result is then limited by only including English trade journals which are available in full text (otherwise the possibility exists that the information is not available) which results in 212 articles. Trade journals are publications covering, and intended to reach, a specific industry or type of business. Since the research question covers a specific trend in a specific industry, trade journals will be most relevant for conducting the research. The main goal of such a trade journal is to keep the members in an industry, so the stakeholders, up-to-date about new developments in the industry. This means that trade journals gives opinions and facts about open access to the stakeholders in the industry. This is relevant for the research, since the articles are focused on the stakeholder side of the industry.

For the research of the articles, each article is assessed by taking two steps. The first step is to see which of the five forces are included in the article. A force is defined in this thesis as one of

the forces of Porter's model; substitute, entrant, rivalry, buyers or suppliers. The forces will be identified in the articles by looking at keywords that need to be present;

- Threat of substitutes: other/substitute models
- Threat of new entrants: costs, economics, materials, regulation
- Rivalry: publishers, competition, incumbents, differentiation, industry growth
- Suppliers: researchers, authors, reviewers, editors
- Buyers: librarians, universities, readers, students

The second step is looking at the reason a certain force changes, by looking for the factors in articles determining the forces. So the factors can be defined as; the reasons determining the bargaining or threat of the force and so the drivers of the forces. This is done by looking at pieces of text found in an article which can be identified with a factor from the checklist of Howson 2008 (see appendix). For example; the bargaining power of buyers will increase due to open access, since they can easily switch to another supplier for the same information. The factors that will be used are the ones from the checklist of Howson, 2008. The checklist contains several factors per force that indicates the forces in the industry in terms of bargaining power, threat or rivalry. This checklist is consistent with the factors mentioned in the article of Porter, M.E. (1979) and the book of Boddy, D. Management: An introduction (2013). When the trade journals are read, the factors that determine the forces will be identified with supporting elements from the text. A coding scheme will be created to denote the different factors, since this will be easier to write down the results for myself. For example, the bargaining power of buyers contains 8 factors varying from B1-B8.

The two steps will be summarized in a table. The first three columns will include; the title, author and year of the article. The fourth column will include the identification of the stakeholders (step 1). And the fifth column will include the pieces of text matching the factors from the checklist (step 2). In order to see which force is influenced most by open access, the number of times the force is mentioned in all articles will be count. Also the number of times the different factors are mentioned in the articles will be count to see which factors were influential for changing the force.

4. RESEARCH RESULTS

Figure 1 shows how many times a forces was related to the articles in the LISTA database. The research covered a range of 101 articles, since some articles were excluded from the research as they could not be identified with any of the factors or forces. Most articles mentioned that OA had most impact on; bargaining

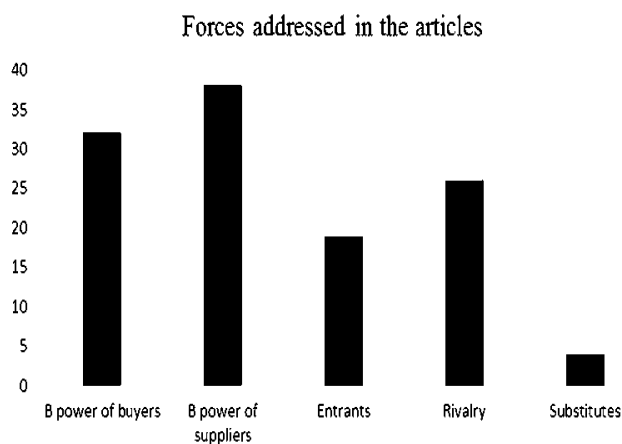


Figure 2. Forces addressed in the articles

power of suppliers, bargaining power of buyers and rivalry in the industry, as can be seen in figure I. In the text below I will describe the results per force in more detail.

4.1 Bargaining power of suppliers

The table below includes the number of times an article mentioned a specific factor concerning the bargaining power of suppliers.

Factor	#*
S1 (<i>the concentration among the suppliers</i>)	7
S2 (<i>size of suppliers relative to buyers</i>)	0
S3 (<i>degree of substitutability among products of different suppliers</i>)	4
S4 (<i>amount and potential of vertical integration</i>)	7
S5 (<i>the extent to which the target is important to the supplier</i>)	3
S6 (<i>how easily can the target company switch suppliers</i>)	0
S (<i>changes supplier force but could not be identified with any factor</i>)	19

*Number of articles that mentioned the factor

S1 (the concentration among suppliers) is an influential factor changing the bargaining power of the suppliers. The concentration of the suppliers is enforced as a consequence of OA, since authors and researchers are working together in different collaborations and institutions which makes them a powerful force to advocate OA since they feel it is important to make scientific information widely available. Authors are increasing their bargaining power by working together and object to the subscription model of the powerful publishers. SHARE is an example of such a movement of authors taking over publishing tasks and remain power over their own work by getting around the powerful publishers (Schwartz, M. 2013). The unidentified factor (S) is changing the bargaining power of suppliers, since costs and copyright and the changing relation in terms of power between the authors and publishers are factors that are changing the bargaining power of suppliers, but those factors did not match the ones mentioned in the checklist of Howson, 2008. But depending on which business model authors and researchers are choosing to publish their work, their power will be increasing or staying the same. The first model (golden route) by which their power is staying the same as in the traditional model is the model in which authors are paying a fee for publishing their work instead of buyers paying the fee and so authors and researchers are still dependent on the publishers to get their work published in a prestigious journal. If they are not able to pay this fee, they are not able to publish their research and therefore are still dependent on the publishers by the money they need to pay to them in order to get their articles published (Albanese, A. 2006 & LaGuardia, C. 2005). The second model (green route) is the one increasing the bargaining power of suppliers, since in this model authors and researchers are getting around the publishers, by self-archiving their work in repositories. This means suppliers are taking over the publication tasks and remain power over their own work, are independent of the publishers and have the copyright over their own work. Hereby suppliers vertically integrate themselves (S4) by taking over the role of the publisher and sometimes the role of the editors and have more power over their own work and decide for themselves where and how to publish (Peek, R. 2006 & Hodgson, C. 2014 & Poynder, R. 2005 & Boettcher, J. 2006 & Moyle, M. et al 2014).. Authors are objecting to giving up their copyright since they feel like their hard work is given away for free and it can easily be substituted by others (S3) (Drake, M.A. 2007 & Verma, H. 2015). An important issue within the copyright regulations in the golden route are the commercial reuse of OA information because of the CCBY license which states that the

information might be mixed, copied and reused by every reader. This license is used by many big publishers and this means authors do not retain power over their own work (Albanese, A. 2007 & Poynder, R. 2010 & Anderson, R. 2015). So the bargaining power of the suppliers highly depend on the business model they choose, but is inclining to increase due to the concentration of the suppliers objecting to the powerful publishers and the vertical integration by taking over publishing tasks.

An important notion is that different funders (independent institutions and libraries) are mostly paying for the costs to enable authors to publish their work and so can also be discussed to be on the supply side. This would mean that libraries take two different roles in the industry since they are the funders of the authors, since they are mostly researchers from universities and belong to the same group as the librarians who are buyers and also coupled to the university. (Shaw, S. 2006 & Jacso, P. 2006 & Ashling, J. 2007).

Bargaining power of suppliers

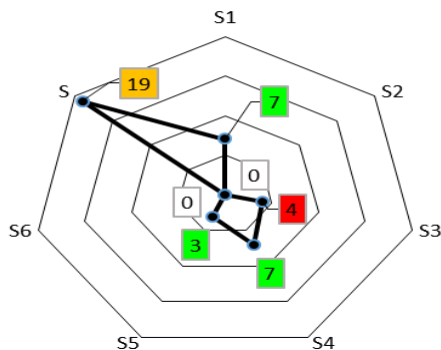


Figure 3. Factors determining bargaining power of suppliers

*Red = negative influence / Green = positive influence

4.2 Rivalry in the industry

The table below includes the number of times an article mentioned a specific factor concerning the rivalry.

Factor	#*
R1 (relative market share)	9
R2 (importance of the product to the main competitors)	3
R3 (extent to which objective are driven by turnover and market share)	3
R4 (normal year supply/demand balance)	1
R5 (number of competitors)	1
R6 (industry growth)	3
R8 (fixed costs)	1
R (could not be identified but changes rivalry)	4

*Number of articles that mentioned the factor

R1 is the most present factor influencing the rivalry and publishers in the industry. When looking at the traditional industry, there were a few major publishers present; Elsevier, Springer and Wiley. But when researching the OA articles, new major publishers showed up having a great market share in OA journals/articles; PubMed Central, BioMed Central, Springer, PLOS and Hindawi. Still, there are a few major publishers present (more than in the traditional industry) with the greatest market share which makes the rivalry among those publishers quite high. For example PLOS is said to double in size due to the fee prices they charge from authors (Albanese, A. 2005). And Hindawi is growing since it converted to OA articles and got the highest monthly total submitted manuscripts wanting to publish in OA. (McClure, M. 2008 & Information Today, 2009). But also traditional high-profit seeking publishers chose to publish OA

articles instead of just subscription articles, since they feel like keeping up with their competitors which makes the rivalry high; for example Elsevier also started to offer OA articles (Albanese, A. 2006). So there are a few major publishers present in the market, as there were before, but the number of major publishers creating OA journals is increasing and therefore rivalry increases. This increasing number of major publishers is also due to the fact that the OA industry is increasing every year (R6), since the number of OA articles/journals are said to be doubled every year (Poynder, R. 2010). This indicates that more and more publishers are offering OA products, especially the major publishers like Elsevier, which could mean rivalry is increasing. The publishers were the most present stakeholder objecting to open access, because they are afraid to lose their exclusively high profit margins and since they are mostly driven by turnover and market share, they did not want to give up the subscription journals (R2&R3) (Brynko, B. 2006 & Drake, M.A. 2007 & Peek, R. 2008). However publishers do not have much choice but starting to offer open access products, since the rest of the industry is advocating OA that much and since the internet enables to distribute information easily, publishers have no power over this trend/movement (Van Orsdel, L.C. and Born, K. 2007). But since most publishers now ask a relatively high fee from the authors who want to distribute their work via those major publishers instead of the fee from the libraries, OA will not destroy the competition among publishers (Peek, R. 2008). Since all the journals and articles are freely accessible on the internet for everyone, it is easy for readers to substitute between journals of different publishers and their products are not highly differentiated anymore. This will increase the rivalry in the industry, since publishers can compete on the same journals now. (R7) (Ojala, M. 2016). Although it seems like OA lowers the bargaining position of the publishers, since authors can now get around publishers by using the self-repository option of open access and buyers can freely access all the journals, there are also stakeholders who think that publishers will use OA and author charges to gain even more profit from publishing articles/journals (Enis, M. 2015).

So open access increases the rivalry among the publishers in the industry, since there are becoming more major publishers offering OA articles and the OA industry is growing every year. Also the products can be substituted due to the freely accessibility to everyone, which makes it possible for the publishers to compete directly with each-other. Although the rivalry is increasing due to open access, publishers might lose power when authors choose for the self-repository OA option since they will then lose their bargaining over suppliers and buyers as they are getting around the publishers by self-repository journals and articles and make them available to the buyers.

Rivalry

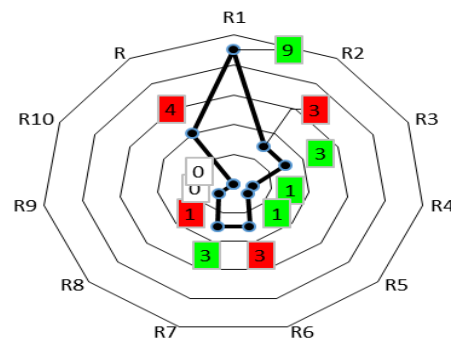


Figure 3 Factors determining rivalry

*Red = negative influence / Green = positive influence

4.3 Bargaining power of buyers

The table below includes the number of times an article mentioned a specific factor concerning the bargaining power of buyers.

Factor	#*
B1 (<i>concentration among buyers</i>)	20
B2 (<i>size of customers relative to the target</i>)	1
B3 (<i>how easy it is for buyers to substitute between products of suppliers</i>)	3
B4 (<i>the ease with which buyers can switch suppliers</i>)	1
B5 (<i>the amount of vertical integration</i>)	1
B6 (<i>The costs/practicability of customers switching suppliers</i>)	0
B7 (<i>importance to the customer of the target's product in terms of its cost base</i>)	3
B8 (<i>the importance to the customer target's product in terms of quality</i>)	2
B (<i>did change the buyer force but could not be identified with any factor</i>)	3

*Number of articles that mentioned the factor

The most influential factor for changing the bargaining power of the buyers is the factor B1. This factor is about the concentration among the buyers which can be enforced by concentrating themselves in collaborations or organizations. This is increasing their bargaining power in the industry since they are building a powerful coalition objecting to the publishers with their high priced subscription journals and advocating OA. Such collaborations are ensuring the success of OA by forming a powerful group of buyers. Especially librarians are collaborating in different organizations to ensure that publishers do not create any cost barriers on the availability of scientific information (Harnad, S. 2005 & Online, 2009 & Peek, R. 2009 & Munch, V. 2011 & Kelley, M. 2014 & LaGuardia, C. 2015 & Library Journal, 2009). An example of such a collaboration is the widely known SPARC (Scholarly Publishing and Academic Resources) (Oder, N. et al. 2009 & Peek, R. 2008 & Miller, R. 2009 & Anderson, R. 2015). Another example in which different libraries ensemble themselves is the OCA; open content alliance (O'Leary, M. 2009 & Berry, J.N. 2010). An example of an action advocating OA is introduced by Harvard; the Lab which offers an infrastructure for the financials and repository of OA and concentrating the readers of the journals (Peek, R. 2010). Those examples show that due to OA buyers are enforcing themselves by collaborations and actions to advocate OA. Also the buyer force will increase, since the number of readers and buyers will heavily increase when not having to pay for accessing and using the articles, which makes sense since all information is freely available for everyone (B2) (Hodgson, C. 2014).

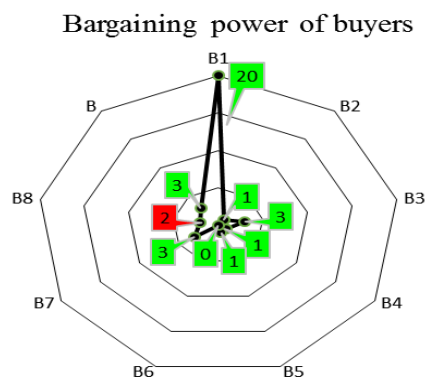


Figure 5. Factors determining bargaining power of buyers. *Red = negative influence / Green = positive influence

The whole reason for advocating OA is the costs that will be saved when information is freely available. So the costs are a key driver for buyers and this is said to increase the power of buyers in the industry since they will more easily chose OA articles/journals than paying high subscription fees to the publishers. (B7) Therefore buyers are in the position to substitute between subscription journals and OA journals and when they have to pay a fee, they are more likely to choose for the OA option. This indicates that buyers have more power than before in the industry, since before OA they had no choice but to pay the high prices since journals could not be substituted (B3) (Peet, L. and Schwartz, M. 2015 & L.C. van Ordsel, 2007 & Enis, M. 2015). Of course OA makes it easier for the readers to substitute between the different journals/articles from different publishers, since it does not incur any costs and they are not restricted with contracts or membership fees (Peet, L. 2014 & Tenopir, C. 2004). But readers are also concerned about OA in terms of quality of the articles (B8). They are afraid quality of articles will reduce since in some situations there are no expert editors and publishers to make the work perfect and information can be published by every author and therefore in terms of quality they might be dependent on the major expert publishers (Quint, B. 2006 & Publishers weekly, 2014).

So the bargaining power of the buyers in the industry will increase since they are concentrating themselves in very powerful collaborations advocating OA and object to the powerful publishers in the industry. Since buyers highly value costs and are able to substitute the subscription journals, they will chose for the OA option over the subscription journals which will cause decreasing demand and profit for the publishers.

4.4 The threat of new entrants

The table below includes the number of times an article mentioned a specific factor concerning the threat of new entrants.

Factor	#*
E1 (<i>extent of economies of scale</i>)	1
E2 (<i>experience curve</i>)	1
E3 (<i>size of investment</i>)	6
E4 (<i>To what degree do buyers perceive products or services to be clearly differentiated?</i>)	0
E5 (<i>customer's switching costs</i>)	1
E6 (<i>degree of regulation</i>)	2
E7 (<i>access to distribution channels</i>)	6
E8 (<i>access to essential technology</i>)	1
E9 (<i>access to raw materials</i>)	1
E10 (<i>access to favorable locations</i>)	1
E11 (<i>access to other cost advantages</i>)	0

*Number of articles that mentioned the factor

Most of the factors are not highly relevant, since they are only assessed once. The number of OA articles is increasing so more publishers started offering OA articles (Poynder, R. 2010). New names are becoming major publishers of OA articles, for example; Hindawi and PLOS. The size of investment highly influences the threat of new entrants (E3), which means that if investments are high when wanting to enter the market, the threat of new entrants will be low. There is a discussion about the increasing or decreasing investments when publishing in OA. Most articles say that the investments are increasing since the high subscription fees from buyers disappear, but offering OA articles bears the same costs as offering subscription journals. This would mean that there is an entry barrier for competitors trying to enter the market. (Albanese, A. 2004 & Albanese, A. 2005 & Information Today, 2002). Another influential factor is factor E7 (access to distribution channels) because the existing

publishers already have a great distribution channel by which they can spread their journals and articles and so also for the OA journals the distribution channel is already available and therefore it is not hard for publishers in the market to offer OA journals. But since there are a few major publishers which own those distribution channels, it is hard for other (smaller) publishers to enter the market and offering OA journals since the great distribution channels are already used by the major publishers in the industry (Zalta, E. and Nodelman, U. 2010 & Information Today, 2011 & Polanka, S. 2013). So the barriers to entry the market remain as high as in the traditional industry and the threat of new entrants is low because of the concentration of a few major publishers, the high investments and the unavailability of distribution channels.

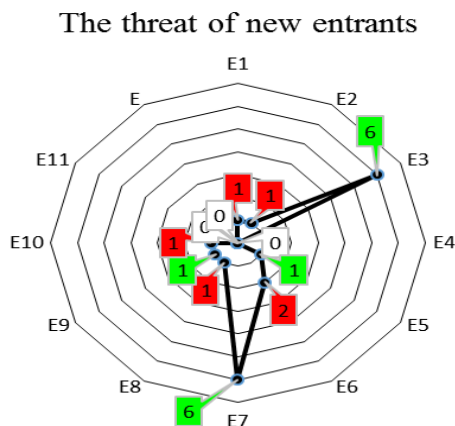


Figure 4. Factors determining the threat of new entrants
**Red = negative influence / Green = positive influence*

4.5 The threat of substitutes

The focus of this research was on the threat of one substitute to the industry, which is open access. The traditional subscription journals had to make room for the open access journals, which makes open access a substitute itself. In the articles about open access, there were no other substitutes mentioned for open access journals.

5. CONCLUSION

The research of the articles showed that open access did most certainly have an influence on the five forces model of the higher education publishing industry. However, not all the forces within the model changed. The three forces that were most assessed in the articles about open access were; bargaining power of suppliers, bargaining power of buyers and rivalry. The first research question provided the identity and positions of the stakeholders present in the “traditional publishing industry” mapped in the five forces model. The buyers force includes libraries, universities and readers, the rivalry force includes publishers and the supplier force includes authors/researchers and editors/reviewers. After researching the open access articles, a new supplier was identified; funders. Funders are supporting authors and researchers when having to pay fees for the publication of their articles and so can also be seen as facilitators of academic journals. The positions from the different stakeholders in the industry remained mostly the same, but the power of the most influential forces did change; the power of the publishers, buyers and suppliers. For the second research question, different factors identified in the open access articles caused the change in the forces. Starting with the buying force, libraries, universities and readers increased their power due to highly concentrating themselves in different powerful

collaborations or institutions (like SPARC) objecting to the bargaining publishers had over them and advocating OA principles. For the bargaining power of suppliers open access caused change, but this depends on which business model they choose since the power of suppliers is different per business model. This is because the different business models depend upon ways to collect the amount of money needed to cover the costs and the difference in copyright. If authors are publishing via the APC model they have to pay the publishers a fee for publication and have to publish under the CCBY license where they do not have any power over their own work and still are under the pressure of the powerful publishers. When publishing through self-repository at the university, authors retain power over their own work and are getting around publishers by doing publishing tasks themselves. Authors also increase their power by concentrating themselves in powerful collaborations to object to the publishers in the industry and vertically integrate themselves by taking over publishing tasks. The rivalry in the industry will increase with open access, since there are more and more major publishers on the market offering OA journals and the product differentiation cause substitutability among products and therefore increase the rivalry. But the power publishers had over the authors and buyers will decrease since they are not dependent on publishers by getting around them. Also because of the formed powerful collaborations publishers have no choice but to offer OA journals to keep up with the competition and the trends in the market. In figure 8 below the changes in the five forces model of the publishing industry can be found, since the changes are marked with red. The use of the five forces model was valuable in this research, since it provided a framework for mapping the different stakeholders in the industry. Also it resulted in a good overview of the overall publishing industry by visualizing the relationships between all the forces and see how the stakeholders are influenced by each-other and by other threats in the industry. The factors belonging to every force make the model particle and usable, since those determined why and how a force changed as a result of open access. Seeing how the five forces model changed due to open access has provided an overview of the consequences in terms of bargaining power of threats for the stakeholders in the market when switching to open access journals instead of subscription journals.

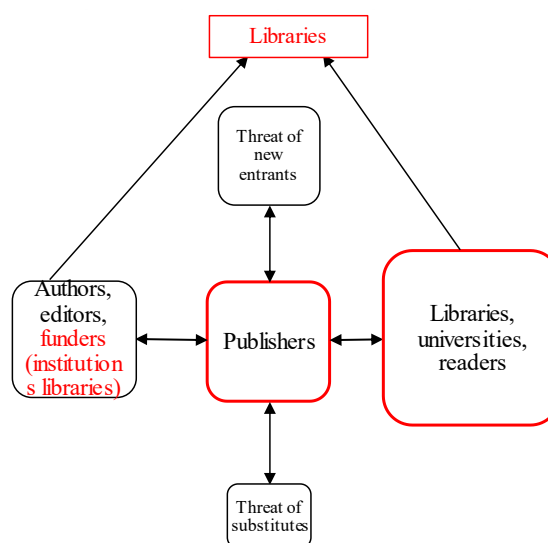


Figure 7. The open access publishing industry

6. LIMITATIONS AND FUTURE RESEARCH

This research also had limitations that might cause bias into the results. Starting with the database which is used, the LISTA database is mostly focused on the publishing industry in the UK and US. Therefore it might not be fully representative for the overall worldwide publishing industry. Only 101 articles were used in the research, although the search resulted in 213 articles. So not all the articles could be used in this research because they were not available in full text or they could not be identified with any of the forces or any of the factors. This latter might indicate that the use of the five forces model restricted the results, since there was valuable information in those articles, but this information could not be used. Also the checklist from Howson was not usable for all the articles, although for most it was, since some articles could not be identified with the factors from the checklist, but did change the force. For example 19 articles did change the bargaining power of the suppliers but could not be identified with any factor.

Therefore the usability of the checklist used in this research can be doubted in certain situations. Although some factors could not be identified with the factors in the checklist, they were taken into account within the research results to make sure the research is not missing out on important changes in the forces. The practicality of the five forces model was sometimes not optimal, since it was not possible to link certain articles to the five forces model and see what the changes were for the forces. This is most likely because of the fact that it is a very static model and so it cannot include exceptions. Since the publishing industry is a distinct one and not like others, since for example the university has both the role of supplier and buyer and the rivalry is not high, but the competing firms do have a lot of power in the industry, it was hard to use a model which is very static.

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8. APPENDIX

8.1 Example research method

Reliability of the author is marked in yellow

STEP 1: identification of the stakeholder/force in the article is made bold

STEP 2: how do the forces/stakeholders state their market position by looking at the factors in the checklist marked green

CC BY and Its Discontents: An OA Challenge. [ANDERSON, RICK](#)

Recently I attended two sessions of the conference of a major learned society in the humanities. Both dealt with issues related to open access (OA), and in both I was deeply taken aback by the degree to which an overwhelming majority of the scholars in attendance expressed frustration and even anger at the OA community. The word predatory was used at one point—not in reference to rapacious publishers but to OA advocates. That was pretty shocking.

In a different meeting, I listened to a presentation by the executive director of another large, important scholarly society, this one in the social sciences. His presentation was not heated, but he made it clear that among his organization's members there is deep dissatisfaction with significant aspects of the OA movement's current direction.

Many private conversations before and since, often with scholars who did not want to express anything publicly that might be construed as resistance to OA, have only reinforced the messages I received in those meetings.

Why would these scholars and scientists—academics who value the sharing of knowledge and who want to see the benefits of scholarship spread as broadly as possible—object to OA?

FREE TO READ OR FREE TO USE?

Highlights that academics are objecting against OA

The answer is that they don't typically object to OA itself. Many of them say so very explicitly. Their concern is with a particular parameter of OA as it is currently defined by a large and dominant segment of the OA community: the Creative Commons Attribution (CC BY) license. It is enshrined in what is now the closest thing to a canonical definition that OA has: the Berlin Declaration on Open Access. The declaration does not use the term Creative Commons (CC licensing was a relatively new thing when it was being formulated), but it defines acceptable reuse licensing in terms that align exactly with those of CC BY:

BERLIN DECLARATION The author(s) and right holder(s) of (open access) contributions grant(s) to all users a...license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship.

CC BY DEFINITION This license lets others distribute, remix, tweak, and build upon your work, even commercially as long as they credit you for the original creation.

Authors their work can be easily reused in other articles, which makes the articles less unique

According to the declaration, what makes an article OA is not that it can be read by everyone at no charge. The article's content (and "all supplemental materials") must also be made publicly available for any kind of reuse, including commercially, without the author's permission.

It's important to note that not everyone in the OA community agrees that CC BY or its functional equivalent is a necessary feature of true OA. Some distinguish between "gratis" OA (which makes an article free to read but leaves the author some or all of the traditional exclusive prerogatives provided by copyright law) and "libre" OA (which makes it reusable under CC BY terms) and are happy to consider both of them genuine forms of OA, while others assert that there is no such thing as OA without CC BY.

CC BY GAINING GROUND

Although there is disagreement among individuals in the OA community about whether CC BY should be enshrined in our definition of OA, highly influential institutions have taken significant steps to make that enshrinement more official. CC BY licensing is publicly endorsed by the Scholarly Publishing and Academic Resources Coalition (SPARC) as "the standard terms for Open Access." Recently, both the Gates Foundation and the Ford Foundation have announced that all of their grant-funded projects and research must be published under CC BY licenses.

The Public Library of Science (PLOS)—whose journals collectively published more than 35,000 articles last year, making it the 500-pound gorilla of OA publishing—asserts that "open access stands for unrestricted access and unrestricted reuse" and does not allow its authors to use any license other than CC BY. Nor does BioMed Central, another very important OA publisher, or its sister company Chemistry Central. In the UK, the Research Councils UK (RCUK) (which funds roughly £3 billion [about \$4.5 billion] of research annually) also generally requires the results of research it funds to be published under a CC BY license. (Funded authors who do not use RCUK block grant funding to cover an article publishing charge may restrict commercial reuse of their work.)

Those are important publishers according to OA and an important fundraiser of OA and they handle the CCBY license as a standard for every OA article.

COMMERCIAL IS THE CONCERN

Consider the findings of a recent survey taken by publisher Taylor & Francis among its authors, who represent a broad spectrum of academic and scientific disciplines. That survey found that fully 65 percent of them consider the reuse terms of CC BY to be "unacceptable."

Authors object to the CCBY license since they do not want their work to be commercially reused, they want their work to be for free and do not want it to be used for making money.

Why do authors mind? The answer will vary from author to author, of course, but one of the most common concerns expressed has to do with commercial reuse. In one recent situation, several authors who had published with PLOS and BioMed Central were startled and outraged to see that their articles had been bundled into a high-priced book published by Apple Academic Press.

It can be reused for commercial ends, which makes it unfair for the authors who published it in OA

In my experience, many authors who would happily make their work freely available for noncommercial reuse, adaptation, remixing, performing, etc.—for whom, in fact, that kind of free and noncommercial reuse is a big part of what OA is all about—are not comfortable allowing all comers to reuse their work commercially without at least asking permission. The authors I have spoken with mostly tend to say the same thing: "We believe in openness and sharing, and we want our work to be as freely and widely available as possible. But if you're going to take my work and somehow sell access to it or otherwise use it to make money, you need to ask my permission first." Some would be willing to allow commercial use in a nonprofit context without permission; others don't want any commercial reuse of any kind without their authorization. (And then there's the growing question of whether it would be acceptable to require students to make their work available on an OA basis, including CC BY, as a condition of academic progress.) We in the scholarly community need to be asking ourselves: Where do we believe authors' rights should end and the public's right to access and reuse should begin? Does it make a difference whether the scholarship in question was supported with public funds? If so, does public funding give the public a moral right to read the results of that scholarship, or to read and reuse without any restriction, or to read and reuse with some restrictions? What if the scholarly product was not supported by public funding—should it be made freely available simply because it is scholarship, and we don't want to commodify knowledge? I don't know how this issue will be resolved. One thing does seem clear to me, however: if authors (in the aggregate) have anything to say about it, the future of OA is unlikely to include CC BY as a required feature.

RESULTS FROM THE ARTICLE

Reliable information, since he interviewed stakeholders and went to the meetings where stakeholders were present himself.

Authors (academics and scientists) and publishers (like PLOS and Biomed central) are the present stakeholders in this article and so are the forces suppliers and rivalry. The great publishers, PLOS, Biomed central and also important organizations like SPARC and RCUK, who are funding open access, see CCBY as standard. Authors and academics object to CCBY, but they have to follow this standard if they want to publish via PLOS and Biomed central, so the power of the publishers is increasing and authors is decreasing.

Publishers like PLOS, Biomed central handle the CCBY license as standard when author's want to publish in Open Access, this means that the power of the author will reduce, since all the information written can be reused for commercial goals and so the substitutability between products of the authors (suppliers) will increase.

#	Titel	Year	Reliable author	Stakeholders/forces	Factors changing the forces
1	CC BY and Its Discontents: An OA Challenge.	2015	Obtained information from primary sources which are stakeholders or experts on OA	Publishers (PLOS, Biomed central) and organizations like SPARC and RCUK (funder) see CCBY as standard, so authors and academics/scientists (suppliers) have no choice but to publish by CCBY license although they object to it. This highlights that the publishers have a powerful role.	Publishers like PLOS, Biomed central handle the CCBY license as standard when author's want to publish in OA, this means that the power of the author will reduce, since all the information written can be reused for commercial goals without their permission and so the substitutability between products of the authors will increase and buyers can easily switch to other authors* (suppliers). The rivalry among publishers might also increase by competing commercially with the same reused articles since there is less product differentiation*.

*Those factors determining the bargaining power, threats and rivalry of the forces are mentioned in the checklist of Howson

8.2 Checklist Howson including the codes

Threat of new entrants - E

- What is the extent of economies of scale, if any? - E1
- Is the experience curve important? - E2
- What size of investment is required to reach cost parity with existing players? - E3
- To what degree do consumers perceive product or services to be clearly differentiated? - E4
- How big are customers' switching costs? - E5
- To what degree is the industry regulated? - E6
- Access to distribution channels – E7
- Access to essential technology – E8
- Access to raw materials – E9
- Access to favorable locations – E10
- Access to other cost advantages which are independent of scale – E11

Bargaining power of suppliers - S

- The degree of concentration among suppliers - S1
- The size of suppliers relative to buyers - S2
- The degree of substitutability between products of the various suppliers - S3
- The amount of, and potential for, vertical integration - S4
- The extent to which the target is important to the supplier - S5
- How easily can the target company switch suppliers? - S6

Bargaining power of buyers - B

- The degree of concentration among customers – B1
- The size of customers relative to the target – B2
- How easy is it for customers to substitute between products of their suppliers and potential suppliers? – B3
- The ease with which customers can switch suppliers – B4
- The amount of, and potential for, vertical integration by customers – B5
- The costs/practicability of customers switching suppliers – B6
- The importance to the customer of the target's product or service in terms of its cost base – B7
- The importance to the customer target's product or service in terms of quality – B8

Threat of substitutes - P

- How big is the threat of substitute products? – P1

Industry rivalry - R

- Relative market share – R1
- Importance of the product to the main competitors – R2
- Extent to which the objectives of the main competitors are driven by turnover and market share – R3
- 'Normal year' supply/demand balance – R4
- Number of competitors – R5
- Industry growth (5 = low) – R6
- Degree of industry differentiation (5 = low) – R7
- Fixed costs relative to variable costs – R8
- Stage of industry cycle (1 = peak, 5 = trough) – R9