

Universitat Autònoma de Barcelona

Facultat d'Economia i Empresa

Department of Business

Doctorate in Economics, Management and Organization

DOCTORAL DISSERTATION

**Firm, Stakeholders, Value Dynamics
and Social Economic Progress.**

The case of the Spanish Pharmaceutical Industry

Author:

Pau Turon i Dols

Dissertation Advisor:

Prof. Emili Grifell-Tatjé, Ph.D.

Bellaterra (Barcelona), September 2015

UAB

Universitat Autònoma de Barcelona

I would like to dedicate this thesis to
my wife Elisabet and to my daughters Aina and Natàlia

Acknowledgements

Exploring the frontier of a discipline is a long journey where the explorer, most of the time, is travelling alone. Nevertheless, the final written report, as happens in this thesis, consists of valuable contributions which come from people met during those travels. Thanks to all them for their contributions.

First of all, the author has a debt that is impossible to pay with the Prof. Dr. Emili Grifell-Tatjé, Dissertation Advisor, for his relevant and frequent contributions to the thesis. He merits the feasibility of this work having made the share of academic and professional responsibilities possible. Since the beginning of our relationship he has always believed that the combination of both worlds has a fruitful output that enriches both areas. I will always be grateful for his trust and determination to push the project towards the objective.

Secondly, thanks to the Institution described in the second chapter and its managers for allowing free access to the key people and key data necessary for developing the pin factory study. Thanks also to all the employees who have provided the information and complemented it with relevant comments (Manuel Jiménez, Modesto Ibáñez, Alfredo Fernández, Xavier Nafria, Rosa Aguirre, Susana Rodríguez, Gonzalo Bañares, Mónica Artasu, Ignacio Rodríguez, Sergi Palao, José Miquel, Vicente Calduch, Ruth Vior and Montserrat Araujo). Additionally, to the rest of the team of that institution that have always supported this thesis project.

Thirdly, many thanks to Dr. Josep Rialp for his contribution to the third chapter and to Prof. Dr. C.A.K. Lovel for his contribution to the fourth chapter. For their valuable suggestions and comments and for dedicating their time and knowledge to improving this thesis.

Fourth, I am really thankful to the tribunal members of the thesis pre-defense for their valuable suggestions to improve the manuscript.

Fifth, thanks to Paul Wakely for the revision of the English version, for the effort of making the ideas understandable, for his suggestions and patience when correcting any draft. Any remaining mistake is the sole responsibility of the author.

Finally, there are no words to thank my wife Elisabet and my daughters, Aina and Natàlia. My gratitude can only be expressed through the feelings and deep emotions that love allows. I am really proud of them. It is a privilege to have this family always supporting me in any project we face. Thanks for making it possible.

Abstract

Stakeholder theory has scarcely dealt with value dynamics. The way the firm creates value is the first step of a two phase cycle. The second step is the distribution (appropriation) of the created value to the stakeholders. As a consequence the value dynamics is a central factor in order to understand the relationship between firm and stakeholders through time and how these relationships condition the social economic progress of society.

The Spanish Health care sector has been used as a framework for the study of these dynamics, particularly putting the focus on the effect of the main stakeholder, the Spanish public sector, in its role of customer and regulator simultaneously. Using its power and its capacity of influence it has been able to change the value dynamics capturing a significant part of the value created by the firms. In the second chapter we have analyzed in depth the relationships between firm and stakeholder in a *pin factory study* focusing the attention on a multinational firm that operates in this market. The particular characteristics of the stakeholders involved allow the study of the value dynamics at a level of detail that has not been achieved in the past, to our knowledge.

The dynamics of influences between firm and stakeholders have also been studied, taking as a reference Frooman's model (1999) and its four propositions. A new methodology has been developed through an economic approach. It can be applied using quantitative data. Five hypotheses have been formulated and contrasted statistically with data coming from the Spanish pharmaceutical industry. We find strong empirical support for Frooman's model.

Finally, the fourth chapter is about social economic progress. As the Nobel Prize winners Joseph Stiglitz and Amartya Sen and Professor Jean-Paul Fitoussi (Stiglitz, Sen and Fitoussi 2009) concluded, measures of social progress are often confused with measures of economic performance, such as GDP. The purpose of this chapter is to develop a concept and a measure of social economic progress that integrates the economic and social aspects. The concept is inspired by Davis (1947), an early precursor of stakeholder theory. We develop an analytical framework where social economic progress and its components can be measured together with the social responsibility of the firm and its sustainability.

Contents ¹

Acknowledgements	5
Abstract	7
Contents	9
List of Figures	13
List of Tables	15
Nomenclature	17
Chapter 1.	
Introduction to Stakeholders, Value Dynamics and the case of the Spanish Health care sector	19
Abstract	19
1.1. Theoretical Framework. The Stakeholder Theory	21
1.2. The approaches to the Stakeholder Theory	24
1.3. The definition of the stakeholder concept	28
1.4. The influence of the stakeholders	29
1.5. Creation and distribution of value	32
1.6. The stakeholder relationships	36
1.7. The Spanish healthcare sector (2003-2012)	39
1.7.1. The control of healthcare expenditure. The pressure of the main stakeholder	43
1.7.1.1. First period. 2003-2006	43
1.7.1.2. Second period. 2006-2009	46
1.7.1.3. Third period. 2009-2012	47
1.8. Concluding remarks	50

¹ The thesis follows The Chicago Manual of Style. Version 16th

1.9. Appendix A. Regulation implemented in the Spanish Pharmaceutical Sector. Period 2003-2012	52
---	----

Chapter 2.

Main Stakeholder Influence as a “Shaker” of Value Dynamics

Abstract	55
2.1. Introduction	57
2.2. The Firm	60
2.3. Background	61
2.3.1. Willingness to pay and economic value creation.	62
2.3.2. Economic profit decomposition	66
2.3.3. Creation and distribution of value	69
2.4. Data	72
2.4.1. Output definition	72
2.4.2. Input definition	73
2.4.3. The period of study	75
2.5. Results and discussion	75
2.6. Concluding remarks..	82
2.7. Appendix B. Tables	85
2.8. Appendix C. Stakeholder management and value creation	93
2.9. Appendix D. Corporate Social Responsibility and Corporate Financial Performance	95

Chapter 3.

Stakeholders, Power and Strategies of Influence: The case of the Pharmaceutical Industry in Spain

Abstract	99
3.1. Introduction	101
3.2. Relevant facts in the Spanish health care sector	103
3.3. The dynamics of stakeholder relationships, power and influence	104
3.3.1. Background	104
3.3.2. Frooman’s model	105

3.3.3. Typology of power and relationship interdependence	109
3.4. Formulation of the hypotheses	112
3.4.1. Hypothesis 1	112
3.4.2. Hypothesis 2	113
3.4.3. Hypothesis 3	113
3.4.4. Hypothesis 4	114
3.4.5. Hypothesis 5	115
3.5. Methodology	115
3.5.1. Strategy of hypothesis contrast	117
3.5.2. Hypothesis contrast	120
3.5.2.1. Hypothesis 1	120
3.5.2.2. Hypothesis 2	122
3.5.2.3. Hypothesis 3	123
3.5.2.4. Hypothesis 4	124
3.5.2.5. Hypothesis 5	125
3.6. The sample	126
3.6.1. Output definition	127
3.6.2. Input definition	128
3.6.3. The period of study	128
3.7. Results and discussion	129
3.8. Conclusions	131
3.9. Appendix E. Tables	135

Chapter 4.

Economic Progress and the Analysis of Responsible Stakeholder Behavior

of the Firm	145
Abstract	145
4.1. Introduction	147
4.2. Hiram S. Davis	149
4.2.1. Hiram S. Davis and Stakeholder Theory	149
4.2.2. Hiram S. Davis and Economic Progress	154
4.3. Methodology	159

4.3.1. Productivity and value creation	160
4.3.2. Balanced distribution of created value	162
4.4. Sustainability of the firm	164
4.5. Social created value	167
4.6. Re-employment of resources	172
4.6.1. Firm re-employment	174
4.7. Labor company stakeholder responsibility	177
4.8. Compensation mechanisms	179
4.9. Concluding remarks	185
Chapter 5.	
Summary of the thesis contributions and future lines of research	189
Cited References	195

List of Figures

Figure 1. Willingness to pay. Created and captured value	63
Figure 2. Willingness to pay. Value creation dynamics	64
Figure 3. Operationalization of stakeholder strategies of influence	119
Figure 4. Technical change with an increase of productivity in an upsizing and downsizing of demand	173
Figure 5. Compensating mechanism. Partial productivity	181

List of Tables

Table 1.1.	Classification of the firms depending on the dynamic of influences	36
Table 2.1.	Evolution of profits, revenues and outputs. Period 2003-2012	86
Table 2.2.	Economic of expenses. Period 2003-2012	87
Table 2.3.	Dynamics of value creation and distribution. Period 2003-2012	88
Table 2.4.	Quantity effect. Period 2003-2012	89
Table 2.5.	Contribution of Willingness price effect to value creation. Period 2003-2012	90
Table 2.6.	Dynamic of influences. Comparison between 2003-06 and 2009-12	91
Table 3.1.	Typology of Resource Relationships. Frooman's model (1999:199)	135
Table 3.2.	Typology of relationships applied to Spanish Health Care sector. Predicted stakeholder strategy by Frooman's model	136
Table 3.3.	Summary of output, inputs and profit average of Spanish Pharmaceutical sector	137
Table 3.4.	Statistics Hypothesis 1. Main Stakeholder	138
Table 3.4.1.	Wilcoxon test	138
Table 3.4.2.	Mann-Whitney test	138
Table 3.5.	Statistics Hypothesis 2. Wilcoxon test. Raw Material Suppliers	139
Table 3.6.	Statistics Hypothesis 3. Labor	140
Table 3.6.1.	Wilcoxon test	140
Table 3.6.2.	Mann-Whitney test	140
Table 3.7.	Statistics Hypothesis 4. Wilcoxon test. Shareholder	141
Table 3.8.	Statistics Hypothesis 5. Wilcoxon test. Capital Suppliers	142
Table 4.1.	Value creation considering social costs	169

Nomenclature

AC	Autonomous Communities
AEC	Economic Amortization
INT	Interest of borrowed capital
IMSPP	Spanish Price Index of medicinal substances and pharmaceutical products
IPMP	Spanish Price Index for products used for manufacturing pharmaceuticals
CAPM	Capital Asset Pricing Model
CFP	Corporate Financial Performance
CSP	Corporate Social Performance
CSR	Corporate Social Responsibility
EVA [®]	Economic Value Added
GDP	Gross Domestic Profit
GTAGS	Working Group about Health Expenditure (<i>Grupo de Trabajo de Análisis sobre el Gasto Sanitario</i>)
IT	Information Technologies
NHS	National Health System
OCDE	Organization for Economic Cooperation and Development
RDT	Resource Dependence Theory
TFP	Total Factor Productivity

Chapter 1

Introduction to Stakeholders, Value Dynamics and the case of the Spanish Health care sector

Abstract

Stakeholder theory introduces, as a main focus of interest, the effect of stakeholders on the firm and how the firm influences the stakeholders to achieve their own objectives. This introductory chapter reviews the basic concepts of stakeholder theory and the different approaches that can be found in the literature to describe the stakeholder firm relationships. The events that have recently occurred in the Spanish health care sector, mainly related to the expenditure control, allow the analysis of the dynamics of value creation and distribution (appropriation) among stakeholders. In this chapter we introduce the relevant events of the sector during the period 2003-2012, the evolution of the expenditure control measures and their effects on firms. The analysis of the value and influence dynamics is possible due to the well defined features of the stakeholders.

Chapter 1

Introduction to Stakeholders, Value Dynamics and the case of the Spanish Health care sector

1.1. Theoretical Framework. The Stakeholder Theory

The conceptual framework on which the thesis is focused corresponds to the stakeholder theory. This approach has been consolidated since the publication of R. Freeman's work *Strategic Management: A Stakeholder Approach* (1984). The theory is based on two main research questions: what is the purpose of the firm and what responsibility do managers have versus stakeholders? The answers to these questions influence the way that managers decide how to manage the firm's activity and what the relationships are that need to be established with the stakeholders in order to achieve their objectives (Freeman, Wicks and Parmar et al. 2004). The theory is about groups or individuals related to the firm that could affect the organization and about the response of the firm to these groups.

The relevant concepts that should be defined in this framework and the ones we have taken into consideration to develop this thesis are the identification of the relevant stakeholders, the influence mechanisms between stakeholders and the firm, the meaning of value creation, how the created value should be measured and how it is distributed among the stakeholders involved.

Regarding the relationship analysis between stakeholders and the organization Lamberg et al. (2008) outlined that in the literature several typologies of relationships between them have been studied. First, it has been done from the point of view of the organization (Savage et al. 1991, Jawahar and McLaughlin 2001) and subsequently from the point of view of the influence that stakeholders can have on the decisions of the organizations (Oliver 1991, Rowley 1997, Frooman 1999, Frooman and Murrel 2005). The approach of this work has been the second which is much less frequent in the literature.

The main contribution of the thesis is the study of the dynamic relationship between stakeholders and the firm, how the value is created and distributed, how it changes through time and consequently its implications for the social responsibility of the firm and social

and economic progress of society. The premise we propose is that these value dynamics² are triggered by the strategies they use to influence each other. The implications that multiple interactions have for the process of creation of value and distribution (appropriation) are variable through time. The second contribution of this thesis is to bring a quantitative approach to determine and to understand the effects of influence dynamics. The methodology proposed has been applied to firms that belong to the pharmaceutical industry in Spain during the period 2003-2012. The contingencies that the sector has suffered have been useful to show different aspects of interest about the stakeholder-firm relationships on which we have put the focus. As an example we wondered who the main stakeholder is. We reviewed the strategies of influence they are using, how the firm reacts and how the reaction of the firm affects the other stakeholders. It has been considered through the second and third chapters that the most salient stakeholder, the *main stakeholder*, is the Spanish public sector due to its capacity of influence and as a consequence of its role as main customer and regulator at the same time. This high concentration of power and capacity of influence in the same stakeholder is not frequent and it is worth highlighting and studying. It occurs in a highly regulated market as is the Health Care sector. We contribute to the literature analyzing at the highest level of detail the impact of the main stakeholder behavior on the firm, and subsequently on the stakeholder network. The Spanish Public Sector has captured our interest as it has been applying control measures of Healthcare expenditure, particularly affecting the pharmaceutical industry when increasing intensity on lowering the prices of the medicinal substances over the last years. The pressure on the prices caused a growing imbalance in the process of value distribution of the firms. The firms were obliged to look for new sources of value creation to compensate the effects of the main stakeholder. The approach proposed in this thesis allows the researcher to identify the changes in the sources of value creation and to follow up the changes in the distribution among the stakeholders. Additionally, it allows us to show the different typologies of influence strategies that the stakeholders are using to resist the pressure introduced in the stakeholder network through the firm.

In this introductory chapter the link of the thesis with the stakeholder theory will be introduced with focus on value creation and distribution and the influence strategies. We will also introduce the situation of the Spanish Healthcare sector in the period of interest,

² We use value dynamics in the sense of the analysis of changes in value creation and distribution through time.

splitting it into three different subperiods to show the changes of the dynamics of influence.

The second chapter has been focused on a *pin factory study* to see the impact of main stakeholder pressure on a pharmaceutical multinational firm that operates in the sector. The quality of the compiled information has allowed for a detailed analysis of the impact of the expenditure control measures and also the assessment of the impact of the influences established among the relevant stakeholders. We analyze how each one participates in the process of value creation and its distribution. The follow-up of the contributions is also analysed in order to investigate the evolution of the dynamics of influence.

The objective in the third chapter is to contrast the model of influences proposed by Frooman (1999). It is the first model in the stakeholders literature that is intended to predict how the strategy applied by the stakeholders should be, depending on the power of each party and the degree of mutual interdependence. Considering Frooman's propositions a set of hypothesis to be contrasted has been developed. We have used the data of the Spanish pharmaceutical industry to test them. The economical approach made it possible to demonstrate the applicability of the Frooman model to real situations, particularly when the relationships are mainly driven by power.

The contribution of the fourth chapter is about the concept of social economic progress and its measure. We start from the conclusion of the report commissioned to Professors Stiglitz, Sen and Fitoussi (2009) by the President of the French Republic, Nicholas Sarkozy who was dissatisfied with the present statistical information about the economy and the society. They concluded that the current social progress measures are biased. This bias come from the use economic performance indicators, such as GDP, when evaluating social progress. We retrieve the thoughts of Davis (1947), that we consider as a precursor of the stakeholder theory, as his contributions about economic progress were aligned with the conclusions of Stiglitz, Sen and Fitoussi. Inspired by Davis we define the concept of social economic progress when two conditions are fulfilled at the same time: i) increase of firm productivity as source of value creation at lowest social cost, and ii) balanced distribution of the created value. We propose the concept of social economic progress as a combination of social and economic aspects that must be considered when a measure of the social progress of society has to be implemented. We develop a measure of the contribution of the firm to social economic progress but it can be extended to any level

of aggregation of economy. The measure is based on how much value is created by the firm and how it is distributed to the stakeholders. Enlarging the first condition of social economic progress, we integrate in the measure of value creation both, the effect of changes in productivity and the effect of social aspects in the value created. We study different situation that result when both effects are combined. Moreover, we extract some interesting conclusions about the distribution of worth regarding social economic progress and firm sustainability depending on the distribution among stakeholders. We analyze the limits of the value captured by one stakeholder regarding firm sustainability and social economic progress. The social responsibility of the firm is also introduced as a chosen behavior to facilitate social economic progress. Particularly, we have studied the situation affecting labor and its re-employment when the economy faces a downsizing of demand situation.

In the next section we introduce a short review of the approaches that have been used in the literature to contribute to the stakeholder theory. Through the thesis we will use some of them to make our own contributions.

1.2. The approaches to the Stakeholder Theory

The stakeholder theory has been presented following different perspectives but the taxonomy proposed by Donaldson and Preston (1995) that included the descriptive, instrumental, normative and managerial approaches has been the most used.

- **Descriptive/Empirical.** The theory is used to describe and to explain some features or special behaviors (i.e. to describe the nature of the firm, what the managers think about the management, how top management members think in relation to the different parties that constitute the organization). Jawahar and McLaughlin (2001) developed such an approach. They noted that there are few contributions in the literature using the descriptive approach explaining how the organizations interact with the stakeholders. The first authors who tried to fill the gap were Brenner and Cochran (1991) postulating that the nature of the stakeholders, their values, their relative influence on the decision and the nature of the situation are relevant issues to predict the behavior of the organization (Clarkson et al. 1994, Jones and Wicks 1999).

- **Instrumental.** The instrumental approach argues that some results will be obtained through the adoption of defined behaviours (Jones and Wicks 1999). It explores, in combination with the data brought by the descriptive approach, the connections (or its absence) between stakeholders and the achievement of traditional objectives of the organization (i.e. profitability and growth). Regarding the methodological aspects of this approach it should be said that traditional statistical tools, direct observation and interviews are used. This approach has been used to measure variables beyond the financial results. As an example of this is *Corporate Social Performance* that tries to bring a vision in the line of taking into consideration the effects of the behaviour of the firm on the stakeholders. Jones (1995) developed an instrumental theory through the concept of stakeholders, integrating it with other economic concepts that come from agency theory, transactional costs, theory of production and with concepts that were borrowed from behavioral science and Ethics.

It should be said that the instrumental approach has been used to bring more data to the discussion about if the firm achieves a better performance managing the stakeholders in comparison with other alternative ways to manage the firm. Up to now the conclusions are not clear and there is not a consensus in the literature. In general, the studies have been focused on the cause-effect relationships and mostly in the short term (Garriga and Melé 2004). Early examples of this kind of research were collected by Griffin and Mahon (1997). Some more contributions appeared at the end of the 1990s like Frooman (1997), Waddock and Graves (1997), Roman, Hayibor and Agle (1999) and Preston and Donaldson (1999) and more recently the contributions of Bhattacharya, Korschun and Sen (2009) and Godfrey, Merrill and Hansen (2009) are reported in the literature. These conclusions should be treated with caution due to the difficulty of measuring the correlation between stakeholder management and performance (Rowley and Berman 2000, Garriga and Melé 2004). Despite the different trials to formalize the stakeholder theory it has been criticized for the lack of contrastable empirical variables (Pesqueux and Damak 2005).

- **Normative.** The normative approach can be found right from the beginning of the stakeholder's theory (Purnell and Freeman 2012). It is focused on the interpretation of the organizational function including and recommending moral or philosophical guidelines in the management of the firm (Jones 1994). It is not based on

contrastable hypothesis but it is a categorical approach to the practices related with management. Some years later Jones and Wicks (1999) also tried to integrate the normative approach with the instrumental and descriptive to propose as a result the convergent theory. A discussion about the implications of the normative approach can be found in Gilmartin and Freeman (2002).

- **Managerial.** The theory is developed around what could be done in the firm and allows the understanding of how value is created and exchanged (Freeman et al. 2010). The theory of stakeholders is managerial in a broad sense of the term but not only does it describe the existing situations nor does it just predict the cause-effect relationship but it also recommends attitudes, structures and practices that when taken as a whole constitute stakeholder management. The management of the stakeholders requires giving attention to the legitimate stakeholders when organizational structures are established, when general policies are defined and when deciding about specific situations. This requirement applies to professional managers, shareholders, governments and the other groups involved (Donaldson and Preston 1995).

After receiving a peak of contributions at the end of the 1990s from different schools of thought the stakeholder theory is still controversial without its formal development having been completed (Laplume et al. 2008, Margolis and Walsh 2003, Jensen 2002, Jensen 2010, Rowley 1997). Following Laplume et al. (2008) the theory is at a critical crossroad because it is still looking to be considered as a first level theory in the mainstream of management literature.

Freeman et al. (2010) revised the contributions of different authors who have helped in the development of the theory since 1984. They explained how changes in everything surrounding business have made it necessary to rethink the dominant models in order to understand them³. They suggested three problems where the stakeholder theory can contribute to their resolution: i) the problem of value creation and exchange, ii) the problem of capitalism ethics, and iii) the problem of the managerial mindset. They named these concepts as the basic mechanics of stakeholder theory.

³It should be said that Freeman et al. (2010) understand the dominant fourth approaches in the literature to conceptualize how value is created and exchanged (starting from concepts like “markets”, “strategy”, “business structure”, “agency relationships” and “transaction costs”) represented by icons like Milton Friedman, Michael Porter, Michael Jensen and Oliver Williamson are complementary and compatible with stakeholder theory instead of being exclusive as it has been said in the last years.

The thesis has been focused on the first problem of basic stakeholder mechanics, the problem of creation and exchange of value, developing a specific methodology to make the study of the dynamics of value and the dynamics of influence compatible.

We consider that the thesis contributes to the descriptive, instrumental, normative and managerial approach. In relation to the descriptive/empiric approach we contribute a study in the second chapter of a multinational pharmaceutical firm where the interactions among the stakeholders have been investigated considering the sector contingencies we describe at the end of the first chapter. The focus has been put on the main stakeholder behavior and how it influences the sources of value creation and how the distribution of value changes.

The contribution to the instrumental approach is the quantitative methodology based on production theory which to our knowledge has not been applied to this conceptual framework before. The instrumental approach uses variables like firm performance (e.g. profitability and growth) but not value creation. We contribute to the methodology of the instrumental approach as we define how the firm creates and distributes value. This is a measure of monitoring the performance of the firm that clarifies the contribution of each stakeholder to the performance of the firm. This approach will be useful to understand the relationships and influences among stakeholders through real data that could be quantified and linked to our research questions. In each chapter the methodology applied will be described and adapted to each case when it is necessary to go into details.

From the point of view of the normative approach this work contributes with the concept of the social responsibility of the firm and its relationship with social economic progress where the way value is created (including social aspects) and the way value is distributed to the the stakeholders is taken into consideration. The behaviour of the firm, particularly when it affects the stakeholders, has direct influence on relevant economic aspects. The decisions taken by the firm related to the way of creating value, employment of resources and distribution of the economic wealth created are directly related to the macroeconomic variables such as economic progress.

Considering the previous arguments we conclude that our contribution is also managerial because it tries to solve the problem of value creation and distribution, collects descriptive aspects and analyses the cause-effect relationships. It also recommends policies and proposes specific decisions to manage the stakeholders.

1.3. The definition of the stakeholder concept

The definition of the *stakeholder* concept that Freeman (1984, 46) established is “any group or individual that could affect or be affected by the achievement of the firm’s objectives”. The debate around the definition of stakeholders has existed since the early steps of the theory. The scholars have been trying to determine who or which group is salient for the managers and who merits their attention. We review here some of the more relevant definitions in order to select which will be the one we use throughout this thesis. Freeman’s definition, as it was broad, was complemented by the acknowledgement of the existence of direct stakeholders (linked by contract) and indirect stakeholders (Hill and Jones 1992). This first classification was replaced in the literature by the primary and secondary stakeholders (Clarkson 1995, Hillman and Keim 2001). The group of primary stakeholders is composed of investors, customers, workers, suppliers and it includes in the classification the public stakeholders: the government and institutions that provide infrastructures and markets. The public stakeholders dictate laws and regulations and they are those who should be obeyed and who collect taxes. They have a high level of influence (Nemetz 2015) as they can use legitimacy and coercive power for promulgating regulatory requirements, or by incentivizing through the power of reward, such as providing subsidies for firms to engage in sustainable practices. The secondary stakeholders are those that influence or are influenced by the organization but are not essential for its survival (Clarkson 1995, Pajunen 2006). Carrol (1993) argued that the groups could be stakeholders by virtue of their legitimacy and the scope of the definition could be widened to those who have power (capacity to influence the organization). Mitchell, Agle and Wood (1997) proposed that the stakeholders have to possess one or more of the three following attributes: power of influence, legitimacy in relation to the organization and urgency to satisfy their demands. An exhaustive summary of the different approaches that have arisen in the literature to identify the stakeholders depending on their attributes is detailed in Mitchell, Agle and Wood (1997) and Frooman (2010).

We use the definition of Mitchell, Agle and Wood (2007) to identify the salient stakeholder. Moreover, we follow the definition of stakeholder recently proposed by Garcia de Castro and Aguilera (2015, 138). They defined the stakeholder⁴ as “any group or individual who creates and captures economic value in its interaction with the firm”. This

⁴ This definition is quite similar to what Freeman and Evan (1990), Hill and Jones (1992) speak of stakeholder as contractors or participants in exchange relationships but more appropriate for our work as it makes explicit the value creation and capture.

fact is interesting because it allows the quantitative follow-up of the impact of influence and its development with homogeneous assessment criteria and therefore enables us to quantitatively analyze the value dynamics of value creation and distribution.

For the purpose of this thesis, focusing our analysis on the value dynamics, we consider managers as being in the centre of the stakeholder network, overlapping with the firm, as it is outlined in the stakeholder model described by Donalson and Preston (1995). By omission, it might be interpreted that managers are in the centre of the network, connecting all stakeholders and as a result their role is included under the umbrella of the firm. In that position they are the ones who physically interact with the stakeholder network on behalf of the firm. They take the decisions regarding the internal organization and they negotiate with third parties through the prices of inputs and outputs. They are the ones who receive the influence of the stakeholders and are responsible for transferring influences. They regulate the value dynamics of value creation and distribution among stakeholders.

We use the concepts of manager and firm as synonymous during our analysis. In our analysis, for the sake of clarity, the managers will not be explicitly considered as an independent stakeholder group but they could be included in case of necessity. This means that their contribution to value created will not be outlined and they will not be considered an independent receptor of the distributed value.

1.4. The influence of the stakeholders

Two approaches have been used to study the influence of the stakeholders (Frooman and Murrell 2005). The first is the *demographic* approach that has been dominant in the mainstream of the theory. It sets out to identify which are the key attributes in order to facilitate the identification of relevant stakeholders, or in terms of network theory it emphasizes the nodes in the stakeholder network. The works of Carroll (1989), Clarkson (1995), Freeman (1984), Mitchell, Agle and Wood (1997), Rowley and Moldoveanu (2003) have been particularly influential. The second is based on the *structural* approach. It emphasizes the relationships and the links among nodes (Savage, Blair and Sorenson 1989, Granovetter 1985, Rowley 1997, Lamberg, Savage and Pajunen 2003).

Significantly fewer studies have used the structural approach (Hill and Jones 1992, Rowley 1997, Frooman 1999) but it should be said that these contributions are relevant for the thesis. First, we highlight Rowley's contribution (1997) where the concept of stakeholder interrelation was introduced, and secondly, Frooman's contribution (1999) where the mutual influence of stakeholders and firm was systematized. Rowley (1997) considered that a coherent theory of the firm requires not only an explanation of the stakeholder influences but it should also explain how the firm reacts to these influences. Rowley developed his arguments by focusing on the density of the stakeholder network and the centrality of the organization inside the network as explicative variables of the degree of resilience of the firm to stakeholder demands. The contribution of Frooman (1999) is the second point of reference. It was the first systematic approach to the strategies of influence. Frooman (1999) proposed a descriptive model with the intention of establishing different relationship typologies between a stakeholder and the firm. He asked two relevant questions: i) Is the firm dependent on the stakeholder? ii) Is the stakeholder dependent on the firm? To answer the questions, Frooman used the concept of power as an attribute of the relationship that links stakeholder and firm (structural approach) and not as a feature of each individual agent (geographical approach). The use of the power concept as a feature of the stakeholder is related to the identification of salient stakeholders. Furthermore, the structural approach allows detecting or predicting the relationships of influence. The structural component was only previously analyzed by Hill and Jones (1992) and Jones (1995). These authors introduced the contracts as a nexus joining stakeholders. Later Willer, Lovaglia and Markovski (1997) defined power as the potential structure to obtain favourable *pay-offs* in the relationship where the interest of each party comes into conflict. Considering the relevance of the Frooman model for the thesis contribution we will study its implications in chapter three. We will apply it to the Spanish pharmaceutical industry as we consider that power in the relationship is the key factor to understand the dynamics of value creation and distribution in the studied period.

Considering that the main stakeholder is the public sector, it is worth mentioning that Oliver (1991) studied the influence of institutional stakeholders (government, local authorities and public opinion) from the perspective of institutional theory and the resource dependence theory. Oliver looked for the explanatory capacity of resource dependence predictions of organizational strategy that should complement the more limited range of organizational responses that institutional theory had traditionally offered. Oliver outlined

(1991, 148) that the Resource dependence theory “focuses on active choice behaviors that organizations can exercise to manipulate external dependencies or exert influence over the allocation of critical resources” but institutional theory usually “limits its predictions to different types of structural or procedural conformity to the environment”. The degree of power attributed to the organization in relation to its environment explains the divergent assumptions of both theories. Oliver (1991) proposed a typology of organizational answers with regard to pressure, ranging from passivity to active resistance. These answers were typified as acquiescence, compromise, avoidance, defiance and manipulation and he proposed a set of hypotheses to foresee the organization’s response when under pressure.

We also mention the contribution of Jawahar and McLaughlin (2001) noting that the relative relevance of primary stakeholders is dependent on the life cycle phase which the firm is in. Verbeke and Tung (2013) also give support to the idea that the relationship between firm and stakeholders evolve over time. The contribution of Pajunen (2006) described a case study (a paper manufacturing firm named “Kymi Corporation”) where the influence of the stakeholders pushed them to the limit, whereby the firm faced a crisis threatening the firm’s survival. The study led to the development of a model that combines the resource theory with the network relationship in order to show how the influence of the stakeholders consists of attributes and structures based on power forms. Pajunen (2006) proposed a matrix to identify the stakeholder influence in a position where the organization in the stakeholder network (based on relative power) and the direct dependence of the resources (based on absolute power) cross over.

Concerning the contributions on corporate governance, Spitzeck and Hansen (2010) developed a model integrating the power of the stakeholder and the scope of the participation in the decision making process of the firm (Lozano 2005, Mackey, Mackey and Barney 2007). They noted that in this sense there is no significant empirical research, apart from some sporadic contributions (i.e. Mirvis and Googins (2006) that assess how the input from stakeholders is taken into consideration in corporate level decision making).

The way in which external entities can influence the behaviour of an organization has also been investigated from other theoretical approaches (Frooman and Murrell 2005). As examples we can mention the theories that study open systems. They put the emphasis on how the environment affects the organization (Donaldson and Preston 1995, Oliver, 1991). Other approaches are the agency theory (Hill and Jones 1992) and the exchange theory (Blau 1964, Cook and Emerson 1978, Emerson 1962). The agency theory is useful

in order to model the stakeholder theory when the interactions are conditioned by the conflict of interests, particularly when the exchange is not negotiated, but it is the theory of resources and the exchange theory which argue how the events will develop in conflict situations (Pfeffer and Salancik 1978). As pointed out by Dill 1975, Freeman 1984, Frooman 1999 and Lamberg, Savage and Pajunen 2003, these theories propose that when the interests diverge, and the negotiations are blocked, it is power which determines the result. We study this situation in the second and third chapters.

The conclusion, after revising the literature, is that beyond the Rowley (1997) and Frooman (1999) contributions there are few recent contributions that deal with relationships of influence. From our point of view, it makes sense under this conceptual framework to study situations where the structure of relationships shows ideal characteristics. It enables the understanding of value and influence dynamics with little distortion. It will be interesting to check when analyzing these situations if some conclusions could be extracted about the stakeholder capacity of influence and how the firm manages the reaction by exerting its own influences over the stakeholders.

1.5. Creation and distribution of value

The issue of value creation and its distribution (appropriation) in the stakeholder theory has regularly received attention from different authors. In this section we outline some of the more relevant contributions.

In the stakeholder framework the firm is understood to be a unit that consumes resources in the present (labor, raw materials and capital) but also its existence allows for future consumption (Ackoff 1994). The firms create wealth but it is not obvious to everybody that they also have the function of distributing it. The redistribution is achieved through the payment of salaries, buying of raw materials from suppliers, giving dividends to shareholders, paying taxes to the government and paying interest rates to the capital lenders. Ackoff (1994) noted that the activity of business is the only way known of producing and distributing economic worth simultaneously. Clarkson (1995) also argued that the social purpose of the firm is to create and distribute wealth to all the primary stakeholders without favouring a single group at the expense of others. Considering this it should be said that people are the only ones who can capture the created rents (Coff 1999) because the firm, as a contract nexus (Jensen and Meckling 1976), can not capture value

because they are legal entities. From this perspective it is not enough to say that the strategic resources generate economic worth for the firm without noting that the stakeholders capture the created value in the end. In other words, the result obtained by the firm is the output of a two step cycle, the value generation is the first step and the distribution of the economic worth is the second one. It is not possible to predict the result obtained by the organization by discussing only the first step and not the second. To Coff (1999), a firm generates rents when all the stakeholders receive enough compensation to be maintained in the place they occupy due to the following relation being fulfilled $payment \geq opportunity\ cost$. This shows that it should be taken into consideration that some stakeholders obtain more than is necessary to be maintained in their corresponding position. Following Coff (1999), the power of negotiation in the hands of the stakeholders to capture rents is greater if the stakeholders work in a coordinated manner, if they have access to key information, if the cost for the firm is high, if they have to be substituted by new ones or if the stakeholders face low costs in the event they decide to cooperate with third parties. In the opinion of Bosse, Phillips and Harrison (2009), the definition of rents by Coff (1999) is consistent with the idea that the firms create value by coordinating the economic exchanges through the stakeholder network. The authors who support the management of the stakeholders suggest that when firms create value, they end up distributing this value (in various ways) among stakeholders. They compare this concept to the traditional approach where the quantity of value that a firm can capture is measured as the portion of the created value that is not distributed to the stakeholders who are not shareholders. Within the theory, the firm tries to distribute part of the value, as material resources, procedures and interactions of “fair play”, to a wide group of stakeholders. Distributing this value (Preston and Donaldson 1999) the firm creates a positive reciprocity between the stakeholders that gives support to the creation of additional rents.

Conversely, Jensen (2002) associated the process of value creation to the definition of a unidimensional objective function that should integrate the exchanges (“trade-off”) between the relevant variables. The objective of this function should be the maximization of the firm’s market value in the long term. In order to create additional value, it is necessary to know precisely what is the maximal value that could be generated and to know how it could be achieved. Jensen (2002) stated that in order to do this it is necessary to create the suitable environment as well as to motivate managers and workers to look for this added value, to detect and to implement changes and strategies that could cause a

value increase. He noted that an indicator related to the long term maximization is necessary to manage and to have a clear understanding about what is the best option for the organization. Under most circumstances this indicator will show if the firm is performing well or if its performance is decreasing. In a later contribution, Jensen (2010) noted that the most suitable measure to manage an organization is the change in the market value using the Economic Value Added (EVA) that can be associated to an economic profit indicator.

As we have mentioned, Freeman et al. (2010) pointed out the value creation and distribution as a field of research and this is the reason why it is necessary to define accurately what is understood as *created economic worth* and also define the methodology to quantify it. This doctoral thesis considers, as Ackoff did, that the business activity (and as a consequence the firm) is the only one valid mechanism to create wealth. The low number of proposals in stakeholder literature about how the economic worth created by the firm could be measured is quite surprising. Jensen is a clear example of this problem when he discusses the maximization of market value because the market value only reflects the wealth created by the firm appropriated by the shareholders. If the market value grows it does not necessarily indicate that the firm generates more economic worth. That's because this could be done at the cost of the participation of the rest of the stakeholders and it could happen that the total economic worth does not increase in this process.

On the other hand, it is worth mentioning that in perfectly competitive markets the economic profit should take zero value after the remuneration of shareholders accordingly to the risk taken. This does not mean that the firm has not created value as Jensen suggested. As a consequence, it seems clear that we have to differentiate between the process of the creation of economic worth and the process of its distribution. This is, moreover, of enormous interest from the perspective of social responsibility in the stakeholder theory in order to understand how the firm has generated the economic worth that will later be distributed. We will discuss such aspects in the second and fourth chapters

Through this thesis the quantification of economic worth generated and its distribution is based on the theory of production duality. The antecedents can be found in the thirties and forties of the twentieth century, however Fuss and McFadden (1978: viii) credit Shephard (1953) as "the first comprehensive treatment of the subject and proof of the basic duality of cost and production". This thesis exploits a sort of duality between prices and quantities, which is based on profit change decomposition. We express profit change as the sum of an empirical quantity indicator, which allows changes in quantities to

influence profit while holding prices are fixed, and an empirical price indicator, which allows changes in prices to influence profit while holding quantities are fixed. We isolate the empirical quantity indicator, which is allocated via the empirical price indicator and profit change itself. This analytical framework allows us to discuss the value created by the firm and its distribution. Additionally, the management and accounting literature have decomposed the empirical quantity indicator into different components (Davis 1955, Eldor and Sudit 1981, Genescà and Grifell-Tatjé 1992, Kendrick and Creamer 1961, Kurosawa 1975, Kurosawa 1991, Miller 1984). Furthermore, under certain conditions, the empirical indicator of quantity change is the monetary value of productivity change and produces an exact relationship between the empirical quantity and price indicators. Jorgenson and Griliches (1967) mention Siegel (1952, 1961) as introducing the concept of a dual price-based productivity index. Fourastié (1957) was a prolific user of a dual productivity approach.

A similar methodology was developed in the French literature by Puiseux and Bernard (1965), Vincent (1965) and Méraud (1969), among others, and applied by the public institution Centre d'Etude des Revenus et des Coûts (CERC) to the study of the French public firms (CERC 1969). An important stream of research was produced using this approach during the 1970s and 1980s. The common characteristic of this literature is that it quantifies the value generated by the firm (surplus) and its distribution. The Spanish researchers were attracted by this methodological approach and it is worth mentioning the work of Maroto (1980) and Arruñada (1987). Grifell-Tatjé and Lovell (2008) recovered this approach and studied the impact of the reforms introduced in the US postal monopoly, quantifying the wealth generated by the reforms in the US Postal Service and how it was distributed. Arocena, Blazquez and Grifell-Tatjé (2011) used the methodology to determine who obtained the benefits from the reforms introduced by the regulation of the Spanish electricity sector. Grifell-Tatjé (2011) studied if the organizational form of the firms in the Spanish financial system explained the different levels of performance and if the wealth generated by each level had been distributed in a different way among the stakeholders. Estache and Grifell-Tatjé (2013) studied the effectiveness of the privatization of the water supply service in Mali (Africa). More important is the contribution of Grifell-Tatjé and Lovell (2015) who have summarized and completed the previous works by integrating the literature from different disciplines (economics, business, management and accounting) under a single methodology. One of the objectives was the quantification of

worth generated by the firm and its distribution. A whole branch of study based on index number theory has been developed in economic science, based on the aggregation process of economic information (Balk 2008). The previous authors applied it at the level of firms using the modern theory of production as a theoretical context, with the information mainly coming from accounting sources. In the second and third chapter of the thesis we have adapted the methodology to the study of power and interdependence relationships between stakeholders and firms. In the fourth, we have used it to explore the interdependence between firm behavior and social economic progress.

1.6. The stakeholder relationships

In order to study the dynamic of influences it is necessary to define the different kind of stakeholder relationships. They have been structured using two variables: i) the capacity of influence of the main stakeholder on the organization and ii) the capacity that the organization has to react and influence other stakeholders. The map of possibilities shown in Table 1.1 arises from crossing these two variables.

Table 1.1 Classification of the firms depending on the dynamic of influences

	Capacity of reaction of the firm: (influence of the organization on other stakeholders)	
Capacity of influence of the main stakeholder	High	Low
High	A	C
Low	B	D

Table 1.1 is the simplest table that can be built and it is structured in four quadrants that allow the classification and allocation of the firm in specific time points depending on the two mentioned factors. The place occupied by the firm will depend on the level of influence received from the main stakeholder and the capacity of reaction to influence the other primary stakeholders. It can be expected that these relationships change through time. and this fact allows us to analyze and investigate if a change has occurred. The changes that we will consider will be derived from the dynamics of value creation and distribution

and are consequence of the historical contingencies that the firm has faced during the period studied. The consequences of these changes are reflected in the retrospective accounting data.

In order to identify in which quadrant of Table 1.1 the firm is, it will be necessary to analyze whether the firm receives pressure from the main stakeholder. This implies the main stakeholder is capturing economic worth. Secondly, it has to be assessed if the firm can forward the pressure to other stakeholders meaning that the firm is able to capture worth from them. It is also a point of interest to investigate if the firm's capacity of influence is enough to compensate the worth captured by the main stakeholder. This empirical and quantitative approach contains the arguments to satisfy the requirements of Friedman and Miles (2002) in declaring that a large part of the efforts of stakeholder theory had been focused on the identification of who were the stakeholders instead of placing them in the dynamics between organization and stakeholders. This analysis allows us to see the interaction between stakeholders and firm from a new perspective.

- **Quadrant “A”**. It describes a situation where the main stakeholder exerts a strong influence on the firm and at the same time the firm has a strong capacity of influence over the other stakeholders. It implies that the main stakeholder has a decisive influence in the decision making process and, in the context of this work, we understand that he can capture a significant portion of the value created by the firm. On the other hand the firm is in the position to forward this pressure to the rest of the stakeholders in proportion to compensate this influence. The firm can extract economic worth proportionally to its capacity of exerting pressure.
- **Quadrant “B”**. It defines the situation where the stakeholders do not have any significant capacity of influence over the firm. Conversely the firm has a strong capacity of influence and it can capture worth from them. Although this is an idealized situation it could be similar to a situation where the firm has great market power.
- **Quadrant “C”**. It determines a situation where the main stakeholder has high capacity of influence and, at the same time, the other stakeholders have a strong influence capacity, too. The firm is in a difficult situation, with very few options to retain the created worth. It is expected that the economic worth will be distributed between the stakeholders and the situation, if it is maintained in the long term, will have an evident risk for the survival of the firm. The pressures coming from

different stakeholders can result in the firm not having the capacity to solve all the demands placed on it and in the end it becomes unviable. From the point of view of stakeholder management it is expected that the firm will focus on reducing each stakeholder's capacity of influence, by seeking new alliances or new deals with some of the key stakeholders, and by looking for alternative raw material suppliers. This could also involve diversifying the offer to its customers by including new products in the portfolio that could add new additional value or by developing alternative processes that improve the performance.

- **Quadrant “D”**. It expresses a situation where the main stakeholder does not have the capacity of influencing the firm but the firm does not have influence capacity on the other stakeholders either. It shows a situation where the firm has managed to free itself from pressures coming from the stakeholders but it is not able to transform this privileged situation in order to capture worth from its stakeholder network by acting directly through prices or costs. It is expected that this coincides with a stable and mature market situation where the firm enjoys a long term, stable relationship with the stakeholders; thus balancing in a sustainable manner the contribution and participation of each stakeholder in the cycle of value creation and distribution.

When starting out from these initial situations we need to take into consideration which are the factors and strategies that could cause a change in the firm or stakeholder capacity of influence. The understanding of these dynamics is relevant to identify the policies that are applied by the firms or to figure out what the structural barriers are that make it impossible for these kinds of changes to happen. From this perspective it is necessary to study the potential dynamics that could be found in a real situation and what impact they can have on stakeholder management.

The consequences of the analysis of influence dynamics, as is set out in this thesis, are relevant for company management because they enable the understanding of the improvement or worsening position of the firm versus the stakeholders. The firm can not survive without its stakeholders but it is not possible to accept that one of them systematically captures all or most of the created value because this makes the situation unsustainable. As a consequence, these dynamics of change should be within certain limits that guarantee the feasibility of each participant in the stakeholder-firm network. Up to

now these limits are not fixed but our work contributes to the theory showing what happens to these limits when the main stakeholder pushes the system into a new situation and the consequences of this displacement.

1.7. The Spanish healthcare sector (2003-2012)

The Spanish Healthcare sector shows some characteristics that converts it into an interesting case to be studied. In this section we revise the situation in the sector and the contingencies derived from the necessity to control healthcare expenditure by the public sector. The objective of this section is to put the analysis of the second and third chapters in their context.

The political organization of the Spanish State is based on a State with central government, divided into 17 autonomous communities (AC) each with decentralized power of decision with their own government and parliament. The population is around 47 million spread over an area of 505,995 km². The life expectancy at birth in the Spanish State for 2012 is one of the highest in Europe, on average 82.2 years, being 85.1 for women and 79.4 years for men (Instituto Nacional Estadística 2014). The main causes of mortality in Spain are cardiovascular, cancer and respiratory diseases but their rates are one of the lowest in Europe (García et al. 2010).

The National Health System (NHS) is a universal coverage system financed by taxes (Moreno, Puig and Raya 2011) and it operates mainly in the public sector⁵ (Prieto and Lago-Peñas 2012, Rubio and Reyes 2007). The competences in healthcare have been totally transferred to the AC since 2002 and as a result there are 17 health departments (councils or health departments) that have jurisdiction over the organization and service provision in their own territory. The central Health Ministry and Social Policy department retains the authority on determined strategic competences as the legislation related to pharmaceutical drugs and it also has to guarantee equal conditions in service provision in all the territory. The organism that holds the maximum responsibility in terms of coordination of NHS is the Interterritorial Council of NHS which consists of the Ministry of Health and 17 competent councils in representation of the AC. The decisions of the Interterritorial Council of NHS are adopted by consensus and are transcribed into

⁵ The legal framework of health care functioning is what was established in the Law 14/1986 of 25th April, General de Sanidad or Law 16/2003, of 28th May of cohesion and quality of NHS.

recommendations because they affect the competences transferred to the AC (Durán, Lara and van Weveren 2006).

Concerning the financing of NHS, Garcia et al. (2010) indicated that Spain has followed the trend of increase concurrent with the international pattern, reaching €3,150 per capita and 9.7% of Gross Domestic Profit (GDP) in 2009⁶ and 9.2% of GDP in 2012, still below the European average (European Commission 2013, OCDE 2015). Healthcare expenditure⁷ is paid for with public funds, collected from taxes (94%).

The AC administrate 89.9% of public health resources (corresponding to 30% of their global budget) compared with 3% that is managed by the central administration and 1.25% controlled by the municipalities.

The Spanish public sector provides for 71% of health care expenditure, voluntary private insurance accounts for 5.5% and out of pocket payments is about 23.5%, mostly in the form of co-payment for medication by patients under 65-years old (European Commission 2013).

It can be estimated that 40% of hospitals⁸ belong to the NHS and the rest are privately owned despite the fact that some of them are within the hospital network of public use and are hospitals with harmonized agreements which receive public financial support for their activity.

Traditionally the public system subcontracts private entities of hospital care at a rate of 15 to 20% of the total supply of specialized health services. In general these are services such as high resolution diagnostics, and ambulatory or surgical procedures in the framework of waiting lists. The private voluntary Insurance Policies play a relatively lower role but every day they are becoming more relevant. These insurance policies, independent of the public system, are contracted by people so as to have access to services for which there are long waiting lists in the public system (i.e. specialist health care services or bucodental services). They cover approximately 13% of the population but there are some significant differences among AC.

⁶ <http://www.who.int/nha/country/esp.pdf> (accessed Sep 28, 2014)

⁷ Healthcare expenditure is broken down in the following concepts: specialized care: ambulatory and hospitalary (54 %), primary care (16 %), pharmaceutical expenditure (19.8 %), public health and prevention (1.4 %). All of these expenditure items have been increasing in the last decade although in a different manner and it should be highlighted that the annual increase of pharmaceutical expenditure has slowed down since 2004 where the growth was 6.26 % corresponding to 20,6 % of the total public health care expenditure (Durán, Lara and Van Waveren 2006)

⁸ The total amount of hospital beds is 160.981, that means 3.43 beds per 1,000 inhabitants and 71.2 % of the beds installed depending functionally on the public sector. The population ratio of primary care is 1,410 people per family doctor, 1,029 children per paediatrician and 1,663 patients per nurse. In the hospital sector, per each 1,000 people there are 1.7 doctors, 2.93 nurses and 2.47 professional human resources associated to nursing

The health care reforms made in the 1980s had as their objective the enlargement of the extension and access to health care services in order to complete the transition from a social security system to a system of universal health-care coverage. The decentralization process of public health care started in 1981. In that moment, according to Cantanero and Lago-Peñas (2012) three models could be distinguished: i) ten regions accounting for approximately half of the population did not have health care responsibilities until the end of the process in 2002. All the responsibility was carried out by the government, ii) five AC: Catalonia, Galicia, the Canary Islands, Community of Valencia, and Andalusia were dealing with their own health care expenditure responsibilities, but with actual fiscal responsibility limited and iii) two AC with special status (Navarre and the Basque Country) fiscally and politically accountable.

During the period 1963-1986, the increase of the percentage of GDP corresponding to public health expenditure was significant, from 0.9% to 4.2%, due to the fact that the annual average real growth rate of public health expenditure reached 10.9% (Blanco, Urbanos and Tuissard 2013). In the 1990s the objectives of NHS were focused on cost containment (Moreno, Puig and Raya 2010) and innovation in management. At the beginning of 21st century they were oriented to achieving better coordination and cohesion after the decentralization process, seeking a mechanism to balance the decentralization forces and equity among the communities in the State. The reforms can be grouped into four parts: i) adaptation of organisms and tools of the new decentralized organization, ii) enlarging the services and their modernization, iii) allocation and distribution of the funds in order to help the AC to assume the transferred competences, iv) creation of a national system of information that includes autonomic and national levels and that gives transparency to the follow-up and the distribution of resources in the whole State.

Healthcare expenditure has become a worrying question for developed economies in recent years. This is caused mainly by two factors: the high percentage of GDP allocated to this purpose and its sustained growth. In relation to the first factor in the OCDE countries expenditure oscillates between 6 and 11% of their GDP (Hopkins, Morgan and Astolfi 2007, Hernández de Cos and Moral-Benito 2011). In relation to the second the average expenditure in a sample of 134 countries (Hernández and Poullier 2007) increased from 4.5% in 1980 to 6.1% in 2006. In the Spanish State, following data published in 2007 by the “Working Group about Health Expenditure” (*Grupo de Trabajo de Análisis sobre el Gasto Sanitario* (GTAGS)) it was noted that this budget represented €50,535 million in

absolute figures, 5.53% of GDP and 15.19% of the public administration expenditure in 2005. Four years later, the total Health expenditure was increased up to €101,820 million in 2009 and reduced to €94,639 million in 2012 (OCDE 2015). The rhythm of annual growth between 1999 and 2005 was 8.53% with a peak of 11.37% in 2003, with the increase in the AC being between 10% and 18% (Abelló et al. 2007). In the last decade those responsible for the management of public funds have put the emphasis on strategies that allow the achievement of the objectives of rationalization and control of health expenditure from the political, technical and economic perspectives.

To understand better how the pressure on the cost expenditure was applied we must mention that the Spanish health care expenditure is split into three components: i) primary attention, ii) specialized care and iii) pharmaceutical. The pharmaceutical expenditure contains the supply of medicinal substances to the patients. It is the most relevant for our analysis focused on the impact of the main stakeholder on the pharmaceutical industry. Pharmaceutical expenditure is composed of two different factors: i) the pharmaceutical hospital expenditure where the medicinal substances are dispensed directly by the hospital or under hospital authorization and, ii) the substances delivered to the patients through pharmacies.

The Spanish public sector is the main purchaser of those products in the Spanish pharmaceutical market. This fact gives it a certain degree of monopsonist power (Piña and Suárez-Serrano 2009).

The Spanish pharmaceutical hospital expenditure corresponds to the medicinal substances consumed by the patients during their stay in hospital as well as the ambulatory medicines that can only be obtained through the hospital. The public pharmaceutical hospital expenditure represented €1,152 million in 1999, including hospital and extrahospital expenses. This amount increased up to €2,020 million in 2003. From 2000 to 2003, the pharmaceutical expenditure increased due to several factors: i) the high ratio of demographic ageing, ii) the price of new medicinal substances introduced in the Spanish market and iii) the reception of people coming from the European Union, both temporarily or permanently. A high variability of increment rates was observed depending on the AC that was assigned to different procurement management in each of them. At the end of the period, in 2012, the pharmaceutical hospital expenditure was €4,317. This is the concept of pharmaceutical hospital expenditure we refer to in chapter two.

The second component of pharmaceutical expenditure, the expenses related to prescriptions directly supplied to patients was at a corresponding figure of €1,325 million in 2003 (IEF 2005). At the end of the period, the expenditure was €8,863 million in year 2012.

In chapter three we refer to the total pharmaceutical expenditure that includes the sum of both components: hospital and prescriptions, that corresponds to €13,180 million in 2012 and to 1,35 % of GDP (Farmaindustria 2014).

Finally, regarding the firms operating in the market, there were 250 manufacturing pharmaceutical firms in 2003 and this number increased to 282 firms in 2012. There were 377 companies with registered medicines which increased to 402 in 2012 (Farmaindustria 2013, 2014). The number of employees working in Spanish pharmaceutical firms was at 36,713 in 2012 (EFPIA 2014).

The firms that carry out their activities in the Spanish healthcare sector have suffered from strong pressure to reduce the selling price of their products in the period since 2005 to 2012. This pressure, exerted by the main customer of this market, the NHS, is a consequence of the necessity to control the increase in health expenditure in recent years, particularly in the period 2003-2006 (Sánchez 2007, Costa-Font and Puig-Junoy 2004). In order to study how this pressure has changed we have divided the period 2003-2012 into three subintervals: 2003-2006, 2006-2009 and 2009-2012. We revise some relevant aspects in the following paragraphs in order to put them in their context.

1.7.1. The control of healthcare expenditure. The pressure of the main stakeholder

1.7.1.1. First period. 2003-2006

The facts that took place in this interval were conditioned by the decentralization process of the NHS from 1981 to 2002. Despite the progressive decentralization, in this period a centralized system was predominant in order to take the decisions and to control the expenses (Repullo 2007, Antoñanzas et al. 2007, Costa-Font and Puig-Junoy 2004). The situation after 2003 was completely different. On the one hand the decentralization of all services was completed and a formal discipline concerning the expenditure was imposed on all AC. On the other hand the management of inflationary services was decentralized. They were difficult to manage (i.e. the social welfare services). The AC were faced with the difficult decision of having to rationalize the expenditure locally and facing, at the same time, the unlimited necessities of the demand with limited resources.

Additionally the central administration required them to have a rigorous control of expenses, something which was rarely accomplished when they themselves managed the same services (Repullo 2007).

The public pharmaceutical expenditure has been increasing in the last decade, the process having started in 2000 due to several factors such as the demographic ageing rate, the price of new drugs and the fact that Spain is a receptor of foreign people, on a temporary (vacational) or permanent basis and this consequently has its impact on the cost of financed drugs. One of the most important measures to control all of these expenses was the establishment of reference prices for drugs and the signing of a deal (*Pacto de Estabilidad*) between the government and the pharmaceutical industry in the period 2001-2004 (Piña and Suárez 2009).

The Pacto de Estabilidad 2001-2004 structured a set of measures such as: fixing of maximum price, co-payment, exclusion of some drugs from the publically financed system, reduction of the profit margin of the major and minor dealers, inclusion of generic drugs in the market, application of reference prices and some more agreements to limit the growth of pharmaceutical expenditure and to create a suitable framework for research (Piña and Suárez 2009).

From the normative point of view it should be said that at the end of 2004 the *Royal Decree 2402/2004 of 30th December* was published. It included conjunctural revisions of the pharmaceutical drug prices and it supposed the first clear sign of the change in the trend towards the containment of pharmaceutical expenditure whilst being the first of a long list of Royal Decrees and regulations (see Appendix A). The normatives will be analyzed in the following periods in this section and afterwards, in the following chapters, we will see and assess their impact on the sector.

In the political agenda serious problems of financial capacity arose only three years after the introduction of the new financial model. It caused health care financing to be the central subject of the first two conferences of AC Presidents organized by the new elected government in 2005.

In view of this situation, the commitment agreed between the local administrations was translated into a set of rationalization of healthcare expenditure measures that were derived from the report set out by the GTAGS (IEF 2005). Sánchez (2007) affirmed that, in this context, better future measures to be taken were those that had an impact on management and would favour a normative framework which could empower the

efficiency of the system. It is necessary to recall that due to decentralization, the purchasing capacity of the AC was fragmented in relation to the situation of the NHS in the previous decade. The service provision and organization of product supply were managed from a local perspective and the potential benefits that could be offered to the suppliers were reduced quite significantly (Sánchez 2007).

The recommendations of GTAGS could be summarized by indicating that the efficiency of purchasing systems should be improved, encouraging the centralization and homogenization in each area of the decisions regarding the acquisition of medical devices for hospital use. They recommended the extension of the measures to equipment, IT tools and to all types of medical devices. A permanent revision of the result of these mechanisms was necessary. It was intended to drive, reinforce and enlarge the previous initiatives of some AC addressed at improving the price variability of resources used in the production of health care services and it was also intended to improve the negotiation power in relation to the suppliers (Urbanos 2006).

In this context every local administration had to implement measures within their scope of responsibility in order to favour this framework. Given the heavy weight of the medical care services in relation to the total expenses of AC, the incentives to establish measures through the available mechanism, for instance the purchasing centres, were a point to be taken into consideration (Sánchez 2007).

One example of the costs derived from the public monopsony fragmentation into 17 entities with financial autonomy can be found in Repullo (2007) and it shows the evidence of the extra price paid for a lack of coordination. After studying seventy tenders over a period of three years which were designed to acquire skin staplers in public hospitals (Abelló et al. 2007, Saniline 2007) it can be seen that the price oscillated between 4 to 10 euros/unit without a clear relationship between the sales volume of each tender and the unitary price of the medical device. Some other works outline this variability in the prices and also conclude that savings in connection with the improvement of the public information system and the purchasing process could be made (González and Pinilla 2006).

As a consideration of the restrictions this policy could imply it is interesting to note that the purchasing centres in their conventional form offered a limited margin of manoeuvre despite the fact that their usefulness was recognised. They could generate a strong competition among suppliers before adjudications but once these were awarded

there were no incentives to achieve additional reductions in the prices. It is necessary to remember that firms and health services followed the rhythm of the administrative contracting procedure, which was usually rigid and complex, and not all the companies had access to it. It should be outlined that it was not possible to extend any potential improvement in the price to the whole range of local administrations. In this context it could be preferable for the firm to discriminate in each case depending on the order or the payment term, among other variables, and to apply different conditions while maintaining the prices awarded. The firms who are offering, when applying for tenders proposed by these purchasing centers, should estimate the potential demand during the effective period of the contract. The fact that if they win the tender, they do not know the purchasing plan or the delivery plan consequently leads to a high degree of uncertainty and overstocking that is transferred to the final price. It should also be taken into consideration that the pharmaceutical industry operates in a multinational market and they have to adapt and plan their strategies accordingly and this double planning leads to additional costs being included in the final price.

The centralization of operations within the scope of the AC has not always resulted in improvements in efficiency. The proliferation of purchasing centres subject to different administrative procedures, material cataloguing, and codification of different products implied the raising of fragmented and differentiated markets. This situation is not necessarily efficient as transaction costs of the firms (information and negotiation) are not reduced or could even be increased because they are obliged to maintain teams of personnel to manage the fragmented market in order not to lose the market share. Costs of this type will also be included in the final price.

1.7.1.2. Second period. 2006-2009

This period is marked by legislative changes and the trend within purchasing management of introducing e-procurement in the face of the outworn traditional approaches.

The publication of the *Ley 29/2006, Ley de garantías y uso racional de los medicamentos y productos sanitarios* y *Ley de contratos del sector público, 2007* that substitutes *Ley del Medicamento de 1990* marked the legislative changes. This law was designed to contribute in changing from the old administrative procedures to a new emerging market in most medical devices, introducing more competition and a more

transparent price formation (Sánchez 2007), particularly to facilitate the introduction of generic drugs.

The objective of the Ley 29/2006 was to guarantee the quality of pharmaceutical drugs and medical devices and the quality of the pharmacy services in the whole NHS. The law transposed the European legislation on generic drugs adopted in 2004. The main merit of this law was to integrate both the European and Spanish normatives in relation to the production and commercialization of drugs which at that moment was a long way away (Antoñanzas et al. 2007).

The incorporation of those generic drugs in the Spanish pharmaceutical market was an initiative of the State to increase price competition and to cooperate in the moderation of pharmaceutical expenditure. The measures adopted in previous periods were not very effective in enabling the generic drugs to reach a significant market share which would promote competition in the sector, as it was only 4.3% in 2004. Despite the fact that the generic market share increased until 7% in 2005, it was not enough to achieve the objective (Piña and Suárez 2009).

On the matter of prescriptions by active substance it should be taken into consideration that there were two laws to take into account. The Law only mentioned that it would support prescriptions by active substance but nothing was mentioned in relation to the cost. Later on, through the Royal Decree Law 9/2011, it was compulsory to prescribe by active substance and dispense the ones with a lower price.

On the other hand the Law established a reduction of 20% for all drugs with more than 10 years on the market if there was a similar generic drug with lower price.

The next regulation to be considered in this period was the *Orden Ministerial por la que se determinan los nuevos conjuntos de medicamentos, sus precios de referencia y se revisan precios de referencia fijados con anterioridad*. It became effective in March 2009 and supposed the creation of 13 new groups of drugs, the revision of reference prices of the existing ones and the updating of the list of minor prices. According to the estimate of the Ministry of Health this order would save €344 million, the equivalent of 2.9% of public pharmaceutical expenditure in pharmacies registered at the end of 2008. From a business perspective, the impact of the new Order on the income of pharmaceutical firms was nearly €300 million in the first year of implementation (Farmaindustria 2011).

1.7.1.3. Third period. 2009-2012

During the meeting of the Interterritorial Council of the National Health System March, 18th 2010, the main decision making organism of the NHS renewed its commitment to implement a policy that guaranteed the quality, equity, cohesion and sustainability of the NHS. A new set of measures was included with the intention of achieving two objectives: i) to maintain the rhythm of measures to improve the cohesion and quality of the system and ii) to promote measures of cost containment through policies of rational use aimed at professionals and users, grouping resources to the NHS scale in order to improve negotiation power. The agreement proposed short term strategies mainly focused on pharmaceutical policy setting out the bases of what would be a new agreement. The second strategic plan of pharmaceutical policy was formalized (II Plan Estratégico de Política Farmacéutica) and it included the modification of the current price reference system, the reduction of generic drug prices and the fixation of maximum prices for minor disease drugs. A potential saving of €1,500 million was estimated. The agreement announced the immediate creation of a centralized purchasing procedure for all the NHS (to which any AC could adhere voluntarily) with the objective of improving the negotiation capacity as regards suppliers through the exchange of information, with this procedure being applicable to all medical products, including pharmaceutical drugs (García et al. 2010).

The situation was particularly relevant considering the general economic conjuncture. The decisions taken by the Spanish government since 2010 to accomplish the control of Healthcare expenditure objectives have had a great impact on the sector's development. Of late, some shock measures have been implemented by means of the emission of several laws by Royal-Decree (2010-2012). As a consequence firms have faced a significant reduction of 15% in their incomes.

In order to revise the details of the measures taken it should be said that some regulations have been published but special attention should be paid to two laws by Royal-Decree (2010 and 2011) that have both cut 7.5% off the final price of drugs. The situation in the pharmaceutical industry became complex. This sudden contraction of income has put firms in a precarious situation and they had to react urgently and with efficacy in order to compensate for this disequilibrium which could even put their firms's survival in danger.

The year 2010 was the first since historical data has existed in which the volume of the pharmaceutical market decreased in relation to the previous year. Pharmaceutical

expenditure decreased -1.28% compared to 2009. The rate of decrease continued to go down steadily at -5.1% which included a -7.6% related to pharmacies and a less significant increment in the hospital market of +1.1% which meant that Healthcare expenditure was higher in 2010 than in 2011 (Farmaindustria 2011).

The estimated impact of the two Royal-Decrees is over €4,000 million. As a consequence the companies that operate in Spain have been obliged to reduce their staff by more than 4,000 employees and to almost completely stop their investments in Research and Development in 2011 (Farmaindustria 2011). One of the few indicators that showed a positive development in 2010 was the area of drug export which increased due to the necessity of opening new markets in order to compensate for the losses in the domestic market. On the other hand, the debt of local public administrations with the pharmaceutical industry as suppliers of drugs to public hospitals, has been continuously increasing. At the end of 2010 it was at €4,685 million (+41.4% more than 2009) and the average payment period was 390 days (100 days more than the previous year). €6,369 million in 2011 (€1,685 million more than in 2010) and an average payment period of 525 days (135 days more than at the end of 2010). This level of debt and delay in reimbursement was not sustainable for most pharmaceutical companies (Farmaindustria 2011). The figures were increased in 2011-2012 due to the commitment undertaken by the Spanish government to reduce the public deficit by no less than 5.3% of GDP (8.9% in 2011). This objective required an intense effort in terms of reduction of public expenditure in this period.

The Autonomous Communities, who are ultimately responsible for the payment of public pharmaceutical invoices, have implemented measures to increase the pressure in normative matters. Control measures have been approved in different areas. There is currently a deep cause for concern about how the local control measures could affect the public drug market in Spain (Farmaindustria 2011). It is feared that if the measures are passed with a low level of coordination they could lead to an unstable scenario thus putting at risk the criteria etiquette of drug access.

The Plan for the Pharmaceutical industry disclosed by the Government in 2011 to redirect the situation should serve as a point of inflexion. The premise was that economic recovery was dependent on the integral development of strategic sectors in Spain. The pharmaceutical sector, considering its relevant contribution to the economy in terms of research and productivity, needed an impulse (Farmaindustria 2010). Despite being the fourth biggest export sector, a high quality employment generator and having a stimulating

influence on other sectors, it was in a critical situation. Despite the intentions of the sectorial plan it never came to be implemented due to the government's non-fulfilment of aspects of the deals. Conversely, the government set out new measures of regulatory pressure (implanted in 2012) which only served to worsen the situation.

The whole pack of measures applied has driven the sector to a critical point in the first half of 2012. The institutional diligences developed by different business organizations succeeded in the first quarter of 2012. The Government articulated several measures in order to face the payments related to the debt of public administrations, including the drug supply debt to hospitals in the NHS. The Secretary of the Treasury, D. Cristobal Montoro guaranteed the payment at the end of June 2012 to unblock the situation. The Government fulfilled the commitment of paying a significant part of the past debt. However this does not change the fact that future perspectives are still a cause for concern but at least cash-flow tensions diminished considerably.

However, it should be said that the regulatory dispositions have been increasing the pressure on the sector and the decrees published in 2012 want to achieve additional savings of €3,500 million.

These facts show the culmination of a progressive process of increasing the pressure by the main stakeholder. This process has the suitable features to be analyzed as we do it in the next chapters while looking for the implications analyzed for the firms and for the whole sector.

1.8. Concluding remarks

The stakeholder theory is a conceptual framework that deals with the firm and stakeholder relationships and their influence on firm objectives. Through the last 30 years it has been built through different approaches: descriptive, instrumental, normative and managerial but still lacks formalization in some relevant aspects. This thesis is intended to contribute to the formalization through the study of the dynamics of influence between stakeholders and the firm.

We propose that the change of value through time and its link to the capacity of influence is a relevant factor for this analysis. Firstly, we have introduced a taxonomy to classify the firms depending on the influence relationships. This classification will be

useful to understand the evolution through time of the relationship between firm and stakeholders.

We have selected the Spanish pharmaceutical framework as a key sector of the economy. It is relevant for our analysis due to the well defined stakeholder-firm relationships. The evolution of the Spanish pharmaceutical sector has been reviewed during the period 2003-2012 in order to understand the increase of pressure on the firms through several expenditure control measures, ranging from organizational to legislative. The measures have exerted a high impact on the profit and loss account of the firms.

The first chapter facilitates the understanding of the framework of this thesis. The basic concepts of stakeholder theory have been introduced. We conclude that the firm's behavior is worth studying from the point of view of the dynamic of value creation and distribution as one of the key factors of the theory. The theory lacks formalization of theoretical concepts and subsequently the finding of empirical support for them. In order to develop the objectives of the thesis, particularly the effect of value dynamics and influences, a pin factory study focused on a pharmaceutical firm is developed. In the third chapter a representative sample of the Spanish Health Care sector is used to contrast the main model of influences described in the literature. Finally, the fourth chapter is about social economic progress and firm stakeholder responsibility.

1.9. Appendix A. Regulation implemented in the Spanish Pharmaceutical Sector (2003-2012)

2004	<i>Real Decreto 2402/2004, de 30 de diciembre, por el que se desarrollaba el artículo 104 de la Ley 25/1990, de 20 de diciembre, del Medicamento,</i>	Conjunctural Price revision of pharmaceutical drugs and measures to contain pharmaceutical expenditure
2006	<i>LEY 29/2006, de 26 de julio</i> ³⁴ , <i>de garantías y uso racional de los medicamentos y productos sanitarios. (BOE 178, de 27 de julio).</i>	<p>Transposes the European legislation on generic drugs approved in 2004. Facilitates the introduction of generic drugs in the market.</p> <p>Cuts prices by 10% off of drugs with more than 10 years in the market</p>
2008	<i>ORDEN SCO/3803/2008, de 23 de diciembre, por la que se determinan los nuevos conjuntos de medicamentos, sus precios de referencia, y se revisan los precios de referencia determinados por Orden SCO/3997/2006, de 28 de diciembre, y por Orden SCO/3867/2007, de 27 de diciembre.</i>	Revision of reference prices. Savings expected of €300 million
2010	<i>Real Decreto-Ley 4/2010, de 26 de marzo, de racionalización del gasto farmacéutico con cargo al Sistema Nacional de Salud.</i>	Reduction of Selling Price of generic drugs by 25% average
2010	<i>Decreto-Ley 8/2010, de 20 de mayo, por el que se adoptan medidas extraordinarias para la reducción del déficit público</i>	<p>Implies a compulsory deduction by 7.5% of the Selling Price of the non generic drugs and not under the price reference system.</p> <p>The impact of the two RD is over €2,000 million</p>
2010	<i>Orden SPI/3052/2010, de Precios de Referencia</i>	Modification of reference prices. It is fixed for each group as the lowest cost/treatment/day calculated on the daily dose rate.

2011	<i>Ley 7/2011, de 11 de abril, por la que se modifican la Ley 41/1999 de 12 de noviembre sobre sistemas de pagos y de liquidación de valores y el Real Decreto-ley 5/2005, de 11 de marzo,</i>	Reforms to drive productivity and to improve public contracts
2011	<i>Real Decreto-ley 9/2011, de 19 de agosto, de medidas para la mejora de la calidad y cohesión del Sistema Nacional de Salud, de contribución a la consolidación fiscal, y de elevación del importe máximo de los avales del Estado para 2011, publicado en el BOE de 20 de agosto de 2011</i>	Introduction of a new deduction by 15% of the Selling Price of drugs with more than 10 years on the market and which do not have an authorized generic or biosimilar authorized and which were not in the reference system. The accumulated impact was about €4,000 million The impact of the two RD is around €4,000 million
2012	<i>Real Decreto-ley 16/2012, de 20 de abril, de medidas urgentes para garantizar la sostenibilidad del Sistema Nacional de Salud y mejorar la calidad y seguridad de sus prestaciones</i>	It is supposed there will be a strong contraction of public pharmaceutical expenditure. Prescription by brand name is accepted and it is not to be substituted by that of a lower price. A preference for the generic drug and price quality is established once more. Suggestions on price reduction by the pharmaceutical industry will only be considered if they exceed 10% Co-payment according to Income
2012	<i>Real Decreto-ley 16/2012, de 20 de abril, de medidas urgentes para garantizar la sostenibilidad del Sistema Nacional de Salud y mejorar la calidad y seguridad de sus prestaciones</i>	The contribution of pensioners is established in order to encourage the use of generic drugs and to provide the appropriate packaging for the period of treatment. It establishes a centralized platform of purchases The estimation of savings from the measures is about €3,550 million

Extracted from Piña and Suárez (2009); AEMPS (2012), Borrell and Merino (2006), Hernández and Moral (2011), Lago, Viveros and Heredia (2012), Moreno, Puig-Junoy and Raya (2011).

Chapter 2

Main Stakeholder Influence as a “Shaker” of Value Dynamics

Abstract

A pin factory study has been performed to study in detail the effect of the Spanish public sector (main stakeholder) on a pharmaceutical firm that operated in the Spanish health care sector during the period 2003-2012. The firm has come under a lot of pressure to reduce sales prices, particularly in 2010 and 2011 when two Royal-Decrees were published cutting the prices -7.5% each year. Consequently, the firm had to react in order to compensate for the loss. Throughout the chapter the impact of the main stakeholder's behaviour is qualitatively and quantitatively assessed as is the firm's reaction with respect to how it manages the influences of the rest of the stakeholders. Moreover, the effects of the relationships of influence can be clearly observed through the dynamics of value creation and distribution. The concepts of willingness-to-pay have been adapted to fit into the value dynamics which are necessary to understand the capacity of influence of the stakeholders.

Chapter 2

Main Stakeholder Influence as a “Shaker” of Value Dynamics⁹

2.1. Introduction

The dynamics of value creation and distribution (or appropriation) have scarcely been studied in the literature of stakeholders, particularly by means of empirical research. Della Corte and Del Gaudio (2014) pointed out that there are many conceptual papers about this topic but little empirical work has been done. Some years before, Laplume, Sonpar and Liz (2008) already reported the need of more empirical research as that which existed was sporadic and mainly focused on large publicly traded corporations. As a general framework for the empirical work to be done in this chapter we follow the guidelines of Helper (2000). She remarked on the importance of carrying out good fieldwork research based on accurate and vivid examples at firm level, following the tradition initiated by the early work of Adam Smith (1776) in which he detailed the operations of a pin factory.

We use the stakeholder model of the corporation as a theoretical framework, in which the relationship between firm and stakeholders goes in both directions and all of them are interrelated through a central node that is occupied by the firm (Donaldson and Preston 1995). The stakeholders are not considered as having unidirectional relationships with the firm as input providers (suppliers, investors and employees) or as receptors of the output (customers). The relationships between firm and stakeholders are bidirectional and the stakeholder network is interconnected through the firm. Two main features emerge from this approach: the first is which stakeholders have to be considered and, the second, how their relationship is with the firm. The focal point of Mitchell, Agle and Wood (1997) is the identification of the salient stakeholders. They selected three main features that define the salience of the relevant stakeholders for the firm: power of influence, legitimacy and urgency in attending their claims. This definition easily allows the identification of the salient stakeholders but says little about how the interactions between firm and stakeholders are. Frooman (1999) complements the approach of Mitchell, Agle and Wood

⁹ A preliminary version of this chapter was presented in “Value Creation and Distribution Dynamics derived of Main Stakeholder Influence. A case study in Spanish Healthcare Sector,” DEMO workshop, University of Illes Balears, Mallorca, Spain, September 8, 2011. We highly appreciate the suggestions of R. Aguilera that acted as a referee. It was also presented as “Productivity, Firm Value Creation and its distribution: The Spanish Health Care Case,” Congreso de Eficiencia y Productividad EFIUCO, University of Córdoba, Córdoba, Spain, May, 26-28, 2014. Finally, it was also presented in Asia Pacific Productivity Conference. “Productivity, Firm Value Creation and its Distribution: The Spanish Health Care Case”. CEPA. University of Queensland, Brisbane, Australia, July 8-11, 2014.

(1997) by moving the focus from the identification of stakeholders to the influence strategies that firm and stakeholders use, that is, their relationship. He selected the power and interdependence between firm and stakeholders as the factors that allow the prediction of the strategic behavior of firm and stakeholders respectively. Recently, García-Castro and Aguilera (2015, 138) have defined a stakeholder as “any group or individual who creates and captures economic value in its interaction with the firm”. This definition is consistent with the approach of Mitchell, Agle and Wood (1997) although it centres the attention on the economic relationship with the firm as being the relevant aspect to be considered. As a consequence, it opens the possibility of studying the influence strategies that firm and stakeholders use through the analysis of the dynamics of economic value created and captured in their interaction. This study follows this economic approach and contributes empirically to the understanding of the strategic behavior of the stakeholders and the reaction of the firm when faced with it.

We use the stakeholder model of the corporation to analyze a situation where the power of one stakeholder over the firm is clearly defined. We have identified this escenario in the Spanish pharmaceutical market during the period from 2003 to 2012. The specific features of this market merit attention. The market is highly regulated and controlled by the public sector and additionally the regulator coincides with the main customer. When these two roles (customer and regulator) coincide, it results in a special concentration of power in the hands of this stakeholder that we name the main stakeholder¹⁰ (Neville and Menguc 2006, Harvey and Schaefer 2001, Yamak and Suer 2005). The main stakeholder’s features which make it into the most salient and the main claimant are: i) high power of influence due to its monopsonist position, ii) legitimacy as it is the main customer and simultaneously the regulator, and iii) urgency in its demands because it can issue laws or Royal-Decrees using his role of regulator. Therefore, the Spanish health public sector fulfills the three conditions of the definition of salient stakeholder of Mitchell, Agle and Wood (1997). Additionally, it gives or denies the authorization to operate in the

¹⁰ As we consider the public sector is the relevant agent for starting the dynamics of value as main stakeholder it has been checked if other authors have used the same approach. Among the contributions we highlight the contribution of Neville and Menguc (2006) which mentioned that the main stakeholder could be linked to the government due to its power to implement regulations and punish those that are not following the rules. We note that it is the same role we assign to the Spanish public health sector. It is worthwhile also to note that Neville and Menguc (2006) identified other relevant stakeholders for analysis (customers and workers) in the same line we propose in the chapter. Harvey and Schaefer (2001) also assign the role of main stakeholder to the regulator, in that case in the environmental framework. Yamak and Suer (2005) introduced the State as a stakeholder in the banking sector. They noted that the State aggregates different stakeholders, as we do in our case. Due to the pharmaceutical drug market configuration we grouped the following agents under the same umbrella. The agents that constitute the main stakeholder are i) the figure of the legislator/regulator represented by the State; ii) the managers of public resources through local governments of Autonomous Communities; iii) the consumers represented by the hospitals or their groupings as prescriptors or executors of purchasing acts.

pharmaceutical market and, furthermore, it has the capacity of using coercitive power when necessary. For those reasons we consider that the main stakeholder has the capacity and the power of appropriating, totally or partially, the economic value created by the firm. As a consequence, the firm must react by taking decisions to compensate the appropriation of the main stakeholder. This reaction can be: i) external, which implies a modification of the strategy of the firm towards the rest of the stakeholders and/or, ii) internal, which involves a reorganization of the business processes.

We contribute to the literature through a *pin factory study*.¹¹ We highlight that this empirical study allows the follow-up of the contribution of firm and ten stakeholders to the value created and its distribution through the nine-year period. This high number of stakeholders and this long serie of years is only possible due to the full access to the information that was supplied by the firm at the highest level of detail. Throughout this pin factory study we analyze the behavior of the main stakeholder when trying to capture value created by the firm and, secondly, the firm’s reaction to this capture. Specifically, the three research questions that this study answers are: i) if the the main stakeholder, using its power, is able to capture value through time, ii) if the main stakeholder triggers the dynamics of value creation and distribution meaning that the sources of value creation change through time in order to compensate the effect of the main stakeholder and iii) if the distribution of value is also affected by the pressure of the main stakeholder.

In order to solve these questions we use the empirical approach through the pin factory study in a multinational pharmaceutical firm that operates in Spain. The methodology to monitor the value creation by the firm and its distribution to the stakeholders has its roots in the *willingness-to-pay* approach (Brandenburger and Stuart 1996) and the economics of business performance (Grifell-Tatjé and Lovell 2015). As a short summary of our findings we outline that within the period of interest, from 2003 to 2012, the main stakeholder becomes the “shaker” of a value redistribution process applying its strong capacity of influence and capturing a big portion of the value created by the firm.

This chapter is divided into six different sections. The second section presents the firm we use as a pin factory study. The third section introduces the methodological contribution that allows us to define, model and understand the process of value generation

¹¹ We borrow the expression “pin factory” from Grifell-Tatjé and Lovell (2015) who use this expression for the studies at firm level based on a detailed amount of qualitative and quantitative inside information.

and distribution and how it is linked to the dynamic of influences. In the fourth the data source. In the fifth we discuss the results and trends of the dynamics of value and influences and in the last section we outline the conclusions.

2.2. The Firm

This pin factory study is focused on a multinational firm, originally from Germany that has been in the hospital market for 175 years and in the Spanish market since 1955. The total sales of the worldwide Group were about €5 billion in 2012 and it has more than 46,000 employees working in its different subsidiaries. The Spanish legal entities sell approximately 10% of the total sales of the Group (€425 million) and the products they commercialize have a high market share ($> 25\%$), as well as being one of the references in the markets where they operate. We focus on a company in Spain which specializes in pharmaceutical drugs because it has received direct pressure from the main stakeholder during the period of study.

From the point of view of the stakeholders involved in the firm it is necessary to mention that it is an unusual case of shareholder concentration. The property of the firm is in the hands of members of a single family. The family has passed ownership from generation to generation (without significant share dispersion). The president, as member of the family and owner, in his role of stakeholder, retains a great power of influence over management decisions. In fact, we face a situation where agency costs are minimal.

Considering the interest of the stakeholder relationships we study the response to the pressure of the main stakeholder over the firm. Firstly, as there is no dispersion of capital the stakeholder *owner/shareholder* is clearly identifiable. Secondly, the stakeholder *suppliers* are split into different subgroups. Some of them have a capacity of influence based on the power of negotiation that should be taken into consideration because they could hold a monopoly. The valid alternatives to this kind of supplier are relatively few because of the high number of requirements demanded for the raw materials that are components of a pharmaceutical drug or a medical device. For this reason the firm can exert only a moderate capacity of influence on some kind of suppliers due to the lack of multiple alternatives or the difficulties in their substitution. The process of supplier qualification demanded by the health authorities is relatively time consuming and expensive. The other suppliers are non-specific with much less capacity of influence.

Finally, the *workers* in their role of stakeholder are organized in a union committee that can withstand the proposals of the firm if they are not aligned with their interest. This set of relationships means that this pin factory study is unique and it makes sense for it to be studied from the point of view of the stakeholder theory.

2.3. Background

In this section we describe the theoretical framework related to the process of value creation and distribution when stakeholders are involved¹². We have borrowed some of the concepts introduced by the willingness-to-pay approach (Brandenburger and Stuart 1996) and adapted them to our focus of research. The willingness to pay approach has recently raised the interest of scholars and has been broadly discussed in the management literature. We have combined it with the economics of business performance in order to better describe the value dynamics between firm and stakeholders.

To focus what we have to consider it is worth mentioning some conclusions extracted by Lepak, Smith and Taylor (2007)¹³. They concluded that “there is little consensus about what value creation is and how it can be achieved” and insisted that there is a lot of work to be done in order to understand this central concept where several streams of literature, such as agency theory, resource-based theory, management and organization, organizational theory and stakeholder theory converge. A second conclusion was that “the process of value creation is often confused with the process of value capture”. They argued that value creation and value capture should be viewed as distinct processes. They noticed that the source that creates value may or may not be able to capture or retain it in the long run. Value created by one source or at one level of analysis may be captured at another.

Finally, Lepak, Smith and Taylor (2007) proposed that value creation is subjective and this subjective value realization “must at least translate into the user’s willingness to exchange¹⁴ a monetary amount for the value received”. We use the willingness to pay framework to define what is value creation and how it is distributed by converting a static definition to a dynamic approach.

¹² See Appendix C for a more detailed discussion of stakeholder management and value creation

¹³ This conclusion was written after their experience as guest editors for the Special Topic Forum on Value Creation in Academy of Management Review

¹⁴ Recently, Garcia-Castro and Aguilera (2015) reinforced the idea that the stakeholders are the ones that exchange value with the firm

In the next subsection we describe the details of the methodology that allows us to quantify the contribution of each stakeholder to the created or distributed value and the impact of the main stakeholder's capacity of influence. We remember that Friedman and Miles (2002) declared that most of the efforts on stakeholder theory had been focused on the identification of who or what the stakeholders were, instead of placing them in the dynamics that arise between the firm and the organization. This study gives new insights in this direction.

2.3.1 Willingness to pay and economic value creation

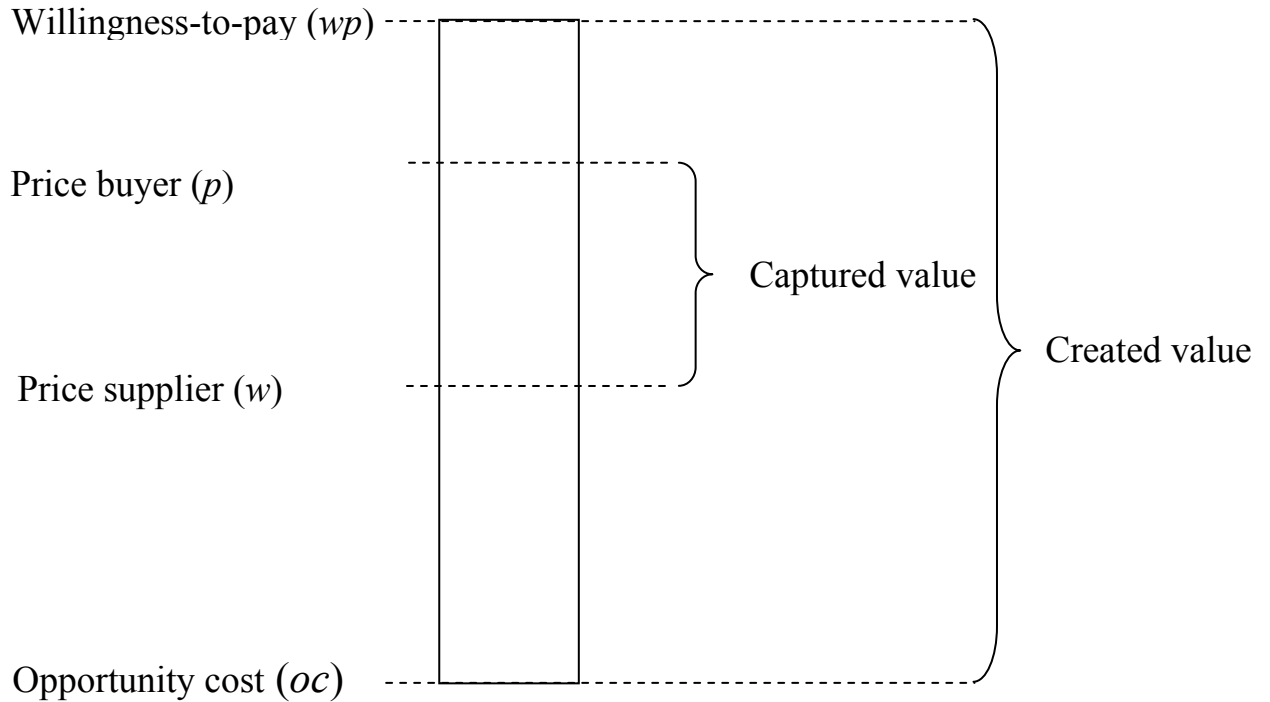
Value creation, as described by Brandenburger and Stuart (1996), is based on the subjective assessment made by the economic agents (customers and suppliers) in a given time point. Figure 1 shows the basic scheme of what is considered created value and captured value as well.

The superior extreme indicates the maximum quantity that the customer is willing to pay (w_p) to the firm for the products that it commercializes and the inferior shows the opportunity cost of suppliers (oc). The difference between willingness to pay and the opportunity cost is considered to be the created value. Both extremes, upper and lower, are non-observable quantities. This fact gives a subjective feature to value created in this approach. Only the prices of outputs and inputs are observable. In the framework of willingness-to-pay, the difference between the actual price paid by the buyer (p) and the actual price received by the supplier (w) is defined as captured value by the firm. It is worth mentioning that the situation described is static.

Brandenburger and Stuart (1996, 21) borrowed the approach from Davis and Kay (1990) who consider that the prices that the firm pays for labour and intermediate inputs correspond with the ones that the suppliers "would have earned elsewhere" (Brandenburger and Stuart 1996,10). In contrast, the opportunity cost of the input capital (operating assets) has to be calculated. Under this approach the revenues minus the costs defines the profit of the firm that is the economic profit that Davis and Kay (1990) called *added value*. In other words, it is the profit earned by the firm less the cost of financing the firm's capital adjusted to its risk. This work follows this approach in which the value captured by the firm is given by the economic profit. Defining the profit of the firm as the economic profit makes null the difference between the price received by the supplier and

its opportunity cost. Hence, the lower bound of the willingness to pay’s approach is observable, for instance, the firm’s unitary cost ($c(w)$).

Figure 1. Willingness-to-pay. Created and captured value



From an economic point of view a positive economic profit is interpreted as a measure of a lack of market competition, as in a perfect competitive market the economic profit should be equal to zero. In a business perspective it is considered that positive values reflect the success of the firm in its effort to differentiate the product. In other words, the consumers perceive some distinct attributes in the product of the firm that result in a willingness to pay higher than for the products of its rivals. In this situation, the firm can translate the difference in the willingness to pay to a higher market price.

This study performs an evaluation of the behavior of the firm in a dynamic context. The dynamic approach means that value changes are monitored through time. The willingness to pay framework has to be adapted to this new situation in which both the value created and the value captured by the firm are compared in two different time points. Consequently, the willingness to pay, the price of the product and its unitary cost can be defined in each period of time. In that situation, when the willingness to pay of period $t+1$

is higher than period t or/and the unitary cost is lower, additional value has been created. Figure 2 describes a change in the value created between the two periods. The firm captures additional value from the buyers when $wp^{t+1} > p^{t+1}$ and $p^{t+1} > p^t$. This capture is also in the side of suppliers when $w^{t+1} < w^t$ which produces a lower unit cost $c^{t+1}(w^{t+1}) < c^{t+1}(w^t)$, where $c^{t+1}(w^{t+1})$ expresses the unitary cost of producing in $t+1$, and $c^{t+1}(w^t)$ the unitary cost of period $t+1$ with the input prices from the previous period t .

Figure 2. Value creation dynamics.

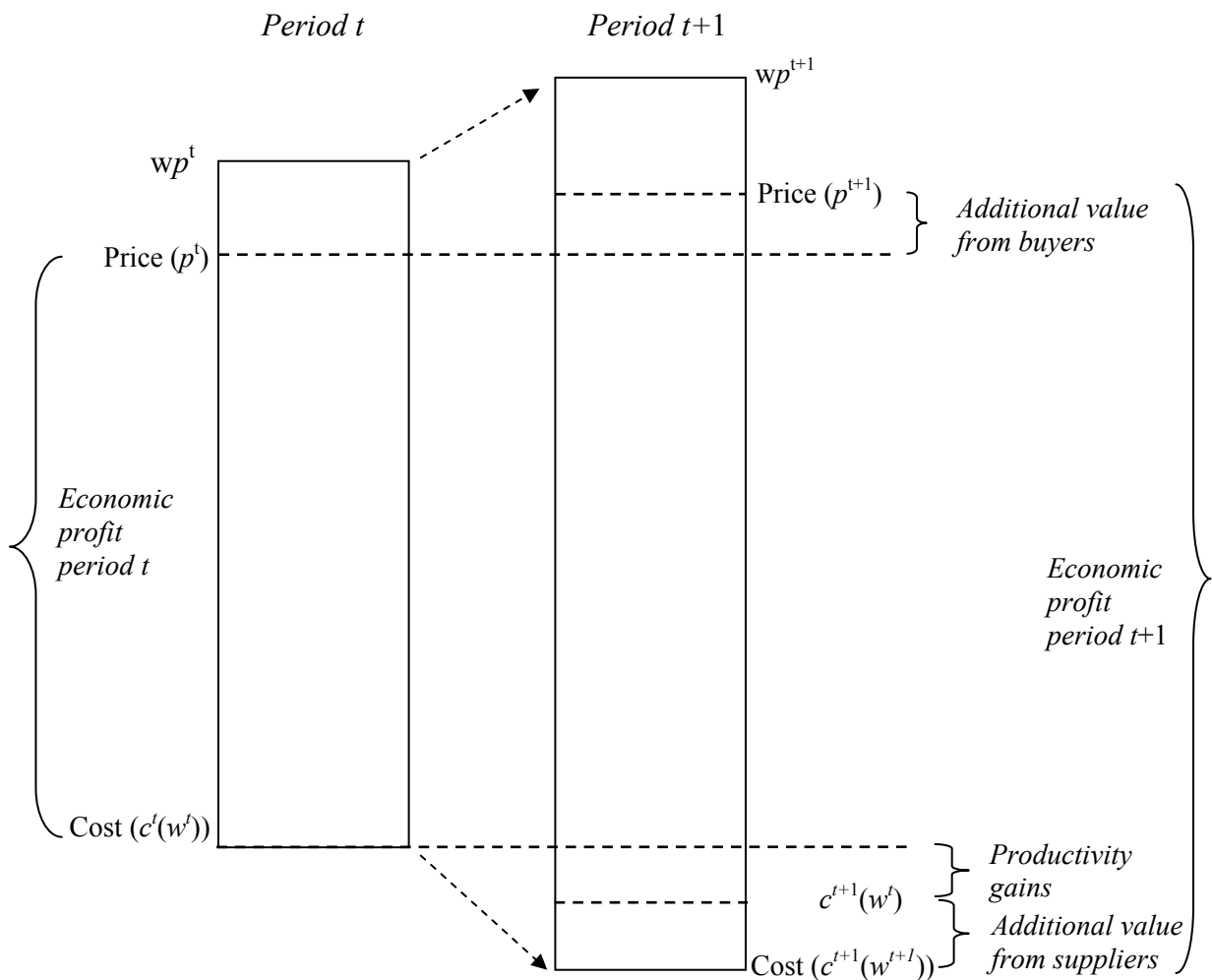


Figure 2 shows that the customers are paying more for the goods ($p^{t+1} > p^t$). This means that the consumer has identified some attributes in the product (i.e. better quality or service) and/or its scarcity has increased his desire to pay more for it. Something similar happens with the suppliers. The firm is paying less for the inputs which produces a lower

unitary cost ($c^{t+1}(w^{t+1}) < c^{t+1}(w^t)$) increasing the value created. Figure 2 also shows that unit cost change can have another driver. The relationship between the quantities of outputs and inputs in period t and $t+1$ has changed. The Figure 2 reflects the situation where the quantity of output per unit of input is higher than the previous period. In this case the unitary cost is lower because there are gains of productivity, i.e. $c^{t+1}(w^t) < c^t(w^t)$. Thus productivity is a source of value creation and its capture by the firm through a superior economic profit depends on if the productivity bonus is shared with the rest of the stakeholders (buyers and suppliers). Figure 2 displays a situation where the firm appropriates all the additional value created. It is necessary to recall that the distribution of the value created is only possible through the variation of output and input prices. The value created is shared with the rest of stakeholders when the price to the buyers is lower ($p^{t+1} < p^t$) or/and the prices of the suppliers higher ($w^{t+1} > w^t$).

Additionally, apart from input and output price variations and productivity changes, the firm can increase its profit by selling more goods with a positive margin. It is also a source of value creation and, as in the case of productivity, it can be captured by the firm or the rest of the stakeholders. Recently Garcia-Castro et al. (2015), in the literature of business strategy, have associated this effect with replicability¹⁵. A firm can grow and create more value replicating its activities in other contexts. Apart from this, we consider that replicability as well as productivity are the reflections of internal decisions of the firm.

It is interesting to recall, before proceeding with the analysis, the contribution of Jensen (2010) introduced in section 1.5 of the first chapter in order to discuss it from the new perspective of the meaning of value creation. Jensen (2010) noted that the most suitable measure to manage an organization is the change in the market value using the Economic Value Added (EVA) (Stern, Steward and Chew 1996). The EVA is conceptually identical to the Davis and Kay (1990) approach. From our perspective, the use of the economic profit change as an indicator of the additional value created by the organization is problematic. In fact, it only reflects the additional value captured by the firm. The measurement is only focused on the value that corresponds to the shareholders. Used in that sense the evolution of economic profit through time captures only a part of the total picture but it is not able to determine the sources of value creation nor the dynamics of influences between stakeholder and firm. As we have discussed this pin factory study defines profit as an economic profit because it introduces as cost, the opportunity cost of the

¹⁵ This effect has been labelled with different names in the literature see Chapter 4 in Grifell-Tatjé and Lovell (2015).

owners' funds, but there is no additional interpretation. In fact, any definition of profit is a residual which is what Figure 2 shows.

2.3.2. Economic profit decomposition

We introduce the methodological notation where an output quantity vector of a firm is expressed by $y^T = (y_1, \dots, y_M) \in \mathbb{R}_+^M$ and its price vector by $p^T = (p_1, \dots, p_M) \in \mathbb{R}_{++}^M$; an input quantity vector is expressed by $x^T = (x_1, \dots, x_N) \in \mathbb{R}_+^N$, The input price vector is expressed by $w^T = (w_1, \dots, w_N) \in \mathbb{R}_{++}^N$. The input price N associated with the capital of the firm incorporates the required opportunity cost of the company's investors. The unitary cost vector is expressed as $c^T = (c_1, \dots, c_M)$ and defined as $c_j = \sum w_{ji} x_{ij} / y_j$ being x_{ij} the contribution of input i in output j is expressed as $x_{ij} = (x_{1j}, \dots, x_{Nj})$, being $i=1, \dots, N$ and $j=1, \dots, M$.

We define revenue as $R = p^T y = \sum p_m y_m$ and cost as $C = w^T x = \sum w_n x_n = c^T y$. Economic profit π is defined as the difference between the revenue generated by outputs and the cost of employing the inputs used to produce those outputs including the opportunity cost of the capital and expressed as $\pi = p^T y - w^T x = R - C = R - c^T y$.

To go into depth through the analysis of creation and distribution of value we need to use the decomposition of changes in profit between two time points. This approach will be based on the economics of business performance. Concepts of economic theory of production and index number theory will be used in order to distinguish the processes of value creation and its distribution among stakeholders.

The quantification of economic worth created by the firm and its following distribution is based on the production theory and the exploitation of the duality of prices and quantities. The aspects related to the duality have been already introduced in section 1.5.

The economic profit can be decomposed into two effects i) the first term is the quantity effect that shows the contribution of individual quantity changes, holding prices fixed at their arithmetic mean values $\bar{p} = (1/2)(p^t + p^{t+1})$ and $\bar{w} = (1/2)(w^{t+1} + w^t)$ and ii) the second term is the price effect that shows the contribution of individual price changes to profit change, holding quantities fixed at their arithmetic mean values $\bar{y} = (1/2)(y^t + y^{t+1})$ and $\bar{x} = (1/2)(x^{t+1} + x^t)$. The quantity effect and price effect are Bennet (1920) indicators. Arithmetic mean quantity weights (\bar{y} and \bar{x}) and arithmetic mean price weights (\bar{p} and \bar{w}) are used to avoid choosing between base period and comparison period weights.

The Bennet indicators have a set of properties similar to Fisher index numbers and they have been studied by Diewert (2005).

Then, economic profit change is decomposed as

$$\pi^{t+1} - \pi^t = [\bar{p}^T(y^{t+1} - y^t) - \bar{w}^T(x^{t+1} - x^t)] + [\bar{y}^T(p^{t+1} - p^t) - \bar{x}^T(w^{t+1} - w^t)], \quad (2.1)$$

which decomposes economic profit change from period t to period $t+1$ into the contributions of changes in individual quantities (the first term on the right side) and changes in individual prices (the second term). Because profit change is expressed in value terms, so is each component. The first term on the right side is the quantity effect that shows the contribution of $1+N$ individual quantity changes to profit change, holding $1+N$ individual prices fixed at their arithmetic mean levels. The second term is an aggregate price effect that shows the contribution of $1+N$ individual price changes to profit change, holding $1+N$ individual quantities fixed at their arithmetic mean levels. Expression (2.1) serves two purposes. It indicates whether profit change is due primarily to quantity changes in the aggregate or to price changes in the aggregate. It also identifies individual quantities and individual prices that have the most enhanced or retarded profit change. Expression (2.1) is also useful in identifying the individual beneficiaries of the financial fruits of quantity change. Considering our intention of describing the dynamics of value creation and distribution a rearrangement of expression (2.1) to obtain (2.2) that allows the identification of the beneficiaries of quantity change.

$$[\bar{p}^T(y^{t+1} - y^t) - \bar{w}^T(x^{t+1} - x^t)] = (\pi^{t+1} - \pi^t) - \bar{y}^T(p^{t+1} - p^t) + \bar{x}^T(w^{t+1} - w^t), \quad (2.2)$$

the left side of (2.2) is the quantity effect from expression (2.1). The right side quantifies the value captured by the stakeholders (shareholders, customers, labor and suppliers). The value receptors can include stakeholders to which the change in economic profit $(\pi^{t+1} - \pi^t)$ is allocated, consumers who pay less for the outputs when $p^{t+1} < p^t \Rightarrow -y(p^{t+1} - p^t) > 0$, and firm suppliers who are receptors of the changes in the corresponding resource prices when $w^{t+1} > w^t \Rightarrow \bar{x}(w^{t+1} - w^t) > 0$.

On the other hand, we decompose the quantity effect in the expression (2.2) into the productivity effect and growth (replication or margin) effect following Grifell-Tatjé and

Lovell (2015). Such decomposition brings to our analysis the contribution of two factors related to the firm's decisions that will be helpful to understand how the firm deals internally with the pressure of the main stakeholder. Genescà and Grifell-Tatjé (1992) propose using the unitary cost instead of the prices of products as weights in the measure of productivity change, when prices are distorted by regulation. Caves, Christensen and Swanson (1980) also pointed out the inadequate use of the output prices in this circumstance, although their solution is slightly different¹⁶. The use of the unitary cost in the measure of productivity instead of output prices allows the decomposition of the quantity effect as

$$\bar{p}^T(y^{t+1} - y^t) - \bar{w}^T(x^{t+1} - x^t) = \{\bar{c}^T(y^{t+1} - y^t) - \bar{w}^T(x^{t+1} - x^t)\} + \{(\bar{p} - \bar{c})^T(y^{t+1} - y^t)\}, \quad (2.3)$$

where

$$\bar{c}^T(y^{t+1} - y^t) - \bar{w}^T(x^{t+1} - x^t) = (1/2) [w^{tT}x^{t+1}(Y_L/X_L) - 1] + w^{t+1T}x^t(1 - (Y_P/X_P)^{-1}), \quad (2.4)$$

and

$$\frac{Y_L}{X_L} = \frac{c^{tT}y^{t+1}/c^{tT}y^t}{w^{tT}x^{t+1}/w^{tT}x^t} \quad \text{Laspeyres productivity index}$$

$$\frac{Y_P}{X_P} = \frac{c^{t+1T}y^{t+1}/c^{t+1T}y^t}{w^{t+1T}x^{t+1}/w^{t+1T}x^t}, \quad \text{Paasche productivity index}$$

where the unitary costs are the weights of the outputs in the Laspeyres and Paasche productivity indexes. The first expression of the right side of the equation (2.3) is expressed as $\bar{c}^T(y^{t+1} - y^t) - \bar{w}^T(x^{t+1} - x^t)$ which measures productivity change where $\bar{c} = (1/2)(c^t + c^{t+1})$ is the arithmetic mean of the unitary cost of period t and $t+1$. Expression (2.4) collects the contribution, in monetary terms, of the variation in productivity which is measured as the arithmetic mean of the monetary contributions associated with Laspeyres and Paasche productivity indexes. The expression $\bar{c}^T(y^{t+1} - y^t) - \bar{w}^T(x^{t+1} - x^t) \gtrless 0$ when productivity variation is higher, equal or lower than 1. The

¹⁶ It consists of the estimation of the elasticities of cost with respect to outputs.

expression (2.4) can be understood as having the same structure as a Fisher index but expressed in monetary terms.

The second expression of the right side of the equation (2.3) is $\overline{(p - c)}^T(y^{t+1} - y^t)$ that defines a growth effect, where the business margin, in periods t and $t+1$ is expressed as the arithmetic mean of the difference between the price and the unitary cost $\overline{(p - c)} = (1/2) \{ (p^t - c^t) + (p^{t+1} - c^{t+1}) \}$. The expression $\overline{(p - c)}^T(y^{t+1} - y^t) > 0$ in the following two situations: i) $\overline{(p - c)} > 0$ and $y^{t+1} > y^t$ which means output expansion with positive firm margin. This situation shows the effect of increases in demand indicating that if $y^{t+1} > y^t$ the contribution of the growth effect will be positive to the quantity effect. Then the firm will be willing to increase the quantity of goods introduced into the market because it directly brings a positive contribution to the created value, and ii) $\overline{(p - c)} < 0$ and $y^{t+1} < y^t$ which means a contraction of sales in a situation where the unitary cost is higher than the price of the product. This is the expected business behavior as it reduces the losses. The growth effect $\overline{(p - c)}^T(y^{t+1} - y^t)$ can also take negative values when $\overline{(p - c)} < 0$ and $y^{t+1} > y^t$ or $\overline{(p - c)} > 0$ and $y^{t+1} < y^t$. The result $\overline{(p - c)}^T(y^{t+1} - y^t) = 0$ is possible when $\overline{(p - c)} = 0$ or $y^{t+1} = y^t$.

The expression (2.3) is useful because it permits the assessing and differentiating of the contribution of the productivity and growth effect. The productivity effect helps to assess the impact of the firm's decisions over stakeholders that contribute to manufacturing factors and also the improvements of the productive process. Additionally it shows the proportional effect of the quantity change sold through the second expression of the right side of (2.3), the growth effect that Garcia-Castro et al. (2015) has associated with replicability.

2.3.3. Creation and distribution of value

The two step cycle of value creation and distribution can be derived from the expression (2.2). The creation of value, in the context of this work, is rooted in Grifell-Tatjé and Lovell (2015) who reviewed and updated the economic and accounting literature¹⁷ from the 1970s. This Chapter expands, adapts and applies the methodology to the context of stakeholder theory. We equate *Created value = Distributed value*. We have to take into consideration that the agents contributing to value creation or the receptors of

¹⁷ See Chapter 4 of Grifell-Tatjé and Lovell (2015) for a detailed discussion of this literature.

distributed value will depend on whether $p^{t+1} \geq p^t$, $w^{t+1} \geq w^t$ and $\pi^{t+1} \geq \pi^t$. Thus, we define created value as

Definition of Created Value

Created value is defined by the sum of: i) the quantity effect, ii) the contribution of output price increments, iii) the decrements of costs derived from reducing input prices and iv) if applicable, when $\pi^{t+1} - \pi^t < 0$ the term of economic profit reduction that is considered a contribution of the shareholder to the value created by the firm that will be distributed to the rest of the stakeholders.

To visualize this concept we reorganize the expression (2.2) to obtain (2.5) when $p^{t+1} > p^t$ or $w^{t+1} < w^t$ or $\pi^{t+1} < \pi^t$

$$\text{Created value} = [\bar{p}^T(y^{t+1} - y^t) - \bar{w}^T(x^{t+1} - x^t)] + [\bar{y}^T(p^{t+1} - p^t) - \bar{x}^T(w^{t+1} - w^t)] - (\pi^{t+1} - \pi^t). \quad (2.5)$$

$p^{t+1} > p^t$ $w^{t+1} < w^t$ $\pi^{t+1} < \pi^t$

As can be deduced from expression (2.3) when the quantity effect is positive it implies a positive contribution to the created value through the productivity and/or growth effect. When the quantity effect is negative it does not imply value creation but destruction of value.

We define as *willingness price effect* as the contributions of: i) output price increments, when $p^{t+1} > p^t$ and ii) the decrements of costs derived from reducing input prices when $w^{t+1} < w^t$. The willingness price effect is summarized in the following expression $[\bar{y}^T(p^{t+1} - p^t) - \bar{x}^T(w^{t+1} - w^t)]$ with $p^{t+1} > p^t$ and $w^{t+1} < w^t$ that is part of the expression (2.5). It collects the discussion about the willingness-to-pay approach related to the variation of output price increases and input cost decreases as a source of value described in subsection 2.4.1 and displayed by Figure 2. Thus, we define created value as “created value = quantity effect + willingness price effect + profit contribution”. We note that Davis (1947) did not consider the willingness price effect as a source of value creation. He only considered the productivity effect.

The last term, when $\pi^{t+1} < \pi^t$ can be considered, from the point of view of the firm, as a reduction of the additional amount of money that corresponds to the shareholder. As we have considered value creation when a price reduction from the suppliers is achieved, we might consider value creation when there is a reduction of the additional amount of

money that corresponds to the shareholder. This approach explains why economic profit contribution is part of the expression (2.5).

Furthermore, we define distributed value as

Definition of Distributed Value

Distributed value is defined by the sum of: i) output price decrements, ii) the increments of costs derived from increasing input prices and iii) when $\pi^{t+1} - \pi^t > 0$ the term of economic profit increment captured by the shareholder.

The quantity of distributed value corresponds with the aggregation of price variations derived from customers that have achieved output price reductions, the portion coming from input suppliers who have achieved increases in the price (labor or raw material suppliers) and the increment in the economic profit between two periods when this difference is positive (shareholder).

Again we use (2.2) to obtain (2.6). We express the distributed value when $p^{t+1} < p^t$ or $w^{t+1} > w^t$ or $\pi^{t+1} > \pi^t$ as:

$$\text{Distributed value} = -\bar{y}^T(p^{t+1} - p^t) + \bar{x}^T(w^{t+1} - w^t) + (\pi^{t+1} - \pi^t). \quad (2.6)$$

$p^{t+1} < p^t \qquad w^{t+1} > w^t \qquad \pi^{t+1} > \pi^t$

Therefore, it follows from expressions (2.5) and (2.6) the relation between created value and distributed value that we equate as “Created value = Distributed value”, which defines the next expression (2.7), where $p^{t+1} > p^t$, $w^{t+1} < w^t$, $\pi^{t+1} < \pi^t$ in the left side of expression (2.6) and $p^{t+1}_{ms} < p^t_{ms}$ ($ms = \text{main stakeholder}$), $p^{t+1} < p^t$, $w^{t+1} > w^t$, $\pi^{t+1} > \pi^t$ in the right side. The expression (2.7) becomes the focus of the value dynamic analysis.

$$\begin{aligned} & [\bar{p}^T(y^{t+1} - y^t) - \bar{w}^T(x^{t+1} - x^t)] + [\bar{y}^T(p^{t+1} - p^t) - \bar{x}^T(w^{t+1} - w^t)] - (\pi^{t+1} - \pi^t) = \\ & -\bar{y}^T_{ms}(p^{t+1}_{ms} - p^t_{ms}) - \bar{y}^T(p^{t+1} - p^t) + \bar{x}^T(w^{t+1} - w^t) + (\pi^{t+1} - \pi^t). \end{aligned} \quad (2.7)$$

$p^{t+1}_{ms} < p^t_{ms} \qquad p^{t+1} < p^t \qquad w^{t+1} > w^t \qquad \pi^{t+1} > \pi^t$

The previous expression summarizes all the sources of value creation (left side of the equality) and all the stakeholders involved in the distribution (right side of equality). This approach is aligned with scholars (Coff 1999) who argue that the processes of value creation and value distribution should be separated since “the source that creates value may or may not be able to capture or retain the value in the long run” (Lepak, Smith and Taylor

2007, 181). The expression (2.7) makes visible the *value slippage* that occurs when the source and the subject who appropriates the created value are different. We focus our analysis in order to know if the value is migrating to the main stakeholder due to its capacity of influence. Additionally, it allows us to clarify the value captured by the main stakeholder through the term $-\bar{y}_{ms}^T (p_{ms}^{t+1} - p_{ms}^t)$. The expression allows us to understand the firm's reaction through the analysis of the left side where the changes in the sources of value creation are directly related to the action of the firm through internal firm decision (quantity effect), through the capacity of influence of the firm through prices (willingness price effect) or showing a decrease in the economic profit when $(\pi^{t+1} - \pi^t) < 0$.

Evaluating the price changes of the right side we can assess quantitatively the intensity of the capacity of influence of the stakeholders over the firm. The capacity of influence of a stakeholder is expressed by the amount of value that it is able to capture. Following-up its variation through time we can see the evolution of his capacity of influence over the firm.

2.4. Data

The firm has given access to all necessary data in order to perform the study. All the raw data was facilitated by the firm based on the analytical accounts. To place it in the correct historical context several interviews have been held with several top managers Managing Director, Financial Director, Controlling Director, IT Director and some more interviews, when necessary, with expert technicians in the aforementioned management areas who have co-operated in the collection and aggregation of data and the interpretation of results. For this reason it is relevant to point out the fact that the work carried out has been based on high quality information (both exhaustive and detailed) in all defined variables described in the next subsections, and that after being cross-checked with the information supplied by management, converts this case into a pin factory study.

For all variables the average of the quantities and prices at the beginning and end of the period was calculated.

2.4.1. Output definition

When faced with the multiple potential approaches in relation to the available data, the strategy has been to define the outputs depending on the customer groups that can be assigned to stakeholders that will be coherent with the analysis to be performed. We have

classified the output in three groups of customers: i) Spanish public health sector (y_1), ii) Spanish private sector (y_2) and iii) export customers (y_3) which are mainly subsidiaries in European countries. The Spanish public health sector has been assigned to the role of main stakeholder and allows us to detect differences compared with the private health sector and the export market. This means we have three stakeholders on the demand side. The output quantities are considered as physical units sold (y_m^t) to each kind of customer in each period.

This first classification facilitates a second level of analysis related to whether the products come from manufacturing sites located in Spain or come from goods purchased from other firms in the Group. This second level makes it possible to follow-up the internal decisions of the managers related with the manufacturing process. This information is relevant in order to understand the behavior as a reaction to the pressure of the main stakeholder.

The net income coming from each stakeholder will be assigned to each stakeholder as ($p_m y_m$) corresponding to the sales to each in current euros. The calculated average price (p_m) corresponding to the finished goods sold to each group will be calculated as the ratio of the sales income from each group by units sold ($p_m y_m / y_m$).

2.4.2. Input definition

For the purposes of analysis we consider a set of six inputs to be assigned to different stakeholders: labor (workers), raw materials (split into three subgroups of suppliers), imported goods from other firms of the group, and suppliers of capital (lenders). In general the price of each input will be calculated through the ratio of total expense on that input divided by average units of the resource used.

- Labor. Units of labor x_ℓ are defined as the average number of employees contracted by the firm at the beginning and at the end of the year. $x_\ell w_\ell$ corresponds with the expense in salaries documented in Financial accounts for each year. w_ℓ is the price of the average salary and it will be calculated through the ratio of total expense in salaries divided by the average number of employees calculated as $x_\ell w_\ell / x_\ell$.
- Capital. The expenses related to capital have been calculated as the sum of the economic amortization (AEC), the interests of the borrowed capital (INT) and the return required by the shareholder. The return required by the shareholder (r_{sh}) for his/her own resources (OR) has been calculated using the CAPM model where we

consider the return without risk, defined as the 10 year bonus of Germany as the firm is of German origin, the Spanish premium risk as the selected firm is an investment in Spain and the beta estimation of the pharmaceutical sector following Harrison (2009). The return required by the stakeholder using this criteria is comprised of the interval of 6.83% (2006) to 8.59% (2011).

The stock of capital of period “0” (K^0) is the total assets at the beginning of the period. To calculate the stock of capital of period “1” (K^1) we have subtracted the economic amortization of period “0” (AEC^0) to the stock of capital of period “0” (K^0) and added the investments of the period “1” (Inv^1). To obtain K_0^1 all are deflated to period “0” using the Spanish Consumer Price Index (IPC) as deflator (d). We assign to 2003 the year “0”.

$$K^1 = K^0 - AEC^0 + Inv^1 = K^0(1 - \delta) + Inv^1 \quad \text{as} \quad AEC^0 = \delta K^0$$

$$K_0^1 = K^0(1 - \delta) + \frac{Inv^1}{(1 + d)}$$

In general terms, we repeat the same until the period of interest and deflating to time 0 using the Spanish Consumer Price Index (IPC) as deflator (d^t) of each year to obtain:

$$K_0^{t+1} = K^0(1 - \delta)^{t+1} + \frac{Inv^1(1 - \delta)^t}{(1 + d^1)} + \dots + \frac{Inv^{t+1}}{(1 + d^1) \dots (1 + d^{t+1})}$$

Once the stock of capital of period “ τ ” as K_0^τ is obtained for each period we can calculate the price (w_k) calculating the ratio [$w_k^\tau = (AEC^\tau + INT^\tau + OR^\tau r_{sh}^\tau)/K_0^\tau$] through the expenses of capital and the units of capital of each period we obtain w_k^τ . Data corresponding to income and expenses are not deflated.

- Raw Material. In the case of raw material the total expenses are expressed as $w_{rm}x_{rm}$. We have divided this expense into three subgroups: i) medicinal substances ($w_d x_d$), ii) primary packaging ($w_{pp} x_{pp}$), iii) rest of suppliers ($w_o x_o$) related to the ancillary material needed to elaborate the final product. The units of medicinal substances x_d and primary packaging x_{pp} are in kg and x_o are the physical units of ancillary material. To calculate the prices of each group of inputs (w_{rm} , w_d , w_{pp} , w_o)

the ratios of the total expenses of each input related to the average quantity of the corresponding input have been calculated.

- Imported goods. This concept shows the imported goods from other legal entities that belong to the same Group. The income related to this concept is regulated by transfer prices defined internally between headquarters and subsidiaries. Concerning the quantities x_g are expressed in physical units. To calculate the price w_g the total expenses associated to this concept ($x_g w_g$) divided by its average quantity has been used.

The unitary cost of the period has been created from the point of view of using a perspective based on customer. For that reason, the unitary cost is the same for all the output. It is calculated as the sum of all costs related to inputs divided by the total quantity of output sold to all customers in the period in order to estimate expressions (2.3) and (2.4) although for confidentiality reasons they are not reported in Table 2.1.

2.4.3. The period of study

In order to perform the empirical analysis of the evolution of the pressure exerted by the main stakeholder we have selected the interval from 2003 to 2012. It has been divided into three periods 2003-2006, 2006-2009, 2009-2012. The period 2003-2006 is defined as the accumulation of three annual subperiods 2003-2004, 2004-2005 and 2005-2006. The periods 2006-2009 and 2009-2012 are defined following the same procedure. The first corresponds to the increase in healthcare expenditure since the end of management decentralization in favor of the Autonomous Communities. The second aims to observe the effect of political decisions taken to control healthcare expenditure. The third is mainly focused on the impact of the Royal-Decrees published with the objective of reducing product prices (see section 1.7).

2.5. Results and discussion

The results of the study carried out are summarized from Table 2.1 to 2.6 (see Appendix B). Table 2.1 and 2.2 are built directly with the data obtained from the internal and extended information needed for this study made available by the firm. Table 2.1 shows the evolution of economic profits, revenues, physical quantities and prices of the three outputs defined in section 2.4.1 through the period 2003-2012. Table 2.2 shows total

expenses, quantities and prices of the six inputs considered in the analysis and defined in subsection 2.4.2. Table 2.3 is built in order to analyze the dynamics of value creation and distribution after using the expressions (2.5) and (2.7) in periods 2003-2006, 2006-2009 and 2009-2012. Furthermore, this table allows us to monitor the influence relationships among the stakeholders and firm through time. Table 2.4 details the contribution of the productivity effect and growth effect to the quantity effect. Table 2.5 summarizes the contribution of each stakeholder to the value created through the willingness price effect. Table 2.6 visualizes the variation of the firm's position in front of its stakeholders regarding the changes in the influence relationship.

The discussion starts with the analysis of the economic profit described in Table 2.1. We note that in all the years considered, the economic profit has been positive but it describes a trend divided into three phases. In the first three years, until 2005, the increase of economic profit was significant, rising from €8,187 million to €21,733 million. In a second phase the profit was stabilized around €14 million for four years, until 2009. It dropped in 2010 to €6,514 million, being the lowest in 2011 (€4,753 million). It is interesting to note that the start of the decrease matches up with the initial measures of health care expenditure control taken by the main stakeholder, the Spanish Public Health Sector. The minimal economic profit coincides with the hard measures applied by the government when they issued the Royal-Decrees that cut the selling price of the pharmaceutical companies by 7.5% for two consecutive years (2010 and 2011). The last year (2012) shows a recovery of the economic profit, this being a consequence of the expected reaction of the firm. It is worth remembering that economic theory proposes that in a perfect competitive market the economic profit should be equal to zero. It is known that the firms can take advantage of misbalances or asymmetries to generate profits over the perfect competitive level. That rationale could be used as an argument by the regulator, when using regulatory measures such as the Royal-Decree, in order justify the cut-off of profits above zero. It is worth noting that the previous argument is only valid if it is only taken into consideration that economic profit is coming from a single and isolated market. This is not the case of the firm we are studying as it generates a percentage of its profit from markets abroad through sales to other subsidiaries which are internally regulated by the transfer price. It means that the level of economic profit is biased because of this factor. This aspect should be taken into consideration when interpreting the economic profit of the firm.

Regarding the outputs, it can be observed in Table 2.1 that the price of the goods sold to the Spanish public sector decreases from €0.41 (2005) to €0.34 (2012). It certainly corresponds to the pressure applied to the prices by the main stakeholder, as the price level of 2012 is slightly inferior to 2003 price (€0.35). In the Spanish private sector, the trend is quite similar. At the end of the interval €0.37 in 2012 it is still higher than 2003 (€0.35). It is interesting to note that in the first period, until 2006, the average prices of the Spanish public sector were higher than the Spanish private sector. After the actions of the main stakeholder the public prices decreased below the private prices and this trend has been maintained up to now. It is worth mentioning that the firm has been able to increase the total revenue from year to year, starting from €139,913 million (2003) and achieving €223,951 million in 2012. We note the contribution of the subsidiaries to this income during the last two years that compensates for the reduction in the domestic market.

Concerning the input quantities and price trends described in Table 2.2 it is remarkable that the average salary of firm employees has maintained a rising trend with increments every year except in 2010, increasing from €39,006 (2003) to €51,164 (2012). It is also worth noting that the price of raw materials, particularly the medicinal substances, has been increased to more than double their initial price rising from €1.24 (2004) to €4.10 (2010). This increment is mainly explained by the increase in one substance that suffered an impact in its availability due to a quality issue in the global market, thus causing an unexpected rise in the price. In the last year the situation has been returning to standard levels but is still high €3.77 (2012). On the other hand the cost of primary packaging increased as well during the interval 2003-2012 but with less impact than medicinal substances, as the prices were changing from 1.01 euro/kg to 1.52 euro/kg. The cost of capital has been stable for some years at around 10% but it increased significantly in the last two years rising until 13% and 16% respectively. It coincided with an increase of the Spanish premium risk rate. Finally, the cost of imported goods from other companies of the Group shows an increase through the years, flattening out since 2009 and decreasing in the last year. It has decreased from €0.21 (2011) to €0.18 (2012) suggesting that the company has adjusted this internal price as part of the measures to compensate for the pressure of the main stakeholder trying to spread the impact throughout the whole Group.

The dynamics of value creation and distribution are shown in Table 2.3. We start by highlighting that the value created by the firm shows an increase in absolute quantities through the three periods from €15,814 million (2003-2006) to €23,830 million (2009-

2012). As a consequence, the stakeholders will receive more value but we note that it does not mean that the number of stakeholders participating will increase.

From the point of view of created value, and knowing that it will be related to the reaction of the firm, it merits attention to know which are the drivers of the increasing trend. It can be seen that in the first period (2003-2006) the willingness price effect is the only contributor to created value (€16,276 million) but the quantity effect is negative (- €0,461 million). We will explain the causes of this negative result later when analyzing Table 2.4. The quantity effect is positive in the following periods, becoming the most important contribution to the created value in 2006-2009 (€12,730 million) but dropping to €4,963 million in the last period. We can confirm that the firm took internal measures to increase productivity in the second and third period but the impact in the last period was lower due to other factors that we will consider later. Conversely, the willingness price effect is positive in all periods but it oscillates. After the €16,276 million of the first period it decreases to €9,778 million in the second and increases again to €14,203 million in the third becoming the main contributor to the created value. The detailed contribution of each stakeholder to the willingness price effect is described in Table 2.5 and will be analyzed later as it shows the capacity of influence of the firm over the stakeholders.

To finish the analysis of created value it has to be noted that in the third period a significant decrease in the economic profit is observed (- €4,662 million). It corresponds to the impact for the shareholder. This is an important fact that merits attention as it means that the shareholder does not receive a part of the value created. On the contrary, they are contributors to created value as the amount of economic profit that corresponds to them decreases. Now, we can identify the stakeholders as receptors of this created value analyzing the right side of Table 2.3 where the value distribution among stakeholders is detailed.

It is worth noting that all the value created is distributed as defined in section 2.3.3. We have split the receptors of distributed value into groups according to the expression (2.6). Through the price effect related to outputs we can highlight the impact of the Spanish public health sector as the stakeholder who is able to increase its percentage of captured value significantly. In the first period it received nothing but in the second 14% (€3,155 million) and in the third 31% (€7,293 million) of the distributed value. This trend clearly shows the impact of the health expenditure control measures imposed by the government and it makes the capacity of influence of the main stakeholder explicit. The

Spanish private sector has been able to capture part of the created value during the last period but only by 5%.

It is interesting to mention that employees have been able to capture a sustained and significant part of the distributed value in all periods (28% - 16% - 18%) showing that their capacity of influence has not been eroded by the reaction of the firm when trying to compensate for the effect of the main stakeholder value capture. The slight decrease in the percentage is more related to the new people who have been contracted to work in the new facilities, with lower salaries compared to the former employees, than to the pressure of the firm on the salaries.

The suppliers related to medicinal substances are also able to revert the trend of the first period and to capture enough worth in the second and third periods to become part of the stakeholders that receive value. Their value capture is significant (23% and 13%) showing once more the impact of the availability of product crisis mentioned at the beginning of this section. As a consequence, the firm is not able to transfer the pressure of the main stakeholder to them. Regarding the primary packaging suppliers, their contribution to the value created and the capture is oscillating around plus or minus 5%, depending on the period. From the point of view of capacity of influence it means that it is quite balanced. In one period it is the firm who retains the value and in the next one it is the supplier who captures the value. The capital suppliers capture a large part of the value created by the firm. The first aspect to be considered is the increase of the cost which was increased as a result of Spain's premium risk as a country but it is worth mentioning that it is also partially a consequence of the main stakeholder behavior. The Spanish public sector was systematically delaying payments to all suppliers. The firms had to assume a delay in payment of over 300 days in 2010-2011. This fact is little more than a new way to increase pressure on the health care suppliers, obliging them to finance part of the healthcare expenditure. As a consequence, the firm needed additional external sources of financial resources. Additionally, the level of debt was also increased due to the strong investments in new facilities.

The role of the finished goods imported from the Group has a crucial role in the evolution of the created and distributed value. As can be seen during the first and second period, the Group was the receptor of created value (24% in both periods) but it changes to a contributor in the third (see Table 2.5). The Group, through the prices sold to the firm, is partially compensating for the impact of the main stakeholder. The decrease in the

economic profit is the last remarkable topic of Table 2.3. It shows that the shareholder has lost its part of distributed value, confirming the trend of the previous periods. In the first it was able to capture 35% but only 1% in the second. This result makes explicit the relevancy of the impact of the main stakeholder on the company as it has lost an important part of the value created and additionally it has to contribute to the worth that will be distributed among the rest of the stakeholders. As we have seen, the capacity of influence of the firm over the stakeholders is limited, as almost all the stakeholders are receiving value. This means that in order to find the clues to the firm's reaction we should have a look at the drivers of value creation.

To identify if the firm's reaction is mainly focused on the internal organizational measures or strategic decisions, we follow the evolution of productivity and growth effects as detailed in expression (2.3) and calculated in Table 2.4. The figures show an interesting trend related to the productivity effect as it is positive in the first and second period. The contribution of the second period to the quantity effect (€9,834 million) is certainly high. This substantial increment reflects one of the main drivers of the reaction of the firm. The firm took organizational measures to increase productivity drastically in the second period in order to react to the capture of value made by the main stakeholder, as previously discussed. In the last period the productivity dropped into negative results (- €3,752 million) as a consequence of a demand crisis and the impact of the final go-live phase of the new facilities. This additional capacity was mainly planned to maintain the dominant presence of the firm's products in the Spanish market and to enhance their presence in the international markets.

At the same time, the growth effect has become more significant as a mechanism of reaction in the second and third period (€2,895 and €8,716 million respectively). The growth effect had a negative contribution in the first period (- €1,048 million) that was greater in absolute terms than the productivity effect (€0,586 million) resulting in a negative quantity effect. This means that the contribution of the term $\overline{(p - c)}^T (y^{t+1} - y^t) < 0$. This is a consequence of our definition of unitary cost. Looking at the yearly results we have found two explanations. On the one hand, the quantity sold to the main stakeholder during the year 2005 was significantly less than in 2004 making the term $(y^{t+1} - y^t) < 0$. On the other hand, the firm was not taking into consideration the opportunity cost in the calculation on the internal price (p) to the subsidiaries. In this situation the internal price

(p) was lower than the unitary cost including the opportunity cost (c), thus $\overline{(p - c)} < 0$. This situation was not reproduced in the following subperiods.

The firm realized that the average margin was being eroded. The output prices were decreasing quickly. Then the firm reacted by increasing the market share. This means trying to sell more units in order to compensate for the margin loss, in particular by increasing the sales to the export market.

The only thing that is still pending is the analysis of the firm’s capacity of influence through the willingness price effect as part of the firm’s reaction. Table 2.5 monitors this influence detailing the drivers of the willingness price effect as a value creating factor. A sustained contribution to the price effect is only seen in the category of the rest of suppliers (17.7%; 4.3%; 29.6%). It becomes €4,206 million in the third period meaning that the firm has capacity of influence only over the non specific suppliers. We have seen that the firm has no influence on labor, nor on active substances nor primary packaging. The second relevant contributor to the willingness price effect is the imported finished goods in the third period (68%, €9,719 million) that we have already mentioned as a mechanism of compensation from the Group that here contributes to the value created.

It is worth ending the discussion by noting that the contribution to the willingness price effect coming from the Spanish Public Sector in the first period was 49 % (€7,970 million) but it disappeared in the following periods. In the first period half of the willingness price effect was coming through prices related to the main stakeholder. After starting the control measures as obliged by the main stakeholder, the composition of value creation through the willingness price effect changed completely. This is the origin of the dynamics of value and influence observed and that is why we consider the main stakeholder as the shaker of the value dynamics.

As a means to visualize the change of the firm’s situation as regards its stakeholders Table 2.6 has been created which compares the situation between periods 2003-06 and 2009-12. The vertical axis of the table represents the level of influence of the main stakeholder (high or low). We assign *low* to the first period (2003-2006) as the main stakeholder was contributing to the value created by the firm through prices. Consequently, we assign *high* in the second and third period as the main stakeholder is capturing distributed value.

The same criteria has been followed in the horizontal axis but taking into consideration the stakeholders that are not depending on the decisions of the firm that have

changed its capacity of influence. These are the Spanish Private Sector and the medicinal substance suppliers. Both were showing a *low* capacity of influence in the first period as they were net contributors to the value created but this became *high* in the third. Representing these changes in Table 2.6 we obtain the dynamic of influences between the stakeholders and firm showing that the firm has a worse position in relation to the aforementioned stakeholders at the end of the third period. It is confirmed that the firm has not been able to react. It was the support coming from the Group in terms of lowering the internal prices of imported finished goods, increasing the internal prices of products exported to subsidiaries and a lower level of economic profit assumed by the shareholder that have compensated for the value captured by the main stakeholder.

2.6. Concluding remarks

The aim of this chapter has been the study of the dynamics of value creation and distribution under the prism of stakeholder theory. The use of a pin factory study has to be considered a relevant contribution because it implies performing the analysis using information sources of high quality. Thus, the conclusions regarding the value dynamics are more reliable.

The influence relationships between stakeholder and firm show the reality that organizations face when they develop their activity. Moreover, the process of firm value creation is often affected by stakeholder behavior. As a consequence, the firm has to take decisions regarding how to manage stakeholders.

To our knowledge the empirical research performed within stakeholder theory¹⁸ has not put the focus on the quantitative aspects of those relationships of influence nor the impact of the firm's decisions. Our contribution through this chapter allows this kind of assessment. Following this purpose a methodology has been developed that has been used to show the evolution of value dynamics through time. How the process of value creation and distribution works has been detailed from a qualitative and quantitative perspective

The effect of the main stakeholder on the firm is central in this chapter. The Spanish Public Health Sector, in its combined role of customer and regulator, matches the requirements of being the main stakeholder. It has the power to strongly influence the firm over a short period of time. The established dynamics between stakeholders and firm were

¹⁸ See Appendix D. for a more detailed discussion on the empirical research related to corporate social responsibility versus corporate financial performance.

unilaterally changed. We have confirmed through the pin factory study that the main stakeholder has the power to shake these value dynamics. The study concludes that the main stakeholder has enough power of influence to become the receptor of the created value. As a consequence, the firm has been obliged to react by using its own capacity of influence on other stakeholders and by reorganizing the firm in order to increase productivity and growth. Additionally, some other stakeholders are able to resist the capacity of influence of the firm. Labor is able to retain its capture of value through time. On the other hand, the study has demonstrated that the shareholder was strongly affected by the main stakeholder as it finally became a contributor to the value created.

It is worth mentioning that the pin factory study is adequate to show how the theory of stakeholders and the methodology introduced can be used to understand the firm value dynamics. Despite this, some limitations arise when thinking of an extensive use of this approach. The first restriction is that this approach only allows the quantitative analysis of the stakeholder that exchange value with the firm. Secondly, the researcher should have a good source of information from the firm. It is necessary in order to differentiate the correct stakeholder groups, to allocate prices and quantities to these groups and to understand the qualitative background where the firm operates. This is not always feasible as the information might be confidential or is not available. Nevertheless, further research is needed in order to accumulate more cases showing the strengths and weaknesses of it.

We consider that our contribution permits the development of formal empirical research to the theory. This allows a rigorous approach to the topics of interest of stakeholder theory thus adding knowledge to how stakeholder and firm behave and influence each other.

2.7. Appendix B. Tables

Table 2.1. Evolution of profits, revenues and outputs. Period 2003-2012.
expressed in current € of each year

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1. Economic profit (€ x1000)	8,187	16,543	21,733	13,734	13,212	14,946	14,053	6,514	4,753	9,390
2. Outputs										
2.1. Spanish Public Health Sector										
Income (x1000 €)	49,191	53,929	58,777	58,100	64,943	70,989	74,310	70,381	68,743	66,790
Units sold (x1000 #)	141,297	152,959	142,690	144,876	162,295	176,410	193,616	185,392	186,041	194,623
Price (€)	0.35	0.35	0.41	0.40	0.40	0.40	0.38	0.38	0.37	0.34
2.2. Spanish Private Health Sector										
Income (x1000 €)	32,082	36,477	41,409	39,703	45,135	49,042	48,906	47,954	48,307	45,386
Units sold (x1000 #)	92,703	101,107	105,424	109,265	120,065	133,742	123,544	121,245	127,509	122,798
Price (€)	0.35	0.36	0.39	0.36	0.38	0.37	0.40	0.40	0.38	0.37
2.3. Goods exported to subsidiaries										
Income (x1000 €)	38,293	43,813	48,990	44,084	51,011	57,945	62,911	64,551	68,294	82,811
3. Total Revenue (€ x1000)	139,913	148,944	157,134	163,823	186,460	195,191	202,679	201,666	211,953	223,951

(*) c.d. Confidential data related to Units sold and Price are not shown. Full information has been available for calculation but restricted due to confidentiality issues.

Table 2.2. Evolution of Expenses. Period 2003-2012.
expressed in current € of each year

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
2. Inputs										
2.1. Labour										
Cost of salaries (x1000 €)	33,077	34,820	40,633	38,961	43,839	47,962	47,127	50,360	53,058	56,690
Employees (#)	848	901	943	891	976	992	994	1,117	1,071	1,108
Price (€)	39,006	38,646	43,089	43,727	44,917	48,349	47,412	45,085	49,541	51,164
2.2. Raw Materials										
2.2.1. Medicinal substances										
Cost (x1000 €)	5,053	6,501	7,463	4,200	5,316	6,929	9,392	12,625	11,756	12,699
Units (x 1000 kg)	3,466	5,229	5,455	2,979	3,777	3,941	3,320	3,082	3,109	3,370
Price (€)	1.46	1.24	1.37	1.41	1.41	1.76	2.83	4.10	3.78	3.77
2.2.2. Primary packaging										
Cost (x1000 €)	2,386	2,386	3,457	3,162	4,089	4,195	3,788	3,869	4,947	6,548
Units (x 1000 kg)	2,353	2,353	3,367	2,375	3,065	3,099	2,949	2,958	3,740	4,299
Price (€)	1.01	1.01	1.03	1.33	1.33	1.35	1.28	1.31	1.32	1.52
2.2.3. Rest of suppliers										
Cost (x1000 €)	13,276	11,233	9,189	10,272	11,309	11,531	12,301	11,606	13,669	12,301
Units (#)	353,211	378,790	404,368	341,751	412,442	423,222	427,780	429,993	501,132	593,409
Price (€)	0.038	0.030	0.023	0.030	0.027	0.027	0.029	0.027	0.027	0.021
2.3. Capital										
Cost (x1000 €)	16,244	17,557	19,165	21,286	24,119	25,145	27,558	28,073	32,746	37,380
Capital stock (x1000 € 2003)	158,138	206,707	190,014	197,725	212,668	216,545	210,597	242,886	241,713	232,943
Price (€)	0.103	0.085	0.101	0.108	0.113	0.116	0.131	0.116	0.135	0.160
2.4. Imported goods										
Cost (x1000 €)	41,341	45,180	47,537	50,273	59,204	67,268	71,908	69,839	64,414	59,979
Units (#)	229,783	267,747	252,133	259,156	303,279	335,588	342,031	333,928	306,625	333,352
Price (€)	0.18	0.17	0.19	0.19	0.20	0.20	0.21	0.21	0.21	0.18
2.5. Total expenses (x1000 €)	135,926	142,096	153,807	156,187	180,089	191,742	198,593	202,492	211,479	218,376

Table 2.3. Dynamics of Value Creation and Distribution. Period 2003-2012.
Cummulate results by period (current €)

	2003-2006	2006-2009	2009-2012		2003-2006	2006-2009	2009-2012			
Created Value	15,814,558	22,509,322	23,830,478	Distributed value	15,814,558	22,509,322	23,830,478			
Quantity Effect	(461,927)	12,730,433	4,963,931	Price Effect						
Willingness Price Effect	16,276,485	9,778,889	14,203,666	Outputs						
				Spanish Public Health Sector	-	3,155,918	14%	7,293,527	31%	
				Spanish Private Health Sector	-	-		1,098,249	5%	
				Export to Subsidiaries	-	-		-		
				Inputs						
				Labour	4,367,035	28%	3,556,779	16%	4,188,024	18%
				Raw Materials						
				· Medicinal substances	-		5,233,403	23%	3,037,959	13%
				· Primary Packaging	909,833	6%	-		924,346	4%
				· Rest of suppliers	-		-		-	
				Imported Finished Goods	3,759,717	24%	5,333,913	24%	-	
				Capital	1,231,321	8%	4,910,160	22%	7,288,372	31%
$[\pi(t+1) - \pi(t)] < 0$		-	4,662,880	$\pi(t+1) - \pi(t) > 0$	5,546,652	35%	319,148	1%	-	

Table 2.4. Quantity effect. Period 2003-2012.
 Cumulate results by period (current €)

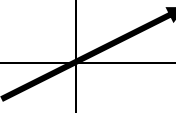
	2003-2006	2006-2009	2009-2012
Quantity Effect	(461,927)	12,730,433	4,963,931
<i>Productivity Effect</i>	586,441	9,834,880	(3,752,870)
<i>Growth Effect</i>	(1,048,368)	2,895,553	8,716,802

Table 2.5. Contribution of Willingness price effect to value creation. Period 2003-2012.
Cummulate results by period (current €)

	2003-2006		2006-2009		2009-2012	
Willingness Price Effect	16,276,485		9,778,889		14,203,666	
Outputs						
Spanish Public Health Sector	7,970,581	49.0%	-	-	-	-
Spanish Private Health Sector	1,535,964	9.4%	4,073,411	41.7%	-	-
Export to Subsidiaries	3,797,855	23.3%	5,139,228	52.6%	277,734	2.0%
Inputs						
Labour	-	-	-	-	-	-
Raw Materials						
· Medicinal substances	90,286	0.6%	-	-	-	-
· Primary Packaging	-	-	141,084	1.4%	-	-
· Rest of suppliers	2,881,800	17.7%	425,166	4.3%	4,206,828	29.6%
Finished Goods (Imported)	-	-	-	-	9,719,104	68.4%
Capital	-	-	-	-	-	-

Table 2.6. Dynamic of influences. Comparison between 2003-06 and 2009-12

	Capacity of reaction of the firm “Influence of the firm over stakeholders”	
Capacity of influence of Main Stakeholder	High	Low
High		Firm (2009-12)
Low	Firm (2003-06)	



1. Main stakeholder: Spanish Public Health Sector
2. Stakeholders with change in influence over the firm:
 - Spanish Private Health Sector
 - Medicinal substances supplier

2.8. Appendix C. Stakeholder management and value creation

The sources of value creation and later the distribution among firm and salient stakeholders are key factors in stakeholder management, particularly when studying how to deal with the impact of the decisions of the stakeholder over the firm. Understanding how the value is generated and distributed helps to understand the sort of relationships that link the firm and the stakeholders, how they behave, how they react and how they can be managed.

We have considered that the total wealth accumulated by the firm is a social fact, in the sense that part of it is created and afterwards it is distributed among stakeholders (workers, customers, owners or shareholders, suppliers and public sector agents). It is interesting to note that the total wealth or economic worth could be split into: i) a fraction for the owner/shareholder, related to the Corporate Financial Performance (CFP) and ii) a second portion for the other stakeholders that could be related to the Corporate Social Responsibility (CSR) aspects.

It has been argued that to increase the shareholder value a company must address the needs of its stakeholders more efficiently and effectively than the companies against which it competes¹⁹. Furthermore, it has been stated that by addressing and balancing the claims of multiple stakeholders (Freeman and Evan 1990), managers can increase the efficiency of their organization. These two ideas are part of the debate of the scholars that argue that a firm has a debt to society that goes beyond the creation of wealth for the shareholders (MacKey, MacKey and Barney 2007, Swanson 1999). These schools of thought consider that on some occasions management decisions have to be taken that go beyond shareholder interest despite the fact that these decisions could reduce the present value and the current cash flow of the firm (Clarkson 1995, Donaldson and Preston 1995, Freeman 1984, Mitchell, Agle, and Wood 1997, Wood and Jones 1995). They conclude that the firms that do not consider this premise run the risk of ignoring the relevant stakeholders in the long term survival of the firm.

Clarkson (1995) asserted that the survival and continuing profitability of the corporation depends upon its ability to fulfil its economic and social purpose, which is to create and distribute wealth to ensure that each primary stakeholder group continues as part of the corporation’s stakeholder system. Thus, an organization can be viewed as a set of

¹⁹ The discussion started after the contribution of Milton Friedman (1962) who published an article arguing that the firm should only be focused on profit maximization for shareholders, thus it is not necessary to apply any kind of stakeholder management policy.

interdependent relationships among stakeholders (Chakravarthy 1986, Donaldson and Preston 1995, Greenley and Foxall 1997, Hill and Jones 1992, Jones 1995). Hillman and Keim (2001) summarized that building better relations with stakeholders such as employees, customers, suppliers and communities could lead to increased financial returns by helping firms develop intangible but valuable assets which can be sources of competitive advantage. For example, Hillman and Keim (2001) propose that investing in stakeholder relations may lead to customer or supplier loyalty, reduced turnover among employees, or improved firm reputation. These valuable assets in turn lead to a positive relationship between stakeholder management and shareholder value wherein effective stakeholder management leads to improved financial performance. They stated that managing relationships with primary stakeholders can result in much more than just their continued participation in the firm. Hillman and Keim (2001) also concluded that using corporate resources for social issues not related to primary stakeholders may not create value for shareholders. They tested their propositions with data from S&P 500 firms and found evidence that stakeholder management leads to improved shareholder value, while social issue participation is negatively associated with shareholder value. By developing long term relationships with these stakeholders, firms expand the set of value-creating exchanges with these groups beyond that which would be possible with interactions limited to market transactions. Chakravarthy (1986), Jones (1995) and Hillman and Keim (2001) put emphasis on the value that can be created by interactions between firms and primary stakeholders, which are relational rather than transactional since transactional interactions can be easily duplicated and thus offer little potential for competitive advantage. Relationships involve investments by both (or multiple) parties and thereby include a time dimension; reputation is important and fair dealing and moral treatment by both (or multiple) parties enhances the value of relationships.

2.9. Appendix D. Corporate Social Responsibility versus Corporate Financial Performance

The empirical research related to the stakeholder theory has mainly focused on the relationship between the corporate social responsibility²⁰ (CSR) and the corporate financial performance (CFP) with the objective of determining if there is positive, negative or no correlation between the two concepts. It has been recurrently studied if a clear relationship between financial performance and social responsibility exists (i.e. Aupperle, Carroll and Hatfield 1985, Griffin and Mahon 1997, Waddock and Graves 1997a, Frooman 1997, Roman, Hayibor and Agle 1999, Preston and Donaldson 1999, Mackey, Mackey and Barney 2007, Godfrey, Merrill and Hansen 2009). The conclusion is that there is no clear correlation between both variables (Rowley and Berman 2000, Garriga and Melè 2004). Empirical support has been found in both directions as a good social performance leads to an improvement in CFP and a good CFP leads to a suitable CSR (Hillman and Keim 2001). Griffin and Mahon (1997) highlighted the high number of studies with negative conclusions but it should be said that most of them were investigating the impact on the stock market of potential corporate illegalities. Several works found inconclusive results (Alexander and Buchholz 1978, Abbott and Monsen 1979, Aupperle, Carrol and Hatfield 1985, Cochran and Wood 1984, Coffey and Fryxell 1991, McGuire, Sundgren and Schneeweis 1988). On the other hand, a positive relationship can be found in Johnson and Greening (1994), Riahi-Belkaoui (1992), Spicer (1978), Sturdivant (1977), Cheng, Ioannou and Serafeim (2014). Some of the reasons to explain the high variability and the inconsistencies of the obtained results are the existence of some deficiencies in the definition of concepts, in the operationalization of variables and in the methodological differences among the studies (Ullmann 1985, Wartick and Cochran 1985, Orlitzky, Schmidt and Rynes 2003).

Much less attention has been paid to the analysis of the relationship that links the wealth created by the firm and its social aspects when it is captured by or distributed among the stakeholders. The contributions to the literature, explicitly mentioning that the firm is embedded in a stakeholder network, have not gone into the dynamic of influences, the study of value dynamics or the quantitative aspects in depth (Kochan and Rubinstein

²⁰ Within the stakeholder theory, as Donaldson and Preston (1995), Clarkson (1995), Post, Preston and Sachs (2002) stated, a company can last over time if it is able to build and maintain sustainable and durable relationships with all members of its stakeholder network. Post, Preston and Sachs, (2002) noted these relationships are essential assets that managers must manage and they are ultimate sources of organizational wealth.

2000, Friedman and Miles 2002, Spence 2004, Meyer and Muller 2006, Neville and Menguc 2006, Roloff 2008, Tsai et al 2005). Neville and Menguc (2006) also recognized as necessary an interpretation of the facts related with the decisions of the firms and stakeholders from a multidisciplinary perspective.

There have been different ways of operationalization related to shareholder value creation or firm performance. They are usually based on accounting measures. Concerning the way that Corporate Social Performance (CSP) and Corporate Financial Performance (CFP) have been operationalized it should be said that Orlitzky, Schmidt and Rynes (2003) identified three broad subdivisions when operationalizing CFP: i) market-based (investor returns), ii) accounting-based (accounting returns) and iii) perceptual (survey) measures. Orlitzky, Schmidt and Rynes (2003) argued that market-based measures of CFP, such as price per share or share price appreciation, reflect the notion that shareholders are a primary stakeholder group whose satisfaction determines the company's fate. The bidding and asking processes of stock-market participants, who rely on their perceptions of past, current, and future stock returns and risk, determine a firm's stock price and thus market value. Alternatively, accounting-based indicators, such as the firm's Return on Assets, Return on Equity, or Earnings per Share, try to capture a firm's internal efficiency in some way. Accounting returns are subject to managers' discretionary allocations of funds to different projects and policy choices, and thus reflect internal decision-making capabilities and managerial performance. Lastly, perceptual measures of CFP ask survey respondents to provide subjective estimates of, for instance, the firm's "soundness of financial position", "wise use of corporate assets" or "financial goal achievement relative to competitors" (Reimann 1975).

Regarding the operationalization of CSP, Orlitzky, Schmidt and Rynes (2003) outlined that it has been associated with the following four measurement strategies: i) CSP disclosures, ii) reputation ratings, iii) social audits, CSP processes and observable outcomes, and iv) managerial CSP principles and values. Firstly, CSP disclosure measurement consists of content analysis of annual reports, letters to shareholders and a number of other corporate disclosures to the public as surrogates of CSP. Content analysis is employed to compare units of text against particular CSP themes in order to draw inferences about the organization's underlying social performance. It is interesting to note, as Orlitzky, Schmidt and Rynes (2003) summarize, that firms high in CSP may use corporate social responsibility disclosures as one of the informational signals upon which stakeholders base their assessments of corporate reputation under conditions of incomplete

information (Fombrun and Shanley 1990). Furthermore, firms with high CSP reputation ratings may improve relations with partners including capital suppliers. They should be attracting better employees (Turban and Greening 1997) or increasing current employees’ goodwill, which in turn may improve financial outcomes (Davis 1973, Waddock and Graves 1997).

Chapter 3

Stakeholders, Power and Strategies of Influence: The case of the Pharmaceutical Industry in Spain

Abstract

Frooman (1999) proposed a model for predicting the strategy that a stakeholder will use to influence the firm depending on who has the power in the relationship (firm or stakeholder) and its degree of interdependence (high or low). Despite some authors having tried to empirically validate the model using a qualitative approach it has not been possible up to now. This chapter focuses on the research of empirical support for Frooman's model by using a new approach that is focused on the economic and quantitative aspects of the relationships between firm and stakeholders. For that purpose, using the acquired knowledge of the Spanish pharmaceutical industry in Spain, we have identified the different typologies of relationship for each stakeholder. This fact permits the definition and operationalization of five hypotheses, one for each stakeholder. Using the dynamics of value creation and distribution it has been possible to validate the hypotheses and to find empirical support for the model when the economic aspects of the relationship between firm and stakeholders are considered.

Chapter 3

Stakeholders, Power and Strategies of Influence: The case of the Pharmaceutical Industry in Spain

3.1. Introduction

It has been argued in the literature that the more interesting relationships among stakeholders and firms are those where the interests of each party come into conflict (Freeman 1984, Frooman 1999, Lamberg et al. 2003). Moreover, there is no need to manage the stakeholders and neither is there a need to build a theory about them if they are in agreement (Frooman 1999, Frooman and Murrell 2005). This is why extreme situations, like the one described in this chapter, are interesting because the behavior of firms is expected to be more evident and feasible for analysis from the point of view of stakeholder management.

The theoretical framework for the third chapter is based on the model of influences between firm and stakeholders developed by Frooman (1999). Frooman's model is focused on identifying which strategy should be applied by each stakeholder depending on the power relationship that links the firm and the stakeholder and the mutual degree of interdependence. Up to now, despite the interest of stakeholder theory in the dynamic of influences²¹ it remains a difficult issue to be modeled. In this chapter we contribute to the knowledge of these dynamics of influence.

Frooman's model has its roots in: i) the stakeholder model where the firm is in the centre of a wheel where the stakeholders are located at the end of the radius (Freeman 1984) and, ii) the resource based view when considering "the resource dimension of a relationship and the power that stems from it, viewing power, then, as an attribute of the relationship between the actors—not of the actors themselves". Frooman's approach to power differs from the concept of power previously described in the stakeholder literature where power was understood as an attribute of the individual (Freeman 1984, Mitchell, Agle and Wood 1997).

Recently, Frooman's model has been examined by Tsai et al (2005), Hendry (2005) and Sharma and Henriques (2005) concluding that it has not been possible to demonstrate

²¹ It is worth mentioning that we use "dynamic of influences" here in the sense of studying the social relationships. We distinguish this meaning from the previously used one when discussing about "value dynamics". Value dynamics are related to the change of value creation sources and value distribution through time.

its applicability in real situations. However, a common characteristic of this previous research is that they focus on the qualitative aspects of the relationship between firm and stakeholders. This study takes another approach exploring the quantitative economic perspective of the relationship that links firm and stakeholders.

The research question of the chapter is focused on finding empirical support to Frooman's model of influences. We consider that one of the best scenarios for challenging Frooman's model is a direct withdrawal of economic worth by the most salient stakeholder by means of using his power. The aforementioned feature has been identified in the pharmaceutical industry sector of Spain, a member of the "PIIGS" group (Portugal, Italy, Ireland, Greece and Spain). The Spanish government, in a desperate attempt to escape from the "poisonous" cycle of "expenditure-debt", decided in 2005 to start a set of measures to control the deficit, some of which had a great impact on medicinal substances and medical device suppliers. These regulations hold consequences for all the stakeholders (owners /shareholders, workers, suppliers). The most salient stakeholder in that market, the Spanish public health sector, fulfils the attributes described in the definition of Mitchell, Agle and Wood (1997): power to influence the firm, legitimacy and urgency. Secondly, we have considered additional stakeholders based on their capacity of influence and the degree of interdependence with the firm (workers, suppliers of raw materials and capital, and shareholders). The Spanish public health sector had the power to enforce the withdrawal of resources needed by the firms as regulator and customer simultaneously, and consequently it was able to capture value created by them. The firms's reaction to this loss was expected to exert great pressure on the stakeholder network, showing what degree of power and influence the firm has over the stakeholders and vice versa. This gave visibility to the strategies that firm and stakeholders applied. Therefore, Frooman's model can be contrasted with reality.

Firstly, we will analyze the sector in order to identify the different kinds of relationships between stakeholder and firm. This is used to assign to each stakeholder its strategy of influence following Frooman's propositions. Secondly, a set of hypotheses are defined. Thirdly, a methodology based on value dynamics is developed in order to make the contrast of hypotheses operative. The methodology relates the stakeholder's behavior with regards to the value created and distributed. Finally, the study concludes giving empirical support to the propositions formulated by Frooman (1999).

3.2. Relevant facts in the Spanish health care sector

This section briefly summarizes the facts reported in section 1.7. It is interesting to recall that some relevant regulatory changes have affected the Spanish health care sector in the first decade of the 2000s. The government designed and implemented control measures to correct health care expenditure.

Since 2003, when the decentralization of the Spanish health care system was finalized, a non-sustainable increment in health care expenditure was observed. Each autonomous community pertaining to the Spanish State was able to fix their own price policy regarding the purchase of medicinal substances and medical devices. The evolution of health care expenditure worsened in the following three years. The government was forced to look for a strategy to revert the trend of expenditure. In 2005 a committee of experts was created to face the problem and propose solutions. The conclusions pointed out that the existence of several decision makers, with one distributed in each community, was creating a dysfunction in the health care system. The firms were taking advantage of these separations of responsibilities. They were able to fix different prices depending on the different negotiative power they had in each community. The first measures implemented by the health care public sector were focused on organizational matters, particularly enhancing the centralization of purchasing decisions and the introduction of generic drugs into the market. After some years, the imperious need for expenditure control was achieved through the publication of new Laws regulating the prices of medicinal substances and finally through the direct publication of Royal-Decrees. The more relevant ones were published in 2010 and 2011 and were focused on cutting the price of medicinal substances by -15% each year.

The pharmaceutical industry was pushed into a completely new scenario where the firms faced a relevant reduction in their profit. Most of them faced a critical situation regarding sustainability which particularly affected research and development activities. The firms were forced to apply cost reduction policies and to look for alternatives to generate additional profit. At the same time they were looking to transfer the cost of the adjustment to other stakeholders by using their capacity of influence.

3.3. The dynamics of stakeholder relationships, power and influence

3.3.1. Background

The only two schools of thought that deal with stakeholder dynamics are related to strategy and organization and the stakeholder theory literature. In the contributions to strategy and organization it is outlined how the stakeholders can exploit the dynamic asymmetries of knowledge during the process of developing business competences through time (Coff 2010). Furthermore, there exists an increasing interest in the study of these capabilities as an explanation of the dynamics among stakeholders (Blyler and Coff 2003). Coff (2010) references the development of business competences as a dynamic process and as a developing need. It was proposed that the stakeholders and firm should cooperate to generate profits, increasing the economic worth available. Furthermore, when gains exist, there will be a subsequent process of distribution where one of the stakeholders might capture a percentage of the worth created which would be greater than its contribution. The different power of influence of each stakeholder can affect firms unevenly and its effect will be different depending on the time factor and some other variables that may affect the relationship and negotiative processes. These negotiating skills will have an impact when there are overlapping areas among firm's interests, shared stakeholders or because the effects of the measures adopted by a single stakeholder affect all of them horizontally.

There have been some attempts to systematize the stakeholder dynamics within the stakeholder theory (Hill and Jones 1992, Beaulieu and Pasquero 2002, Johnson-Cramer and Berman 2007, Hsieh 2008, Sachs and Maurer 2009). Some authors have limited their contributions to a description of the stakeholder dynamics and some other authors have taken into consideration reciprocity and competence among stakeholders to achieve power of influence over the firm (Klumpes 2003). A reduced group of authors, more in line with our work, have tried to propose models of influence (Frooman 1999, Frooman and Murrell 2005, Sachs and Rühli 2005). A high percentage of the works use stakeholder dynamics focusing the analysis on case studies (Beaulieu and Pasquero 2002). Windson (2010) concluded that there are three limitations or weaknesses in stakeholder thinking: i) it is static and it should be dynamic, ii) it is oriented to the unilateral adaptation of the organization to the influence of stakeholders when stakeholder management should be a mutual contribution process and iii) it is biased so as to consider all the stakeholders to be in the same category when more than one subgroup should be defined. It is worth remembering that the relative positions of stakeholders can change drastically (Elias,

Cavana and Jackson 2002) depending on the specific situation and the type of decisions taken in each case. The real problem that should be faced when designing a dynamic model is that the crossover of interactions is very complicated. In fact, the situations surrounding them can easily change. As Windsor (2010) states, the different studies of change processes described in the literature and the ones that model the mutual influence among stakeholders should help to clarify how the model should be built (Barnett 2007, Frooman and Murrell 2005, Zietsma and Winn 2008).

3.3.2. Frooman's model

The backbone of both schools of thought discussed in the previous section regarding stakeholder dynamics is the approach based on the Resource Dependence Theory (RDT) which emphasizes that the firm is dependent on its stakeholders. RDT defined the concept of power through the acknowledgement of the dependence relationship between two organizations. One having power over the other implies that there exists an asymmetry in the relationship (Pfeffer and Salancik 1978). Therefore in order to know if "A" has power over "B", firstly, it should be verified that "B" is dependent on the resources that are supplied by "A", and that "A" is not dependent on "B". Pfeffer and Salancik (1978) proposed that if the stakeholder's network is asymmetric, the power of the less dependent organization increases and this power could be used to influence the rest of the organizations. If the relationship is symmetric either of them has the same dominance as regards relationship influences.

Frooman (1999) based his model on RDT. He used *power*, a central concept in his analysis, as an attribute of the relationship between firm and stakeholder. Power is not taken into consideration as a feature for each separate agent. It is linked to its relationship. The type of link established between both is intrinsically related to negotiation power concerning resources and their interdependence. The concept of power, used in that sense, is not considered an attribute that could be assigned to one of the parties as has been done in other approaches (Mitchell, Agle and Wood 1997). It is part of the description of the relationship between both parties. The model of influences as suggested by Frooman (1999) has been used as a reference in several contributions to literature on stakeholders. The strategic behaviour between firm and stakeholders is deemed to be subjective and is not properly understood. It implies difficulties when collecting and analyzing quantitative data to create models (Hendry 2005). To overcome this shortcoming Frooman (1999) laid down the basis of his model of influences based on the typology of resource relationships

depending on power and interdependence between firm and stakeholder (see Table 3.1 in Appendix E). Thus, taking into consideration the previous arguments, the model is applicable when power relationships between firm and stakeholders are clearly established. Moreover, the model is applicable when who has the negotiation power can be identified and the interdependence relationships can be assessed.

Frooman formulated the four propositions that predict what should be the strategy of the stakeholder that we analyse later. Frooman used a static approach considering only a fixed time point. Conversely, we use a dynamic approach analyzing the situation over a long period of time.

The analysis of the relationship between stakeholders and firms has a structural component that was only previously dealt with by Hill and Jones (1992), Jones (1995) and Willer, Lovaglia and Markovsky (1997). The first two understand contracts as a nexus among stakeholders. Willer, Lovaglia and Markovsky (1997) defined power as the structural potential to obtain favourable *pay-offs* in relationships when the interests of each party came into conflict. Frooman (1999) identified two mechanisms that are used by stakeholders to exert control over the organization: i) determining if the firm can make enough resources to manufacture their outputs and ii) determining if the firm can use them as it desires.

The decision about the influence strategy selected by the stakeholder will depend on the kind of relationship between the firm and stakeholder.

Frooman's approach leads to four stakeholder influence strategies: i) *direct withholding*, ii) *indirect withholding* iii) *direct usage* and iv) *indirect usage*. These strategies are the result of the combination of four concepts: i) direct, ii) indirect, iii) withholding, and iv) usage. The *direct strategy* implies that the stakeholder is able to apply it alone. When Frooman refers to *indirect strategy* it means that the strategy is applied in combination with other stakeholders. The *withholding strategy* is defined as the one where the stakeholder discontinues the resource provision to the firm with the intention of changing the firm's behavior. It can lead to a capture of value by the stakeholder. The *usage strategy* intends the same objective as the previous one but by applying mechanisms of a lower level of pressure. In the context of usage strategy the implication of the stakeholder in the relationship avoids the open use of threatening strategies over the resource needed by the firm. Summarizing, the four stakeholder strategies proposed by Frooman's model: i) a direct withholding strategy means high intensity measures applied by one stakeholder, ii) a direct usage strategy means measures applied by a single

stakeholder with less intensity than the previous, iii) an indirect withholding strategy means measures applied by more than one stakeholder to balance the firm's power, and iv) an indirect usage strategy is related to very low intensity measures applied by more than one stakeholder over the firm.

Frooman states through his four propositions that the strategy selected by the stakeholder is applied depending on who has the power in the relationship and what the degree of interdependence is. Frooman established (1999, 202) the four propositions on which the model of stakeholder influence stands:

- *Proposition 1: When the relationship is marked by stakeholder power, the stakeholder will choose a direct withholding strategy to influence the firm.*
- *Proposition 2: When the relationship is marked by firm power, the stakeholder will choose an indirect usage strategy to influence the firm.*
- *Proposition 3: When the relationship is one of high interdependence, the stakeholder will choose a direct usage strategy to influence the firm*
- *Proposition 4: When the relationship is one of low interdependence, the stakeholder will choose an indirect withholding strategy to influence the firm.*

The consequences of the four propositions are i) if the firm's dependence on the stakeholder is high it implies that the stakeholder will be able to use a direct withholding strategy, applying high intensity measures by one stakeholder alone, ii) if the firm has the power over the stakeholder, the stakeholder will only be able to apply an indirect usage strategy looking for the establishment of alliances with other stakeholders when applying low intensity measures, iii) if the interrelation of the stakeholder and firm is high, the stakeholder will try to use direct usage strategies, indicating lower intensity measures alone compared to the direct withholding strategy, and iv) if the interrelation between stakeholder and the firm is low it implies that the stakeholder will apply an indirect withholding strategy in order to threaten the resource needed by the firm, using the collaboration of additional stakeholders, by applying measures to balance firm power.

Among the researchers who have tried to test the model, either in one sector or against a group of firms, we find three different contributions: i) Tsai et al. (2005) who applied the model to a business downsizing case in Taiwan, ii) Hendry (2005) on non-governmental environmental activist firms and iii) Sharma and Henriques (2005) on the

forest industry in Canada. Tsai et al. (2005) concluded that the Frooman model did not correspond with reality and some other variables should be incorporated as regards the legitimacy of firm decisions. Hendry (2005) also performed a qualitative research in order to test the model. The conclusions revealed that the model was too simple to correctly describe stakeholder influence strategies and related alliances. His conclusion was that it was necessary to develop an alternative model. Finally, Sharma and Henriques (2005) applied the model to explain the trend observed in the development of sustainable practices in the exploitation of natural resources in Canada. In none of the above mentioned cases was empirical support for the model found. We consider that the previous contrasts failed because the model was not contrasted through an economic perspective. Only the qualitative approach was used. We, on the other hand, use a quantitative approach to contrast the hypotheses formulated in the next section.

As it was stated by Tsai et al. (2005) the basic premise in stakeholder theory is linked to existing conflicts among multiple stakeholders and the central point of the theory is how to minimize them. In individual situations only power permits their resolution. This power is based on the asymmetry of the mutual exchange factors in the relationship when one of the parties has coercive power over the other and allows it to increase control (Tsai et al. 2005). In the case of the Spanish Health Care sector, the main stakeholder holds a dominant position which is demonstrated by their capacity to enforce unilateral measures on the pharmaceutical industry suppliers. He has the capacity, as a regulator, to authorize or stop their business using his coercitive capabilities. Additionally, the fixation of maximum prices is within his power. In the studied period, what were started as indirect measures to control the health care expenditure have ended up as direct measures with the application of several regulations imposed on the sector.

The impact of the economic worth captured by the main stakeholder has the suitable features to test the hypotheses derived from Frooman's model propositions. It is expected that in a real situation where multiple firms and stakeholders participate (some of them sharing both in common), the majority of influence strategy typologies described in Frooman's model should appear. We study them from a qualitative and quantitative perspective.

Tsai et al. (2005) suggested that future research on stakeholder influence strategies should combine the RDT theory and institutional factors in a dynamic model that takes into consideration the strategy of the firm. These authors refer to the fact that the firms act whilst considering their dependence in relation to resources and institutional pressure,

while the stakeholders react to the actions taken by firms. Under these premises the authors stated that a dynamic model would not only contribute to a more complete theory about influence strategies but it would also increase the knowledge about organizational changes and human resource management. This multifocal approach is what we use in this work and what we develop in the following sections.

3.3.3. Typology of power and relationship interdependence

As mentioned in the introduction, the objective of this chapter is to clarify if Frooman's predictions about stakeholder strategies are observed in real life. We have selected the Spanish Health Care sector because, without doubt, the main stakeholder (the Spanish Public sector) has used the power it has over firms, acting as a regulator through several laws and Royal-Decrees. It enables us to identify a real situation that matches with the first proposition of Frooman's model. We will use this fact as the central argument of our analysis about Frooman's influence model.

Additionally, on a second level of interest, the Spanish Health Care sector has particular features that are worth studying from the perspective of Frooman's model. We have observed that there are four additional stakeholder relationships that could match Frooman's propositions. Therefore, it is worth adding new hypotheses to test the model. For the sake of clarification of the hypotheses' formulation we build Table 3.2. The objective of Table 3.2 is to outline the predicted stakeholder strategies by Frooman's model using the knowledge we have about the Spanish Health Care sector. The Table identifies each relevant stakeholder, the dependence of the stakeholder on the firm, the firm's dependence on the stakeholder, the typology of relationship that Frooman proposes and finally the predicted stakeholder strategy using Frooman's model. Therefore, we use Table 3.2 as a basis for the hypotheses' formulation and their contrast.

The first stakeholder we analyze in Table 3.2 is the Spanish public health sector, as the stakeholder customer/regulator, because it is the most relevant for the analysis. The Spanish public health sector is the main customer of the health care market with more than 70% of total expenditure from 2003 to 2012 (OECD Statistics 2014). Additionally, it acts as the regulator of a highly regulated market. Considering these two factors it is expected, in terms of Frooman's model, that the public sector has the power on the stakeholder side. Frooman's model defines the situation as stakeholder power. The firm is dependent on the stakeholder because the Spanish public sector is able to fix the policies that define the market rules regarding authorization of products and their prices. The firm can not change

these rules and it is obliged to follow the directives issued by the regulator. On the other hand the public sector is not dependent on the firm as it has more than one alternative to purchase the products. As the public sector has the power, the strategy predicted by Frooman's model throughout proposition one is direct withholding. When a direct withholding strategy is applied we consider that the stakeholder captures value and there is evidence that it is able to increase the capture of more value when comparing two different time periods. We test this prediction in the next section throughout hypothesis 1.

Secondly, concerning the relationship between raw material suppliers and the firm, we estimate that the firm has the power. We expect, in general terms, that the firm has more than one alternative to purchase the products they need for their manufacturing process. As a consequence the firm is not dependent on the stakeholder. The raw material supplier depends on the firm as the firm is its customer. So, for raw material suppliers, the strategy predicted by the second proposition of Frooman is an indirect usage strategy. We have to mention that the power in the hands of the supplier will be greater the more specific the input for the manufacturing process is. In the limit of specificity the supplier might behave as a monopolist. For the analysis of the Spanish pharmaceutical sector we consider that the total amount of purchases to non-monopolistic suppliers far exceeds the amount of purchasing expenses to monopolist suppliers. Moreover, we consider the firm has the power. Furthermore, the stakeholder is contributing to the value created. The second proposition from Frooman will be contrasted in the next section through hypothesis 2.

Thirdly, we consider the relationship between the firm and its employees. The employees of the pharmaceutical sector in Spain are highly organized. As a representative example there is a salary negotiation at the sector level. Additionally, most of the firms have multisectorial union committees operating at firm level controlling the process. It is expected that the more organized the workers are, the more likely it is that they could pursue their own interests. The interrelationship between employees and firm is high as the firm needs human beings in order to produce its products and the employees need the firm to earn their salaries. Thus, in terms of Frooman's model (proposition three), this implies that the stakeholder labor will use a direct usage strategy. We interpret that the stakeholder is able to capture value but in this case it is not able to increase the amount of captured value. The value captured is smaller than in the withholding strategy.

Regarding the shareholders, we expect that the more concentrated the shares are, the more power the shareholder has. At one end, we have the family business where all the

shares are concentrated. At the other end we find the companies that quote in the stock market where the shares are dispersed. Moreover, in the sample of firms selected from the Spanish pharmaceutical sector we observe more than 95% are not quoting in the stock market and additionally some of them are that family businesses. Following La Porta, López-de-Silanes and Shleifer (1999) the owner of shareholders in Spanish family businesses are normally influential as the shares are concentrated. The interrelation between firm and shareholder should be high because the shareholder has the option to influence the decisions of the firm as they usually sit on the board of directors (Cennamo, Berrone and López-Mejía 2009, Zellweer and Nason 2008). For that reason we consider that Frooman's prediction is the direct usage strategy. Despite this we can not affirm without doubt what the relationship between shareholder and firm in the sector really is. As Berrone, Cruz and Gómez-Mejía (2010) pointed out, the family business is a highly heterogeneous group with regards to the level of involvement with the firm. This implies that the interrelationship can adopt any possibility and for that reason we put emphasis on that premise which should be taken into consideration when we test the corresponding hypotheses. Again, the use of a direct usage strategy indicates that the stakeholder has to capture value and the capture remains at the same level or decreases through time. We test this relationship with respect to Frooman's model (third proposition) in the next section through the fourth hypothesis.

Capital suppliers are included in the analysis representing a stakeholder that is not dependent on the firm and the firm is not dependent on them. On the one hand, capital suppliers are not dependent on the firm as they have diversified business in different sectors. On the other hand, the firms have different options to obtain capital resources and there are many capital suppliers available. Following Frooman's reasoning this means that the typology of relationship matches low interdependency. Frooman's fourth proposition predicts an indirect withholding strategy. We consider that in this case an indirect strategy would be related to the alliance with a third party. We realize that it is not easy to identify such a third party due to the fact that we are only considering the primary stakeholders for analysis. We consider that as a result of this indirect withholding strategy between firm and capital suppliers the forces are balanced. Then, the result is expected to be neutral with regards to the creation or capture. Consequently, the power of the firm is not so intense as we expect in the indirect usage strategy. As we have considered previously that firm power implies that the stakeholder is creating value for the firm and the direct usage strategy

means that the stakeholder is capturing value, we assign neutrality to the indirect withholding strategy with respect to value. We test through hypothesis 5 if the capital suppliers apply an indirect withholding strategy on the firm.

Once the predicted strategies for the Spanish Health Care sector stakeholders are defined we proceed to formulate five hypotheses in order to test Frooman's model and its propositions.

3.4. Formulation of hypotheses

We introduce in this section the hypothesis to contrast Frooman's model based on the conclusions of the discussion about Table 3.2 of the previous section regarding the stakeholder strategy.

3.4.1. Hypothesis 1

The first proposition of Frooman's model predicts that if the relationship between firm and stakeholder is marked by stakeholder power, then the stakeholder will choose a *direct withholding strategy* to influence the firm. The direct withholding strategy is that which the stakeholder is capable of withholding on his own, thus controlling or threatening the resource flow needed by the firm. The relationship should be easily recognized because the stakeholder can give an ultimatum as regards the acceptance of the conditions or there is no deal (Hendry 2005). Taking as a reference Table 3.2, for stating the first hypothesis, we use the relationship between the Spanish public sector and the firm. The first hypothesis is formulated using two sub-hypotheses:

Hypothesis 1a

The Spanish public health sector, as the main stakeholder, has successfully applied a direct strategy by capturing value created by the firm thus using the power conferred as a result of being the regulator and the main customer at the same time.

Hypothesis 1b

The Spanish public health sector has applied a withholding strategy by being able to increment the value captured through time.

Remark of hypothesis 1

When hypothesis 1a and hypothesis 1b are fulfilled the stakeholder is applying a direct withholding strategy and Frooman's first proposition is confirmed.

The next hypothesis is related to the second proposition of Frooman's model. The typology of relationship between raw material supplier and firm described in Table 3.2 is defined as firm power. Therefore, following Frooman's model, the stakeholder will use an indirect usage strategy.

3.4.2. Hypothesis 2

As the firm holds the power, the stakeholder raw material supplier applies an indirect usage strategy to influence the firm. The raw material supplier is a contributor to the value created by the firm.

As the firm has the power, it is expected that the stakeholder raw material suppliers are a contributor to the value created instead of taking part of it. In terms of value, this hypothesis means that the capacity of raw material suppliers to capture value is negligible because they can not completely block the flow of the supplied resource (usage) needed by the firm. Additionally they need the help of other stakeholders in order to influence the firm (indirect).

3.4.3. Hypothesis 3

The third Frooman proposition deals with the relationship of high interdependence that applies to stakeholder labor and the stakeholder shareholder. He proposes that the stakeholder chooses a direct usage strategy to influence the firm. For means of clarity we have defined hypothesis 3 and hypothesis 4 for labor and shareholder respectively.

Hypothesis 3a

As the relationship of stakeholder labor with the firm is highly interdependent, labor applies a direct strategy, being able to capture value created by the firm.

Hypothesis 3b

As the stakeholder labor applies a usage strategy, the captured value remains stable or decreases through time.

Remark of hypothesis 3

When hypothesis 3a and hypothesis 3b are fulfilled the stakeholder labor is applying a direct usage strategy and the third Frooman proposition is confirmed.

The direct usage strategy is expected to have a significant impact in terms of captured value. The hypothesis 3b focuses on the stability of the value capture. It can be variable but can not be increased contrary to what we have defined for a direct withholding strategy. In this case the stakeholder is not able to block the flow of the resource.

3.4.4. Hypothesis 4

Hypothesis 4 is also subdivided into two sub-hypotheses and it is a repetition of hypothesis 3 for the case of the shareholders.

Hypothesis 4a

As the relationship of stakeholder shareholder with the firm is highly interdependent, the shareholder applies a direct strategy being able to capture value created by the firm.

Hypothesis 4b

As the stakeholder shareholder applies a usage strategy, the captured value remains at the same level or decreases through time.

Remark of hypothesis 4

When hypothesis 4a and hypothesis 4b are fulfilled the stakeholder shareholder is applying a direct usage strategy and Frooman's third proposition is confirmed.

The fourth hypothesis is interpreted as the shareholder being able to capture value from the firm through time and again the shareholder percentage can be equal or inferior. We reiterate here what we introduced in section 3.3.3 concerning the interrelationship between shareholder and firm. As most of the firms are family businesses we have introduced the hypothesis in terms of a direct usage strategy but we have to mention that if

instead of high interdependence the dominant relationship were of low interdependence we should formulate the hypothesis in terms of an indirect withholding strategy.

3.4.5. Hypothesis 5

Finally, Frooman's last proposition, the fifth, focuses on low interdependence relationships. Returning again to Table 3.2 we can observe that capital suppliers are expected to follow the indirect withholding strategy.

Hypothesis 5

As the interdependence of stakeholder capital suppliers with the firm is low, the stakeholder capital supplier applies an indirect withholding strategy that turns out to be neutral regarding the created or captured value.

We expect that this strategy is based on the capital suppliers' alliance with other stakeholders whose contribution is not easy to isolate. From the value capture perspective the impact of this withholding strategy is neutral, meaning that the influence of the stakeholder on the firm and the firm on the stakeholder are balanced.

3.5. Methodology

The methodology used for the hypotheses contrast is based on what we have developed in section 2.3 of the previous chapter. We introduce an output quantity vector of a firm i as expressed by $y_i^T = (y_{i1}, \dots, y_{iM}) \in \mathbb{R}_+^M$ where $i = 1, \dots, I$ and I denotes the number of firms included in the analysis. The output price vector of firm i is defined by $p_i^T = (p_{i1}, \dots, p_{iM}) \in \mathbb{R}_{++}^M$. The input quantity vector of firm i is expressed by $x_i^T = (x_{i1}, \dots, x_{iN}) \in \mathbb{R}_+^N$ and the input price vector of firm i is defined by $w_i^T = (w_{i1}, \dots, w_{iN}) \in \mathbb{R}_{++}^N$. The economic profit π of firm i is defined as $\pi_i = p_i^T y_i - w_i^T x_i = R_i - C_i$ where revenue $R_i = p_i^T y_i = \sum p_{im} y_{im}$ and cost C_i is expressed as $C_i = w_i^T x_i = \sum w_{in} x_{in}$. In order to make the exposition clearer we will omit the subindex i related to the firm i until it is necessary. τ is defined as the number of years included in the period of study.

The variation of economic profit for each firm is decomposed in quantity effect and price effect following Grifell-Tatjé and Lovell (2008, 2015) as shown in expressions (2.1) that we reproduce here

$$\pi^{t+1} - \pi^t = [\bar{p}^T(y^{t+1} - y^t) - \bar{w}^T(x^{t+1} - x^t)] + [\bar{y}^T(p^{t+1} - p^t) - \bar{x}^T(w^{t+1} - w^t)],$$

we reorganize the quantity effect and profit variation in order to obtain the following expression, equivalent to expression (2.2)

$$[\bar{p}^T(y^{t+1} - y^t) - \bar{w}^T(x^{t+1} - x^t)] = (\pi^{t+1} - \pi^t) - \bar{y}^T(p^{t+1} - p^t) + \bar{x}^T(w^{t+1} - w^t),$$

the right side of the expression allows the identification of the stakeholders' beneficiaries of quantity changes (left side) such as shareholders through the profit variation ($\pi^{t+1} - \pi^t$) when $\pi^{t+1} > \pi^t$, customers through the factor $-\bar{y}^T(p^{t+1} - p^t)$ when $p^{t+1} < p^t$ and productive factors, such as labor and suppliers, throughout the term $\bar{x}^T(w^{t+1} - w^t)$ when $w^{t+1} > w^t$.

In the second chapter we used the willingness-to-pay approach adapted to a dynamic situation. Focusing on what is interesting for our hypotheses contrast we use the *willingness price effect*. It collects the price variations that contribute to the firm value creation. Customers contribute to the value created when $p^{t+1} > p^t$ and/or providers of input factors contribute when the opportunity cost $oc^{t+1} < oc^t$ that reflects changes in productive factor prices $w^{t+1} < w^t$. Additionally the firm is capable of creating value through the productivity and growth effect. The created value is distributed to the stakeholder customers, raw material suppliers, labor and capital suppliers through prices or through an increase of profit for the shareholder. The cycle of value creation can be derived from expression (2.2). We have defined the value created $V_c(p, y, w, x)$ as the sum of i) the quantity effect, ii) the contribution of output price increments and the decrements of costs derived from reducing input prices (willingness price effect) and iii) if applicable the profit reduction as stated in expression (2.5) of the previous chapter that we reproduce here.

$$V_c(p, y, w, x) = [\bar{p}^T(y^{t+1} - y^t) - \bar{w}^T(x^{t+1} - x^t)] + \underbrace{[\bar{y}^T(p^{t+1} - p^t)]}_{p^{t+1} > p^t} - \underbrace{\bar{x}^T(w^{t+1} - w^t)}_{w^{t+1} < w^t} - \underbrace{(\pi^{t+1} - \pi^t)}_{\pi^{t+1} < \pi^t},$$

on the other hand the distributed value $V_d(p, y, w, x)$ has been defined as the sum of: i) output price decrements, ii) the increments of costs derived from increasing input prices and iii) the increment of profit

$$V_d(p, y, w, x) = -\underbrace{\bar{y}^T(p^{t+1} - p^t)}_{p^{t+1} < p^t} + \underbrace{\bar{x}^T(w^{t+1} - w^t)}_{w^{t+1} > w^t} + \underbrace{(\pi^{t+1} - \pi^t)}_{\pi^{t+1} > \pi^t}.$$

We remember that the created value is equal to the distributed value as $V_c(p,y,w,x) = V_d(p,y,w,x)$. Henceforth, we use the customer factor that corresponds with the main stakeholder with the subindex ms . Secondly, we expand the supplier term to include the different stakeholders like raw material suppliers, labor and capital suppliers. Additionally, whether they are contributors to the value created by the firm is included on the left side of the next expression or participants of the value created are found on the right side. Finally, we obtain the following expression

$$\begin{aligned}
& [\bar{p}^T(y^{t+1} - y^t) - \bar{w}^T(x^{t+1} - x^t)] + [\bar{y}_{ms}^T(p_{ms}^{t+1} - p_{ms}^t) - \bar{x}_s^T(w_s^{t+1} - w_s^t) - \bar{x}_l^T(w_l^{t+1} - w_l^t) - \\
& - \bar{x}_k^T(w_k^{t+1} - w_k^t) - (\pi^{t+1} - \pi^t)] = \\
& - \bar{y}_{ms}^T(p_{ms}^{t+1} - p_{ms}^t) + \bar{x}_s^T(w_s^{t+1} - w_s^t) + \bar{x}_l^T(w_l^{t+1} - w_l^t) + \bar{x}_k^T(w_k^{t+1} - w_k^t) + (\pi^{t+1} - \pi^t),
\end{aligned}
\tag{3.1}$$

where ms = main stakeholder (Spanish public sector), s = raw material suppliers, l = labor, k = capital suppliers. Now, we are able to assess the value dynamics observed in the Spanish Health Care sector. Additionally, it quantitatively permits the assessment of the capacity of influence of stakeholders. Henceforth, we use generated value $V(p,y,w,x)$ as equivalent to created and distributed value $V(p,y,w,x) = V_c(p,y,w,x) = V_d(p,y,w,x)$ or in other terms $V(p,y,w,x) = \text{Quantity effect} + \text{Willingness price effect} + \text{Profit contribution}$.

On the one hand, the term $[\bar{y}_{ms}^T(p_{ms}^{t+1} - p_{ms}^t) - \bar{x}_s^T(w_s^{t+1} - w_s^t) - \bar{x}_l^T(w_l^{t+1} - w_l^t) - \bar{x}_k^T(w_k^{t+1} - w_k^t)]$ when $p_{ms}^{t+1} > p_{ms}^t$, $w_s^{t+1} < w_s^t$, $w_l^{t+1} < w_l^t$, $w_k^{t+1} < w_k^t$ allows the follow-up of the contribution of the main stakeholder, raw material suppliers, capital suppliers to the created value. Finally the term $(\pi^{t+1} - \pi^t)$ is linked to the contribution of the shareholder. On the other hand, the distributed value is compiled on the right side of expression (3.1). In order to contrast the hypotheses we need to separate the effect of each selected stakeholder in each hypothesis. That is why we have split the contribution of raw material suppliers, labor and external capital suppliers and shareholder. Then, the hypotheses contrast is feasible using these terms.

3.5.1. Strategy of hypotheses contrast

To test the hypotheses we need to make the results comparable among firms with different sizes by means of using the percentage of value created or captured by the

different stakeholders. We define $\lambda_{st,i}^{t,t+1}$ for each stakeholder (st) as the percentage of value created or captured by the stakeholder in relation to the total amount of value generated by the firm i between year t and year $t+1$.

We define for the main stakeholder (ms) of firm i

$$\lambda_{ms,i}^{t,t+1} = \frac{\bar{y}_{ms,i}^T (p_{ms,i}^{t+1} - p_{ms,i}^t)}{V_i(p,y,w,x)}, \quad i = 1, \dots, I.$$

For the raw material suppliers, labor and capital suppliers ($st, input$) of firm i

$$\lambda_{st\ input,i}^{t,t+1} = \frac{-[\bar{x}_{st\ input,i}^T (w_{st\ input,i}^{t+1} - w_{st\ input,i}^t)]}{V_i(p,y,w,x)}, \quad i = 1, \dots, I.$$

For the shareholder (sh) of firm i

$$\lambda_{sh,i}^{t,t+1} = \frac{-(\pi_i^{t+1} - \pi_i^t)}{V_i(p,y,w,x)}, \quad i = 1, \dots, I.$$

Then, $\lambda_{st,i}^{t,t+1}$ can be positive, zero or negative, that is $\lambda_{st,i}^{t,t+1} \gtrless 0$. Firstly, when $\lambda_{st,i}^{t,t+1} > 0$ corresponds to the stakeholder contribution to the value created. Secondly, $\lambda_{st,i}^{t,t+1} < 0$ expresses the value captured by the stakeholder in relation to the total generated value. Finally, when $\lambda_{st,i}^{t,t+1} = 0$ is interpreted as the stakeholder is neither contributing nor capturing value.

In order to perform the analysis we follow the approach taken by Försund and Hjalmarsson (1979) who propose studying an industrial sector by defining an average company that they consider representative of it. We use the average of $\lambda_{st,i}^{t,t+1}$ of each stakeholder as representative of the stakeholder behavior. The average of the value created or captured by the stakeholder is defined as $\bar{\lambda}_{st} = \frac{1}{n} [\sum_{t=1}^{\tau} \sum_{i=1}^I \lambda_{st,i}^{t,t+1}]$, where n is the number of observations within the period using all firms included in the sample, τ is the number of years included in the period and I the number of firms. When $\bar{\lambda}_{st} > 0$ implies that the stakeholder is contributing, on average, to the value created. Conversely, when $\bar{\lambda}_{st} < 0$ the stakeholder, on average, is capturing value. $\bar{\lambda}_{st} = 0$ determines that there is neither contribution nor capture of the value created.

Figure 3. Operationalization of stakeholder strategies of influence

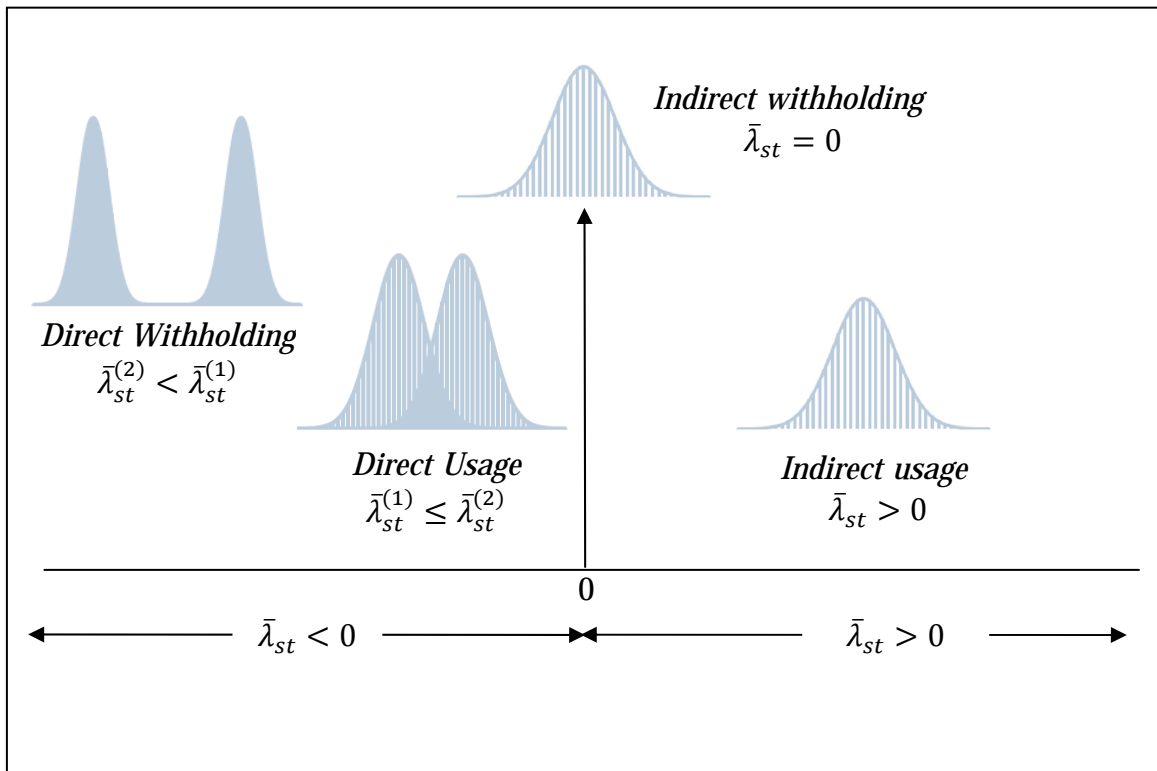


Figure 3 describes the strategy of operationalization that we use for building the statistical contrasts. Accordingly, we detail the following conditions regarding $\bar{\lambda}_{st}$ in order to formalize the hypotheses contrast. The distributions represented in the figure are normal with the objective of making the visualization easy and understandable but we expect non-normal distributions for the sample.

The result of a direct strategy corresponds to $\bar{\lambda}_{st} < 0$. The stakeholder is able to capture value.

- The result of an indirect strategy corresponds to $\bar{\lambda}_{st} \geq 0$. The stakeholder is not able to capture value. Conversely, it is contributing to the created value $\bar{\lambda}_{st} > 0$ or is neutral $\bar{\lambda}_{st} = 0$.

When dealing with withholding and usage concepts we are referring to their distinct intensity based upon the following conditions:

- The results of captured value related to a direct withholding strategy must show statistical differences between two periods. When that occurs the stakeholder gives evidence of its capacity of withholding the resource. Therefore we define

$\bar{\lambda}_{st}^{(1)} > \bar{\lambda}_{st}^{(2)}$; $\bar{\lambda}_{st}^{(1)} < 0$, $\bar{\lambda}_{st}^{(2)} < 0$, where (1) and (2) defines the selected subperiods in the next section 3.6.3.

- For a direct usage strategy we define that the difference between two periods is not statistically different or in the second period the value capture has decreased $\bar{\lambda}_{st}^{(1)} \leq \bar{\lambda}_{st}^{(2)}$; but still $\bar{\lambda}_{st}^{(1)} < 0$, $\bar{\lambda}_{st}^{(2)} < 0$. We consider that in that situation the stakeholder is capturing value at a regular level. The value captured can be different from period to period but without reaching a significant difference or being smaller in the second than in the first.

Finally, in the framework of an indirect strategy, we define the differentiation between an indirect usage and an indirect withholding strategy in the next two conditions.

- We define an indirect withholding strategy when the result of the strategy can not be distinguished from zero as $\bar{\lambda}_{st} = 0$. The stakeholder is not able to capture value but is not contributing to the value created by the firm.
- An indirect usage strategy is defined when $\bar{\lambda}_{st} \neq 0$; $\bar{\lambda}_{st} > 0$. The stakeholder is not able to capture value. The stakeholder is creating value for the firm.

The previous definitions allow us to classify the influence strategies applied by the stakeholder in a continuum depending on the intensity of value created or captured. The classification of strategies regarding their intensity is as follows: direct withholding > direct usage > indirect withholding > indirect usage. With this approach we have a clear strategy to contrast the previous hypotheses.

Henceforth, we define H_0^h as the null hypothesis of hypothesis h and H_1^h as the alternative hypothesis of hypothesis h .

3.5.2. Hypotheses contrast

3.5.2.1. Hypothesis 1

To test the first hypothesis (about stakeholder power and its related strategy) implies analyzing if the Spanish public sector is contributing to the created value $p_{ms}^{t+1} > p_{ms}^t \Rightarrow \bar{y}_{ms}^T(p_{ms}^{t+1} - p_{ms}^t) > 0$ or if the Spanish public sector is able to capture a percentage of economic worth created by the firm $p_{ms}^{t+1} < p_{ms}^t \Rightarrow \bar{y}_{ms}^T(p_{ms}^{t+1} - p_{ms}^t) < 0$. If we confirm the value captured by the Spanish public sector it indicates that it has power over the firm and it is applying a direct strategy but we can still not confirm the withholding. To complete the rationale we introduced a second sub-hypothesis for testing that the Spanish

public sector has increased the amount of value captured when comparing two different periods. Therefore, when both conditions are fulfilled, as stated in the remark of hypothesis 1, we confirm the hypothesis one as we have found empirical support of a direct withholding strategy.

We make the results comparable among firms of different sizes by means of using the percentage of value created or captured by the Spanish public sector. We define

$$\lambda_{ms,i}^{t,t+1} = \frac{\bar{y}_{ms,i}^T (p_{ms,i}^{t+1} - p_{ms,i}^t)}{V_i(p,y,w,x)}, \quad i = 1, \dots, I,$$

as the percentage of value created or captured by the Spanish public sector in relation to the total amount of value created by the firm i between year t and year $t+1$. In order to test if it is a direct withholding strategy, we build a set of two sub-hypotheses. The first in order to contrast if the strategy is direct and the second to contrast if it is a withholding strategy. So, the first contrast, corresponding to hypothesis 1a, is expressed by the null hypothesis (H_0^{1a}) and the alternative hypothesis (H_1^{1a}) as:

- $H_0^{1a}: \bar{\lambda}_{ms} = 0$
- $H_1^{1a}: \bar{\lambda}_{ms} < 0$

When testing the previous hypothesis we consider that the null hypothesis is rejected if the statistical test that compares $\bar{\lambda}_{ms}$ with the zero value shows that they are statistically different. If the null hypothesis is rejected and $\bar{\lambda}_{ms} < 0$ then we interpret that the main stakeholder has captured value through a direct strategy confirming hypothesis 1a.

To test hypothesis 1b, that leads to the confirmation of a withholding strategy, we compare two periods (2003-07 and 2007-12) in order to observe the variation of the value captured by the Spanish public sector. A statistical difference between periods is understood as two different levels of value capture and therefore two different levels of intensity. It correlates with the increment of pressure exerted by the main stakeholder. In terms of the statistical contrast we compare the mean of the two periods in order to confirm that they are statistically different. We formulate the null hypothesis (H_0^{1b}) and the alternative hypothesis (H_1^{1b}) as

- $H_0^{1b}: \bar{\lambda}_{ms}^{(1)} = \bar{\lambda}_{ms}^{(2)}$
- $H_1^{1b}: \bar{\lambda}_{ms}^{(1)} > \bar{\lambda}_{ms}^{(2)}$

When rejecting H_0^{1b} we accept H_1^{1b} implies that the Spanish public sector has captured more value in the second period than in the first. The acceptance H_1^{1b} confirms the stakeholder power relationship and the capacity of increasing the capture through time. On the other hand, if we accepted both, H_1^{1a} and H_1^{1b} we consider that hypothesis 1 is accepted and it is confirmed that the Spanish public sector used a direct withholding strategy. Consequently, the first proposition of Frooman finds empirical support in the Spanish pharmaceutical sector.

3.5.2.2. Hypothesis 2

To test the second hypothesis we use a similar approach. The factor related to raw material suppliers is represented by $-\bar{x}_s^T(w_s^{t+1} - w_s^t)$. When the price of raw material increases $w_s^{t+1} > w_s^t \Rightarrow -\bar{x}_s^T(w_s^{t+1} - w_s^t) < 0$, it implies the supplier is able to capture value. When input price decreases $w_s^{t+1} < w_s^t \Rightarrow -\bar{x}_s^T(w_s^{t+1} - w_s^t) > 0$ it is the firm who creates the value through the supplier contribution. We expect that the capacity of influence of such an indirect usage influence strategy is low or negligible. It means that it is likely that the stakeholder is contributing to the value created due to the firm's power relationship. For contrasting the hypothesis we use, for the firm i , the contribution of the raw material supplier to the value created in relation to the total generated value $V_i(p, y, w, x)$ as

$$\lambda_{s,i}^{t,t+1} = \frac{-\bar{x}_{s,i}^T(w_{s,i}^{t+1} - w_{s,i}^t)}{V_i(p, y, w, x)}, \quad i = 1, \dots, I$$

For each period we calculate the average of the raw material supplier contribution in percentage using the following expression as $\bar{\lambda}_s = \frac{1}{n} [\sum_{t=1}^{\tau} \sum_{i=1}^f \lambda_{s,i}^{t,t+1}]$. Now, we build the null hypothesis (H_0^2) and the alternative hypothesis (H_1^2) as

- H_0^2 : $\bar{\lambda}_s = 0$
- H_1^2 : $\bar{\lambda}_s > 0$

When testing the second hypothesis we consider that the null hypothesis H_0^2 is rejected if the statistical test that compares $\bar{\lambda}_s$ with the zero value shows that they are statistically different. If the null hypothesis is rejected and H_1^2 : $\bar{\lambda}_s > 0$ is accepted we interpret that the raw material suppliers are contributors to the created value. Coherent with our definition they apply an indirect usage strategy. As a consequence, we confirm hypothesis 2. As formulated in hypothesis 2 the firm applies its power of influence on raw material

suppliers, they are not able to capture value nor resist the pressure exerted by the firm to reduce the input factor prices. This acceptance gives empirical support to the second proposition of Frooman.

3.5.2.3. Hypothesis 3

To test the third hypothesis we use a similar strategy but using the value term related to labor $-\bar{x}_l^T(w_l^{t+1} - w_l^t)$. We expect that when $w_l^{t+1} > w_l^t$ implies that $-\bar{x}_l^T(w_l^{t+1} - w_l^t) < 0$, labor is able to capture value and, when $w_l^{t+1} < w_l^t \Rightarrow -\bar{x}_l^T(w_l^{t+1} - w_l^t) > 0$ it is the firm who collects the value created by labor. Then, the first condition for a direct usage strategy is that the term $-\bar{x}_l^T(w_l^{t+1} - w_l^t) < 0$, $w_l^{t+1} > w_l^t$ in order to match the direct condition. We test this in hypothesis 3a. Hypothesis 3b expresses the second condition related to the usage. For that reason we need a set of two sub-hypotheses. Again we define the ratio of value captured by labor in relation to the total generated value

$$\lambda_{l,i}^{t,t+1} = \frac{-\bar{x}_{l,i}^T(w_{l,i}^{t+1} - w_{l,i}^t)}{V_i(p, y, w, x)}, \quad i = 1, \dots, I$$

and the average of this ratio for the period as $\bar{\lambda}_l = \frac{1}{n} [\sum_{t=1}^{\tau} \sum_{i=1}^I \lambda_{l,i}^{t,t+1}]$. Then the hypothesis 3a, for testing the direct strategy a is formulated as

- $H_0^{3a}: \bar{\lambda}_l = 0$
- $H_1^{3a}: \bar{\lambda}_l < 0$

We consider that the null hypothesis H_0^{3a} is rejected and H_1^{3a} is accepted if the statistical test that compares $\bar{\lambda}_l$ with the zero value shows that they are statistically different. If the null hypothesis is rejected and $\bar{\lambda}_l < 0$ we interpret that labor captures value through a direct strategy.

To test hypothesis 3b, that leads to the confirmation of a usage strategy, we compare two periods (2003-07 and 2007-12) in order to observe that there is no variation or a decrease in the value captured by labor. A statistical difference between periods is understood as two different levels of value capture and therefore two different levels of intensity meaning withholding instead of usage when $\bar{\lambda}_l^{(1)} > \bar{\lambda}_l^{(2)}$. For that reason, in terms of the statistical contrast, we compare the mean of the two periods in order to confirm that they are not statistically different or that the second increases, meaning that the value

captured is reduced in the second period. We formulate the null hypothesis (H_0^{3b}) and the alternative hypothesis (H_1^{3b}) as

- $H_0^{3b} : \bar{\lambda}_t^{(1)} \leq \bar{\lambda}_t^{(2)}$
- $H_1^{3b} : \bar{\lambda}_t^{(1)} > \bar{\lambda}_t^{(2)}$

When we can not reject H_0^{3b} it implies that labor has captured the same value in both periods or the value capture has decreased. If hypothesis H_1^{3a} is accepted and H_0^{3b} can not be rejected we accept hypothesis 3. The combination of both results confirms that labor uses a direct usage. This result gives empirical support to the third proposition of Frooman's model.

3.5.2.4. Hypothesis 4

The fourth hypothesis is focused on the shareholder through $-(\pi_i^{t+1} - \pi_i^t)$ factor. We expect that when $-(\pi_i^{t+1} - \pi_i^t) < 0$, $\pi_i^{t+1} > \pi_i^t$ the shareholder is able to capture value and when $-(\pi_i^{t+1} - \pi_i^t) > 0$, $\pi_i^{t+1} < \pi_i^t$ it is the shareholder who is contributing to the value created by the firm. Then, hypothesis 4a claims for direct strategy meaning that the term $-(\pi_i^{t+1} - \pi_i^t) < 0$. Again we define the ratio of value captured by the shareholder in relation to the total generated value

$$\lambda_{sh,i}^{t,t+1} = \frac{-(\pi_i^{t+1} - \pi_i^t)}{V_i(p, y, w, x)}, \quad i = 1, \dots, I$$

and the average of this ratio for the period as $\bar{\lambda}_{sh} = \frac{1}{n} [\sum_{t=1}^{\tau} \sum_{i=1}^I \lambda_{sh,i}^{t,t+1}]$. Then the hypothesis 4a, for testing the direct strategy is formulated as

- $H_0^{4a} : \bar{\lambda}_{sh} = 0$,
- $H_1^{4a} : \bar{\lambda}_{sh} < 0$

We consider that the null hypothesis H_0^{4a} is rejected and H_1^{4a} is accepted if the statistical test that compares $\bar{\lambda}_{sh}$ with the zero value shows that they are statistically different. If the null hypothesis is rejected we interpret that the shareholder captures value through a direct strategy.

As we have done in the previous hypothesis, to test the confirmation of a usage strategy, we compare the same two periods in order to observe the variation of the value

captured by the shareholder. Thus, we formulate the null hypothesis (H_0^{4b}) and the alternative hypothesis (H_1^{4b}) as

- $H_0^{4b} : \bar{\lambda}_{sh}^{(1)} \leq \bar{\lambda}_{sh}^{(2)}$
- $H_1^{4b} : \bar{\lambda}_{sh}^{(1)} > \bar{\lambda}_{sh}^{(2)}$

When it is not possible to reject H_0^{4b} it implies that the shareholder has captured the same value in both periods or the capture in the second is smaller than in the first. When hypothesis H_1^{4a} is accepted and H_0^{4b} can not be rejected, we understand that hypothesis 4 is accepted and Frooman's third proposition receives empirical support.

Following the argument we have introduced in section 3.3.3. regarding the relationship between shareholder and firm we have to mention here that the fourth hypothesis could be formulated in terms of an indirect withholding strategy as $H_0^{4c} : \bar{\lambda}_{sh} = 0$; $H_1^{4c} : \bar{\lambda}_{sh} \neq 0$. We will only consider this strategy if we observe that the direct usage strategy does not receive empirical support.

3.5.2.5. Hypothesis 5

Following the same procedure, the last hypothesis will use the term related to external capital suppliers $-\bar{x}_k^T(w_k^{t+1} - w_k^t)$. For contrasting hypothesis 5 we use for the firm i the term related to the capital supplier capture in relation to the total generated value $V_i(p, y, w, x)$ as

$$\lambda_{k,i}^{t,t+1} = \frac{-\bar{x}_{k,i}^T(w_{k,i}^{t+1} - w_{k,i}^t)}{V_i(p, y, w, x)}, \quad i = 1, \dots, I$$

and the average of this ratio for the period as $\bar{\lambda}_k = \frac{1}{n} [\sum_{t=1}^{\tau} \sum_{i=1}^I \lambda_{k,i}^{t,t+1}]$. Then to determine if an indirect withholding is applied, hypothesis 5 is formulated as

- $H_0^5 : \bar{\lambda}_k = 0$
- $H_1^5 : \bar{\lambda}_k > 0$

We consider that the null hypothesis H_0^5 is rejected and H_1^5 is accepted if the statistical test that compares $\bar{\lambda}_k$ with the zero value shows that they are statistically different. If the null hypothesis can not be rejected we interpret that the situation is balanced in terms of value and hypothesis 5 is accepted. The capital supplier is not able to capture nor is he contributing to the value generated. This is coherent with the definition of the application

of an indirect withholding strategy. If that is the case we confirm hypothesis 5 and the fourth Frooman proposition is supported empirically.

Finally, as the distribution of $\bar{\lambda}$ values are not expected to be normal we use the non-parametric test of Wilcoxon (1945) for the hypotheses contrast when it is necessary to determine if the distribution is different from 0 and the Mann-Whitney (1947) test for testing if the data set comes from the same distribution.

3.6. The Sample

The PROFARMA program was identified as a representative sample of the Spanish pharmaceutical sector that was affected by the situation described in chapter 1, section 1.7.

The firms included in such a program fulfil the criteria defined in the third chapter. The PROFARMA program was established by the Spanish government in the period 2009-2012. It was intended to develop a stronger pharmaceutical industry for the patient's benefit. It included the modernization of the sector and the giving of priority to activities with more added value. It pursued investments in new facilities, the development of new production technologies and the enhancement of research and development activities in order to increase the competitiveness of the sector. For local firms, it implied that they were to look for new markets through the internationalization and for foreign companies to increase their commitment in the development of the industrial infrastructure, increasing investments and improving the commercial exchange. The exclusion criteria of the PROFARMA program are: i) pharmaceutical firms only with commercial activity, ii) scientific and technical activities in R+D+I should reach the minimum requirements of the program, iii) the firm only manufactures raw materials or intermediate products, iv) the firm only manufactures for export markets, v) the firm only manufactures for the veterinary market, vi) The firm does not have medicinal substances authorized for human use or being in the research phase authorized by Spanish Agency of Medicines and Medical Devices (Agencia Española de Medicamentos y Productos Sanitarios), and vii) the firm only manufactures medical devices. The sample data set is extracted from the published series of SABI and AMADEUS databases and is complemented with corporate reports. The PROFARMA sample used for testing the Frooman model is composed of 44 firms²². We have added the firm used in the second chapter to the sample, as it fulfils PROFARMA criteria. We consider the PROFARMA sample is representative of the sector

²² They were 44 in PROFARMA but one was excluded because no data were available for the whole period.

as it covers 15.6% of the firms operating in this sector. Moreover, the total number of observations of the sample is 396. The observations are distributed within the intervals 2003-2007 (176) and 2007-2012 (220). The sample is composed of both, firms owned by Spanish capital (52.3%) and firms owned by foreign capital (47.7%). Regarding the number of employees, the following typologies have been included in the sample: with more than or equal to 1,000 employees (31.8%), within the interval of 500-999 employees (29.5%), within 250-499 employees (20.5%) and with less than 250 employees (18.2%).

The methodology in Section 3.5, based on the concept of economic worth, clearly limits the definition of the variables associated with the income obtained by the pharmaceuticals as well as costs incurred. Fortunately, the Spanish accounting standards allow for the clear identification of the most relevant parameters in the current study. For all variables the average of the quantities and prices at the beginning and the end of the period was calculated.

Outputs and inputs are defined in the following subsection. Table 3.3 summarizes the basic statistics related to the data set used for the analysis.

3.6.1. Output definition

Regarding the outputs we only consider one single output. This is the stakeholder customer that we have considered as the main stakeholder. It collects all the customers of the firm in one single output. It is assigned to the Spanish public health sector as main customer because the percentage of sales corresponding to it is more than 70% of total sales.

The net income will be assigned to the main stakeholder customer as $(p_{ms}y_{ms})$ corresponding to the sales to each in current euros. The physical units sold (y_{ms}) by each firm is calculated as the net income divided by the Spanish price index of medicinal substances and pharmaceutical products (IMSPP) extracted from Instituto Nacional de Estadística database of year t as $y_{ms} = p_{ms}y_{ms} / \text{IMSPP}^t$, taking the year 2003 as reference.

3.6.2. Input definition

For the purposes of analysis we consider a set of three inputs to be assigned to different stakeholders: labor (workers), raw materials and suppliers of capital (lenders). In general the price of each input will be calculated through the ratio of total expense on that input divided by average units of the resource used for each firm i .

- **Raw Material.** Total expenses dedicated to raw materials are expressed as $w_{rm}x_{rm}$. The units of raw material x_{rm} are obtained using the Spanish Price Index for products used for manufacturing pharmaceuticals (IPMP) of each year t as $x_{rm} = w_{rm}x_{rm} / IPMP^t$ taking the year 2003 as reference.
- **Labor.** Units of labor x_ℓ are defined as the average number of employees contracted by each firm as documented in Financial accounts at the beginning and at the end of the year. $x_\ell w_\ell$ correspond with the expense in salaries documented in Financial accounts for each year. w_ℓ is the price of the average salary of each firm and it will be calculated through the ratio of total expense in salaries divided by the average number of employees calculated as $x_\ell w_\ell / x_\ell$.
- **Capital suppliers.** The expenses related to capital have been calculated as the sum of the economic amortization (AEC) and the interests of the borrowed capital (INT).

To calculate the stock of capital of each period we have taken into account the total assets adding the investments (Inv), all with reference to 2003 monetary units.

$$K^1 = K^0 - AEC^0 + Inv^1 = K^0(1 - \delta) + Inv^1 \quad \text{as} \quad AEC^0 = \delta K^0$$

$$K_0^1 = K^0(1 - \delta) + \frac{Inv^1}{(1 + d)}$$

Repeating the same until the period and deflating to time 0 using the Spanish Consumer Price Index (IPC) as deflator (d) to obtain:

$$K_0^{t+1} = K^0(1 - \delta)^{t+1} + \frac{Inv^1(1 - \delta)^t}{(1 + d)} + \dots + \frac{Inv^t(1 - \delta)}{(1 + d)^t} + \frac{Inv^{t+1}}{(1 + d)^{t+1}}$$

Once the stock of capital of period “ τ ” as K_0^τ is obtained for each period we can calculate the price (w_k) calculating the ratio [$w_k^\tau = (AEC^\tau + INT^\tau)/K_0^\tau$] through the expenses of capital and the units of capital of each period we obtain w_k^τ .

3.6.3. The period of study

The time interval chosen in the study is determined by the developments of the public Healthcare system explained in Section 3.2. With the objective of making the hypotheses contrast, the period from 2003 until 2012 has been selected. When necessary for testing the hypotheses defined in the previous section, this period has been divided into two subperiods. We use two periods instead of the three periods introduced in the first

chapter section 1.7 because we expect that expenditure control measures that were decided during the period 2006-2009 started to be effective progressively during this central period and affected each with different intensity. For that reason, we have split the central period 2006-2009 in two parts. We consider each part of them as belonging to the first interval, period (1) from 2003 to 2007 and the second interval, period (2), from 2007 to 2012.

3.7. Results and discussion

We start this section summarizing the statistical results in Table 3.4, 3.5, 3.6, 3.7 and 3.8 that are related to the hypotheses proposed in section 3.4.

Regarding hypothesis 1 (see Table 3.4) we reject the null hypothesis $H_0^{1a}: \bar{\lambda}_{ms} = 0$ and we accept the alternative $H_1^{1a}: \bar{\lambda}_{ms} < 0$ (see Table 3.4.1). We confirm that during the period 2003-2012 the Spanish public sector was able to capture value from the firm. This means that the Spanish public sector used a direct strategy. This confirms the validity of the hypothesis 1a. In order to confirm the withholding feature of the stakeholder strategy we applied the median Mann-Whitney test. We confirm that the null hypothesis $H_0^{1b}: \bar{\lambda}_{ms}^{(1)} = \bar{\lambda}_{ms}^{(2)}$ is rejected (see Table 3.4.2.). Then, the alternative hypothesis $H_1^{1b}: \bar{\lambda}_{ms}^{(1)} > \bar{\lambda}_{ms}^{(2)}$ is accepted. Consequently, the mean of the first period is greater than the mean of the second period and they are statistically different. This result confirms hypothesis 1b supporting the idea that the Spanish public sector increased the strength of its influence on the firm using a withholding strategy, capturing more value in the second period than in the first. Furthermore, combining both results we confirm the remark of hypothesis 1. The Spanish public sector had the power and was able to apply a direct withholding strategy. We conclude that this result gives support to Frooman's first proposition.

As stated in Table 3.5 the null hypothesis of the second hypothesis $H_0^2: \bar{\lambda}_s = 0$ is rejected. This means that the firm is able to capture value from raw material suppliers. We note that the rejection of the null hypothesis implies that we confirm hypothesis 2. The stakeholder strategy is coherent with an indirect usage strategy. It can be interpreted that the firm has the power and suppliers are applying an indirect usage strategy thus trying to resist the firm's power. Nevertheless, they are not able to resist the pressure of the firm and they are obliged to decrease the price of inputs. We conclude that the second proposition of Frooman receives empirical support.

The result of the contrast of the third hypothesis regarding labor (see Table 3.6) is that the null hypothesis H_0^{3a} : $\bar{\lambda}_l = 0$ is rejected and H_1^{3a} : $\bar{\lambda}_l < 0$ is accepted (see Table 3.6.1). As a consequence, stakeholder labor is able to capture value created by the firm during the period studied. Thus, we confirm hypothesis 3a. We interpret this result as labor is applying a direct strategy. The second contrast shows that we can not reject the null hypothesis H_0^{3b} : $\bar{\lambda}_{ms}^{(1)} \leq \bar{\lambda}_{ms}^{(2)}$ (see Table 3.6.2). This means that the stakeholder labor is only able to maintain its level of value capture or to reduced it. This confirms hypothesis 3b. Consequently we understand that it is applying a usage strategy. Furthermore, combining both results we confirm hypothesis 3 which means that labor is following a direct usage strategy. We conclude that we have found empirical support to Frooman's third proposition.

Regarding hypothesis 4 related to the shareholder strategy we conclude that we can not reject the null hypothesis H_0^{4a} : $\bar{\lambda}_{sh} = 0$ (see Table 3.7). This means that the shareholder is not significantly capturing value from the firm in the period studied. We can not confirm hypothesis 4a nor hypothesis 4. Thus, we can not confirm that the shareholder is using a direct usage strategy as we have done for labor. Conversely, as we have mentioned when hypothesis 4 was introduced, the shareholder might be applying an indirect withholding strategy because the null hypothesis that we mentioned as a potential alternative H_0^{4c} : $\bar{\lambda}_{sh} = 0$, can not be rejected. It is interesting to note that this result confirms what we highlighted from literature that shareholder-firm relationships in a family business are not easily predictable and are not as homogeneous as expected without a deeper knowledge of the firm, as stated by Berrone, Cruz and Gómez-Mejía (2010). This conclusion might indicate that our hypothesis 4 derived from Table 3.2 might be based on a wrong assessment about the shareholder-firm relationship. As we have mentioned earlier the typologies of relationships in a family business model can be multiple and their assessment is not easy without detailed and reliable sources of information. As a consequence, further analysis is required to determine if the relationship between shareholder and firm should be assigned as low interrelationship instead of high interrelationship. As we do not have enough qualitative information coming from the firms included in the sample regarding the shareholder relationship we must conclude that Frooman's third proposition does not receive empirical support regarding the shareholder.

Finally, the fifth hypothesis contrast shows in Table 3.8 that we can not reject the null hypothesis H_0^5 : $\bar{\lambda}_k = 0$. This fact confirms hypothesis 5. Capital suppliers are

applying an indirect withholding strategy because they are not contributing to the value created nor are they capturing value from the firm. As a consequence the fifth proposition of Frooman's receives empirical support in the framework of the Spanish pharmaceutical sector for the period studied.

As a summary, we conclude that Frooman's model receives a strong empirical support as we have confirmed all the propositions with at least one stakeholder.

3.8. Concluding remarks

In this chapter we have identified a clear case of stakeholder power. The Spanish health care sector has been useful as it describes a sector where the relationships between firm and stakeholders are clearly defined. Frooman's model of influence typifies the stakeholder strategies to influence the firm. The impact of the Spanish public health sector on the firm in the period 2003-2012 is strongly affected by the publication of several laws and Royal-Decreets that were intended to control health care expenditure. This creates a framework where the relationship of the firm with their stakeholders can be classified under Frooman's model. All assignments for the stakeholders were matching the model with the exception of shareholder.

By using the model and the qualitative information acquired from the Spanish pharmaceutical sector, the stakeholder-firm relationships have been assigned to the referenced stakeholder strategies predicted by Frooman (1999). Despite some infructuous trials made to validate the model from a qualitative perspective we have considered that the propositions included in Frooman's model could be empirically and quantitatively contrasted using the economic perspective. With that objective in mind we have translated those propositions to hypotheses, one for each primary stakeholder. These hypotheses are based on the knowledge of the sector, particularly the impact of the main stakeholder on the firms. The methodology used to quantitatively assess the value created by the firms and its capture by the stakeholders gave us the opportunity to formulate statistically contrastable hypotheses using non-parametric standard tests. Additionally, we have designed a framework that allows us the operationalization of the stakeholder strategies based on the intensity of value capture. Altogether, the review of Frooman's model of influence is possible taking into consideration that, up to now, support as a valid model has not been found in the literature. The authors, Tsai et al. (2005), Hendry (2005) and Sharma and Henriques (2005) only tried to test the model using a qualitative approach but we have

contributed using an economic perspective through the definition of value created and distributed by the firm.

The conclusion of the analysis is that we have accepted all Frooman's propositions as valid as we have found empirical support for all of them. We have only found one exception among the whole list of stakeholders where the hypothesis formulated is not being supported. The unhomogeneous nature of relationships, characteristic of a family business firm, impeded the correct assignation for shareholder using Frooman's model. Despite the concentrated structure of property that suggested a direct withholding strategy, the empirical results after the hypothesis contrast suggest that the shareholder is really using an indirect withholding strategy. This result merits further attention in order to determine the actual shareholder-firm relationship that exists inside each firm. This assessment is not possible only by using public data and further field research trying to find out what is the right assignation is necessary to confirm or deny this hypothesis.

It is worth noting that our empirical contrast is only based on the definition of stakeholders that exchange economic value with the firm and nothing has been said about the validity of the model for the other stakeholders. This limitation is intrinsically linked to the approach we have followed. We consider that for the other stakeholders a different approach should be followed. In our understanding, the capacity of influence of this category of stakeholders in terms of being able to retain or withhold a needed resource for the firm, requires further investigation. As a matter of fact it is quite plausible that they affect the firm using indirect usage strategies that involve the stakeholders we have considered as partners. For instance, to create a public opinion about environmental topics that affects the firm. On the other hand, they can force that regulator to issue new laws that correct the situation. Then, the behavior of the regulator could be interpreted as quite similar to the one we have studied. We could then observe that the impact of the regulator is transferred to a decrease in demand, and consequently a price decrease or a reduction in profit.

We consider that the number of firms included in the analysis is representative of the pharmaceutical sector but, despite this fact, as part of a future research, it will be worth enlarging the number of firms, corresponding observations and length of the period of study. Finally, it will be worth applying the methodology to other sectors in order to obtain more empirical support for the model.

Frooman's model opens new ways to analyze firms and sectors where the relationship of power between firm and stakeholders is well established. The application of

the model allows the researcher and the firm to understand the strategies currently applied by stakeholders and how these strategies change through time. Consequently, the firm can better understand the situation it faces regarding stakeholder management and then, react accordingly, improving the way it manages the stakeholders in order to achieve its objectives.

We would like to mention as a final conclusion the interest of combining the classical economic theory of the firm with strategic management and the stakeholder theory to find out new crossroads where different disciplines can find overlapping fields of study. This creates a new perspective about how the firm behaves when it is creating value and how it survives value capture as a result of the influence of the stakeholders. We consider this merging of concepts which comes from different theories, as a future field of research when the multi-disciplinary approach can be fruitful in order to help firms, managers and society be more aware of the mutual and reciprocal interactions, particularly when the public sector, as a regulator, influences the framework where the stakeholders live.

3.9. Appendix C. Tables

Table 3.1. Typology of Resource Relationships. Frooman (1999:199).

		Is the stakeholder dependent on the firm?	
		No	Yes
Is the firm dependent on the stakeholder?	No	Low interdependence	Firm power
	Yes	Stakeholder power	High interdependence

Table 3.2. Typology of relationships applied to Spanish pharmaceutical industry. Predicted stakeholder strategy by Frooman's model

	Dependency of stakeholder on the firm	Dependency of the firm in relation to stakeholder	Typology of relationships	Predicted strategy
Customer / Regulator (public sector)	No	Yes	Stakeholder power	Direct withholding
Raw Material Supplier (unspecific)	Yes	No	Firm power	Indirect usage
Employees (highly organized)	Yes	Yes	High interdependence	Direct usage
Shareholder (concentrated)	Yes	Yes	High interdependence	Direct usage
Capital Suppliers (unspecific)	No	No	Low interdependence	Indirect withholding

Table 3.3. Summary of Output, inputs and profit averages of Spanish Pharmaceutical sector

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1. Output										
Revenue (x 1000 €)	142,436	152,202	164,240	188,612	206,733	247,207	265,940	278,482	267,354	248,506
(standard deviation)	173,955	188,816	199,349	248,654	277,354	378,649	427,939	428,383	435,638	357,013
Output (x1000 #)	142,436	151,039	161,207	188,720	210,023	268,322	297,233	323,979	324,093	322,885
(standard deviation)	173,955	187,373	195,667	248,795	281,767	410,991	478,294	498,369	528,092	463,868
Price Index*	1.000	1.008	1.019	0.999	0.984	0.921	0.895	0.860	0.825	0,770
2. Inputs										
2.1. Labour										
Cost of salaries (x1000 €)	23,810	26,317	26,664	30,643	33,162	35,825	36,638	39,794	40,424	40,821
(standard deviation)	22,222	24,871	24,188	32,389	33,307	36,525	36,809	37,848	37,115	36,560
Employees (#)	428	448	451	488	509	521	525	565	563	541
(standard deviation)	323	348	346	417	438	437	426	439	417	401
Price (€)	53,793	54,952	56,046	58,064	60,899	64,651	64,499	64,937	66,860	69,675
(standard deviation)	23,806	18,192	14,577	16,282	17,001	22,811	21,806	19,375	22,297	22,280
2.2. Capital										
Capital expenses (x1000€)	5,704	6,365	6,352	7,545	8,703	9,047	8,174	8,194	9,454	9,701
(standard deviation)	6,307	7,050	7,896	8,690	10,328	11,925	9,993	9,973	11,156	12,851
Capital (x 1000 # in € 2003)	156,988	166,487	197,861	217,969	245,100	263,884	264,835	292,323	298,271	270,508
(standard deviation)	192,964	189,474	267,641	305,866	340,838	355,904	347,813	385,396	383,661	351,893
Price (€)	0.04587	0.04666	0.04339	0.04749	0.04963	0.04260	0.04163	0.03860	0.04015	0.05057
(standard deviation)	0.02604	0.02532	0.02549	0.02805	0.02869	0.02623	0.02853	0.02727	0.02693	0.05509
2.2. Raw materials										
Raw Material exp.(x 1000 €)	97,066	101,485	109,820	127,586	145,522	182,129	197,955	209,139	200,802	185,258
(standard deviation)	132,358	143,656	150,810	186,483	221,109	331,611	385,453	394,584	400,630	331,023
Raw Material (x 1000 #)	97,066	103,009	109,820	130,497	139,469	177,982	205,412	219,385	214,578	200,996
(standard deviation)	132,358	145,814	150,810	190,737	211,912	324,060	399,972	413,914	428,115	359,144
Price Index**	1.000	0.9852	1.000	0.9777	1.0434	1.0233	0.9637	0.9533	0.9358	0.9217
3. Profit										
Profit (x 1000 €)	15,171	17,309	21,469	22,553	21,270	22,668	24,494	22,682	18,146	14,032
(standard deviation)	24,463	25,170	34,515	43,477	35,064	33,423	36,033	32,273	26,806	28,200

(*) corresponds to Spanish price index of medicinal substances and pharmaceutical products(INE, 2015)

(**) corresponds to Spanish Price Index for products used for manufacturing pharmaceuticals(INE 2015)

Table 3.4. Statistics Hypothesis 1. Main Stakeholder**Table 3.4.1. Wilcoxon test**

Stakeholder	Spanish public sector
Period	2003-2012
Sample size	396
Median	-0.2701
95 % Confidence Interval	(-0.3055; -0.2359)
$H_0^{1a}: \bar{\lambda}_{ms} = 0$	Rejected

Table 3.4.2. Mann-Whitney test

Stakeholder	Spanish public sector	Spanish public sector
Period	2003-2007	2007-2012
Sample size	176	220
Median	-0.0041	-0.4660

Stakeholder	Spanish public sector
Period	2003-07 and 2007-12
Point estimate for $\eta_1 - \eta_2$	0.4529
95.1 Percent Confidence Interval for $\eta_1 - \eta_2$	(0.4045; 0.5031)
<i>p</i> -value	< 0.0001
$H_0^{1b}: \bar{\lambda}_{ms}^{(1)} = \bar{\lambda}_{ms}^{(2)}$	Rejected

Table 3.5. Statistics Hypothesis 2. Wilcoxon test. Raw Material Suppliers

Stakeholder	Raw Material Suppliers
Period	2003-2012
Sample size	396
Median	0.0769
95 % Confidence Interval	(0.0630; 0.0914)
$H_0^2: \bar{\lambda}_s = 0$	Rejected

Table 3.6. Statistics Hypothesis 3. Labor**Table 3.6.1. Wilcoxon test**

Stakeholder	Labor
Period	2003-2012
Sample size	396
Median	-0.0814
95 % Confidence Interval	(-0.1018; -0.0605)
$H_0^{3a}: \bar{\lambda}_l = 0$	Rejected

Table 3.6.2. Mann-Whitney test

Stakeholder	Labor	Labor
Period	2003-2007	2007-2012
Sample size	176	220
Median	-0.1037	-0.0458

Stakeholder	Labor
Period	2003-07 and 2007-12
Point estimate for $\eta_1 - \eta_2$	-0.05741
95.1 Percent Confidence Interval for $\eta_1 - \eta_2$	(-0.1002; -0.0195)
<i>p</i> -value	0.0030
$H_0^{3b}: \bar{\lambda}_l^{(1)} \leq \bar{\lambda}_l^{(2)}$	Non Rejected

Table 3.7. Statistics Hypothesis 4. Wilcoxon test. Shareholder

Stakeholder	Shareholder
Period	2003-2012
Sample size	390
Median	-0.027
95 % Confidence Interval	(-0.094; 0.034)
$H_0^{4a}: \bar{\lambda}_{sh} = 0$	Non-rejected

Table 3.8. Statistics Hypothesis 5. Wilcoxon test. Capital Suppliers

Stakeholder	Capital Suppliers
Period	2003-2012
Sample size	390
Median	0.0063
95 % Confidence Interval	(-0.0054; 0.0175)
$H_0^5: \bar{\lambda}_k = 0$	Non-rejected

Chapter 4

Social Economic Progress and the Analysis of Stakeholder Responsible Behavior of the Firm

Abstract

A wide consensus exists about the need to develop new measures of social progress. As the awarded Nobel Prize winners Joseph Stiglitz and Amartya Sen and Professor Jean-Paul Fitoussi (Stiglitz, Sen and Fitoussi 2009) concluded, measures of social progress are often confused with measures of economic performance, such as GDP. In their opinion it is difficult to evaluate the impact of the bias that introduces these economic indicators when trying to assess the real situation regarding social progress. The measures of economic performance omit or underestimate important topics in their calculation, such as inequality, unemployment, health, and environmental issues among others. These omissions lead, in most cases, to the taking of wrong decisions about what has to be done to achieve the desired improvement in social progress. The purpose of this chapter is to develop a concept of social economic progress inspired by Davis (1947) that integrates the economic and social aspects. We develop an analytical framework where social economic progress and its components can be measured together with the social responsibility of the firm and its sustainability.

Chapter 4

Social Economic Progress and the Analysis of Stakeholder Responsible Behavior of the Firm²³

4.1. Introduction

A wide consensus exists about the need to develop new measures and indicators that inform about the real situation and evolution of social progress. As the Nobel Prize winners Joseph Stiglitz and Amartya Sen and Professor Jean-Paul Fitoussi (Stiglitz, Sen and Fitoussi 2009) concluded, measures of social progress are often confused with measures of economic performance, such as GDP. In their opinion it is difficult to evaluate the impact of the bias that these economic indicators introduce when trying to assess the real situation regarding social progress. The measures of economic performance omit or underestimate important topics in their calculation, such as inequality, unemployment, health, and environmental issues among others. These omissions lead, in most cases, to the taking of wrong decisions about what has to be done to achieve the desired improvement in social progress. Our work contributes in that direction by retrieving the work of Davis (1947), an early proponent of stakeholder responsibility, considering social aspects as part of an inclusive definition of economic progress.

Through the chapter we revisit, extend and operationalize the concept of economic progress as proposed by Davis (1947), in which a range of stakeholders participate. Davis's concept of economic progress is aligned with the concept of social progress proposed by Stiglitz, Sen and Fitoussi (2009) and the OECD (2014) report focused on inclusive growth. Davis's work allowed the integration of economic performance and social aspects in one single concept that we name *social economic progress*. The name social economic progress describes the idea that measures of economic performance are not enough to describe the social progress of a society. Davis called this idea "economic progress" and Stiglitz, Sen and Fitoussi "social progress" thus the term "social economic progress" incorporates, in a descriptive way, both expressions. However, we keep the

²³ A preliminary version of this chapter was presented as "Economic Progress and the Analysis of Stakeholder Responsible Behavior of the Firm," DEMO workshop, University of Illes Balears, Mallorca, Spain, September 19-20, 2014. It was also presented as "Economic Progress and the Analysis of Firm Behaviour," 1 Day Workshop Programm. Advanced Efficiency and Productivity, Centre for Efficiency and Productivity Analysis (CEPA), University of Queensland, Australia, October 3, 2014. (with C.A.K. Lovell).

terminology "economic progress," when the Chapter is focused on the original contributions of Davis.

Davis considered productivity growth to be the sole driver, but not the only component, of economic progress. Davis considered economic progress, driven by productivity growth, to incorporate: i) sufficient output growth to create a rapid re-employment of resources, labor in particular, displaced by productivity growth, ii) a balanced distribution of the wealth created by productivity growth, iii) provision of "seed" capital for future production, and iv) imposition of minimal social costs, such as the impairment of health and the wasteful use of resources. Each component is necessary for productivity growth to translate into economic progress. Davis, Stiglitz, Sen and Fitoussi struggle for the same objective. We remark, as an example, that both concepts look for a reduction of inequality. Davis, through a balanced distribution of the wealth and Stiglitz, Sen and Fitoussi (2009, 24) through equality "in the opportunities, capacities, and life chances of those born under different circumstances". Furthermore, we note they coincide in the importance of a reduction of unemployment as a source of inequality and origin of well being.

Our work makes the analysis of social economic progress applicable to the whole economy, to the sectoral level and to the firm level to where social economic progress originates. We develop an analytical framework where social economic progress and its components can be measured together with the social responsibility of the firm and its sustainability. Finally, it is worth mentioning that the firms can be classified depending on their contribution to social economic progress. This classification makes studies about their spatial distribution possible. Moreover, it can be described how they are clustered and how they interact with other firms and their stakeholders in order to contribute to the social economic progress of the whole economy.

The chapter is organized as follows. In section 4.2 we revisit Davis's economic progress contribution. In section 4.3 we develop the methodology to operationalize the measure of social economic progress. In section 4.4 we discuss the sustainability of the firm. In section 4.5 we introduce the social costs in the measure of the value created by the firm. In section 4.6 we discuss re-employment of displaced resources in growing and contracting economies, and the relationship linking re-employment with social responsibility. In section 4.7 we focus on the labor company stakeholder responsibility. In

section 4.8 we explore the mechanisms by which a firm can compensate for the cost of its social responsibility. Section 4.9 concludes.

4.2. Hiram S. Davis

4.2.1 Hiram S. Davis and Stakeholder Theory

Davis, as a major research associate and Director of the Industrial Research Department at Wharton School²⁴, contributed to the debate of economic progress in the context of the US recession in the 1930s and the turbulent period of World War II in the 1940s. He served in the government as Secretary of the Textile Committee under the Combined Production and Resources Board during wartime (1943-1945). As part of his governmental responsibility he developed textile studies²⁵ but after he focused his interest on the study of industrial systems, economic progress and productivity²⁶. In 1953, the Industrial Research Department became a unit of the Wharton School's Department of Industry. Later, in 1968, it was renamed as the Department of Management. It is interesting to note that Wharton School had a relevant role in the development of stakeholder theory, as summarized by Freeman and Velamuri (2005), when recalling that some precursor works of stakeholder theory were carried out over ten years through the Busch Center, the Wharton Applied Research Center, and the Managerial and Behavioral Science Center. All of them were department members of the Wharton School at the University of Pennsylvania. It is worth noting that “the study of economic and social problems of business” was the foundational mission of this school (1921). This mission was very close to the topics of interest of stakeholder theory and it is not a surprise that Davis’s contributions are in alignment with the future stakeholder theory.

²⁴ The Industrial Research Unit of the Wharton School of the University of Pennsylvania was founded in 1921 as the Industrial Research Department with a mission to "study the economic and social problems of business." Sponsored by the Trustees of the University and financially assisted by the Carnegie Corporation, the Department worked in close relationship with a group of representative Philadelphia firms, which furnished data for research and analysis.
in http://www.archives.upenn.edu/faids/upb/upb5/upb5_9ir.html#ref2085 (accessed May 10, 2014)

²⁵ In the archives of Wharton School are reported the following works “Code of Fair Competition for wool Textile Industry” (Gardiner and Davis 1933), Production and Equipment Trends in American Worsted Yarn Manufacture, 1919-1932, (Davis and Brown, 1933), Textile Markets, Their Structure in Relation to Price Research, (Kennedy and Davis 1939), Inventory Policies in the Textile Industries series (Davis 1941), Wool and the War (Davis 1942), Economic Issues in Textiles (Davis,1945) in http://www.archives.upenn.edu/faids/upb/upb5/upb5_9ir.html (accessed May 10, 2014).

²⁶ In the archives of Wharton School are reported the following works "Studies of the Industrial System" (1944), “Industrial Study of Economic Progress” (1947) and "Economic History from Accounting Records” (1955a) in http://www.archives.upenn.edu/faids/upb/upb5/upb5_9ir.html (accessed April 18, 2015).

Hiram S. Davis (1947) in his work “The Industrial Study of Economic Progress” intended the study of the conditions that stimulate or delay economic progress. It has its origins in discussions of staff in the post-war program of the Industrial Research Department. During the discussion it becomes apparent that “no more important objective could be set for industry studies than that of increasing our knowledge of the conditions which stimulate and those which retard economic progress” (p. vii). Some of the pillars of stakeholder theory can be found in Davis’s work and that is why we consider him as one of their precursors.

We start the review with the problem of stakeholder identification. Davis (1947) had in mind the same concept that Freeman²⁷ (1984) and Clarkson (1995) used almost 40 years later. He was completely in agreement with Clarkson’s definition of primary stakeholders. Davis listed six possible stakeholders in the distribution of the benefits derived from an increase in efficiency. Davis named them as *participants* instead of *stakeholders* but the definitions are compatible. In Davis’s words (Davis, 1947:95) the participants were:

i) customers, who may receive their benefit in lower prices or improved product, ii) wage or salary workers, who may receive their benefit in such forms as higher wage and salary rates, bonuses of various sorts, and shorter hours, iii) suppliers, who may receive higher prices for materials, iv) the enterprisers and investors who may receive higher dividend rates (or an increased equity in the business), v) the business itself, which may increase its retained earnings, vi) the government, which will share through taxes any benefit which accrues as profit.

Secondly, it is considered as a main point of interest for the economic progress analysis (Davis 1947,1) that “the painful adjustments on the part of all those who are associated with the production process” derived from progress jerks and rushes previously mentioned by Schumpeter (1939). Davis indicated that the victims of the adjustment, whether farmers, laborers, manufacturers or investors, want to seek protection. They look for security. We consider that, in terms of stakeholder theory terminology, they are dealing with the social effects of the achieved firm objectives regarding social economic progress.

²⁷ Freeman recognize that stakeholder concept was not invented by him and he was only complilating the existing literature. Despite this we note that he does not reference Davis in his work.

It is interesting to note that Davis (1947) cites Professor Walker, who was in the service of Australian government, calling for adding goals of a minimal standard of consumption and improved working conditions to objectives of increased production and economic freedom even at the expense of some *freedom* and some *productive efficiency*. It means that Davis includes the notion of sacrificing efficiency in order to have an alternative benefit for society. Finally Davis wondered (Davis 1947,2) “How far can we assure security and not stifle progress, the creator of abundance?” and also mentioned “may this emphasis on security aspects mean that we will unintentionally does not choke or impede progress?”.

Thirdly, Davis worried about the social cost of economic progress. He integrated in his contribution a preliminary vision of the stakeholder point of view, particularly focused on labor and re-employment because he was influenced by the long unemployment interval of the 1930s. He had to admit that America had known economic progress through the transition from an agricultural to an industrial and trade model. America experienced a technological development leading to a higher level of consumption despite unemployment and other social costs. Being fully aware of variability in the assessment of these social costs depending on subjective matters, Davis declared (1947,11):

In seeking to read social cost qualification into the “progress” concept, we are reacting in part to a group conscience which tells us that such costs ought not to be, or at least are much higher than they should be. If this urge is recognized, it becomes clear that “economic progress” should not be defined in terms of some stated level of social costs, for, at best, that would vary with the standards of each generation, and, at worst, would reflect personal biases.

The accuracy of this assessment can be seen in the increase of sensitivity regarding the social cost through the 20th century up to now. He mentioned that the economic progress desired should come at the lowest social cost. Later we will discuss extensively the notion of Davis’s concept of economic progress and the meaning of lowest social cost.

Fourth, Davis (1947,133) recognized the impact of technological developments on stakeholders, we outline in the following paragraph:

Since economic progress involves shifting of men from one employment to another, some persons may suffer considerable economic loss by the shift

even when it occurs fairly rapidly. If the new jobs do not require the same experience or skills as the old, those persons whose specialized experience brought them relatively high compensation in the old jobs are most likely to find re-employment only at new jobs carrying lower rates of compensation. Economic progress can also mean great loss of income to the investors who happen to own the particular facilities which are outmoded by technological developments.

Fifth, Davis (1947,132) also included in his analysis the social cost of progress and how it affects society in general. He identified as social costs the insecurity of jobs and income, and changes in social relationships of individuals and families, changes in the way of life of a whole community or in the social and political organization, and changes in the social standards and traditional values of the whole society when economic progress is achieved.

Finally, he discussed the potential wasteful use of natural resources to achieve progress. He mentioned the importance of the relationship between progress and the use of natural resources. Furthermore, he thought that the use of natural resources ceased to be part of the study of the *cost of progress* and became a part of the study of the conditions of productive efficiency because at the end of the day, the increases in productivity shall mean a more rational use of natural resources and less waste. Wasteful practices incorporate in the discussion the responsibility towards the environment. Inefficiency in the production process, for instance regarding energy inputs, leads to the use of extra resources that could be saved using efficient technology or work organization. Applying this philosophy will keep the use of the environmental resources needed to manufacture the goods more effective. As Davis mentioned (Davis 147,141) in the US (Ducktown, Tennessee), and as can be seen in the rest of the world, progress has frequently damaged the environment and spoiled natural resources. No less important is the prohibition of unsocial practices that lead the decisions of the firm towards corporate social responsibility which, as we know, has also been a main axis in the stakeholder theory.

We consider, as Davis did, that firms are value creation engines and that it is necessary to preserve them to achieve the social economic progress of society. As a consequence the firms have to be sustainable when achieving their objectives.

Sustainability²⁸ and social responsibility of the firm have been discussed extensively in the literature, including stakeholder theory²⁹. It will be a contribution of this chapter to define how these concepts can be interrelated³⁰. Furthermore, we seek the clarification and definition of sustainability of the firm and how the sustainability of the firm³¹ is related to social economic progress. It is interesting to note that Pezzey and Toman (2002) concluded, after reviewing twenty five years of journal articles about sustainability, that there is a lack of common understanding about this question³². It is proposed that firm

²⁸ Perrini and Tencari (2006) note that a company creates value when it adopts a managerial approach which is sustainability oriented. A company oriented in that sense is the one that develops itself over time by taking into consideration the economic, social and environmental dimensions of its processes and performance. In this perspective, value creation processes are broad and shared and meet, in different ways, the stakeholder expectations. Figge and Schaltegger (2000) outlined that is possible to make a shift in the generally adopted notion of value by introducing the concept of stakeholder value. Thus the sustainability of a firm depends on the sustainability of its stakeholder relationships. It should be considered not only shareholders, employees and clients. It should be added the suppliers, financial partners, local, national or multinational public authorities according firm's size, community and civil society in general (Perrini and Tencari 2006). They suggested that by adopting this stakeholder view means rethinking the nature and purpose of the firm. In this relational view of the firm the success of managerial efforts cannot be measured according a shareholder perspective, but only by adopting a more holistic and comprehensive stakeholder framework.

²⁹ To understand if the firm and stakeholder relationship is sustainable we need to be able to recognize after the analysis if the firm is performing like a firm optimizer, stakeholder optimizer or conversely it is being optimized the complete system at the same time in order to be sustainable. It is interesting to note looking the system from the point of view of the firm (Wheeler, Colbert and Freeman 2003) that it could be distinguished three levels of corporate culture with respect to organizational attitudes to stakeholders and the creation of value:

- “Compliance culture”. The organizational unit is not specially engaged with its stakeholders but where basic societal norms are respected and thus the organization seeks to avoid the destruction of economic, social or ecological value.
- “Relationship management culture”. The organization recognizes the instrumental value of good relations with immediate stakeholders (customers, workers, communities and business partners) and seeks to provide what value is appropriate in each case, within the limits of what is possible and usually after demands of investors are satisfied.
- “Sustainable organization” culture. The organization recognizes the interdependencies and synergies between the firm and its stakeholders. Seeks to maximize the creation of value simultaneously in economic, social and ecological terms.

Each of these three levels represent a different “stakeholder approach” and can be correlated with different definitions of corporate social responsibility going from the idea of “everything should be legislated” (corresponding to the first level) to the concept derived of a depth understanding of the nature of value for the firm and its stakeholders (third level). The authors also coined the “value-based networks” to acknowledge that stakeholders are sometimes grouped in key networks with a common sense of what is valuable. The process of defining value is fundamentally pluralistic and iterative and the business firm is a key player in the construction of what we may one day recognize as a viable, sustainable society. These observations have potentially profound implications for the nature of business (Wheeler, Colbert and Freeman 2003).

³⁰ Within the stakeholder theory, as Donaldson and Preston (1995), Clarkson (1995), Post, Preston and Sachs (2002) stated a company can last over time if it is able to build and maintain sustainable and durable relationships with all members of its stakeholder network. Post, Preston and Sachs, (2002) noted these relationships are essential assets that managers must manage and they are ultimate sources of organizational wealth.

³¹ The concept of corporate sustainability has been defined as “the capability of an organization to continue its activities indefinitely, having taken due account of their impact on natural, social and human capitals” (AccountAbility 1999:94 cited in Perrini and Tencari (2006)). When transposing this idea of sustainability to the business level can also accordingly be defined as meeting the needs of a firm's primary and secondary stakeholders without compromising its ability to meet the needs of future stakeholders as well (Dyllick and Hockerts 2002). Bebbington (2001) revised the accounting literature to check if sustainable development concept was used in a way which equates with “good environmental management” and realized that the international development literature using sustainable development was addressing the question about what kind of economic system would lead to everyone's need being met in an environmentally sustainable society and socially just society.

³² Summarizing they concluded that there is:

- i) no consensus about what constitutes the sustainability objective
- ii) differentiation of the efficiency and equity concepts is needed and the need to maintain this distinction when analyzing issues related to the long-term economic progress and the natural environment,
- iii) economic analytic framework contains presumptions about the prospects for both resource-augmenting technical innovation and resource substitution but the empirical foundation underneath the assumptions is not as strong as it could be

sustainability is achieved when firms retain (at least part of) the value created. We will discuss later the background of the concept of sustainability and its relationship with social economic progress.

4.2.2. Hiram S. Davis and Economic Progress

In this section we retrieve the theoretical framework of economic progress exposed by Davis. As far as we know, the contribution of Davis related to economic progress has not been analyzed in depth. Retrieving Davis's contribution we can shed light on the debate about what the social responsibility of the firm should be and how this behavior contributes to the social economic progress. We consider that it is worthwhile analyzing his contribution regarding economic progress seventy years later and seeing how it can help in the understanding of social economic progress.

We start the discussion with a short review of the theories about economic progress contemporary to Davis. To Professor Chester Wright, economic history is the history of economic progress (Davis 1947:4) and as he had previously stated (Wright 1938:689) “the economist looks upon economic history as primarily a study of how a given people have proceeded in their endeavors to supply their economic wants, as an analysis of the means they have employed and the institutions and economic order they have evolved in their effort to raise their standard of living”.

To put into context what the discussion about economic progress was during the time of Davis, we refer to Hansen (1939) who analyzed the previous contributions regarding economic progress. He outlined that Adam Smith identified population growth as at once a consequence and a cause of economic progress. In terms of Adam Smith, the increment of division of labor increases the productivity that results in an enlarged revenue and stock. As a consequence, there is an improvement in salaries and the subsequent increase in demand. These factors would lead to economic conditions favorable for population growth. Thus, population growth stimulates progress and this, in turn, stimulates further growth and expansion. Conversely, the pessimistic analyses of Malthus and Ricardo were focused on the limitation of natural resources and the danger of an increasing population. Following that increment the real income would be reduced to a bare subsistence level.

iv) the dearth of empirical work on what sustainability might mean for economic and environmental valuations and the continued lack of concrete understanding of what “sustainability policies” might entail in practice.

Hansen (1939:3) considered as “constituent elements of economic progress: (a) inventions, (b) the discovery and development of new territory and new resources, and (c) the growth of population”. He also remembered (Hansen 1939:3) “The earlier economists were concerned chiefly with the effect of economic progress upon the volume of output, or in other words, upon the level of real income. For them economic progress affected the economic life mainly, if not exclusively, in terms of rising productivity and higher real income per capita”. As an example, Fagan (1935) proposed a fairly broad definition of economic progress as moving forward towards “increased production accompanied by a better quality of goods; by a decrease in the relative expenditure of life, labor, and natural resources necessary to produce them; and by an even wider distribution of the resulting wealth³³”. Nonetheless Davis criticized Fagan’s definition on the ground that it omits “greater economy in the use of productive factors,” (Davis 1947,6) which Davis argued is a more fundamental factor in economic progress than expanding output, “for it is only by means of greater efficiency in per unit output that total output can outstrip population growth” (Davis 1947,7).

Hansen (1939:3) also reflected the belief about the risks of economic progress of that moment “Not until the very end of the nineteenth century did an extensive literature arise which stressed the role of economic progress as a leading, if not the main, factor causing fluctuations in employment, output, and income”. Hansen (1939:3) reported the worries about full employment of productive resources when explaining “the role of economic progress in the maintenance of full employment of the productive resources has come under consideration. The earlier economists assumed that the economic system tended automatically to produce full employment of resources. Some unemployment there was periodically, owing to the fluctuations incident to the business cycle; but in the upswing phase of the cyclical movement the economy was believed to function in a manner tending to bring about full recovery-maximum output and employment”. Davis took into consideration, as one of the main points of his analysis, the re-employment of resources.

Ayres (1944) also contributed to the discussion proposing that in order to achieve economic progress it is sufficient to have productivity growth. Davis adopted the concept but added some more necessary conditions that shall be taken into consideration because,

33 Cited by Davis (1947: 5)

as Davis (1947,12) stated, productivity growth is not enough to guarantee economic progress.

Retrieving the central thinking of Davis (1947), economic progress means “increasing the productivity accompanied by a distribution of the resulting gains so complete that they are shared by every member of the community and accomplished without any idleness of men or machines, or wasteful or unsocial practices” (Davis 1947,9). What he really meant by increasing productive efficiency leading to a higher level of consumption is increasing efficiency which is accompanied or followed by an expanding production of goods and services. In other words, the agents of production released from one employment by improvement methods, sooner or later find another thus making a further rise in the total output of all goods and services possible. Thus, in Davis’s words, “the research about the conditions of economic progress should center on those which make for a) increasing productive efficiency, b) relatively rapid re-employment, and c) balanced distribution and use of the income” (Davis 1947,12).

The starting point of Davis’s thought indicates that the worth created by the firm³⁴ is only the part corresponding to the gains of productivity. Davis (1947, 7) pointed out that only the productivity increments will lead to an increase in the absolute quantity of economic worth.

When we referred to increased production being obtained by greater economy in the use of productive agents, we simply meant more units of output for a given use of labor, capital equipment, managerial talent, materials and other factors. To the extent that such savings can be made through new or improved processes, new or improved methods of work and organization, or improved quality of productive factors, it is possible to secure a larger output of the same goods or of different goods, as society may choose.

On the other hand, it is interesting to note Davis’s list of business improvements can be classified as technical or economic change. Hence, technical change, and related increase in productivity, is presented as the main driver of economic progress. Shumpeter (1934) made the initial contributions to the theory of economic development and value

³⁴ It is worth noting that the created value concept used by Davis differs from the concept we have used in chapter 2 and chapter 3. Davis’s worth is much more restrictive as it only considers productivity as a factor that contributes to the value creation. We remind you here that we have considered as value created the sum of the quantity effect, the willingness to pay effect and the decrement of profit as stated in section 2.3.3. We will later adapt the methodology and value created definition to Davis’s concept in order to proceed with the discussion of economic progress.

creation through the process of technical change and innovation. He introduced the concept that some rents become available to entrepreneurs when a technological change is introduced (Shumpeter 1942). Teece (2000) remarked that there is no doubt that technological innovation is the primary driver of economic growth. Nadolny (2010) reviews the rich tradition of economic literature that explains how and why innovation is fundamental to the competitive success of firms. Innovation includes not only technical change to a product or process, but new and better approaches to marketing, distribution and servicing. Nadolny (2010) summarizes that innovation should result in greater productivity because a larger quantity or a better product is produced. Innovation allows a firm to pursue a business strategy focused on cost as it makes it feasible to achieve more output per unit of labor or capital. It also allows a differentiation strategy because new or higher quality of goods or services can be produced, leading to an increase in the price of the output per unit of factor input (Porter 1990, Silverberg and Verspagen 1994). It has also been stated that firms that achieve higher productivity increase their propensity to access distant markets (Fagerberg 1994, Wakelin 1998). Despite the impact of innovation on the performance of the firm, Teece (2010) notes that how and why some firms tap into technical opportunities remains enigmatic. We have to add, as Davis did, that innovation and technological change lead to some relevant social collateral effects that have to be taken into consideration and they oblige firms to position themselves and to behave accordingly in front of the stakeholders. Some firms will try to maximize their own profit regardless of other matters and some will take a socially responsible approach taking more care of their stakeholders.

Davis also considers as a source of economic worth the increase of output price, but only when it reflects an increase in the quality of the product. In that case the firm is not using its capacity of influence. Conversely, when the increase of output prices is achieved using its capacity of influence, it is only a rent transfer from the consumer to the firm. These transfers cannot be considered as created value that leads to economic progress. For clarity of the analysis we are not going to consider explicitly the issue related to the quality of goods.

Davis's condition related to the quick re-employment of resources drives us to an interesting turn of our discussion. When this aspect is considered from the perspective of the firm we realize that the current economic theories defend that the firm has to be as efficient as possible in order to maximize profits and survive in the long term. In this

framework it seems to be completely justified to adjust the resources in order to achieve this objective because if the firm does not adjust its resources it is likely to end up as Scherer and Ross (1990, 48) stated:

No matter how strongly managers prefer to pursue other objectives, and no matter how difficult it is to identify profit-maximizing strategies in a world of uncertainty and high information costs, failure to satisfy this criterion means ultimately that a firm will disappear from the economic scene.

When the stakeholder point of view is added to the discussion, particularly when the affected stakeholder is labor, the justified adjustment of resources means more people unemployed and social aspects have to be taken into consideration. The desired social economic progress is not achieved if unemployed people have difficulty in being contracted again in other new productive alternatives. This known mismatch affects social economic progress, as Davis introduced, and it seems reasonable to discuss what can be done to make the lateral displacement of labor from one sector to another as easy as possible. It is also no less important to take the right social measures when the economic cycle is in the recession phase when demand falls. In this case, as we usually observe in most economies, the impact is not negligible and any measure to avoid an extension of the recessive phase should be taken as a part of the sustainability and social responsibility discussion.

In the next subsections we analyze the implications of Davis's concept of economic progress for social economic progress not only considering the productivity aspects. As Davis proposed it will include the implications of the second condition, the reemployment of resources, particularly when discussing human resources. Moreover, we consider the delay in re-employment as an additional social cost to be considered as it can be understood as a source of social inequality. The third condition, related to the balanced distribution of the created worth, will drive us to the analysis of the value distributed or captured. It is relevant which stakeholder is able to capture value, the value that remains in the firm, in order to guarantee its sustainability, and finally which part of the created value is still available to be distributed to the rest of the stakeholders. For that purpose a balanced distribution is a necessary condition. As we have previously demonstrated, the dynamics of influence are variable and can strongly affect the ideal balanced situation where all

stakeholders and firm receive part of the created value. We analyse these implications in the next section.

In order to finish this section we introduce our definition of Social Economic Progress which is stated as

Definition of (firm contribution to) Social Economic Progress:

A firm is contributing to social economic progress when it achieves an increase in productivity and the created wealth from the productivity gains is redistributed following a balanced strategy, at the lowest social costs.

It is worth mentioning that we do not mention re-employment in the definition of social economic progress because we consider that re-employment by the firm is included in the more general condition of “at the lowest social cost”. Re-employment is an example of what the firm can do to minimize unemployment, one of the important sources of inequality and social costs. Re-employment by the firm, as an option to minimize the social cost of unemployment and inequality, has merited little attention in the literature. We review in more detail the implications of re-employment in section 4.6.

Furthermore, we include, as a remark, an extension of this definition

Remark

A firm is called socially responsible when it contributes to social economic progress.

4.3. Methodology

In order to make the concepts we have been discussing in the previous sections operative, we describe here the methodology we will use to develop the theoretical framework regarding social economic progress. Davis introduced the option of economic progress analysis to different levels of aggregation going from national to a single plant which he did not pursue. We have selected the firm, as unit of analysis, as relevant for our discussion as we consider that more aggregated levels are the additive consequence of single firm contributions to social economic progress. However, the methodology that we introduce can be applied to any level of aggregation from national / sectoral to firm level.

4.3.1 Productivity and value creation

We introduce the methodological notation where an output quantity vector of a firm is expressed by $y = (y_1, \dots, y_M) \in \mathbb{R}_+^M$ and its price vector by $p = (p_1, \dots, p_M) \in \mathbb{R}_{++}^M$; an input quantity vector is expressed by $x = (x_1, \dots, x_{N-1}) \in \mathbb{R}_+^{N-1}$ and its price vector expressed by $w = (w_1, \dots, w_{N-1}) \in \mathbb{R}_{++}^{N-1}$. We have omitted the firm's subindex by way of maintaining a simple notation. When more than one firm is involved in the discussion, we will use the corresponding subindex to differentiate them. The set of technologically feasible combinations of output vectors and input vectors is given by the production set $T = \{(y, x): x \text{ can produce } y\}$, which is assumed to be closed and bound and to satisfy monotonicity and no assumption of free lunch (Kumbhakar and Lovell 2000).

We define operating profit π as the difference between the sales revenue $p^T y = \sum p_m y_m$ and non-capital expense $w_{N-1}^T x_{N-1} = \sum_{n=1}^{N-1} w_n x_n$, and so $\pi = \sum p_m y_m - \sum_{n=1}^{N-1} w_n x_n \geq 0$. We consider two time periods indicated by superscripts t and $t+1$ on variables.

A subsequent work by Davis (1955), which complements his 1947 work, explores the notion of productivity and productivity gains and is based on the concept of *investor input*. The central idea is that a firm's operating profit is considered a return, positive or negative, to investors, who allocate it to depreciation, amortization, interest, taxes and retained earnings³⁵. Grifell-Tatjé and Lovell (2015) have studied the theoretical implications of this approach that we follow and borrow the notation.

Davis (1955) treats operating profit as a gross return to capital, and so $\pi = p^T y - w_{N-1}^T x_{N-1} = rK \Rightarrow r = (p^T y - w_{N-1}^T x_{N-1})/K \geq 0$, r being the gross rate of return to capital. Davis expresses investor input, which generates $\pi - rK = p^T y - w_{N-1}^T x_{N-1} - rK = p^T y - w^T x = 0$. The change in $(\pi - rK)$ between periods t and $t+1$ can be expressed as

$$\begin{aligned} (\pi^{t+1} - r^{t+1} K_0^{t+1}) - (\pi^t - r^t K^t) &= [p^{t+1T} (y^{t+1} - y^t) - w_{N-1}^{t+1T} (x_{N-1}^{t+1} - x_{N-1}^t) - r^t (K_0^{t+1} - K^t)] \\ &\quad + [y^{t+1T} (p^{t+1} - p^t) - x_{N-1}^{t+1T} (w_{N-1}^{t+1} - w_{N-1}^t) - K_0^{t+1} (r^{t+1} - r^t)], \end{aligned} \quad (4.1)$$

³⁵ Davis treats depreciation and amortization as a cost of capital, and defines operating profit as earnings before interest and taxes (EBIT). We simplify the analysis by defining operating profit as earnings before interest, taxes, depreciation and amortization (EBITDA).

in which K_0^{t+1} is the deflated value of period $t+1$ capital. The first term on the right side of the equality in (4.1) is a quantity effect, and the second term is a price effect, each showing the impact of quantity changes and price changes. Since the change in $(\pi - rK)$ is zero by construction, the price effect is the negative of the quantity effect, showing a sort of duality between prices and quantities.

The quantity effect has Laspeyres³⁶ form, with quantity changes weighted by period t prices (one of which is r^t , the period t gross rate of return to capital), and the price effect has Paasche form, with price changes weighted by period $t+1$ quantities (one of which is K_0^{t+1} , the deflated period $t+1$ capital stock). Since $(\pi^t - r^t K^t) = (\pi^{t+1} - r^{t+1} K_0^{t+1}) = 0$ we can write the quantity effect as a Laspeyres productivity effect.

$$p^{tT}(y^{t+1} - y^t) - w^{tT}(x_{N-1}^{t+1} - x_{N-1}^t) - r^t(K_0^{t+1} - K^t) = p^{tT}y^{t+1} - \tilde{w}^{tT}x^{t+1}, \quad (4.2)$$

where $\tilde{w} = (w_1, \dots, w_{N-1}, r)$ and $x^{t+1} = (x_1^{t+1}, \dots, x_{N-1}^{t+1}, K_0^{t+1})$. Additionally, we can express (4.2) as

$$\begin{aligned} p^{tT}y^{t+1} - \tilde{w}^{tT}x^{t+1} &= \tilde{w}^{tT}x^{t+1}[(p^{tT}y^{t+1}/p^{tT}y^t)(\tilde{w}^{tT}x^t/\tilde{w}^{tT}x^{t+1}) - 1] \\ &= \tilde{w}^{tT}x^{t+1}[(Y_L/\check{X}_L) - 1], \end{aligned} \quad (4.3)$$

in which $Y_L = p^{tT}y^{t+1}/p^{tT}y^t$ is a Laspeyres output quantity index, $\check{X}_L = \tilde{w}^{tT}x^{t+1}/\tilde{w}^{tT}x^t$ is a Laspeyres input quantity index, and Y_L/\check{X}_L is a Laspeyres total factor productivity index. $Y_L/\check{X}_L \gtrless 1$ signals productivity growth, stagnation or decline, and scaling $[(Y_L/\check{X}_L) - 1]$ by $\tilde{w}^{tT}x^{t+1}$ generates $p^{tT}y^{t+1} - \tilde{w}^{tT}x^{t+1} \gtrless 1$, the value created by productivity change³⁷. Thus Davis's practice of expressing investor input ensures that the quantity effect coincides with the productivity effect. This makes the negative of the price effect a dual productivity effect. The concept of a dual price-based productivity index apparently was introduced by Siegel (1952). Fourastié (1957) was a prolific user of a dual productivity index.

³⁶ The Laspeyres approach has been followed to give clarity to the explanation but it can be generalized to a Bennet approach as we have done in chapter 3.

³⁷ This methodology can be extended using Bennet index but we have chosen this approach for the sake of clarity in the explanation.

4.3.2. Balanced distribution of created value

The second condition of social economic progress states that the distribution of the created value shall be balanced. Davis did not define the term balanced, but the term is consistent with his clearly expressed desire that each recipient group receive a positive share of the value created³⁸. Expression (4.3) measures value creation in the sense of Davis; it shows how productivity changes: Y_L/\check{X}_L , are transformed into money by the firm. This value generated, in economic worth or productivity bonus, is distributed. We use (4.1), (4.2) and (4.3) to obtain (4.4)

$$\check{w}^{tT} x^{t+1} \left[\left(\frac{Y_L}{\check{X}_L} \right) - 1 \right] = -y^{t+1T} (p^{t+1} - p^t) + x_{N-1}^{t+1T} (w_{N-1}^{t+1} - w_{N-1}^t) + K_0^{t+1} (r^{t+1} - r^t), \quad (4.4)$$

When $Y_L/\check{X}_L > 1 \Rightarrow \check{w}^{tT} x^{t+1} [(Y_L/\check{X}_L) - 1] > 0$, which measures the value created by productivity growth to be distributed to the stakeholders appearing on the right side of (4.4). The three groups of beneficiaries are consumers, suppliers of inputs (including capital) and investors. This process of distribution occurs through output prices, input prices and the return to capital in the firm. Furthermore, expression (4.4) makes operative the view of Davis that the main mechanism of distribution of the generated worth is through prices.

Consumers capture value generated by productivity growth, if $p^{t+1} < p^t$ implies that $-y^{t+1T} (p^{t+1} - p^t) > 0$. In general terms, price reductions are expected to result from competitive pressure in product markets, unless of course the firm has bargaining power gained through product market power that enables it to avoid price reductions. As we note in Section 4.2.2, Davis (1947, Ch. VII) considered price increases as a source of economic value only when they are associated with higher quality or a broader range of products. Analysis of value capture by input suppliers and investors proceeds similarly, with $w^{t+1} > w^t$ and $r^{t+1} > r^t$, and with similar quality and bargaining power caveats.

It is a matter of interest the capture of worth coming from different stakeholders involved in the distribution process. It is particularly remarkable when the capacity of influence of one stakeholder is great enough to capture all the value generated. In that case no value will remain for distribution to the other stakeholders. This fact has relevant

³⁸ Davis (1947; Chapter 7) identified six recipient groups: customers, wage and salary workers, suppliers, investors, the business itself and the government. We group wage and salary workers and suppliers in $x_{N-1}^{t+1T} (w_{N-1}^{t+1} - w_{N-1}^t)$ and we group investors, the business itself and government in $K_0^{t+1} (r^{t+1} - r^t)$.

consequences because in this scenario social economic progress cannot be achieved. All the generated value is going only to one stakeholder and the others do not receive or capture any part of the distributed worth. In the case of suppliers any increase in the price of raw materials will have the effect of transferring economic value to them. The suppliers will look for different strategies to increment their part of the value captured (for instance, increasing the quality of goods, using their negotiation power, trying to be monopolistic or giving additional services in order to become differentiated from other competitors and therefore increasing their capacity of influence).

The last term is related to the investors. However the term expresses the mechanism of distributing worth to investors through the increment of $(r^{t+1}-r^t)$. The r shows the retribution of the stock of capital invested in the company. The amount of the worth retained by this stakeholder through the returns will also be linked to the concept of sustainability of the firm as we will see in section 4.4.

Our definition of a balanced distribution of created value is consistent with Davis' desire.

Definition of *balanced distribution*: *The distribution of created value is balanced when each group of stakeholders receives a positive share of the economic value created by the firm, so that $-y^{t+1T}(p^{t+1} - p^t) > 0$, $x_{N-1}^{t+1T}(w_{N-1}^{t+1} - w_{N-1}^t) > 0$ and $K_0^{t+1}(r^{t+1} - r^t) > 0$.*

This definition does not require that all output prices decline or that all input prices increase. It requires only that each stakeholder group benefits from productivity growth.

Davis anticipated that positive values on the left side of (4.4) would lead to an increase in investment, and an increase in the demand for goods and services throughout the economy, both of which would spur re-employment of resources displaced by productivity growth. Other distributions are possible, and have been proposed. Davis discussed, without advocating, three such proposals, that the productivity bonus go largely to labor, or largely to consumers, or largely to investors. As a practical matter, however, the distribution will be determined by the structure of the relevant markets and the negotiating abilities of market participants.

Although it could seem at a first glance that the balanced distribution is an easy requirement to fulfil, there is evidence that this condition is not frequently fulfilled. As an example, Stiglitz, Sen and Fitoussi (2009) noted “*the increase in average working time*

may be itself the consequence of the society's malfunctioning. If inequality becomes pervasive, the number of persons who have to work harder to ensure their living may greatly increase: [...] they may claim that they have no choice but to work harder (though of course they could, were they willing to accept a much lower standard of material consumption than other citizens)". In other words, they would have to accept a decrease in their salary per hour to ensure their living. In that situation, they are not participants of the distributed wealth. Consequently, this is a cause of inequality and the pursued social economic progress is not achieved.

4.4. Sustainability of the firm

The sustainability of the firm is associated with the economic worth created and the part of this worth that the firm is able to retain. Davis did not deal with sustainability. To analyze the concept of sustainability we will use the expression (4.4) particularly the left hand side that measures, in monetary terms, productivity variations. The right side shows separately the different stakeholder groups that can be recipients of value distribution.

We start first considering the situation of productivity decline $Y_L/\check{X}_L < 1$. In terms of Davis this means that the firm is destroying value. But even if $Y_L/\check{X}_L < 1$, investors can still be in a position of retaining value, in other words, it is not compulsory that they lose worth ($K_0^{t+1}(r^{t+1} - r^t) < 0$). This situation could happen if $Y_L/\check{X}_L < 1$ but the customers pay more for the same goods $p^{t+1} > p^t$ or the suppliers are paid less for the same inputs $w^{t+1} < w^t$. It is relevant in terms of sustainability of the firm to note that when $Y_L/\check{X}_L < 1$ the value retained by investors occurs through a value transfer from other stakeholder groups³⁹. The firm, through the productivity effect, is not contributing to its own sustainability. We consider that this situation is worse in terms of sustainability than when $Y_L/\check{X}_L > 1$ because the worth captured by the firm through the investors is only depending on the capacity of influence and not on its internal efforts and capabilities. We consider that the capacity of influence of the stakeholders over the firm through time can be conditioned by different circumstances and each scenario requires a detailed study as has been done in the previous chapters.

We start thinking about what happens if the investors retain all the value generated through the left hand side of the expression (4.4) when $Y_L/\check{X}_L > 1$. All the effort made by

³⁹ We remember here that in the second and third chapter the rents transfer is considered as part of value creation following the approach of willingness to pay. Davis only considers value creation the contribution of productivity.

the firm in order to achieve new or improved processes, new or improved methods of work and organization, or improved quality of productive factors remains for the shareholders. The retention of this value contributes to the sustainability of the firm.

Definition of Firm Self-Sustainability:

The firm is in a situation of “firm Self-sustainability” when the shareholders retain, at least, all the economic worth that the firm has generated through productivity.

We can represent the condition when the investors retain, at least, all the productivity effect as:

$$K_0^{t+1} (r^{t+1} - r^t) \geq \tilde{w}^{tT} x^{t+1} [(Y_L/\check{X}_L) - 1]. \quad (4.5)$$

Only one stakeholder, the investors, receives all the created value. The rest of the stakeholders (consumers, suppliers and labor) receive no benefit from the value created by the firm. If expression (4.5) is a strict inequality, investors are not just capturing the value created through productivity growth, they are also capturing value transferred from consumers, suppliers and/or labor due to its capacity of influence. It describes the best result for the investors and consequently for the sustainability of the firm, although there is no social economic progress because the distribution of value is not balanced.

After the review of the firm self-sustainability concept we introduce the concept of firm sustainability. We define:

Definition of Firm Sustainability:

The firm is in a situation of “firm sustainability” when the economic worth created by the firm through productivity is distributed to the investors as well as other (one or more) stakeholder groups.

Now the economic worth is distributed to investors and to one or more stakeholders and this implies that the investors retain less worth than generated by the firm. Some other stakeholders are able to capture part of the economic worth. We can express this condition as:

$$\tilde{w}^{tT} x^{t+1} [(Y_L/\check{X}_L) - 1] > K_0^{t+1} (r^{t+1} - r^t) \geq 0. \quad (4.6)$$

In this case investors receive less than all of the value generated by productivity growth, leaving some remaining value to be distributed to the remaining stakeholder groups.

When all the generated value is distributed among the stakeholder groups other than investors we reach a situation we call *alert of sustainability*. This situation is defined as:

Definition of Alert of Sustainability:

The firm is in a situation of “alert of sustainability” when the economic value distributed to the remaining stakeholder groups excluding investors exceeds or is equal to the value created by the firm through productivity, so that

$$\tilde{w}^{t+1} x^{t+1} [(Y_L/\tilde{X}_L) - 1] > 0, \text{ but } K_0^{t+1} (r^{t+1} - r^t) \leq 0. \quad (4.7)$$

It is worth noting that in a situation of alert of sustainability the firm is still creating value. The sustainability of the firm is threatened. This is expected to be a transitory situation as the firm knows that it must react quickly to generate wealth from other sources (i.e. pushing down the prices of raw materials or increasing the prices of sold goods).

When the expression (4.7) is equal to zero $K_0^{t+1}(r^{t+1} - r^t) = 0$ we consider the particular situation as *Metastable equilibrium*⁴⁰ of sustainability. It implies that investors do not receive any of the value created by the firm but they do not contribute.

When discussing social economic progress and its relation to the different types of sustainability, some relevant conclusions can be derived from the previous definitions of sustainability. When condition (4.5) of sustainability is satisfied there is no social economic progress because the distribution of created value is not balanced. None of the stakeholder groups, except investors, receive any part of the created value. This closes the option for social economic progress. In the situation of alert of sustainability there is no possibility for social economic progress. In these situations, the investors are not part of the group that receives the economic value created by the firm.

The conclusion is totally different in the *firm sustainability* scenario, which is the only scenario that opens the possibility to having social economic progress. It occurs in a situation where all the relevant groups of stakeholders are receiving a portion of the created value. As a concluding remark the following should be stated:

⁴⁰ We borrow this concept from Physics. Metastable equilibrium implies that the body is in equilibrium but any influence from the environment displaces the equilibrium to a new state.

Remark:

Social Economic Progress is only possible when the firm is in the situation of Firm Sustainability.

To complete this argument it has to be said that the firm can be in the situation of firm sustainability due to its own decision when deciding the part of value to be distributed through prices or due to market or/and stakeholder influence.

4.5. Social created value

Stiglitz, Sen and Fitoussi (2009, 6) outlined “*there is a broad consensus that we need better metrics and that we need to understand the limitations and uses of existing metrics*”. They noted that people deciding about social economic progress are almost flying blind due to the lack of good metrics, particularly because social aspects are out of the economic performance measures. Here, we introduce the impact of social aspects associated with productivity growth when measuring value created. We remember the discussion mentioned in section 4.2.1 in order to introduce the social aspects to be considered in this section. We take into account that there are social aspects that might favor or reduce social economic progress depending on if they result in an increase or a decrease of the total value created. Davis remarked on some of these social aspects caused by productivity growth. He mentioned the painful adjustments associated with changes in the production process. He observed the social impact as a result of changes in social relationships of individuals and families and changes in their way of life. Davis mentioned the inequality due to the loss of jobs. He noted the insecurity created by the displacement of the working force from one employment to another, for instance, due to automatization. He emphasized that this job migration creates an economic loss even if the shift is fairly rapid. Due to its importance, we deal in more detail with this re-employment situation in the next section. We acknowledge that some of the costs can be related to externalities. Environmental aspects are an example that currently have gained a lot of attention, particularly due to the greenhouse effect. Davis mentioned but did not put the focus on wasteful use of resources and the care of the environment but Stiglitz, Sen and Fitoussi (2009) have put more emphasis on the depletion of resources and degradation of environment. They concluded that a measure of social economic progress shall include the quality of life and its subjective determinants, the sustainability of growth and the environment.

In order to make operative the consideration of social aspects, we define profit including social aspects (π_S) using the same terms that we have used in section 4.4.1. but including a term related to social costs. We define $e^T = (e_1, \dots, e_e) \in \mathbb{R}_+^E$ as a positive quantity vector that originates social costs and $s^T = (s_1, \dots, s_e) \in \mathbb{R}_{++}^E$ where $s^T > 0$ is a price or unitary cost vector related to these quantities. When the price is associated to an externality, the price is a shadow price. Then, the term that defines the social costs is $s^T e$. Moreover, the profit including social aspects is defined as $\pi_S = \sum p_m y_m - \sum_{n=1}^{N-1} w_n x_n - rK - s^T e$, where the social cost $s^T e$ is an additional cost to be discounted to the revenue which makes π_S negative. We calculate the change in the social profit π_S between t and $t+1$ as

$$\begin{aligned} \pi_S^{t+1} - \pi_S^t &= [p^{tT}(y^{t+1} - y^t) - w_{N-1}^{tT}(x_{N-1}^{t+1} - x_{N-1}^t) - r^t(K_0^{t+1} - K^t) - s^{tT}(e^{t+1} - e^t)] \\ &\quad + [y^{t+1T}(p^{t+1} - p^t) - x_{N-1}^{t+1T}(w_{N-1}^{t+1} - w_{N-1}^t) - K_0^{t+1}(r^{t+1} - r^t) - e^{t+1T}(s^{t+1} - s^t)], \end{aligned} \quad (4.8)$$

that can be rewritten using expression (4.3) as

$$\begin{aligned} p^{tT}y^{t+1} - \tilde{w}^{tT}x^{t+1} - s^{tT}(e^{t+1} - e^t) &= \tilde{w}^{tT}x^{t+1}[(Y_L/\tilde{X}_L) - 1] - s^{tT}(e^{t+1} - e^t) \\ &= \tilde{w}^{tT}x^{t+1}[(Y_L/\tilde{X}_L) - 1] - s^{tT}e^t(E_L - 1) \end{aligned} \quad (4.9)$$

The left side of expression (4.9) quantifies the social value created by the firm and the right side explains which part of this social value comes from productivity or/and social quantity change. The objective of the firm, in order to contribute to the social economic progress, shall be to increase the value creation through productivity gains and the reduction in the quantities associated to the social costs. The social quantity index defined as $E_L = s^{tT}e^{t+1}/s^{tT}e^t$ is a Laspeyres quantity index associated to the quantities that generates the social costs, where $E_L \gtrless 1$. When $E_L < 1$ indicates a reduction in the quantities that generate social cost, $E_L - 1 < 0$ express it as a percentage of decline, and $-s^{tT}e^t(E_L - 1) > 0$ translates this percentage in created monetary value. This means a positive contribution to the value created of the social term. When $E_L > 1$ means that the quantities that generate social cost increase and, consequently, this increase creates additional social cost ($-s^{tT}e^t(E_L - 1) < 0$). Finally, when $E_L = 1$ implies that no change occurs between the quantities of period t and $t+1$ ($e^{t+1} = e^t$) and the contribution of the social effect to the value created equals zero.

To clarify the different situations that can happen regarding social value creation, we have constructed the Table 4.1.

Table 4.1. Value creation considering social costs

		Social quantity index	
		$E_L < 1$	$E_L > 1$
Productivity index	$\frac{Y_L}{\check{X}_L} > 1$	NW $\check{w}^T x^{t+1} [(Y_L/\check{X}_L) - 1] - s^T e^t (E_L - 1) > 0$	NE $\check{w}^T x^{t+1} [(Y_L/\check{X}_L) - 1] - s^T e^t (E_L - 1) \geq 0$
	$\frac{Y_L}{\check{X}_L} < 1$	SW $\check{w}^T x^{t+1} [(Y_L/\check{X}_L) - 1] - s^T e^t (E_L - 1) \geq 0$	SE $\check{w}^T x^{t+1} [(Y_L/\check{X}_L) - 1] - s^T e^t (E_L - 1) < 0$

Table 4.1 shows the four possible quadrants (NW, NE, SW, SE) defined by the results of the productivity index and the social quantity index. The table does not consider the uninteresting case in which the indexes take the value equal to one.

We start considering the best possible situation (NW), in which there are productivity gains ($Y_L/\check{X}_L > 1$) and, at the same time, reductions in the quantities ($E_L < 1$) that produce the social costs. We name this scenario *strong value created* as both terms contribute to value created. We consider it is a good practice that public policies are oriented to favor this situation. As an example, we mention the policies oriented to boosting organizational changes that favor productivity increases and are designed to reduce accidents at work and absenteeism.

In contrast, the SE quadrant of Table 4.1 shows the worst case, in which there is a productivity decline ($Y_L/\check{X}_L < 1$) and, at the same time, an increase ($E_L > 1$) in the quantities that produce social costs. As a first example, we consider the scenario where a firm abandon, for any reason (i.e. cost), an efficient and safe technology. It adopts a cheaper alternative which increases labor accidents. A second example can be a situation of technical obsolescence. For instance, we consider a logistic fleet of trucks that is not replaced in due time. As a result, the fleet gets old, the productivity drops mainly due to loss of engine efficiency and consequently an increment in carbon dioxide emissions takes

place, affecting the environment. Both situations are destroying economic value through productivity decline and, additionally, they are increasing the social costs. This scenario is unacceptable from a social economic progress perspective and it should be avoided.

What the SW and NE quadrants have in common is that we can not guess in advance if the result of the sum of productivity and social effects will be value creation or value destruction. In the SW we consider a productivity decline ($Y_L/\check{X}_L < 1$) but a simultaneous reduction in the quantities related to social costs ($E_L < 1$). We consider the example of implementing an environmental management system and a technology that reduces the contamination but needs additional environmental controls. It results in an overall productivity decrease due to the extra need of resources. It has been a matter of debate if policies, processes or innovations that imply losses in productivity but improvement in social aspects have to be favored. As an example, we refer to the 1980s where the introduction of antipollutant technology in electric power manufacturing centres reduced their productive efficiency. Nevertheless, the consolidation of that technology in the sector and the extension to other industrial sectors demonstrate that the social benefit achieved compensates the loss of productivity

The last quadrant, NE, represents an increase in the productivity ($Y_L/\check{X}_L > 1$) and a simultaneous increase in the quantities related to social costs ($E_L > 1$). We recognize that this combination is not an infrequent situation. For instance, when a firm adopts a more productive technology based on organic fuel that increases the emission of carbon dioxide contamination that finally results in an increment of the greenhouse effect. Moreover, increases of productivity due to outsourcing and offshoring processes might increase transport needs and result in additional pollution related to the logistics of intermediate materials. Another example that fits in the NE quadrant, and we analyze in the next section, is a technical change. It increases the productivity of the firm but results in a reduction of employees needed and increased social costs in the case that it causes higher unemployment. The desirable objective would be that the increments of those social costs are lower than the productivity gains.

On the other hand, to discuss the distribution of value created when including the social aspects to the different stakeholders we equate created value (left side) with distributed value (right side). Then we obtain expression (4.10).

$$\begin{aligned} \tilde{w}^{tT} x^{t+1} [(Y_L/\check{X}_L) - 1] - s^{tT} e^t (E_L - 1) = \\ -y^{t+1T} (p^{t+1} - p^t) + x_{N-1}^{t+1T} (w_{N-1}^{t+1} - w_{N-1}^t) + K_0^{t+1} (r^{t+1} - r^t) + e^{tT} (s^{t+1} - s^t) + \pi_S^{t+1} - \pi_S^t \end{aligned} \quad (4.10)$$

This expression that shows social value created and its distribution presents some limitations in its interpretation. We note that each of the two terms of the left side of expression (4.10) are related to a different group of stakeholders. First, as can be read in expression (4.4), the productivity bonus is distributed only to customers, suppliers and investors. The new social stakeholders, represented by $e^{tT}(s^{t+1} - s^t)$, do not appear in that expression. Conversely, the social contribution to value ($-s^{tT}e^t(E_L - 1)$) can only be captured by the stakeholders represented by the terms ($e^{tT}(s^{t+1} - s^t)$ and $(\pi_S^{t+1} - \pi_S^t)$) included in the right side of expression (4.10). The identification of who these stakeholders are and the assignation of each term to a particular group of stakeholders needs future research and it goes beyond the scope of this work.

Finally, to end this section, we introduce the idea of *social firm sustainability* extending what we have discussed in the previous section 4.4. We include the social term in the definition of firm sustainability, the only case that opens the door to social economic progress. Its definition is:

The firm is in a situation of “social firm sustainability” when the economic worth created by the firm through productivity is distributed to the investors as well as other (one or more) stakeholder groups and the quantities that originate social cost decrease.

We can express this condition as:

$$\tilde{w}^{tT} x^{t+1} [(Y_L/\check{X}_L) - 1] > K_0^{t+1} (r^{t+1} - r^t) \geq 0 \text{ and } -s^{tT} e^t (E_L - 1) > 0$$

This definition implies that the firm is in the NW quadrant of Table 4.1 fulfilling the condition of strong value creation. The firm is creating value and at the same time a social cost reduction is achieved. The balanced distribution is still possible as the investors and other stakeholders can participate in the distribution. The increase in productivity has been achieved at lowest social cost. From our stand point, this is the best scenario from the social progress perspective and allows the sustainability of the firm.

4.6. Re-employment of resources

This section will deal with the need of rapid re-employment after a productivity change that results in a release of resources. It is an example of the scenario described in the NE quadrant of Table 4.1. The social consequences of the adjustment of resources will be different depending whether the firm faces a situation of economic growth, henceforth upsizing, or a recession where demand is reduced, henceforth downsizing. In any case it is worthwhile remembering what Davis (1947:63) stated regarding re-employment and its rapidity. This statement is particularly relevant when human resources are involved.

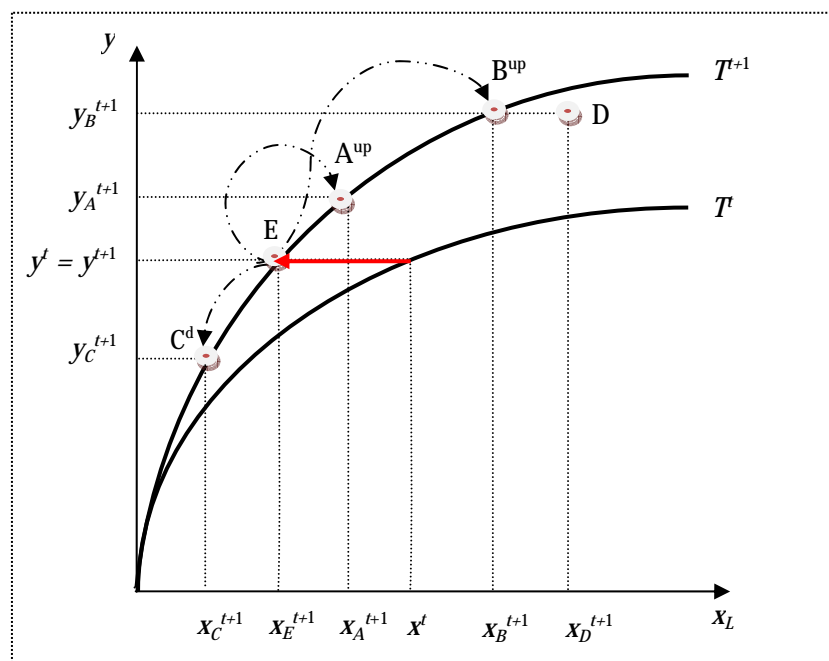
Though the degree of re-employment required to maintain progress may vary with circumstances, it can be taken as a guide that a short period of idleness is to be preferred to a longer one. For the shorter the period, the less interruption to production, and the sooner the total output of all goods and services can be expanded as a result of resource savings made possible by increased efficiency, or at least restored to something like former levels where displacement has not been caused by increased efficiency. In addition, it means less social cost in terms of unemployment. Thus the emphasis in the study of the conditions of re-employment is on those conditions which affect the period of unemployment –the rapidity with which the displaced factors of production again become employed.

Re-employment, that results in a reduction of social costs, is a condition for social economic progress. It is well known that re-employment of exceeding resources is not always easy and immediate, as a consequence, and the social cost impact is not negligible. Both scenarios, the upsizing and the downsizing will be analyzed in this section and their consequences for re-employment, particularly for the decisions that have to be taken by the firm in relation to the level of internal re-employment.

For the simplicity of the exposition that follows we consider a firm with one output and one input ($M=N=1$) and a technology, in two different periods of time, t and $t+1$. Figure 4 reproduces the situation on the assumption of positive technical change ($T^t \subseteq T^{t+1}$). It shows an improvement in technology between period t and $t+1$. The technology improvement is consolidated as an increase of productivity meaning that it is possible to produce the same level of output (y) with less resources (x). Figure 4 shows an efficient

firm with the production set (x^t, y^t) in period t and (x_E^{t+1}, y^{t+1}) in period $t+1$, where $x_E^{t+1} < x^t$ and $y^{t+1} = y^t$. In this case $Y_L/\check{X}_L > 1$ with $Y_L = y^{t+1}/y^t = 1$ as $y^{t+1} = y^t$, and $\check{X}_L = x_E^{t+1}/x^t < 1$ which implies positive economic worth, $\check{w}^{tT} x^{t+1} [(Y_L/\check{X}_L) - 1] > 0$. It is important to stress that none of the restrictive assumptions of the example are necessary for the methodology presented in the previous section.

Figure 4. Technical change with an increase of productivity in an upsizing and downsizing of demand



Let's assume that the firm taken develops its activity in a growing economy. In this context it is expected that the demand and production of period $t+1$ will be higher than the previous one. Figure 4 represents this situation with the following possible sets of production (x_A^{t+1}, y_A^{t+1}) and (x_B^{t+1}, y_B^{t+1}) depending on the level of demand.

It is worthwhile noting that the expected impact of the reduction of resources by means of technical change $(x^t - x_E^{t+1})$ is minimized by the upsizing situation. In the first endpoint (A^{up}) the exceeding resources will be less than expected and corresponding to $(x^t - x_A^{t+1}) < (x^t - x_E^{t+1})$. This means that the social impact will be minimized by the increase of demand. The firm will be able to use the released resources inside the firm. Then the conclusion is, the greater the increase of demand, the less the social impact, as the adjustment of human resources will be lower. In the second endpoint (B^{up}) there is no

social impact as $x_B^{t+1} > x^t$, hence the contrary, the firm is able to contract more resources than previously used, contributing to the absorption of unused resources of the whole economy and favoring the possibility of social economic progress. Thus, the described example fulfills the social economic progress conditions: i) generation of economic value through increase of productivity, and ii) reemployment of the exceeding resources that reduces the quantities that generate social costs. Under these premises we cannot guess any conclusion about the third condition of balanced distribution of the economic worth so we cannot confirm the social economic progress.

Different aspects have to be considered when the same firm is introduced in a context of firm downsizing and a contraction of the economy. The social consequences of the downsizing scenario are totally different than in upsizing. The set of production (x_C^{t+1}, y_C^{t+1}) describes this scenario graphically in Figure 4. Now, the reduction of resources has two different components to be considered. The first is derived from the increment of productivity $(x^t - x_E^{t+1})$ and the second due to less resources being needed to manufacture the output as the level of demand has decreased and the exceeding resources for this reason is $(x_E^{t+1} - x_C^{t+1})$.

The social impact will be deeper than in the upsizing scenario as the firm needs much less resources in $t+1$ $(x^t - x_C^{t+1}) > (x^t - x_E^{t+1})$ to produce a lower level of output. Focusing the attention on the observed endpoint (x_C^{t+1}, y_C^{t+1}) we realize that it will capture technical change and at the same time the decrease of demand. Therefore, we note that economic worth will still be created as $y_C^{t+1} / x_C^{t+1} > y^t / x^t$ which implies a positive value of expression (4.3). Being coherent with what we have exposed it has to be assumed that this value could be captured by the shareholder or be distributed to other stakeholders as well. It is interesting to note that this generated value can still be distributed to stakeholder labor. It means that the workers that are still employed by the firm are likely to be receptors of the generated value if their salary increases. This creates a dual situation for stakeholder labor, part of them become unemployed and part of the workers receives better salaries.

4.6.1. Firm re-employment

To make operative the Davis *re-employment* concept applied to the firm we need to recall the general situation with M outputs and N inputs defined in the methodological section 4.3. We have $y^{\mathcal{T}} = (y_1^{\mathcal{T}}, \dots, y_M^{\mathcal{T}})$ and $x^{\mathcal{T}} = (x_1^{\mathcal{T}}, \dots, x_l^{\mathcal{T}}, \dots, x_N^{\mathcal{T}})$, with $\mathcal{T} = t, t+1$, where $x_l^{\mathcal{T}}$ expresses the observed quantity of labor in period \mathcal{T} . Furthermore, we need to

define a starting point which should be based on a specific behavior of the firm that is used as a benchmark.

The analysis that follows takes a behavior of cost minimization as a benchmark. We have that $x_{CE}^{t+1}(y^{t+1}) = \{x_{1CE}^{t+1}(y^{t+1}), \dots, x_{lCE}^{t+1}(y^{t+1}), \dots, x_{NCE}^{t+1}(y^{t+1})\}$ defines the cost efficient vector of inputs that produces the output vector y^{t+1} with the technology of period $t+1$; $x_{lCE}^{t+1}(y^{t+1})$ and $x_{lCE}^{t+1}(y^t)$ denote the cost minimizing quantities of labour to produce y^{t+1} and y^t respectively.

We can define the firm *re-employment effect* ($\Gamma_{re-employment}$) as:

$$\Gamma_{(re-employment)} = \frac{x_l^{t+1}}{x_{lCE}^{t+1}(y^t)}, \quad (4.11)$$

which is the ratio between the observed level of labour in period $t+1$ and the cost efficient quantity of labour to produce y^t with the technology of period $t+1$. In terms of the simplified situation of Figure 4, the numerator of (4.11) is defined by x_A^{t+1} , x_B^{t+1} or x_C^{t+1} and the denominator by x_E^{t+1} . It has to be said that Γ can take bigger values, equal to or less than 1. $\Gamma < 1$ expresses a downsizing situation and its importance is given by the departure from value one. With $\Gamma \geq 1$, the firm is contracting more workers or the same amount as the cost efficient firm needs to produce the previous level of production (period t). This result is possible in an upsizing and a downsizing situation.

We can extract additional information from the expression (4.11) as it can be rewritten as:

$$\Gamma_{re-employment} = \frac{x_l^{t+1}}{x_{lCE}^{t+1}(y^{t+1})} \cdot \frac{x_{lCE}^{t+1}(y^{t+1})}{x_{lCE}^{t+1}(y^t)}, \quad (4.12)$$

where the first expression of the right hand side defines a *misallocation effect* and the second expression an *efficient re-employment effect*. The misallocation effect is defined by the ratio between the observed quantity of labour in period $t+1$ and the cost efficient quantity of labour needed in that period. The *misallocation effect* can take a value higher or equal to one. When $x_l^{t+1} > x_{lCE}^{t+1}(y^{t+1})$, there is an excess of resources employed by the firm in $t+1$ in relation to the cost efficient quantity of labour needed. In Figure 4, we have identified the point D as an example of this situation of inefficiency. Regarding the efficient re-employment effect in expression (4.12), it expresses the quantity of cost

efficient labour that the firm is able to absorb in an upsizing situation or that which should be adjusted in a downsizing situation. A value higher than one expresses the first situation and lower than one the second. When there is no change in the firm's demand, the efficient re-employment effect takes a value equal to one.

The re-employment effect is one of the expressions that explains the observed employment variation between period t and $t+1$. We have:

$$\begin{aligned} \frac{x_l^{t+1}}{x_l^t} &= \frac{x_l^{t+1}}{x_{l_{CE}}^{t+1}(y^t)} \cdot \left[\frac{x_{l_{CE}}^{t+1}(y^t)}{x_{l_{CE}}^t(y^t)} \cdot \frac{x_{l_{CE}}^t(y^t)}{x_l^t} \right] \\ &= \frac{x_{l_{CE}}^{t+1}(y^{t+1})}{x_{l_{CE}}^{t+1}(y^t)} \cdot \frac{x_{l_{CE}}^{t+1}(y^t)}{x_{l_{CE}}^t(y^t)} \cdot \left[\frac{x_l^{t+1}/x_{l_{CE}}^{t+1}(y^{t+1})}{x_l^t/x_{l_{CE}}^t(y^t)} \right], \end{aligned} \quad (4.13)$$

In the first equation three components explain the observed rate of employment change. The first expression of the right hand side is the *re-employment effect*, the second *the technical change effect* and the third the inverse of the *misallocation* effect in period t . The *technical change effect* is defined by the ratio between the cost efficient quantity of labour to produce the output vector y^t with the technology of period $t+1$, and the cost efficient quantity of labour to produce the same vector of output, with the technology of period t . This ratio measures the impact of technical change and can take a value higher, equal or lower than one. A value lower than one means positive technical change because less quantity of labour is needed to produce the same quantity of output. A value higher than one reflects decline, and no variation with a value equal to one. But, this ratio is also sensitive to substitution processes between inputs as a response to changes in the relationship of their prices.

In the second row of the equation (4.13) the re-employment effect is substituted by its decomposition given by (4.12). In this second row the observed employment variation is explained by the efficient re-employment effect, the technical change effect and the misallocation change effect. The *misallocation change effect* compares the misallocation of period $t+1$ with the misallocation of period t . When the misallocation of period $t+1$ is higher than period t , the misallocation change effect takes a value higher than one, lower than one when the misallocation of period $t+1$ is lower and equal to one with no variation.

4.7. Labor company stakeholder responsibility

The social consequences of the unemployed human resources after a downsizing situation are devastating for the society. Conversely with the situation of economic growth, in a downsizing context of the economy no other sectors will be able to absorb the exceeding resources quickly. Therefore an undesired social situation will occur where the unemployed cannot find a new job. There will not be social economic progress despite the economic worth generated. The condition of quick reemployment is not fulfilled as the unemployed resources cannot be contracted again by the productive sector. It is also worth mentioning that as a consequence of this recessive scenario a vicious circle can be initiated where less output is necessary to be manufactured and as a consequence less people are needed by the firms. The list of unemployed grows and they find severe difficulties in rejoining the productive economy. In this context it is worth analyzing if the firm can be stakeholder responsible with labor in order to contribute to mitigate this vicious circle.

For that reason we introduce into the discussion of this section the concept of company stakeholder responsibility as applied to human resources. This company stakeholder responsibility can also be extended to a situation where the combined effect of productivity and demand generates a final quantity of labor lower than that which was initially contracted. In Figure 4, the point (x_A^{t+1}, y_A^{t+1}) reflects this situation, where $x_A^{t+1} < x^f$. We analyze what would happen regarding social economic progress if the firm decided, during a certain period of time, to accept using more human resources than the efficient quantity needed.

The relevant questions are about whether the firm has to or should be forced to cooperate in the minimization of the social cost of unemployment thus being *socially inefficient* or *socially responsible* in the sense of being stakeholder responsible with labor.

This decision will be inefficient from the point of view of the firm as it generates a higher cost. However it is expected that it will have a positive social impact when it avoids the uncontrolled increase of unemployed people and its related costs. The advantage for the firm is that the workers will remain in the company, trained and active, waiting for the change of the economic cycle. Then the firm will be prepared when economic growth starts again. When this change occurs the real positive compensation for the firm will be a quicker and stronger reaction resulting in a competitive advantage over the non-stakeholder responsible firm. The latter will have to hire untrained and under skilled people

and additionally spend time and resources to train them in order to be efficient again. They will need time to be as productive as the firm with skilled people. Stakeholder responsible company behaviour is intended to create less tension in the labour market and speed up the recovery of the economy and social economic progress when the economic conjuncture changes. This stakeholder responsible behavior of the firm contributes to value created through reduction of social costs.

Coming back to Figure 4 we analyze the impact and consequences of stakeholder responsible policy. We note that there are some hurdles to be overcome by the firm. We remind you that the firm has to be competitive in the market where it is operating. This is a necessary condition in order to avoid being expelled from the market by firms with superior cost structure that can fix prices below the cost of the stakeholder responsible firm. Henceforth the sub index CE will define a cost efficient behaviour of firm j . The unitary cost efficient of firm j , in period $t+1$, can be defined as $uc_{CEj}^{t+1} = (w^{t+1}x_{CEj}^{t+1})/y^{t+1}$, where the price of the input w^{t+1} is given. The unitary cost of a stakeholder responsible firm i that uses more resources for achieving the same output would be $uc_i^{t+1} = (w^{t+1}x_i^{t+1})/y^{t+1}$. As $x_i^{t+1} > x_{CEj}^{t+1}$, then $uc_i^{t+1} > uc_{CEj}^{t+1}$. When they compete the cost efficient firm j is able to fix prices p_j^{t+1} in a way that $uc_{CEj}^{t+1} \leq p_j^{t+1} \leq uc_i^{t+1}$. In that case the stakeholder responsible firm i is not expected to survive in the market as its unitary cost is greater than the price fixed by the cost efficient firm j . This means that all the workers employed in the stakeholder responsible firm will become unemployed in the short and medium run. This is a result which is contrary to the idea of social economic progress and, of course, it means that stakeholder responsible behavior is not sustainable through time.

Thus, to be competitive, the stakeholder responsible firm has to compensate the additional costs if the firm wants to survive in the market. It has to maintain the same level of unitary cost despite the extra resources employed. The quantity to be compensated is at least the difference between the unitary cost of the stakeholder responsible firm i and the price fixed by the cost efficient firm j as $uc_i^{t+1} - p_j^{t+1}$. We expect that the competition in the market will bring the price of the product equal to the minimum unitary cost. Thus, the cost efficient firm j fixes the price $p_j^{t+1} = uc_{CEj}^{t+1}$ and then the extra cost to be compensated by the stakeholder responsible firm i is $uc_i^{t+1} - uc_{CEj}^{t+1}$.

The stakeholder responsible firm has to find mechanisms of compensation in order to maintain the competitiveness. If there are no compensating mechanisms available the

quantity of resources must be equal and cost efficient for both firms, and, consequently, their unitary cost. As a result, the firm cannot implement stakeholder responsible policies.

We compare the unitary costs defined by the difference: $uc_i^{t+1} - uc_{CE_j}^{t+1}$, in order to know the total amount to be compensated by the stakeholder responsible firm. Following Grifell-Tatjé and Lovell (2015), we consider $z_i^{t+1} = x_i^{t+1}/y^{t+1}$ and $z_{CE_j}^{t+1} = x_{CE_j}^{t+1}/y^{t+1}$ and the price of the input, w^{t+1} , may be different for firms i and j . Comparing the unitary costs we obtain

$$\begin{aligned} uc_i^{t+1} - uc_{CE_j}^{t+1} &= w_i^{t+1} z_i^{t+1} - w_j^{t+1} z_{CE_j}^{t+1} \\ &= w_j^{t+1} (z_i^{t+1} - z_{CE_j}^{t+1}) + z_i^{t+1} (w_i^{t+1} - w_j^{t+1}), \end{aligned} \quad (4.14)$$

which can be rewritten as

$$uc_i^{t+1} - uc_{CE_j}^{t+1} = w_j^{t+1} z_i^{t+1} \left[\frac{w_i^{t+1}}{w_j^{t+1}} - \frac{x_{CE_j}^{t+1}}{x_i^{t+1}} \right]. \quad (4.15)$$

We can establish now the condition under which the unitary costs are equal. This means that the expression in brackets in (4.15) should be equal to zero. The price that should be paid by the stakeholder responsible firm is $w_i^{t+1} = w_j^{t+1} \theta_i^{t+1}$, where $\theta_i^{t+1} = x_{CE_j}^{t+1}/x_i^{t+1} \leq 1$ this parameter θ_i expresses the degree of inefficiency assumed by the stakeholder responsible firm i .

As a result, taking into consideration that the stakeholder responsible decision of contracting more workers than necessary implies $x_i^{t+1} > x_{CE_j}^{t+1}$, we can conclude, using expression (4.15) that $w_i^{t+1} < w_j^{t+1}$ as $w_i^{t+1} = w_j^{t+1} \theta_i^{t+1}$. This result shows that only the reduction of the price of the input factor, as a compensating mechanism, is able to make equal the unitary cost of both firms. The price w_i must be exactly adjusted by the level of inefficiency θ_i assumed by the stakeholder responsible firm i .

4.8. Compensation mechanisms

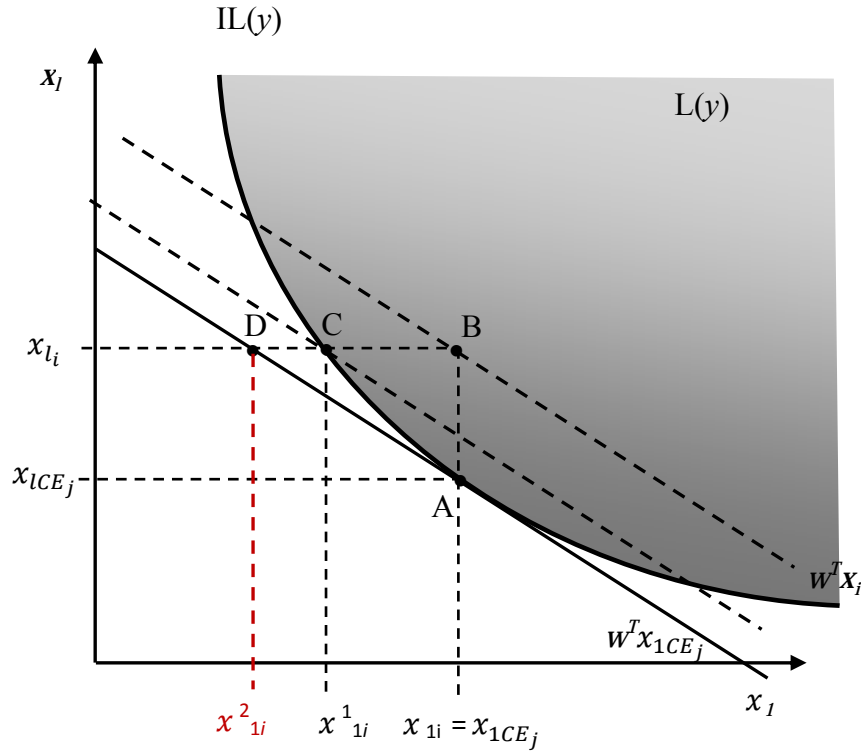
In this section it is investigated if by generalizing the simple example of the previous section the stakeholder responsible firm has another mechanism of compensation other than the reduction of input prices. We anticipate that there is not an alternative way.

But, before proceeding, we have to consider the situation where the firm translates the social inefficiency to higher output prices. It is worth recalling that we have excluded the possibility that firms create economic value through higher prices except when this increase is related to better quality of goods. Thus, the willingness to pay higher prices for equivalent products is not considered as a source of economic worth. We have to mention that it is not clear that consumers would be willing to pay more for equivalent products only for the reason they are produced by a company stakeholder responsible with human resources. It is only an economic transference from customers to firm in order to support the responsibility of the firm over one of its stakeholders, the labour force. In this case, the compensation mechanism is the higher prices of products. But, in fact, when it happens, the firm is not increasing its contribution to the generated worth. It is only using a different kind of influence over the customers that results in additional rents from them.

There is no other possible mechanism than the reduction in input prices. We draw this conclusion with the help of Figure 5, which shows a situation with two inputs $x = (x_0, x_1)$, one of them labour, and an output vector (y) . It can easily be generalized to multiple inputs as we will do later. In Figure 5, the set of input vectors that are feasible for any given y is the input set $L(y)$, which is bounded below by the input isoquant $IL(y)$. The total cost of production of the cost efficient firm j is $C_{CE_j} = w^T x_{CE_j}$ and the total cost of the stakeholder responsible firm i is $C_i = w^T x_i$, the price vector $w = (w_0, w_1)$ is considered the same for both firms.

In Figure 5, the firm j is represented by the point A and it is producing at minimum cost. We consider the increase of employees in the stakeholder responsible firm i as $x_{1_i} > x_{1_{CE_j}}$, the point B in the figure expresses this situation. It is easy to realize that the costs of the stakeholder responsible firm are higher than the efficient firm as $w^T x_i > w^T x_{CE_j}$. This situation is expressed in the Figure 5 by comparing the dotted line $w^T x_{CE_j}$ with the line $w^T x_i$. This higher cost remains true despite the attempt of the stakeholder responsible firm i to use the non-related labour factor more efficiently when reducing x_{1_i} to $x_{1_i}^1$, the point C in Figure 5. Consequently the firm is increasing the partial productivity of this factor and, additionally, it is technically efficient. The cost is reduced, but it is still higher than the cost of the cost efficient firm as is shown in Figure 5.

Figure 5 . Compensating mechanism. Partial productivity



The stakeholder responsible firm i can only have the same total cost as the cost efficient firm at point D. It means using less quantity of the non-related labour input to the level $x_{1i}^2 < x_{1i}^1$. But this combination of factors (x_{li}, x_{1i}^2) which defines the point D, is not achievable with the current technology $L(y)$. Despite the efficient adjustment of the non-related labour input a certain loss of allocative efficiency is still pending to be compensated. As we have seen in the previous simpler example the only remaining adjustment mechanism is the input prices. As a consequence, the equation (4.15) can be generalized to any amount of outputs and inputs (Grifell-Tatjé and Lovell, 2015) and rewritten as

$$uc_i^{t+1} - uc_{CE_j}^{t+1} = w_j^{t+1,T} z_i^{t+1} \left[\frac{z_i^{t+1,T} w_i^{t+1}}{z_i^{t+1,T} w_j^{t+1}} - \frac{w_j^{t+1,T} z_{CE_j}^{t+1}}{w_j^{t+1,T} z_i^{t+1}} \right]$$

$$= \sum_{h=1}^N w_{jh}^{t+1} z_{ih}^{t+1} \left[\frac{w_{ih}^{t+1}}{w_{jh}^{t+1}} - \frac{z_{CE_j}^{t+1}}{z_{ih}^{t+1}} \right], \quad (4.16)$$

where $z_i = \{x_{1i}/Y_i, \dots, x_{Ni}/Y_i\}$ and $z_{CE_j} = \{x_{1CE_j}/Y_j, \dots, x_{NCE_j}/Y_j\}$ with Y_i and Y_j defining an output level for firm i and j respectively (Eichhorn and Voeller 1976). The right hand side

of the first row of expression (4.16) is the generalization of expression (4.15) for the case of multiple inputs and outputs. The second row shows that the difference in the unitary cost between the two firms is equal to the sum of the results from the direct comparison between their partial productivities and input prices.

Based on the first row of equation (4.16), it can be easily demonstrated that when trying to maintain the unitary cost of firm i and j at the same level a price adjustment mechanism has to be used. As a result of the stakeholder responsible behaviour $w_j^{t+1,T} z_i^{t+1} > w_j^{t+1,T} z_{CE_j}^{t+1}$ and then the only way to compensate the disequilibrium created by the extra resources used by firm i is to pay less for the inputs. Therefore, from the first row of expression (4.16), it has to be fulfilled

$$\begin{aligned} z_i^{t+1,T} w_i^{t+1} &= \left[\frac{w_j^{t+1,T} z_{CE_j}^{t+1}}{w_j^{t+1,T} z_i^{t+1}} \right] (z_i^{t+1,T} w_j^{t+1}) \\ &= \theta_i^{t+1} (z_i^{t+1,T} w_j^{t+1}) \end{aligned} \quad (4.17)$$

where $(w_j^{t+1,T} z_{CE_j}^{t+1} / w_j^{t+1,T} z_i^{t+1}) = \theta_i^{t+1} < 1$. As before, θ collects the productivity gap between the two firms. This means that at least one of the prices of productive factors of stakeholder responsible firm i has to be lower than the corresponding price of the cost efficient firm j . It is interesting to note that expression (4.17) does not exclude the possibility that some other prices are also simultaneously incremented by firm i . It has to be said that when this happens the price or prices that participate in the compensation mechanism have to support a bigger reduction in order to obtain the same unitary cost as the cost efficient firm. As a result, we can state the following remark:

Remark

Only the price compensation mechanism is able to maintain the competitiveness of the stakeholder responsible firm. The input prices have to be diminished accordingly with its lower level of allocative efficiency.

The question is which price or prices should be lower. Different options can be considered as a price compensation mechanism depending on whom is assuming the load of the adjustment. In order to compensate the extra resources maintained by the stakeholder responsible firm it is necessary that one or more stakeholders assume the

responsibility of being part of the pricing compensating mechanism thus reducing the prices they obtain and consequently their compensation.

As a framework of this discussion we use the second row of expression (4.16) where the effect of price variation related to each stakeholder group can be easily assessed. On the one hand, we have to take into consideration the adjustment related to making the unitary costs of firm i and j equal. On the other hand, we need to add to the analysis that the behaviour of the stakeholder responsible firm should allow the fulfilment of social economic progress conditions.

The following alternatives have to be considered:

- i) the cost of the compensation mechanism is fully assumed by the stakeholder labor
- ii) the cost is assumed by the shareholder
- iii) the cost is transferred to the suppliers
- iv) a combination of previous options

Let's start the analysis with the first option hypothesizing that the stakeholder responsible firm, despite its assumed inefficiency, is still creating economic value. This supposition enables the first condition of social economic progress and additionally enables that stakeholder labor can capture part of this value. Still, the salary in firm i has to be reduced compared to cost efficient firm j . Davis (1947,127) recognized the existence of this mechanism stating "that the less efficient plants would have a lower wage scale than more efficient". But, the reduction is lower than its level of allocative inefficiency. This result can be seen with the help of Figure 5, where the point C shows that the partial productivity of inputs other than labour are bigger for the stakeholder responsible firm i than for the cost efficient firm j i.e. $z_{il}^{t+1} > z_{CEjl}^{t+1}$, but $z_{ih}^{t+1} < z_{CEjh}^{t+1}$ $h \neq l$. Rewriting the second row of expression (4.15), isolating the factor related to labour, will obtain:

$$uc_i^{t+1} - uc_{CEj}^{t+1} = w_{jl}^{t+1} z_{il}^{t+1} \left[\frac{w_{il}^{t+1}}{w_{jl}^{t+1}} - \frac{z_{CEjl}^{t+1}}{z_{il}^{t+1}} \right] + \sum_{h \neq l} w_{jh}^{t+1} z_{ih}^{t+1} \left[\frac{w_{ih}^{t+1}}{w_{jh}^{t+1}} - \frac{z_{CEjh}^{t+1}}{z_{ih}^{t+1}} \right], \quad (4.18)$$

where the second expression of the right hand side of (4.18) is negative when all the prices, excluding the price of input labour, are equal ($w_{ih} = w_{jh}$ si $h \neq l$). This implies that the reduction in the remuneration of labour is less than the inefficiency caused by the additional quantity of contracted workers. We have:

$$\frac{z_{CEjl}^{t+1}}{z_{il}^{t+1}} w_{jl}^{t+1} < w_{il}^{t+1} < w_{jl}^{t+1}, \quad (4.19)$$

where the price of labour of the stakeholder firm is lower than the cost efficient firm, but higher than the adjusted price by the level of allocative inefficiency.

In the situation described in expression (4.19), the salary in the stakeholder responsible firm i can still be higher in time $t+1$ than in time t . The condition $w_{il}^{t+1} > w_{il}^t$ assures the capture of value by stakeholder labor. Conversely, whether the price reduction results in $w_{il}^{t+1} \leq w_{il}^t$, social economic progress is not possible because the necessary condition of balanced distribution is not fulfilled. This condition represents an important additional restriction for the behavior of the stakeholder responsible firm limiting the number of employees that can be maintained in the firm.

Let's continue with the analysis of the second situation when the shareholders are assuming the cost of stakeholder responsibility by themselves. In that case shareholders will receive less return of their investment than the shareholders of a cost efficient firm. Again the necessary condition for achieving social economic progress demands that they still capture value. If the return in time $t+1$ is inferior to the return in time t social economic progress is not possible.

In the third option we assume the firm is able to transfer the cost of the stakeholder responsibility to the suppliers. In that case the price of supplier inputs are lower in the stakeholder responsible firm than in the cost efficient firm. Social economic progress is not feasible if the supplier prices of the stakeholder responsible firm in time $t+1$ are lower than the prices that the cost efficient firm in time t obtain. This is because these suppliers as stakeholder are not able to receive any part of the generated worth.

The three previous scenarios are expected to have opposition from the corresponding affected stakeholder. It will be really difficult for the workers, shareholders or suppliers to accept all the load of the adjustment by themselves, although the stakeholder labor is the only beneficiary. It seems more reasonable, for the sake of social economic progress, that all the stakeholders involved contribute in a balanced manner to the adjustment, as all of them will receive part of the benefit of the social economic progress.

4.9. Concluding remarks

Stiglitz, Sen and Fitoussi (2009) highlighted the need of developing new measures of social progress that avoid the bias introduced by the economic performance measures. We have retrieved Hiram S. Davis's contributions to the economic progress as they have not been considered in depth. Our work has demonstrated that Davis's ideas are compatible with the social progress proposed by Stiglitz, Sen and Fitoussi and we have operationalized and extended them to develop a measure of social economic progress at a firm level that can be extended to the different levels of aggregation of the economy.

Regarding the conditions for contributing to social economic progress it has to be said that, firstly, it depends on the capacity of the firms to create value. Value creation in this context means an increase of productivity at lowest social cost. Furthermore, when the firm contributes to value creation, the stakeholders are able to capture part of this value. If the capture is balanced, in the sense that any stakeholder is able to capture value, the second condition for contributing to social economic progress is fulfilled. Thirdly, the productivity change releases resources. This release might result in social costs if unemployment is increased. People have to be rapidly re-employed if a reduction of social costs is pursued. For these reasons, we consider that social economic progress is strongly related to the stakeholder responsibility of the firms.

The conditions for contributing to social economic progress at firm level leads us to the following conclusions:

1. The firm, as engine of value creation, has to be socially sustainable. It has to be able to create value through productivity.
2. The social cost related to the productivity increase has to be the lowest. The total value created, increase in productivity less the social cost, shall result in a positive sum. The increase in productivity has to be executed avoiding wasteful or unsocial behaviours.
3. Distribution of the created value to stakeholders through productivity has to be balanced in the sense that all the stakeholders have to be able to capture part of the value created and also the firm shall retain part of it. We use a definition of balanced distribution, requiring only that they receive a part of the value created without defining the percentage. This capture is executed through prices.

4. The value created when the social aspects are considered and its distribution presents some limitations in its interpretation. The productivity bonus is distributed only to customers, suppliers and investors. The social contribution to value can only be captured by the stakeholders represented by the social terms.
5. Rapid re-employment of resources minimizes social costs and favors social economic progress. Depending on the general economic situation (i.e. recession) it could be acceptable that the firm maintains a social inefficiency, for instance maintaining more contracted workers than strictly necessary. The firms that apply this policy are considered stakeholder responsible firms. To apply this policy a compensation mechanism through prices shall be applied. This is the only existing mechanism of compensation as expressed in the remark of section 4.8. This means that the firm can still compete against the cost efficient firm but at least one of the stakeholders has to accept (or be forced into) a reduction in their percentage of captured value. The capacity of influence of the firm and the behaviour of firm and stakeholders will be the key factor to allow economic progress and social economic progress.
6. The part of the resources that is not maintained in the firm has to be quickly re-employed in other sectors of the economy. This opens the option for the regulator to favor, with the appropriate policies, the possibility of the horizontal displacement of the work force.

Summarizing, the social economic progress measure we propose opens new perspectives on the relationship between firm and stakeholders, and about how the objectives of the organization have to be and how all of them have to use their capacity of influence in order to achieve social economic progress. When any of them is willing to use its capacity of influence to jeopardize the value created, the society is not able to achieve social economic progress.

Davis did not define the concept of balanced distribution. It is one of the topics for further research. As the relationships among stakeholders are not symmetric and their relative positions regarding their capacity of influence are changing through time it is expected that a general rule for a balanced distribution does not exist. Additionally, further research is needed about the interpretation of distribution when social aspects are included.

The research should be focused on the identification of the stakeholders that receive the value and the assignation of the social terms to a specific group of stakeholders.

On the other hand, the measure of social economic progress allow the identification of firms following a stakeholder responsible behavior and contributors to the social economic progress of the economy. It is necessary to develop more empirical research in order to quantify the amount of value creation when social costs are considered. We foresee some hurdles in that work due to the subjectivity of the social cost assessment through prices. Nevertheless, the inclusion of social cost in the discussion of social progress, economic progress and sustainability of the firm is a must as all of them are interrelated. We consider that our approach will be useful for developing a future research in order to have a clear picture of the firms that are contributing to social economic progress, how they are distributed in the territory and how they interact with the rest of the agents of the economy.

As a last remark we highlight the need to understand which are the most relevant drivers of social progress. Society can not be oriented to social progress without including (but not only) the economic perspective in the discussion. Social economic progress contributes to this objective and establishes a balanced theoretical framework between the economic perspective and the social perspective.

Chapter 5

Summary of the thesis contributions and future lines of research

The process of value creation and its distribution (appropriation) is central to understanding how the firm and stakeholder relationship is and how they influence each other through time. Our contribution has been focused on the implications of the dynamics of influence between firm and stakeholders and how the process of value creation by the firm and its distribution to the stakeholders works. Particularly, to evaluate the effect of the most salient stakeholder, the main stakeholder.

We have used the Spanish Health care sector and the pharmaceutical industry that operate in that market as a reference for our analysis. It is worth mentioning that the sector is highly regulated. The most salient stakeholder has been considered to be the Spanish public sector. It acts simultaneously as a regulator and main customer and it has the negotiation power, legitimacy and urgency in its claims. This fact conditions the dynamics of value as it has a high capacity of influence over the firm. We have selected the period of time, from the year 2003 to the year 2012, where the main stakeholder used its power and capacity of influence to capture value from the pharmaceutical firms. This framework has lent itself perfectly to the development of a pin factory study in the second chapter and to the testing of Frooman's model of strategies of influences in third chapter respectively.

The pin factory study allows us to analyze the relationships between the firm and stakeholders. We note that we have been able to take into consideration a high number of stakeholders. The analysis of ten stakeholders is not frequent in the literature due to the difficulties in obtaining detailed information from the firm related to all of them. Three different stakeholders are related to the outputs (Spanish public sector, Spanish private sector, subsidiaries), six stakeholders are related to inputs (labor, medicinal substance suppliers, primary packaging supplier, other raw material suppliers, capital suppliers and imported goods from subsidiaries) and finally, the shareholder. The subdivision of the period of interest into three subperiods allows us to monitor the value dynamics and, indirectly, the influence relationships between firm and stakeholders. As a result, we concluded that the main stakeholder had enough capacity of influence to change how the firm was creating value and how the value was distributed to the stakeholders. As a

consequence, the firm had to react using both its own capacity of influence on other stakeholders and by performing an internal reorganization in order to create additional value. Regarding the distribution, the main stakeholder was able to capture a big portion of value created in the last period. The rest of the stakeholders were able to resist the capacity of influence of the firm and maintained their position as receptors of value created. For instance, labor was able to retain its percentage of value capture through time. Moreover, the study demonstrated that the shareholder ended up being the most affected as he became a net contributor to the value created at the end of the period instead of being receptor of it as it was at the beginning of the period. We interpret that the adjustment of the imbalance created by the main stakeholder is assumed by the shareholder through a reduction in the economic profit and, additionally, through the support of other subsidiaries through the decrease of transfer prices. The other mechanisms of adjustment, for instance through prices with the rest of the stakeholders, did not work. Consequently, we conclude that the firm did not have enough capacity of influence versus its stakeholders to compensate the effect of the main stakeholder. The increments of productivity and growth (or replicability) achieved by the firm were not enough to compensate the value captured by the main stakeholder.

We have adapted the willingness to pay approach to a dynamic situation. We have defined the value created as the sum of the three terms: i) the quantity effect (related to productivity and the growth effect), ii) the willingness price effect that collects the contribution of the stakeholders through prices and, iii) the contribution of the shareholder associated with the variation in the economic profit. This value created equates with the distributed value. The value is only distributed through prices. The stakeholders that are able to increase their prices (suppliers), decrease them (customers) or to obtain an increase in profit, the shareholder are who are the ones able to capture value. This approach allows us to identify the changes in each stakeholder contribution or capture through time.

The third chapter introduces a different point of view in the analysis of the dynamic of value creation and distribution. We retrieve Frooman's model of influences that related the stakeholder influence strategy with two factors, the power in the firm-stakeholder relationship and the interdependence between firm and stakeholder. In this chapter we propose a new methodology to test Frooman's model. We have used an economic approach based on how the firms are creating value and how the value is distributed to the stakeholders. Previously, other authors tried to find empirical evidence using only a

qualitative approach but they were not successful. We have operationalized the four proposition in five hypotheses. These hypotheses have been contrasted statistically. We have found strong empirical support for the four propositions of the model.

In the fourth chapter we have introduced a measure of social economic progress. It is an important point as Stiglitz, Sen and Fitoussi (2009) and the OECD (2014) report of inclusive growth concluded. The classical measures of social progress are biased because they are usually based on economic indicators and they omit the social aspects in their calculation. We consider that a measure of social economic progress must describe the economic and social aspects. To develop this measure we have modified the definition of value created we have used in the second and third chapters to incorporate concepts inspired by Davis (1947) in the 1940s. We consider Davis as an early precursor of stakeholder theory. His contribution identifies the impact of progress on the stakeholders of the firm and the social aspects related to them in a similar way to Stiglitz, Sen and Fitoussi (2009). We have included these social aspects in the measure of value creation. We define the value created by the firm as the sum of both the term that reflects increments or decrements in firm performance and the term that represents variations of quantities that generate social costs.

A new taxonomy has been introduced depending on how the firm creates value. The firm's performance and the social aspects are considered in the calculation. Some examples related to the different options have been included. Desirable situations of social economic progress have been identified. Furthermore, as unemployment is a non-desired effect of productivity gains associated with technical change, we analyze this situation in depth because it generates social costs and inequality. Despite the fact that the social costs associated with technical progress are well known, the literature has paid little attention to the discussion of the role of the firm mitigating them through "re-employment". In that situation, when the firm tries to be socially responsible maintaining more workers than necessary an adjustment through prices is necessary. The cost of the adjustment shall be assumed by one or more stakeholders. To achieve social economic progress it shall be assumed in a balanced way. From a quantitative perspective it remains unclear what balanced means. This is a topic for future research.

We acknowledge that firms are a central agent of social economic progress as they are units of value creation. Their role in society is underestimated and undervalued. Moreover, firms have the role of introducing improvements in productivity that lead to an

increase in the total worth available to be distributed to the different stakeholders of society. This is an important component of value created but is not enough to understand social value creation. In order to have the complete picture about social economic progress it is necessary to include the value created (destroyed) when reducing (increasing) the quantities that generate social costs in the measure.

Some limitations have arisen through the thesis. We have considered the stakeholders who create and capture value and their interactions with the firm. We notice that there might be other stakeholders that are not contributing to the dynamics of value but their opinion or their behavior can influence the firm and/or other stakeholders through other mechanisms. These stakeholders merit further research. Secondly, as we have mentioned in the fourth chapter, there is a limitation regarding the distribution of social value created to the different groups of stakeholders. We recognize that the value created through the firm performance can only be distributed to the classical stakeholders (customers, suppliers and shareholders) but to whom the social value is distributed remains uncertain and further research is necessary. On the other hand, we are aware that we have selected a situation with some features that makes it ideal for analysis. The methodology can be applied to other situations where the relationships of power are clearly defined. We expect similar conclusions when the power in the relationship is clearly established but further research will be performed to confirm it. Additionally, it will be a matter of future research to analyze situations where the power in the relationship is not clearly established. For that reason, in subsequent works, we will analyze other sectors and/or firms.

Finally, we have considered that managers are connectors among firm and its stakeholders. In a future applied research managers can be included as a new stakeholder group. We can include them easily in the value dynamics because the theoretical approach we have followed does not exclude this possibility. The role of manager as stakeholders has recently been claimed as central in the stakeholder theory (Tullberg 2013).

In summary, we have contributed to the knowledge of dynamics of value and influence between firm and stakeholders. Our present research has shown some of the features that characterize firm and stakeholder relationships. Will this information be used strategically by the firms or the stakeholders? Our answer is probably “yes” but in both directions. The firms will be more aware of how they can be influenced by the stakeholders and they will design alternative strategies to influence the stakeholders. The same will be true in the case of the stakeholders. Will they use this knowledge to influence the firm or

will they design new strategies to do so in the future? Again it is the same answer. From our perspective it is no more than the essence of the stakeholder theory to develop the knowledge about how to manage the stakeholders in order to achieve the firm's objectives and from the perspective of the stakeholders it is how to influence the firm so as to achieve their own objectives.

Through the thesis we have dealt with firm, stakeholders, value dynamics and social economic progress. We have generated knowledge around the process of value creation and distribution. We have enriched the literature with new insights and methodology to understand the complexity of the relationships of influence between firm and stakeholders. We have proposed a new measure of social economic progress aligned with the current needs of society. We have described how social economic progress can be enhanced through firm performance achievements and the decrease of the quantities that generate social cost. Finally, we have opened new research questions regarding how this value is distributed.

Cited References

- Abbott, Walter F. and R. Joseph Mosen, "On the Measurement of Corporate Social Responsibility: Self-Reported Disclosures and a Method of Measuring Corporate Social Involvement," *Academy of Management Journal* 22, no. 3 (1979): 501-515, doi:10.2307/255740.
- Abelló, Gabriel G., PM. Forero, V. Muakuku and P. Villagrasa, "Gasto público y compras en el sector sanitario," *Gestión y Evaluación de Costes Sanitarios* 8, no. 3 (Julio-Septiembre 2007): 21-38, <http://www.fundacionsigno.com/archivos/20101007153711.pdf>.
- Ackoff, Rusell L., *The Democratic Corporation: A Radical Prescription for Recreating Corporate America and Rediscovering Success*. Oxford University Press. New York. 1994.
- AEMPS. Web Agencia Española Medicamento y productos sanitarios, 2012, http://www.aemps.gob.es/legislacion/espana/laAEMPS/general.htm#ley29_2006 (accessed August 20, 2014).
- Alexander, Gordon J. and Rogene A. Buchholz, "Corporate Social Responsibility and Stock Market Performance," *Academy of Management Journal* 21, no. 3 (1978): 479-86, doi: 10.2307/255728.
- Antoñanzas, Fernando, Juan Oliva, Mariola Pinillos, Carmelo Juárez, "Economic Aspects of the New Spanish Laws On Pharmaceutical Preparations," *The European Journal of Health Economics* 8, no. 3 (2007): 297–300, doi: 10.1007/s10198-007-0050-9.
- Arocena, Pablo, Leticia Blázquez Gómez and E. Grifell-Tatjé, "Assessing the Consequences of Restructuring Reforms on Firms Performance," *The Journal of Economic Policy Reform* 14, no.1 (2011): 21-39, doi:10.1080/17487870.2011.538982.
- Arruñada, Benito, "Los excedentes de productividad de la banca privada," *Investigaciones Económicas*, segunda época 11, no 1 (1987), 151-78.
- Aupperle, Kenneth E, Archie B. Carroll and John D. Hatfield, "An Empirical Examination of the Relationship Between Corporate Social Responsibility and Profitability," *Academy of Management Journal* 28, no.2 (1985): 446-63, doi: 10.2307/256210.

Ayres, C.E. *The Theory of Economic Progress*. Chapel Hill: University of North Carolina Press. 1944.

Balk, Bert M., *Price and Quantity Index Numbers. Models for Measuring Aggregate Change and Difference*. Cambridge University Press: New York. 2008.

Barnett, Michael L., "Stakeholder Influence Capacity and the Variability of Financial Returns to Corporate Social Responsibility." *Academy of Management Review* 32, no. 3 (2007): 794-816, doi: 10.5465/AMR.2007.25275520.

Beaulieu, Suzanne and Jean Pasquero, "Reintroducing Stakeholder Dynamics in Stakeholder Thinking: A Negotiated-order Perspective," *Journal of Corporate Citizenship* 6 (Summer 2002): 53–69, doi:10.9774/GLEAF.4700.2002.su.00007.

Bebbington, Jan, "Sustainable Development: A Review of the International Development Business and Accounting Literature," *Accounting Forum* 25, no. 2 (2001): 128-157, doi:10.1111/1467-6303.00059.

Bennet, T. L., "The Theory of Measurement of Changes in Cost of Living," *Journal of the Royal Statistical Society* 83, no. 3 (1920): 455-62.

Berrone, Pascual, Cristina Cruz and Luis R. Gomez-Mejia, "Socioemotional Wealth in Family Firms: Theoretical Dimensions, Assessment Approaches, and Agenda for Further Research," *Family Business Review* 25 (2012): 258-279, doi: 10.1177/0894486511435355

Bhattacharya, C.B., Daniel Korschun and Sankar Sen, "Strengthening Stakeholder-Company Relationships Through Mutually Beneficial Corporate Social Responsibility Initiatives," *Journal of Business Ethics* 85 (2009):257-272, doi:10.1007/s10551-008-97303).

Blau, Peter. *Exchange and Power in Social Life*. New York: John Wiley. 1964.

Blyler, Maureen and Russell W. Coff, "Dynamic Capabilities, Social Capital, and Rent Appropriation: Ties That Split Pies," *Strategic Management Journal* 24, no. 7 (2003):677–686, doi: 10.1002/smj.327.

Borrell, Joan Ramon and Anna Merino “Efectos perversos de la regulación farmacéutica en España: ¿hasta dónde se traslada la competencia?,” *Gaceta Sanitaria* 20, no. 2 (2006): 41-50, doi:10.1157/13089482.

Bosse, Douglass. A., Robert A. Phillips and Jeffrey S. Harrison, “Stakeholders, Reciprocity, and Firm Performance,” *Strategic Management Journal* 30, no. 4, (2009):447–456, doi: 10.1002/smj.743.

Brandenburger, Adam M. and Harborne W. Stuart Jr., “Value-Based Business Strategy,” *Journal of Economics and Management Strategy* 5, no 1 (1996): 5-24, doi: 10.1111/j.1430-9134.1996.00005.x.

Brenner, S.N and Phillip L. Cochran. 1991. “The Stakeholder Theory of the Firm: Implications for Business and Society Theory and Research,” In *Proceedings of the Second Annual Meeting of the International Association for Business and Society* edited by J.F. Mahon, 449-467. Sundance, UT.

Carroll, Archie B., *Business and Society: Ethics and Stakeholder Management*. South-Western Publishing Company. 1989.

Carroll, Archie B. *Ethics and Stakeholder management*. Cincinnati, OH: South Western. 1993.

Caves, Douglas. W., Lauritz R. Christensen and Joseph A. Swanson, “Productivity in U.S. Railroads, 1951-1974,” *Bell Journal of Economics* 11, no. 1 (1980):166-181.

Cennamo, Carmelo, Pascal Berrone, P. and Luís Gomez-Mejia, L. “Does Stakeholder Management Have a Dark Side?,” *Journal of Business Ethics* 89, no 4 (2009): 491–507, doi:10.1007/s10551-008-0012-x

CERC, *Surplus de Productivité Globale et ‘Comptes de Surplus’*, Documents du Centre d’Études des Revenus et des Coûts, 1, 1er trimestre. Paris: CERC. 1969.

Chakravarthy Balaji S., “Measuring Strategic Performance,” *Strategic Management Journal* 7, no. 5 (1986): 437–458, doi: 10.1002/smj.4250070505.

Cheng, Beiting, Ioannis Ioannou and George Serafein, "Corporate Social Responsibility and Access to Finance," *Strategic Management Journal* 35 (2014): 1-23, doi:10.1002/smj.2131.

Clarkson, Max, Mark Starik, Phil Cochran and Thomas M. Jones, Donna J. Wood, Thomas Donaldson and Lee E. Preston, Michael C. Deck, Steve Wartick, Len Brooks, Dennis Collins, Jim Weber, Jeanne M. Logsdon, Archie B. Carrol, "The Toronto Conference: Reflections on Stakeholder Theory," *Business and Society* 33, no. 1 (April 1994):82-131, doi: 10.1177/000765039403300105.

Clarkson, Max. B. E. "A Stakeholder Framework of Analyzing and Evaluating Corporate Social Performance," *Academy of Management Review* 20, no. 1 (1995): 92-117, doi:10.5465/AMR.1995.9503271994.

Cochran, Philip L. and Robert A. Wood, "Corporate Social Responsibility and Financial Performance," *Academy of Management Journal* 27, no. 1 (1984): 42-56, doi:10.2307/255956.

Coff, Russell W., "When Competitive Advantage Doesn't Lead to Performance: The Resource-Based View and Stakeholder Bargaining Power," *Organization Science* 10, no. 2 (1999):119-133, doi:10.1287/orsc.10.2.119.

Coff, Russell W., "The Coevolution of Rent Appropriation and Capability Development," *Strategic Management Journal* 31, no. 7 (2010): 711–733, doi: 10.1002/smj.844.

Coffey, Betty S. and Gerald E. Fryxell, "Institutional Ownership of Stock and Dimensions of Corporate Social Performance: An Empirical Examination," *Journal of Business Ethics* 10 (1991):437-444, doi: 10.1007/BF00382826.

Cook, Karen. S. and Richard M. Emerson, "Power, Equity and Commitment in Exchange Networks," *American Sociological Review* 43 (1978):721-739.

Costa-Font, Joan and Jaume Puig-Junoy, “The Pharmaceutical Market Regulation in Spain: Is Drug Cost-containment Under Question?,” *Journal of Pharmaceutical Finance, Economics and Policy* 13, no. 4 (2004): 33-49.

Davis, Evan and John Kay “Assessing Corporate Performance”, *Business Strategy Review* 1, no. 2 (1990) 1-16, doi: 10.1111/j.1467-8616.1990.tb00007.x.

Davis, Hiram. S., *The Industrial Study of Economic Progress*. University of Pennsylvania Press. 1947.

Davis, Hiram S., *Productivity Accounting* . University of Pennsylvania Press. 1955.

Davis, Keith, “The Case for and Against Business Assumption of Social Responsibilities,” *Academy of Management Journal* 16 (1973): 312–322, doi: 10.2307/255331.

Decreto-Ley 8/2010, de 20 de mayo, por el que se adoptan medidas extraordinarias para la reducción del déficit público, <http://www.boe.es/boe/dias/2010/05/24/pdfs/BOE-A-2010-8228.pdf> (accessed August 20, 2014).

Della Corte, Valentina and Giovanna Del Gaudio “A Literature Review on Value Creation and Value Capturing in Strategic Management Studies”, *Corporate Ownership & Control* 11, no. 2, (2014), 328-346,

Diewert, W. Erwin, “Index Number Theory Using Differences Rather than Ratios,” *American Journal of Economics and Sociology* 64, no. 1 (January 2005): 347-95, doi:10.1111/j.1536-7150.2005.00365.x.

Dill, William R., “Public Participation in Corporate Planning: Strategic Management in a Kibitzer’s World,” *Long Range Planning* 8, no. 1 (1975): 57-63, doi:10.1016/0024-6301(75)90118-1.

Donaldson, Thomas and Lee E. Preston, “The Stakeholder Theory of the Corporation: Concepts, Evidence, and Implications,” *Academy of Management Review*. 20, no. 1 (1995): 65-91, doi: 10.5465/AMR.1995.9503271992.

Durán, Antonio, Juan L. Lara and Michelle van Waveren, “Spain: Health System Review,” *Health Systems in Transition* 8, no. 4, (2006): 1–208.

Dyllick, Thomas and Kai Hockerts, "Beyond the Business Case for Corporate Sustainability," *Business Strategy and Environment* 11, no. 2 (2002): 130-141, doi:10.1002/bse.323.

Eichhorn, Wolfgang and Joachim Voeller. *Theory of Price Index*. Lecture Notes in Economics and Mathematical Systems, no. 140. Springer. Verlag: Berlin-Heidelberg-New York. 1976.

Eldor, Dan and Ephraim F. Sudit "Productivity-Based Financial Net Income Analysis," *Omega* 9, no.6 (1981): 605-611, doi:10.1016/0305-0483(81)90048-7.

Elias, Arun A., Robert Y. Cavana and Laurie S. Jackson, "Stakeholder Analysis for R&D Project Management," *R&D Management* 32 (2002): 301–310, doi: 10.1111/1467-9310.00262.

Emerson, Richard. M., "Power-Dependence Relations," *American Sociological Review* 27, no. 1. (Feb 1962): 31-41.

Estache, Antonio and Emili Grifell-Tatjé, "How (Un) Even was the Distribution of the Impacts of Mali's Water Privatization Across Stakeholders?," *Journal of Development Studies* 49, no. 4, (2013): 483-499, doi:10.1080/00220388.2012.729046.

European Commission, "Health and Economics Analysis for an Evaluation of the Public Private Partnerships in Health Care Delivery across EU. Annexes", 2013, http://ec.europa.eu/health/expert_panel/documents/publications/docs/ppp_finalreport_annexes_en.pdf (June 27, 2015)

Fagan, Harrison B. *American Economic Progress*. Philadelphia: J.B. Lippincott Company. 1935.

Fagerberg, Jan, "Technology and International Differences in Growth Rates," *Journal of Economic Literature* 32, no. 3 (1994): 1147-1175.

Farmaindustria. Memoria anual 2010. www.farmaindustria.es (accessed August 20, 2014).

Farmaindustria. Memoria anual. 2011. www.farmaindustria.es (accessed August 20, 2014).

Figge, Frank and Stephan Schaltegger. *What Is "Stakeholder value"? Developing a catchphrase into Benchmarking Tool*. Universität Lüneburg-Pictet-UNEP:Lüneburg. 2000.

http://www2.leuphana.de/umanagement/csm/content/nama/downloads/download_publicationen/03-0downloadversion.pdf (accessed August 26, 2014).

Fombrun, Charles and Mark Shanley, "What's in a Name? Reputation Building and Corporate Strategy," *Academy of Management Journal* 33, no. 2 (1990): 233–258, doi:10.2307/256324.

Försund, Finn R. and Lennart Hjalmarsson, Lennart, "Generalised Farrell Measures of Efficiency: An Application to Milk Processing in Swedish Dairy Plants," *Economic Journal, Royal Economic Society* 89, no. 354 (1979): 294-315, doi: 10.2307/1914137

Fourastié, Jean. *Productivity, Prices, and Wages*. The European Productivity Agency of the Organization for European Economic Cooperation. Paris. France. 1957.

Freeman, R. Edward, *Strategic Management: A Stakeholder Approach*. Boston: Pitman, 1984.

Freeman, R. Edward and William M. Evan, "Corporate Governance: A Stakeholder Interpretation," *Journal of Behavioral Economics* 19, no. 4 (1990): 337–359, doi:10.1016/0090-5720(90)90022-Y.

Freeman, R. Edward, Andrew C. Wicks, Bidhan Parmar, "Stakeholder Theory and The Corporate Objective Revisited," *Organization Science* 15, no. 3 (2004): 364-369, doi:10.1287/orsc.1040.0066.

Freeman, R. Edward, S. Ramakrishna Velamuri, "A New Approach to CSR: Company Stakeholder Responsibility" in Andrew Kakabadse and Mette Morsig, "Corporate Social Responsibility; Reconciling Managerial Strategies Towards the 21st Century" Palgrave MacMillan. 2005.

Freeman, Ronald. E. Jeffrey S. Harrison, Andrew C. Wicks, Bidhan L. Parman, Simone de Colle, *Stakeholder Theory. The State of the Art*. Cambridge University Press: New York. 2010.

Friedman, Milton, "The Social Responsibility of Business Is to Increase its Profits," *New York Times Magazine*, September 13 (1970):122-126. Reprint from 1962, <http://www.colorado.edu/studentgroups/libertarians/issues/friedman-soc-resp-business.html> (accessed August 7, 2014).

Friedman, Andrew L. and. Samantha Miles, "Developing Stakeholder Theory," *Journal of Management Studies* 39, no. 1 (2002):1-21, doi: 10.1111/1467-6486.00280.

Frooman, Jeff, "Socially Irresponsible and Illegal Behavior and Shareholder Wealth: A Meta-Analysis of Event Studies," *Business and Society* 36, no. 3 (1997):221-249, doi:10.1177/000765039703600302.

Frooman, Jeff, "Stakeholder Influence Strategies," *Academy of Management Journal* 24, no.2 (1999):191-205, doi: 10.5465/AMR.1999.1893928.

Frooman, Jeff and Audrey J. Murrell, "Stakeholder influence strategies: The Roles of Structural and Demographic Determinants," *Business and Society* 44, no. 1 (2005): 3–31, doi: 10.1177/0007650304273434.

Frooman, Jeff, "The Issue Network: Reshaping the Stakeholder Model," *Canadian Journal of Administrative Sciences. Revue canadienne des sciences de l'administration* 27, no. 2 (2010):161–173, doi:10.1002/CJAS.150.

Fourastié, Jean, *Productivity, Prices and Wages*, Paris, European Productivity Agency. 1957.

Fuss, Melvyn and Daniel McFadden, "Preface" in M. Fuss and D. McFadden ed., *Production economics: A dual Approach to theory and applications*. North Holland: Amsterdam (1978): vii – x.

García Armesto, Sandra, Begoña Abadía, Antonio Durán, Antonio Durán and Enrique Bernal, España. "Análisis del sistema sanitario. Resumen y conclusiones," *Sistemas sanitarios en transición* 12, no. 4. (2010): 1–240.

García-Castro, Roberto and Ruth Aguilera, "Incremental Value Creation and Appropriation in a World with Multiple Stakeholders," *Strategic Management Journal*, 36 (2015): 137–147, doi: 10.1002/smj.2241.

García-Castro, Roberto, Joan- Enric Ricart, Martin B. Lieberman and Natarajan Balasubramanian (2015), “Chapter 10. Business Model Innovation and Replication: Implications for the Measurement of Productivity”, forthcoming in Emili Grifell-Tatjé, C.A.Knox Lovell and Robin Sickles ed., *Oxford Handbook of Productivity Analysis*. New York: Oxford University Press.

Garriga, Elisabet and Domènec Melé, “Corporate Social Responsibility Theories: Mapping the Territory,” *Journal of Business Ethics* 53, no. 1-2, (2004):51-71, doi:10.1023/B:BUSI.0000039399.90587.34.

Genescà Garrigosa, E. and Emili Grifell-Tatjé (1992), “Profits and Total Factor Productivity: A Comparative Analysis,” *Omega* 20, no. 5/6 (1992): 553-568.

Gilmartin, Mattia and Ronald E. Freeman, “Business Ethics and Health Care: A Stakeholder Perspective,” *Health Care Management Review* 27, no. 2 (2002): 52-65, doi:10.2139/ssrn.263354.

Godfrey, Paul C., Craig B. Merrill and Jared M. Hansen, “The Relationship Between Corporate Social Responsibility and Shareholder Value: an Empirical Test of the Risk Management Hypothesis,” *Strategic Management Journal* 30, no. 4 (April 2009): 425-445, doi: 10.1002/smj.750.

González, Beatriz and Jaime Pinilla, “Regulación, competencia y precios en los mercados de productos sanitarios,” *Gaceta Sanitaria* 20, no. 2 (2006): 3-13, doi:10.1157/13089478.

Granovetter, Mark, “Economic Action and Social Structure: The Problem of Embeddedness,” *American Journal of Sociology* 91, no. 3 (Nov 1985): 481-510, doi:10.1086/228311.

Greenley Gordon E. and Gordon R. Foxall, “Multiple Stakeholder Orientation in UK Companies and the Implications for Company Performance,” *Journal of Management Studies* 34 (1997): 259–284. doi: 10.1111/1467-6486.00051.

Grifell-Tatjé, E. and C.A.K. Lovell, "Productivity at the Post: Its Drivers and its Distribution," *Journal of Regulatory Economics* 33, no. 2 (2008): 133-158, doi:10.1007/s11149-007-9051-y.

Grifell-Tatjé, Emili, "Productivity and Distribution: Differences Across Organizational Forms – The Case of Spanish Banks," *Socio-Economic Planning Sciences* 45, no. 2 (2011): 72 – 83, doi:10.1016/j.seps.2010.12.001.

Grifell-Tatjé, Emili and C.A.Knox Lovell, *Productivity Accounting: The Economics of Business Performance*, New York, NY, USA: Cambridge University Press. 2015.

Griffin, Jennifer J. and John F. Mahon, "The Corporate Social Performance and Corporate Financial Performance Debate. Twenty-Five Years of Incomparable Research," *Business and Society* 36, no. 1 (Mar 1997):5-31, doi: 10.1177/000765039703600102.

Hansen, Alvin H. "Economic Progress and Declining Population Growth", *The American Economic Review* 29, no. 1 (Mar., 1939):1-15.

Harvey, Brian and Anja Schaefer, "Managing Relationships with Environmental Stakeholders: A Study U.K. Water and Electricity Utilities," *Journal of Business Ethics* 30, no. 3 (2001):243-260, doi:10.2307/25074496.

Helper, Susan, "Economists and Field Research: 'You Can Observe a Lot Just by Watching'," *American Economic Review* 90, no. 2 (May 2000): 228-232, doi: 10.1257/aer.90.2.228.

Hendry, Jamie R., "Stakeholder Influence Strategies: An Empirical Exploration," *Journal of Business Ethics* 61 (2005): 79–99, doi: 10.1007/s10551-005-8502-6.

Hernández , Patricia and Jean-Pierre Poullier, "Gasto en salud y crecimiento económico," *Presupuesto y Gasto Público* 49 (2007): 11-30. Secretaría General de Presupuestos y Gastos. Instituto de Estudios Fiscales. 2007.

Hernández de Cos, Pablo, Enrique Moral-Beniro, E. *Eficiencia y regulación en el gasto sanitario de los países de la OCDE. Documentos Ocasionales*. N.º 1107 . Banco de España. Publicaciones. 2011.

<http://www.google.es/url?sa=t&drct=j&andq=andesrc=sandfrm=1&andsource=web&andcd=2&an>

[dved=0CCYQFjABandurl=http%3A%2F%2Fwww.bde.es%2Ffbde%2Fes%2Fsecciones%2Finformes%2Fpublicaciones_se%2Fdocumentos_ocasi%2Findex2011.html#UwT3U4jnMcKb0QXujYHoDAandusg=AFQjCNFclOg9rypkDKuUMsiGsmwp-eEvWA](http://www.bde.es/fbde/fes/fsecciones/Finformes/Publicaciones_se/Documentos_Ocasi/index2011.html#UwT3U4jnMcKb0QXujYHoDAandusg=AFQjCNFclOg9rypkDKuUMsiGsmwp-eEvWA)
(accessed August 20, 2014).

Hill, Charles. W.L. and Thomas M. Jones, "Stakeholder-Agency Theory," *Journal of Management Studies* 29, no. 2 (Mar 1992): 131-154,
doi: 10.1111/j.1467-6486.1992.tb00657.x.

Hillman, Amy. J., Gerald D. Keim, "Shareholder Value, Stakeholder Management; and Social Issues: What's the Bottom Line?," *Strategic Management Journal* 22, no. 2 (2001):125-139, doi: 10.1002/1097-0266(200101).

Hopkins, Sandra, David Morgan and Roberto Astolfi, "Financing of Health Care in Spain: A Comparative Analysis," *Presupuesto y Gasto Público* 49 (2007): 31-45. Secretaría General de Presupuestos y Gastos. Instituto de Estudios Fiscales.

Hsieh, Jasper, "Toward a Dynamic Resource Based View of Strategic Stakeholder Management," Working paper, 2008, doi: 10.2139/ssrn.1142545.

Instituto de Estudios Fiscales (IEF), *Informe para el análisis del gasto sanitario*, Grupo de trabajo de la Conferencia de Presidentes para el análisis del Gasto Sanitario, IEF, Madrid. 2005,
<http://documentacion.meh.es/doc/PortalVarios/FinanciacionTerritorial/Autonomica/IGTGS2005.pdf> (accessed August 7, 2014).

Instituto Nacional Estadística (INE). Base datos demográficos. 2014.
http://www.ine.es/ss/Satellite?L=es_ES&c=INESeccion_C&cid=1259926380048&p=1254735110672&pagename=ProductosYServicios/PYSLayout (accessed April 3, 2015)

Jawahar, I.M., Gary L. McLaughlin, "Toward a Descriptive Stakeholder Theory: An Organizational Life Cycle Approach," *Academy of Management Review* 26, no. 3 (2001): 397-414, doi: 10.5465/AMR.2001.4845803.

Jensen, Michael. C. and William H. Meckling, "Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure," *Journal of Financial Economics* 3, no. 4, (1976): 305-360, doi: 10.1016/0304-05X(76)90026-X.

Jensen, Michael C., "Value Maximization, Stakeholder Theory, and the Corporate Objective Function," *Business Ethics Quarterly* 12, no. 2 (2002): 235-256, doi:10.2307/3857812.

Jensen, Michael C., "Value Maximization, Stakeholder Theory, and the Corporate Objective Function," *Journal of Applied Corporate Finance* 22, no. 1 (2010): 32-40, doi:10.1111/j.1745-6622.2010.00259.x.

Johnson, Richard A. and Daniel W. Greening, "Relationships Between Corporate Social Performance, Financial Performance, and Firm Governance," *Academy of Management Proceedings* (1994): 314-318, doi: 10.5465/AMBPP.1994.10345720.

Johnson-Cramer, M., and Berman, S. "A Dynamic Model of Stakeholder Management," Working paper 07-04, San Francisco: Santa Clara University. 2007, <http://www.scu.edu/business/faculty/research/2005-06-papers/upload/wp06-13-berman-stakeholder-mgmt.pdf>, (accessed August 26, 2014).

Jones, Thomas M., "The Toronto Conference: Reflections on Stakeholder Theory," *Business and Society* 33, no. 1, (1994):82-83.

Jones, Thomas M., "Instrumental Stakeholder Theory: A Synthesis of Ethics and Economics," *Academy of Management Review* 20, no. 2 (1995):404-437, doi:10.5465/AMR.1995.9507312924.

Jones, Thomas M. and Andrew C. Wicks, "Convergent stakeholder theory," *Academy of Management Review* 24, no. 2 (1999): 206-214, doi: 10.5465/AMR.1999.12600876.

Jorgenson, D. W. and Z. Griliches, "The Explanation of Productivity Change," *Review of Economic Studies* 34, no. 3, (July 1967): 249-283.

Kendrick, John W. and Daniel Creamer, *Measuring Company Productivity: Handbook with Case Studies*, Studies in Business Economics 74, New York, The Conference Board. 1961.

Klumpes, Paul, "Competition Among Stakeholder Groups for Political Influence Over Business Regulation: The Case of the UK Pensions Industry," *Economic Affairs* 23 (2003), 4-10. doi: 10.1111/1468-0270.00423.

- Kochan, Thomas A. and Saul Rubinstein, "Toward a stakeholder theory of the firm: The Saturn partnership," *Organization Science* 11, no. 4 (2000): 367-386, doi:10.1287/orsc.11.4.367.14601
- Kumbhakar, Subal C. and C. A. Knox Lovell. *Stochastic Frontier Analysis*. Cambridge University Press. 2000.
- Kurosawa, Kazukiyo, "An Aggregate Index for the analysis of Productivity and Profitability," *Omega* 3, no. 2, (1975):157-68, doi:10.1016/0305-0483(75)90115-2.
- Kurosawa, Kazukiyo, *Productivity Measurement and Management at the Company Level: The Japanese Experience*, Amsterdam, Elsevier. 1991.
- Lago Juan Aitor, Javier Eduardo Viveros and Javier Heredia, *El gasto farmacéutico en España. Evolución internacional, situación nacional y medidas de control del gasto*. EAE Business School. Documento. 09/2012, http://www.redaccionmedica.com/contenido/images/eae_gasto_farmaceutico.pdf (accessed August 20, 2014).
- Lamberg, Juha-Antti, Grant T. Savage and Kalle Pajunen, "Strategic Stakeholder Perspective to ESOP Negotiations: The Case of United Airlines," *Management Decision* 41, no. 4 (2003): 383-393, doi:10.1108/00251740310468211.
- Lamberg, Juha-Antti, Kalle Pajunen, Petri Parvinen and Grant T. Savage, "Stakeholder Management and Path Dependence in Organizational Transitions," *Management Decision* 46, no 6 (2008): 846-863, doi: 10.1108/00251740810882635.
- La Porta, Rafael, Florencio López-de-Silanes and Andrei Shleifer, "Corporate Ownership Around the World," *The Journal of Finance* 54, no. 2 (1999): 471-517, doi:10.1111/0022-1082.00115
- Laplume, André. O., Karan Sonpar, Reginald, A. Liz, "Stakeholder Theory: Reviewing a Theory That Moves Us," *Journal of Management* 34, no. 6 (Dec 2008): 1152-1189, doi:10.1177/0149206308324322.

Lepak, David P., Ken G. Smith and M.Susan Taylor, "Value Creation and Value Capture: A Multilevel Perspective", *Academy of Management Review* 32, no. 1, (2007): 180-194, doi: 10.5465/AMR.2007.23464011.

Ley 29/2006, de 26 de julio , de garantías y uso racional de los medicamentos y productos sanitarios. (BOE 178, de 27 de julio), <http://www.boe.es/buscar/doc.php?id=BOE-A-2006-13554> (accessed August 20, 2014).

Ley 7/2011, de 11 de abril, por la que se modifican la Ley 41/1999 de 12 de noviembre sobre sistemas de pagos y de liquidación de valores y el Real Decreto-ley 5/2005, de 11 de marzo, http://www.boe.es/diario_boe/txt.php?id=BOE-A-2011-6549 (accessed August 20, 2014).

Lozano, Josep . M., "Towards the Relational Corporation: From Managing Stakeholder Relationships to Building Stakeholder Relationships (waiting for Copernicus)," *Corporate Governance* 5, no. 2 (2005): 60 – 77, doi:10.1108/14720700510562668.

Mackey, Alison, Mackey, Tyson B and Jay B. Barney, "Corporate Social Responsibility and Firm Performance: Investor Preferences and Corporate Strategies," *Academy of Management Review* 32, no. 3 (2007): 817–835, doi: 10.5465/AMR.2007.25275676

Mann, Henry B. and Donald R. Whitney, "On a Test of Whether one of Two Random Variables is Stochastically Larger than the Other," *Annals of Mathematical Statistics* 18, no. 1 (1947): 50–60, doi:10.1214/aoms/1177730491. MR 22058. Zbl 0041.26103.

Margolis, Joshua D and James P. Walsh, "Misery Loves Companies: Rethinking Social Initiatives by Business," *Administrative Science Quarterly* 48, no. 2 (2003): 268-305, doi:10.2307/3556659.

Maroto Acín, Juan Antonio, "Consideraciones en torno al excedente de productividad global. Una propuesta para la evaluación de resultados en la empresa pública", Tesis doctoral, Universidad Complutense de Madrid. 1980.

McGuire, Jean B., Alison Sundgren and Thomas Schneeweis, "Corporate Social Responsibility and Firm Financial Performance," *Academy of Management Journal* 31, no. 4 (1988): 854-72. doi: 10.2307/256342.

Méraud, Javier, “Introduction a la Journée d’Études du 14 Décembre 1966.” Published as an appendix to CERC (Centre d’Études des Revenus et des Coûts) (1969), “‘Surplus de Productivité Globale’ et ‘Comptes de Surplus’,” Documents du Centre d’Études des Revenus et des Coûts, no 1, 1er trimestre, Paris, CERC. 1966.

Meyer, Meike and Inés Muller “Networked Healthcare: A Practical Guide to Understanding Influence Networks,” *Journal of Medical Marketing* 6, no. 4 (2006): 600–615, doi:10.1057/palgrave.jmm.5050052.

Miller, David M. “Profitability = Productivity + Price Recovery,” *Harvard Business Review* 62, no.3 (1984): 145-53.

Mirvis, Philip. H and Bradley K. Googins, “Stages of Corporate Citizenship,” *California Management Review* 48, no. 2 (2006): 104-126.

Mitchell Ronald K., Bradley R. Agle and Donna Wood, “Towards a Theory of Stakeholder Identification and Saliency: Defining the Principle of Who and What Really Counts,” *Academy of Management Review* 22, no. 4 (1997): 853-886, doi: 10.5465/AMR.1997.9711022105.

Moreno-Torres, Ivan, Jaume Puig-Junoy, Josep M. Raya, “The Impact of Repeated Cost Containment Policies on Pharmaceutical Expenditure: Experience in Spain,” *The European Journal of Health Economics* 12, no. 6 (2011):1-11, doi: 10.1007/s10198-010-0271-1.

Nadolny, Andrew J., “Rethinking The “Innovative Firm”: Innovation Creation In The Australian Water Technology Industry,” *Journal of Knowledge Management Policy* 11, no. 1 (2010):1-16.

Nemetz, Annette M., “A Global Investigation of Government and Community Stakeholder Influences on Large Company Engagement in Sustainability,” *International Journal of Business and Management* 10, no. 2 (2015): 1-14, DOI: 10.5539/ijbm.v10n2p1.

Neville, Benjamin and Bulent Menguc, “Stakeholder Multiplicity: Toward an Understanding of the Interactions between Stakeholders,” *Journal of Business Ethics* 66 (2006): 377–391, doi:10.1007/s10551-006-0015-4.

OCDE. Health Care expenditure OCDE. 2015.

<http://stats.oecd.org/index.aspx?DataSetCode=SHA> (accessed June 28, 2015)

OECD. “All on Board. Making Inclusive Growth Happen”. 2014.

<http://www.oecd.org/inclusive-growth/All-on-Board-Making-Inclusive-Growth-Happen.pdf> (accessed August 4th, 2015)

OECD Health Statistics 2014. How does Spain compare? <http://www.oecd.org/els/health-systems/Briefing-Note-SPAIN-2014.pdf> (accessed February 1st, 2015).

Oliver, Christine, “Strategic Responses to Institutional Processes,” *Academy of Management Review* 16, no. 1 (1991):145-179, doi: 10.5465/AMR.1991.4279002

Orden SCO/3803/2008, de 23 de diciembre, por la que se determinan los nuevos conjuntos de medicamentos, sus precios de referencia, y se revisan los precios de referencia determinados por Orden SCO/3997/2006, de 28 de diciembre, y por Orden SCO/3867/2007, de 27 de diciembre, http://www.boe.es/diario_boe/txt.php?id=BOE-A-2008-21015 (accessed August 20, 2014).

Orden SPI/3052/2010, de Precios de Referencia,

<http://www.boe.es/boe/dias/2010/11/29/pdfs/BOE-A-2010-18258.pdf> (accessed August 20, 2014).

Orlitzky, Marc, Frank L. Schmidt and Sara L. Rynes, “Corporate Social and Financial Performance: A Meta-Analysis.” *Organization Studies* 24, no. 3, (2003): 403–441, doi:10.1177/0170840603024003910.

Pajunen, Kalle, “Stakeholder Influences in Organizational Survival,” *Journal of Management Studies* 43, no. 6 (2006): 1261-1288, doi:10.1111/j.1467-6486.2006.00624.x.

Perrini, Francesco and Antonio Tencari, “Sustainability and Stakeholder Management: the Need for New Corporate Performance Evaluation and Reporting Systems,” *Business Strategy and the Environment* 15 (2006): 296-308, doi: 10.1002/bse.538.

Pesqueux, Yvon and Salma Damak-Ayadi, “Stakeholder Theory in Perspective,” *Corporate Governance* 5, no. 2 (2005): 5-21, doi: 10.1108/14720700510562622.

Pezzey, J.C., Toman, M.A. (2002) “The Economics of Sustainability: A Review of Journal Articles,” *Discussion paper. Resources for the future*. <http://www.rff.org/documents/RFF-DP-02-03.pdf> (accessed July 7, 2013).

Pfeffer, Jeffrey and Gerald R. Salancik. *The External Control of Organizations: A Resource Dependence Perspective*. New York: Harper and Row. 1978.

Piña Mavarez, Enzo and Eugenia Suárez Serrano, “Mecanismos de regulación en la industria farmacéutica española: una valoración del Pacto de Estabilidad Gobierno-Industria Farmacéutica 2001-2004,” *GCG Georgetown University - Universia* 3, no. 1 (2007): 88-103, doi: 10.3232./GCG.2009.V3.N1.05.

Porter, Michael E. *The Competitive Advantage of Nations*. New York. 1990.

Post, James E., Preston, Lee E, Sybille Sachs, “Managing the Extended Enterprise: The New Stakeholder View,” *California Management Review* 45, no. 1 (2002): 6-28.

Preston, Lee E. and Thomas Donaldson, “Stakeholder Management and Organizational Wealth,” *Academy of Management Review* 24, no. 4 (Oct 1999): 619-620, doi:10.5465/AMR.1999.12600806.

Prieto, David C. and Santiago Lago-Peñas, “Decomposing the Determinants of Health Care Expenditure: the Case of Spain,” *The European Journal of Health Economics* 13, no. 1, (2012):19-27 . doi:10.1007/s10198-010-0276-9.

Puiseux, Louis and Pierre Bernard, “Les Progrès de productivité et leur utilisation a l'électricité de France de 1952 a 1962,” *Études et Conjoncture* (1965): 77-98.

Purnell, Lauren S. and R. Edward Freeman, “Stakeholder Theory, Fact/Value Dichotomy, and the Normative Core: How Wall Street Stops the Ethics Conversation,” *Journal of Business Ethics* 109 (2012):109–116, doi:10.1007/s10551-012-1383-6.

Real Decreto 2402/2004, de 30 de diciembre, por el que se desarrollaba el artículo 104 de la Ley 25/1990, de 20 de diciembre, del Medicamento, https://www.boe.es/diario_boe/txt.php?id=BOE-A-2004-21919 (accessed August 20, 2014).

Real Decreto-Ley 4/2010, de 26 de marzo, de racionalización del gasto farmacéutico con cargo al Sistema Nacional de Salud, http://www.boe.es/diario_boe/txt.php?id=BOE-A-2010-5030 (accessed August 20, 2014).

Real Decreto-ley 9/2011, de 19 de agosto, de medidas para la mejora de la calidad y cohesión del Sistema Nacional de Salud, de contribución a la consolidación fiscal, y de elevación del importe máximo de los avales del Estado para 2011, publicado en el BOE de 20 de agosto de 2011, http://www.boe.es/diario_boe/txt.php?id=BOE-A-2011-14021 (accessed August 20, 2014).

Real Decreto-ley 16/2012, de 20 de abril, de medidas urgentes para garantizar la sostenibilidad del Sistema Nacional de Salud y mejorar la calidad y seguridad de sus prestaciones, <http://www.boe.es/boe/dias/2012/04/24/pdfs/BOE-A-2012-5403.pdf> (accessed August 20, 2014).

Reimann, Bernard C., "Organizational Effectiveness and Management's Public Values: A Canonical Analysis," *Academy of Management Journal* 18, no. 2 (1975): 224–241, doi:10.2307/255526.

Repullo, José R., "Gasto sanitario y descentralización: ¿saldrá a cuenta haber transferido el INSALUD?," *Presupuesto y Gasto Público* 49 (2007): 47-66. Secretaría General de Presupuestos y Gastos. Instituto de Estudios Fiscales. 2007.

Riahi-Belkaoui, Ahmed, "Executive Compensation, Organizational Effectiveness, Social Performance and Firm Performance: An Empirical Investigation," *Journal of Business Finance and Accounting* 19, no.1(1992): 25-38, doi: 10.1111/j.1468-5957.1992.tb00608.x.

Roloff, Julia, "Learning From Multi-Stakeholder Networks: Issue-Focused Stakeholder Management," *Journal of Business Ethics* 82, no. 1 (2008): 233–250, doi: 10.1007/s10551-007-9573-3.

Roman, Ronald. M., Sefa Hayibor, and Bradley. R. Agle, "The Relationship between Social and Financial Performance: Repainting a Portrait," *Business Society* 38 (1999): 109–125, doi:10.1177/000765039903800105.

Rowley, Timothy J., “Moving beyond Dyadic Ties: A Network Theory of Stakeholder Influences,” *Academy of Management Journal* 22, no. 4 (1997): 887-910, doi:10.5465/AMR.1997.9711022107.

Rowley, Timothy J. and Shawn Berman, “A New Brand of Corporate Social Performance,” *Business and Society* 39, no. 4 (Dec 2000): 397-418, doi:10.1177/000765030003900404.

Rowley, Timothy J., and Mihnea Moldoveanu, “When Will Stakeholder Groups Act? An Interest- and Identity-Based Model of Stakeholder Group Mobilization,” *Academy of Management Review* 28, no. 2 (2003):204-219, doi: 10.5465/AMR.2003.9416080.

Rubio, M^a José and Francisco Reyes, “Algunas consideraciones sobre el futuro del Sistema Nacional de Salud,” *Revista Administración Sanitaria* 5, no. 2 (2007):195-204.

Sachs, Suzanne and Edwin Rühli, “Changing Managers’ values Toward a Broader Stakeholder Orientation,” *Corporate Governance* 5, no. 2 (2005): 89–98, doi:10.1108/14720700510562686.

Sachs, Sybille and Marc Maurer, “Toward Dynamic Corporate Stakeholder Responsibility,” *Journal of Business Ethics* 85, Supplement 3, (2009): 535–544, doi:10.1007/s10551-009-0213-y.

Sánchez, Francisco, “Medidas de racionalización del gasto sanitario y su aplicación: un enfoque alternativo sobre las centrales de compra,” *Presupuesto y Gasto Público* 49 (2007): 179-192. Secretaría General de Presupuestos y Gastos ©, Instituto de Estudios Fiscales. 2007.

Saniline. Estudio del gasto sanitario. 2007.

Savage, Grant T., John D. Blair and Rich L. Sorenson, “Consider Both Relationships and Substance When Negotiating Strategically,” *Academy of Management Executive* 3, no. 1 (1989):37-48, doi: 10.5465/AME.1989.4277149.

Savage, Grant T, Timothy W. Nix, Carlton J. Whitehead, and John D. Blair, “Strategies for Assessing and Managing Organisational Stakeholders,” *Academy of Management Executive* 5, no 2 (1991): 61-75, doi: 10.5465/AME.1991.4274682.

Scherer, Frederic M. and David R. Ross. *Industrial Market Structure and Economic Performance*. Houghton Mifflin. 3rd. Edition. 1990.

Schumpeter, Joseph A. *Business Cycles*. New York: McGraw-Hill Book Company, Inc. 1939.

Schumpeter, Joseph K. *The Theory of Economic Development*. Boston M.A. Harvard University Press. 1934.

Schumpeter, Joseph K. *Capitalism, Socialism and Democracy*. New York. Harper. 1942.

Sharma, Sanjay and Irene Henriques “Stakeholder Influences on Sustainability Practices in the Canadian Forest Products Industry,” *Strategic Management Journal* 26 (2005): 156-180, doi: 10.1002/smj.439.

Shephard, Ronald W., *Cost and Production Functions*. Princeton University Press: Princeton. 1953.

Siegel, Irving H. “Concepts and Measurements of Production and Productivity,” *Working Paper of the National Conference on Productivity, Bureau of Labor Statistics, U.S. Department of Labor*, 1952.

Siegel, Irving H. “On the Design of Consistent Output and Input Indexes for Productivity Measurement,” in *Output, Input and Productivity Measurement, National Bureau of Economic Research Studies in Income and Wealth* 25. Princeton, NJ: Princeton University Press. 1961.

Silverberg, Gerald and Bart Verspagen, “Collective Learning, Innovation and Growth in a Boundedly Rational, Evolutionary World,” *Journal of Evolutionary Economics* 4, no. 3 (1994): 207-226, doi:10.1007/BF01236369.

Smith, Adam, “An Inquiry into the Nature and Causes of the Wealth of Nations” (1 ed.). London: W. Strahan. 1776. Retrieved 2015-09-05, volume 1 via Google Books

Spence, Martine. “Efficiency and Personalization as Value Creation in Internationalizing High-Technology SMEs,” *Canadian Journal of Administrative Sciences* 21, no. 1 (2004): 65–78, doi: 10.1111/j.1936-4490.2004.tb00323.x.

- Spicer, Barry. H., "Investors, Corporate Social Performance and Information Disclosure: An Empirical Study," *The Accounting Review* 53, no. 1 (1978): 94-111.
- Spitzeck, Heiko, Erik G. Hansen, "Stakeholder Governance: How Stakeholders Influence Corporate Decision Making," *Corporate Governance* 10, no. 4 (2010):378-391, doi:10.1108/14720701011069623.
- Stern, Joel M., G. Bennett Stewart III and Donald H. Chew, "EVA[®]: An Integrated Financial Management System," *European Financial Management* 2, no. 2 (1996): 223-245, doi: 10.1111/j.1468-036X.1996.tb00039.x.
- Stiglitz, Joseph, Amartya Sen and Jean-Paul Fitoussi "The Measurement of Economic Performance and Social Progress Revisited", OFCE, N° 2009-33 (2009): 1-64.
- Sturdivant, Frederic D., "Corporate Social Responsiveness: Management Attitudes and Economic Performance," *California Management Review* 19, no. 3 (1977): 30-39.
- Swanson, Diane L., "Toward An Integrative Theory for Business and Society: A Research Strategy for Corporate Social Performance," *Academy of Management Review* 24 (1999): 506–521, doi: 10.5465/AMR.1999.2202134.
- Teece, David J. *Managing Intellectual Capital: Organizational, Strategic and Policy Dimensions*. Oxford University Press. Oxford. 2000.
- Teece, David J. "Technological Innovation and the Theory of the Firm: The Role of Enterprise-level Knowledge, Complementarities, and (Dynamic) Capabilities". Chapter 16. *Handbook in Economics*. Volume 01. Elsevier. 2010.
doi: 10.1016/S0169-7218(10)01016-6.
- Tsai, Philip D.F., C. Rosa Yeh, Shu-Ling Wu, Ing-Chung Huang, "An Empirical Test of Stakeholder Influence Strategy Models: Evidence From Business Downsizing in Taiwan," *International Journal of Human Resources Management* 16, no. 10 (2005): 1862-1885, doi: 10.1080/09585190500298479.
- Tullberg, Jan, "Stakeholder Theory: Some Revisionist Suggestions," *The Journal of Socio-Economics* 42 (2013):127–135, doi:10.1016/j.socec.2012.11.014.

Turban, Daniel B. and Daniel W. Greening, "Corporate Social Performance and Organizational Attractiveness to Prospective Employees," *Academy of Management Journal* 40, no. 3 (1997): 658–672, doi: 10.2307/257057.

Ullmann, Arie A., "Data in Search of a Theory: A Critical Examination of the Relationship among Social Performance, Social Disclosure, and Economic Performance," *Academy of Management Review* 10 (1985): 540–577, doi: 10.5465/AMR.1985.4278989.

Urbanos, Rosa M^a., "El acuerdo de financiación sanitaria y su repercusión para el Sistema Nacional de Salud," *Presupuesto y Gasto Público* 42 (2006): 229-240. Secretaría General de Presupuestos y Gastos. Instituto de Estudios Fiscales.

Verbeke, Alain and Vincent Tung, "The Future of Stakeholder Management Theory: A Temporal Perspective," *Journal of Business Ethics* 112 (2013):529–543, doi:10.1007/s10551-012-1276-8

Vincent, André L., "De La mesure de la productivité aux problemes generaux de gestion economique," *Revue Economique* 6 (1965): 879-924.

Waddock, Sandra. A. and Samuel B. Graves, "The Corporate Social Performance-Financial Performance Link," *Strategic Management Journal* 18, no. 4 (April 1997): 303-319, doi: 10.1002/(SICI)1097-0266(199704).

Wakelin, Katharine, "Innovation and Export Behavior at the Firm Level," *Research Policy* 26, no. 7-8 (1998): 829-841, doi: 10.1016/S0048-7333(97)00051-6.

Wartick, Stephen L. and Phillip L. Cochran, "The Evolution of the Corporate Social Performance Model," *Academy of Management Review* 10 (1985): 758–769, doi:10.5465/AMR.1985.4279099.

Wheeler, David, Barry Colbert, Edward R. Freeman, "Focusing on Value: Reconciling Corporate Social Responsibility, Sustainability and Stakeholder Approach in a Network World," *Journal of General Management* 28, no. 3 (2003):1-28.

Wilcoxon, Frank, "Individual Comparisons by Ranking Methods," *Biometrics Bulletin* 1, no. 6. (Dec 1945): 80-83.

Willer, David, Michael J. Lovaglia, and Barry Markovsky, "Power and Influence: A Theoretical Bridge," *Social Forces* 76, no. 2 (Dec 1997): 571-603, doi: 10.1016/S0733-558X(00)17005-3.

Windsor, Duane, "The Role of Dynamics in Stakeholder Thinking," *Journal of Business Ethics* 96, no. (2010):79-87, doi: 10.1007/s10551-011-0937-3.

Wright, Chester, "The Nature and Objectives of Economic History," *Journal of Political Economy* 46, no. 5 (Oct., 1938):688-701.

Wood, Donna, J and Raymond E. Jones, "Stakeholder Mismatching: A Theoretical Problem in Empirical Research on Corporate Social Performance," *The International Journal of Organizational Analysis* 3, no 3 (1995):229-267, doi:10.1108/eb028831

Yamak, Sibel and Ömur Sürer, "State as a Stakeholder," *Corporate Governance* 5, no. 2 (2005): 111-120, doi:10.1108/14720700510562695.

Zellweger, Thomas M., Robert S. Nason, "A Stakeholder Perspective on Family Firm Performance," *Family Business Review* 21, no. 3, September 2008: 203-216, doi:10.1111/j.1741-6248.2008.00123.x.

Zietsma, Charlene and Monika I. Winn, "Building Chains and Directing Flows: Strategies and Tactics of Mutual Influence in Stakeholder Conflicts," *Business and Society* 47, no. 1 (2008): 68–101, doi:10.1177/0007650307306641.

