

FOUNDING SCIENCE INSTITUTES:  
THE TRIPLE-HELIX AND HOW THE GLOBAL INSTITUTE FOR FOOD SECURITY WAS  
FOUNDED

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BY  
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## ABSTRACT

In addition to teaching and research, many universities around the world have started to assume a direct role in economic development. In the literature, this trend is referred to as creating the entrepreneur university. Focusing on the interaction among government, business, and academia, the triple-helix theory is used frequently by contemporary social scientists to analyze the processes of creating the entrepreneur university. When reviewing the literature and reading about the triple-helix theory, I realized that a study of a contemporary and global institute, intended from the beginning to function through the interaction of government, business, and academia, and including informants and participants' perceptions was needed. I posed my research question as follows: Does the triple-helix theory explain the factors, motivations, and social processes that led to the creation of the University of Saskatchewan's Global Institute for Food Security (GIFS)? In order to answer this question, I conducted interviews with key academics, businesses, and government actors, gathered archival documents and media reports, and used qualitative data analysis and triangulation. My research findings indicate that the role of the industry in creating the GIFS is strong and that the GIFS embodies the new policy of the University, which as recommended by supporters of commercialization can be summarized with the following four points: improving signature areas, improving the position of the University within university rankings, increasing central planning, and attracting private funding and partnerships. Furthermore, research findings indicate that, for the most part, the triple-helix theory does not help in explaining how the GIFS was founded, as it does not problematize power relations and it appraises the status quo.

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## **DEDICATION**

To my mother,  
Camilia Abdelmoaty Ebada,  
who inspires me.

And to my father,  
Dr. Mohamed Younis,  
and my uncle,  
General Ahmed Mourad Abdelmoaty Ebada,  
who continue to inspire me even after their passing.

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## CHAPTER 1: INTRODUCTION

### **1.1 Introduction to the Study**

Universities in North America and elsewhere around the world are witnessing rapid changes. In recent decades, one of these changes involved universities assuming a third role in addition to teaching and research: economic development. This is a response to the shift from an industrial-based economy to a knowledge-based one. Earlier, innovation was the exclusive role of industry and government. Now, the university participates in innovation as well, which has created what has been called the entrepreneur university. The interactions between government, industry, and the university vary among different countries. However, governments in many countries plan to get the university to play a significant role in creating a scientific/knowledge base for the economy. Contemporary social scientists frequently use the triple-helix theory to analyze the process of commercializing science and the process of creating the entrepreneur university. The model offers an approach to studying science production through analyzing the three helices, or spheres, involved—government, industry, and the university—and the different consequences of their interactions. The triple-helix model “attempts to account for a new configuration of institutional forces emerging within innovation systems” (Etzkowitz et al. 2000: 314).

Arguments exist both in opposition to and in favor of the entrepreneur university. Arguments against the entrepreneur university include the following: the entrepreneur university threatens the academic integrity of the university (Brooks 1993; Giroux 2013; Heller 2016; Hohmann 2016; Pelikan 1992); and it shifts the focus of the university away from basic and toward applied research, which has a negative impact on students’ educational levels (Etzkowitz et al. 2000). Arguments in favour of the entrepreneur university include the following: the entrepreneur university contributes to economic development (Etzkowitz et al. 2000); science has always been interested (i.e. scientists had interests before the entrepreneur university) and, thus, by getting scientists to seek funding from industry, the entrepreneur university does not create something completely new (Kleinman and Vallas 2001); and the special contribution of the three helices can only be reached through the interaction of these three helices (Etzkowitz 2006; Leydesdorff and Etzkowitz 2003). This final argument that the special contribution of the

three helices can only be reached through their interaction is at the heart of the triple-helix theory, which supports the entrepreneur university, as discussed further below.

This study attempts to answer the following research question: Does the triple-helix theory explain the factors, motivations, and social processes that led to the creation of the University of Saskatchewan's Global Institute for Food Security (GIFS)?

This chapter consists of four sections. In this first section, I briefly introduce the study. In the second section, I discuss the significance of the study and re-state the research question. The third section provides a background information on the research centre: the GIFS. In the fourth section, I lay out the main argument of the dissertation and describe its organization.

## **1.2 Significance of the Study and the Research Question**

After my review of the literature, I realized that an empirical study on the commercialization of research conducted at universities, which includes the following four aspects together, was necessary to fully understand these processes. First, a case study on an institute/project that is founded and intended from the beginning to function through the interaction of the three helices. Second, this case study must be contemporary and provide updated research findings capturing social complexities as the process of the commercialization of the university changes. Third, it should be a global institute/project, meaning that it has global goals. Finally, it should include informants and participants' perceptions of the factors, motivations, and processes leading to the creation of the institute. With these requirements in mind, I formulated my research question, mentioned above.

The GIFS is the main focus of my empirical research. According to Chad (2012), the GIFS is a new and global institute at the University of Saskatchewan whose stated purpose is to help the university apply its knowledge and expertise in agriculture and food security to improve food production and distribution around the world. It was founded as a partnership between the Province of Saskatchewan, the Potash Corporation of Saskatchewan (PotashCorp), and the University of Saskatchewan (Global Institute for Food Security 2016).

The commercialization of the university is based on the idea of the interaction of the three helices: government, industry, and the university. The GIFS was, from the outset, meant to function explicitly through the interaction and operation of the three helices. As a contemporary research centre that was funded largely by the private sector/industry and was intended from the

beginning to work through the interaction of the three helices, the GIFS might reflect the influence of the recent trend in university privatization. Studying it will provide a broad perspective on the process of commercializing the university. Furthermore, it will allow us to monitor the interaction of the three helices closely. Moreover, the informants' perceptions and experiences, and the meanings they attach to their contribution to science production and society development will underscore a very significant dimension of the processes leading to the creation of the institute. This is the dimension of the motivations and social processes.

Studying the commercialization of the university through the creation process of a global institute is useful from a broad theoretical perspective. The commercialization of the university is a consequence of a global paradigm which at the moment, is heavily influenced by neoliberal ideas.<sup>1</sup> As a global institute, the GIFS has explicit goals and promises related to global development. Institutes with such goals are supposed to embody global policies and paradigms and to bring their benefits to the world; consequently, they justify global paradigms, in this case the neoliberal paradigm. In other words, as a global paradigm, neoliberalism claims to improve the welfare of the whole world, and on this basis its proponents request the world's adherence to it. Thus, an institute such as the GIFS, with its global goals and promises for global development, is assumed to bring the benefits of the neoliberal paradigm to the world, and its success will increase international support for neoliberal paradigm. Studying a global institute will allow us to see how an institute is supposed to bring the benefits of the neoliberal paradigm to the world in practice. This is in contrast to just studying a university department or a group of scientists who do not necessarily have a global agenda and who might only be affected by the neoliberal paradigm.

On an empirical level, this study will provide the GIFS, policy makers, academics, and social scientists with the sociological perspective required to understand the social structures and processes influencing the creation of science production institutes and the nature and type of power relations that made the creation of the GIFS possible. In addition, it will build on the sociological literature by providing additional empirical knowledge about the commercialization of science and the university.

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<sup>1</sup> The precise meaning of neoliberalism is discussed in Chapter 2, starting on p. 20.

On the theoretical level, this study will contribute to increasing knowledge about the commercialization of the university by building on existing sociological literature and by assessing the triple-helix theory in a new context, one that includes the four aspects I mentioned above. First, that the study should be on an institute that was intended from the beginning to operate through the interaction of the three helices. Second, the study should be contemporary and providing updated research results. Third, it should be on a global institute/project that has global goals. Fourth, the study should include the participants' perceptions of the factors, motivations, and processes that led to the creation of the institute. Through reviewing several sources (including Etzkowitz 2006; Etzkowitz et al. 2000; Kim et al. 2012; Leydesdorff and Etzkowitz 2003; Williams 2012), it became clear that the triple-helix theory is the main theory used in the contemporary sociology of science and that it focuses on the institutions of science production (government, industry, and the university) rather than science products (published papers and innovations). This is consistent with the empirical focus of my study, as I too focus on the institutions of science production rather than the products of science. I do so because institutions have a wider relevance, and they are particularly relevant to policy makers and academics. There is also a practical reason for this focus: I do not have a background in the hard sciences, nor do I have the option of working with a co-researcher who does, and so I cannot focus on the products.

### **1.3 Background**

In this subsection, I provide a brief background on the GIFS.

#### **1.3.1 The Global Institute for Food Security (GIFS)**

The GIFS was officially launched in December 2012. It is founded as a partnership between the Province of Saskatchewan, the University of Saskatchewan, and PotashCorp of Saskatchewan (Global Institute for Food Security 2016). Its primary purpose is to help the university apply its knowledge and expertise in agriculture and food security to the improvement of food production and distribution in the world (Chad 2012).

More precisely, the GIFS has four main goals. The first goal is to contribute knowledge, expertise, and resources to help answer two key questions: 1) How can the quantity and quality of food be expanded sustainably now and in the next century; and 2) how can we know if that

food reaches those who need it (Chad 2012; Global Institute for Food Security 2016)? The second goal is to attract funds, increase commercialization, and secure partnerships. The third goal is to have ethical responsibility towards the global problem of food security. Finally, the GIFS aims to enhance the reputation of the University of Saskatchewan and the province of Saskatchewan (Chad 2012).

The GIFS' exact research focus areas are seed and developmental biology, root-soil-microbial interactions, and digital and computational agriculture (Global Institute for Food Security 2016). The assessment of the Institute would be initiated and managed by the Vice President for Research at the University of Saskatchewan to monitor its achievements (Chad 2012).

#### **1.4 Main Argument and Dissertation Organization**

The main argument of the dissertation is that the GIFS reflects the influence of the recent trend toward the entrepreneur university and the commercialization of science. The trend is characterized by the major role reserved for industry in science production at universities. The role of industry in creating the GIFS was strong. Furthermore, the GIFS embodies the new policy of the University. The new policy of the University as Dr. Peter MacKinnon, former president of the University of Saskatchewan, and other supporters of commercialization recommended, can be summarized with the following four points: improving signature areas, improving the position of the University within university rankings, increasing central planning, and attracting private funding and partnerships. The tripe-helix theory is unable to contribute to the critical analysis of the important role of industry in creating the GIFS. While the triple-helix theory does help explain some aspects of how the GIFS was created, it exaggerates the importance of these aspects. The triple-helix theory, as I argue, justifies the commercialization of the university, instead of explaining it from a critical standpoint.

The dissertation is divided into six chapters. Chapter 2 includes two major sections: a literature review and a discussion of the theoretical framework. The literature review section highlights the significance of my study by describing its wide context. The second section details the theoretical framework underpinning this study. This framework draws on concepts from Bourdieu's habitus and the field and John L. Campbell's institutional change model. I use these concepts as research tools to help investigate how the GIFS was founded.

Chapter 3 discusses the methodology I used to conduct my research. Chapters 4 and 5 presents and discusses the empirical research findings on the GIFS. Chapter 4 discusses the factors and the goals of the GIFS and Chapter 5 discusses its founding process and its early operation period. Chapter 6, the concluding chapter, draws on the analysis of Chapters 4 and 5 while answering the research question and sketching an agenda for future research in the field. The Appendix includes a summary of the GIFS Proposal and Memorandum of Agreement. However, the relevant parts of the Proposal and the Memorandum of Agreement are discussed in the body of the thesis and are integrated with my entire research. I just wrote a briefing of the Proposal and the Memorandum of Agreement in the Appendix to allow the readers to see the important points, which I discussed in the thesis, in their wider context, that is, as part of the Proposal and the Memorandum of Agreement. One of the reasons for this is that the Proposal and the Memorandum of Agreement are not published and the readers have no access to them.

In this chapter I introduced the study and its important aspects. In the following chapter I will discuss the literature review and the theoretical framework.

## **CHAPTER 2: LITERATURE REVIEW AND THEORETICAL FRAMEWORK**

This chapter includes two major sections: the literature review and a presentation of the theoretical framework. The literature review section first discusses the triple-helix theory and the historical development of the entrepreneur university and then goes on to explore the contemporary transformation of the university. Furthermore, it highlights the relationship between the triple-helix theory, the commercialization of the university, and the neoliberal paradigm. Finally, it discusses some critical issues about universities' academic integrity during this era of commercialization. The literature review provides a broad context for the significance of my study and provides a better understanding of the social reality that is the backdrop for my topic.

The second and final section details the theoretical framework underpinning this study. This includes two subsections, one about Bourdieu's concepts of habitus and the field and the other about John L. Campbell's concepts of institutional change model. The subsection on Bourdieu's concepts of habitus and the field discusses his concepts that help explain the social and historical context in which the creation of the GIFS took place. These concepts underscore the existence of different kinds of capital, how to measure them, and how to identify individuals' interests. The subsection also includes a smaller subsection on Bourdieu's critique of functionalism because the triple-helix theory is grounded in functionalist assumptions. The subsection on Campbell's concepts of institutional change model discusses his argument that institutions constitute the wider context of organizations and that these wider institutional contexts influence the creation of organizations. The GIFS is considered an organization in Campbell's view. Campbell's concepts, which define institutions and explain how they change, provide a lens through which to understand the context of the research centre I studied.

### **2.1 Literature Review: The Commercialization of the University and Science, the Triple-Helix, and Neoliberalism**

This section, divided into four subsections, discusses some of the works that have been written about my research topic.



### **2.1.1 The Triple-Helix and the Historical Development of the Entrepreneur University**

The triple-helix theory concerns the interaction among three institutional helices or spheres: government, industry, and the university. The theory identifies four major processes relating to changes in knowledge production that affect these three helices and their interactions (Etzkowitz et al. 2000). The four processes are very much interrelated and occur simultaneously rather than sequentially. The first process is the internal transformation of each helice. An example of this is the change within each helice, such as the new role of the university in economic development. The second process is related to the influence of one institutional sphere upon bringing about transformation. A case in point would be government policy created to transfer intellectual property rights from governments and individuals to universities. Here, an action in one institutional sphere, the government, changed the role and the rights of another institutional sphere, the university. The third process involves institutionalizing and reproducing interfaces. This involves the efforts of groups, such as those in Silicon Valley and beyond, to gather experts from the three spheres to share and discuss ideas with the goal of coming up with solutions that are difficult to reach without the interactions of agents from the three spheres. The final process is the recursive effect of these inter-institutional networks of government, industry, and the university on both their own spheres and larger society. One example of this recursive effect is the change in the character of science production itself. As Etzkowitz et al. (2000) argue, because of commercializing knowledge, the old norms of the university, that is, the disinterested search for knowledge, became threatened. This is not the result of the internal transformation of academia only, but also the result of external influences on the university (Etzkowitz et al. 2000).

In order to fully understand changes in the process of knowledge production, it is important to look at its history. In the 1960s and 1970s, US industry was in crisis due to an increase in international competition. US government officials formulated plans to transfer the practical outcomes of science and technology—produced by universities—to industry.<sup>2</sup> Yet at the time, there were insufficient mechanisms to transfer technology to industry (Etzkowitz et al. 2000). This gap was called the “valley of death” (Etzkowitz 2006). US government officials’ answer to this problem was to allow universities to earn intellectual property rights on research

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<sup>2</sup> In this chapter, I will not discuss how the process of science commercialization happened differently in different countries. Though I do offer examples from specific countries, my main argument is about how science commercialization happened in the West more generally. The process happened in many Western countries in approximately the same way.

funded by the government, as this would result in further transfers of technology to industry. This worked for some time, despite opposition from some who thought that allowing universities to acquire patent rights on research funded by the government was a privatization of goods that were supposed to be public. In response, the proponents of technology transfer searched for a legal framework to protect technology transfer. This came in the form of the 1980 Bayh-Dole Act, which gave the university a legal right to have patents on research funded by the government. The financial benefits of patent rights were divided among the investigator, the investigator's department, and the investigator's university (Etzkowitz et al. 2000).

The Bayh-Dole Act required universities to commercialize their innovations. As a result, universities started to create technology transfer offices. They increased their efforts to commercialize the technology researchers created by forming incubators to assist them in founding new firms. However, initial funding remained a significant obstacle. Different universities and governments responded to this problem in different ways. One solution was to create government programs that were designed to assist in funding new firms; these firms called public entrepreneurs, varied in their degree of dependence on the university. In a UK study, they were classified into four types. The first type, the "independent firm," has no ties with the universities anymore, and has limited contact with the university when compared with its contacts with other firms. The second type, the "hybrid firm," is, to an extent, dependent on the university both financially and administratively and is located within the university. Hybrid firms seek growth that would convert them into fully independent firms. The third type, the "shell firm," is usually located within a wider university holding company. Its main goal is to attract research funding for a particular university department. The fourth type, the "virtual firm," brings together research staff from several research sites and creates new embryonic product ideas that are usually not found within a single department. These ideas are then brought by a third party into the market. These wide and diverse processes of knowledge production enabled universities to have the capacity required to maximize innovation (Etzkowitz et al. 2000).

According to Etzkowitz (2006), the transformation of knowledge production resulted in locating academic research groups and commercial firms together in science parks. The science park could be seen as a continuum that includes commercial firms on one end and academic research groups on the other, and mixtures of the two in the middle. The internal transformation

in industry and the university and new government policies led to a new relationship between these three spheres; thus, “the knowledge-based economy takes on the format of a triple helix of university-industry-government collaboration that should be reflected in striking architectural designs that enhance green spaces” (Etzkowitz 2006: 318). The green spaces Etzkowitz refers to are science parks. He does not just see science parks as an outcome of the transformation of knowledge production and a shift to a knowledge-based economy, but as an expression of these and of the triple-helix concept.

Consistent with this but focusing more on the educational dimension of the university, Sam and van der Sijde (2014) point that the knowledge-based economy required more highly-educated citizens. This pressured governments to expand higher education, which resulted in increasing its overall cost and made it more challenging and difficult for these governments to fully support higher education, as they used to do. Universities were encouraged to become more financially independent and act entrepreneurially to survive in the new knowledge-based economy (Sam and van der Sijde 2014).

After searching for funding and generating income became part of the university’s job, the status of the university changed. Etzkowitz et al. (2000) argued that in Britain, public funding became increasingly dependent on whether or not it would have a direct contribution to the economy. Therefore, public institutions facing funding cuts started to get involved in activities “that either attract industrial funding or generate income” (Etzkowitz et al. 2000: 319). With the end of the Cold War, the focus in the US shifted from defense to economic development. Furthermore, the neoliberal policy perspective recommended a debt reduction policy. Consequently, there was less public money available for scholarly research. These several factors all led to the same outcome—universities with insufficient funds to undertake the research tasks expected of them (Etzkowitz et al. 2000). As universities were forced to seek funding from different sources, universities’ position became weaker, and simultaneously science-intensive firms started to have greater resources (Kleinman and Vallas 2001). MacKinnon (2014) argues that attracting private funding and partnerships has become inevitable for contemporary universities and that university presidents’ responsibility for attracting funding has increased.

The assisted linear model further highlights the interaction of the triple helices within triple-helix theory. Etzkowitz (2006) differentiates between the linear model and the assisted linear model. The linear model appears in the traditional form of science production, where

interactions occur between industry and the university, between government and the university, or between the three agents when government funds are in the form of grants and the government has no significant role in choosing research topics. This model is also called hands-off model (Etzkowitz 2006). The assisted linear model, or the triple-helix, involves the interaction of the three agents and the deliberate intervention of the government in funding research and in providing seed funding and capital venture for new firms, which is why it has been called the assisted linear model rather than just the linear model. This model emerged from the wartime research model, where several research groups from multiple disciplines worked together and used large-scale equipment that no single research group could afford (Etzkowitz 2006).

In terms of the nature of interactions of the three helices, Leydesdorff and Etzkowitz (2003) argue that there are mismatches between the institutional dimensions and the three functions of the three agents/helices. These mismatches create frictions that provide opportunities for innovation (Leydesdorff and Etzkowitz 2003). Thus, mismatches and frictions are part of the contemporary system of science production and are regarded as a positive condition by Leydesdorff and Etzkowitz (2003).

Connected to all of this is the increased importance of critical thinking in knowledge production. Kleinman and Vallas (2001) argued that, as the means of production and consumption have become increasingly dispersed across the globe, companies started to shift their focus from cost reduction and economies of scale to using advanced marketing, finance, and engineering. This required training in critical thinking, which is usually acquired in universities and expressed in university degrees. Kleinman and Vallas (2001) see these changes as a characteristic of post-Fordist firms. This is consistent with Jary and Jary's (2000) arguments, who argued that post-Fordist production forces were characterized by a decline in reliance on blue-collar workers and an increase of reliance on white-collar workers (that is, employees with university degrees). According to these authors, in this type of production, there is a tendency to promote high consumption patterns. This is done by increasing public consciousness about the importance of a distinctive lifestyle, taste, and appearance, which certainly requires the advanced marketing and mass communication skills usually acquired at universities as students learn to think critically. Lyotard (1984) argued that in the past, knowledge was sought for its own sake, whereas in the 1980s it became a commodity, i.e. a producer creates knowledge to sell it to a

consumer who would valorize it in a new product: "... in both cases, the goal is exchange. Knowledge ceases to be an end in itself, it loses its use-value" (Lyotard 1984: 4).

Sam and van der Sijde (2014) point that in the new knowledge-based economy, the labor market became more competitive and higher education became more important. Governments needed more highly educated individuals. Consequently, governments and international organizations put pressure on universities to restructure and become more responsive to these changes.

Kleinman and Vallas (2001) argue that, as a result of the increased frequency of interaction between universities and industry, there is pressure on the university to be isomorphic with industry, and pressure on industry to be isomorphic with the university. Firms' control over capital and the significance of capital in the production of contemporary science put pressure on the university to become isomorphic with industry greater than the other way around. Consequently, the transformation process is asymmetrical and favors the norms of the industry. The process of commercializing science, as I have argued above, leads to what Kleinman and Vallas (2001) call the infusion of industrial norms into the university. Lieberwitz (2017) also criticized the infusion of the industrial norms to the university and she mentioned that the industrial/corporate model pervaded all aspects of the university.

According to Kleinman and Vallas (2001), the pressure on industry to be isomorphic with the university is because firms, or industry, realize the importance of strategic knowledge and expertise. Firms realize that their competitiveness and legitimacy depend on strategic knowledge or intellectual capital and, thus, they attempt to have more access to academic institutions or the university itself. Firms' increased access to the university creates cross-sphere interactions, which create pressures on firms to adopt practices that were known as university practices rather than corporate practices. These include allowing corporate scientists to have more control over their research questions and labor processes; "appropriat[ing] the professional norm of publication and us[ing] it to establish their legitimacy among employees and investors" (Kleinman and Vallas 2001: 470); strengthening academic (or collegial) organizational culture and weakening the bureaucratic organizational culture that characterized corporations; and increasing the importance of the educative component of the social organization of work. This final element is expressed in a large increase in company-provided training and a new approach to relying on some outside trainers.

Thus, according to Kleinman and Vallas (2001), the transformation that takes place is asymmetrical and favours industry norms. This argument complements and contextualizes an important argument by Etzkowitz (2006), which is: “As ... [industry, government, and the university] interact, each sphere is transformed by taking the role of the other, operating on a y axis of their new role as well as on x axis of their traditional one” (Etzkowitz 2006: 312; see also Etzkowitz 2000).

Kleinman and Vallas (2001) and Etzkowitz’s (2006) arguments are not contradictory. Yet, although both might be good descriptions of the social reality, one of them is more accurate than the other. Either the most common pattern in the current transformation of research is that it is asymmetrically favoring the norms of industry, as Kleinman and Vallas (2001) argue, or the most common pattern is that each sphere is transformed by taking the role of the other, as Etzkowitz (2006) argue. More empirical research is needed to know which argument describes the most common pattern more accurately.

In this discussion, I described the process of transformation of the university and the reasons behind it. I discussed aspects of the triple-helix theory and presented the debate in the literature about the nature of the transformation that has taken place in the research world. In the next subsection, I will discuss the triple-helix theory more deeply, the potential implications and consequences of that transformation, and the underlying interests and goals of the parties involved in the process. The next subsection also explores the relation between the triple-helix theory, the commercialized university, and neoliberalism.

### **2.1.2 The Triple-Helix and Neoliberalism**

Hohmann (2016) provides an important study that shows the significance of the triple-helix theory outside its traditional area: contemporary science production. Hohmann (2016) attempts to assess the proposed framework of the triple-helix theory in terms of its usability for Smart Governance. He argues that the Smart Governance is very theoretical and needs a framework to be implemented.

According to Hohmann (2016), contemporary knowledge-based societies are characterized by uncertainty and the role of politics becomes more difficult and problematic. Hohmann (2016) mentions that according to Willke (2007), the problem in contemporary knowledge-based societies is that knowledge work and production became more important and

the legitimacy of decisions became more dependent on knowledge and expertise. Consequently, it became important to create a governance structure that is able to cope with these challenges. For Willke (2007), the solution is Smart Governance, which he defines as “ensemble of principles, factors and capacities that constitute a form of governance able to cope with the conditions and exigencies of the knowledge society” (Willke 2007, quoted in Hohmann 2016: 1). Quoting Willke (2007), Hohmann (2016) adds that the electoral process as a way to delegate political legitimacy became insufficient in ensuring adequate decision making in the context of knowledge-based societies.

To cope with the challenges facing knowledge-based societies mentioned above, Willke (2007) states that Smart Governance attempts to use knowledge from multiple sources to create solutions that adjust successfully to new complex environments. This involves getting hybrids and networks of “different organisational entities” (Hohmann 2016: 2) to participate in decision-making. This requires the creation of wider forms of accountability that extend beyond day-to-day activities while using expert commissions, conferences, and similar activities to improve policies on the midterm and long term. Consequently, the political system becomes more decentralized and a range of experts participate in political decision-making (Hohmann 2016).

There is a similarity between Willke’s (2007) Smart Governance, as referenced by Hohmann (2016), and the triple-helix theory. Central to both is the idea that it is useful when different parties interact and learn from each other according to their expertise. Consequently, when Hohmann (2016) argues that Willke’s (2007) Smart Governance model is very theoretical and needs a framework that enable us to implement it to cope with the problems of knowledge-based societies, he recommends the usage of the triple-helix theory as this framework.

According to Hohmann (2016), by examining whether the triple-helix theory is useful in the implementation of the Smart Governance, there is no clear-cut answer as the theory has limited benefits. There are some pros and cons. In the input-concerned process, the triple-helix theory “includes a variety of different societal actors into the political decision making process” (Hohmann 2016: 6), which makes the structure of democracy more intelligent and more efficient. However, the output-concerned process, or the result of this increase of intelligence in the input-concerned process, “is only possible when being consciously initiated and legitimized by the parliament” (Hohmann 2016: 6).

Hohmann (2016) mentions that as in the triple-helix theory the cooperation between industry and academia is regarded as an important factor for economic growth, economic interests affect the research that will be conducted and the framework in which it is conducted. Consequently, in the input-concerned process, as economic growth is a target, the triple-helix theory has the risk of being implemented in an economic context and “the economic point of view dominates the work of the Triple Helix so that non-economic issues can hardly be addressed” (Hohmann 2016: 6). Thus, finally Hohmann (2016) argues that the triple-helix theory (according to its traditional origin) has limited benefits for the implementation of the Smart Governance.

In conclusion of the discussion on Hohmann (2016), by taking triple-helix theory outside its original area of application and showing the similarities between it and the Smart Governance, Hohmann (2016) highlights a major concept in the theory: that power could be gained when different actors learn from each other according to their expertise in knowledge-intensive societies. Given that in contemporary science production the three helices (government, industry, and the university) interact intensively and transform by taking on the others’ roles (Etzkowitz 2006), then they learn from each other. This means that what the triple-helix theory appraises is already happening and hence the triple-helix theory appraises the status quo. Furthermore, Hohmann (2016) is critical of the triple-helix theory as it has the risk of being implemented in an economic context.

Leydesdorff (2001) work shows some other crucial dimensions of the triple-helix theory. Analyzing the complex relations between government, industry, and the university and their innovations, Leydesdorff (2001) main argument is that the evolutionary perspective of economics can gain from a sociological reflexive perspective that provides a richer understanding of the complex relations and communications between these three helices.

Leydesdorff (2001) uses the term interface to refer to the activities that one helice does, which are typically done by, and are part of the role of, another helice. For example, searching for funding, which is typically considered as an industry’s activity, is done by the university in contemporary society.

Following Leydesdorff’s (2001) argument, in the interaction of these three helices, innovation does not happen through the activity of one helice only, rather each innovation can be considered as one case of interaction between more than one helice. Thus, the entire innovation



system, of contemporary science production, is based on the recursive interaction terms of the three helices. Furthermore, the system is too complex so that intentional input is not supposed to lead to intended output. As these interactions occur at the interfaces of the helices, and as intentional input is not supposed to lead to intended output, these contemporary science production systems have non-linear dynamics (Leydesdorff 2001).

Furthermore, consequences cannot be associated with causes in this model and contexts of activities and interactions of the helices become more important. This is because the uniqueness and context of each, and every, instance of interaction become an important factor. Furthermore, dependency relation between any two helices is not supposed to stay constant. This means that, for example, at one point in time industry might be dependent on the government policy and the government is not dependent on the industry policy and soon after this the exact opposite might happen, i.e. the government might be dependent on the industry policy whereas the industry is not dependent on the government policy. In addition, “the recursion in the interaction terms remains beyond control when analyzed from the perspective of either of the ... [helices] that interact” (Leydesdorff 2001: 3). He argues that though policy makers can sometimes deliberately shape developments, in some cases, contextual factors derive them, i.e. the particular set of factors of each particular case push the actions in certain directions that are beyond the control of policy makers. Contemporary science production systems internalize this aspect of complexity and become more knowledge-intensive (Leydesdorff 2001).

To sum up the above discussion, Leydesdorff’s (2001) arguments mean that contemporary developments and interactions of government, industry, and the university in science production are characterized by non-linearity, unpredictability, uniqueness of each case, and the dependency of each case on its context.

However, there is limited possibility for mutual expectations in these systems. Leydesdorff (2001) indicates that there are two ways to understand the mutual expectations and exchange relations in these systems. First, it could be analyzed as the result of the interactions of interactions. One interaction happens when any two or the three helices deal or interact together once. At any given period of time, many of these interactions are happening. Because all these interactions influence each other, they could be seen as interacting together, and this is what is meant by interaction of interactions. Second, these mutual expectations could also be analyzed as a result based on the previous activity, or interaction, done by the two helices in question.

A logical consequence of this argument, about mutual expectations in contemporary science production systems, is that actors in these systems need to have some knowledge about the activities and interactions happening by other actors, who are involved in science production, to be able to understand and anticipate. However, the knowledge that actors possess is limited. We can conclude this as Leydesdorff (2001) mentions that these systems are characterized by non-linearity and unpredictability and Hohmann (2016) mentions that contemporary knowledge-based societies are characterized by uncertainty and ignorance (Hohmann's (2016) point is that in contemporary knowledge-based societies, legitimacy of decisions became more dependent on knowledge and expertise and thus a lot of knowledge is needed, and it is not easy to possess all the knowledge needed to make informed decisions). Hence, a logical consequence of this is that the best solution is the cooperation of the three helices, which is what is happening now in contemporary science production systems.

According to Leydesdorff (2001), in contrast to a system of two helices only interacting, which the relation between them could be stabilized, a system in which three helices are interacting is not expected to stabilize. Consequently, a model (theory) of three helices is complex enough to understand the process of contemporary science production, which involves a continuous transformation of each helix (Leydesdorff 2001). This means that the triple-helix theory enables us to understand the complexity of contemporary science production systems but not to see any stability or to predict/anticipate.

Another major argument by Leydesdorff (2001) is that the internal complexity that each helix gained historically, through many processes including the interaction with the other helices, gives it the ability to deal with the complexity of the respective environment. For example, the complexity industry gained historically gives it the ability to deal with the contemporary market. This is a point that Leydesdorff (2001) mentioned explicitly. Furthermore, Leydesdorff (2001) focused very much on describing and analyzing the complexity of the entire system of the government, industry, and the university relations. His argument was that this complexity of the system is what makes the system capable of producing the science needed in contemporary societies. These arguments are consistent with the argument of Leydesdorff and Etzkowitz (2003) that the mismatches between the institutional dimensions and the three functions of the three helices generate frictions, which leads to opportunities for innovation. This is because both arguments, Leydesdorff's (2001) and Leydesdorff and Etzkowitz' (2003), see the

complexity of each helice and the complexity and non-linearity of the entire system as positive characteristics.

Furthermore, Leydesdorff (2001) argues that an overlay of interaction could be seen as a sub-systemic (interface) and/or a super-systemic (factor). While a super-systemic factor is part of the environment, “each participant can also be implied in the (re)construction of the overlay by reflecting on his or her environment” (Leydesdorff 2001: 5). Thus actors have some agency which they use in reflecting on their environment and hence factors are not just part of the environment, rather factors include the reflections of the actors on their environments. This is what Leydesdorff meant by arguing that the economic evolutionary perspective would gain from a reflexive perspective from sociology, which is Leydesdorff’s (2001) main point of the article. On the same lines, Leydesdorff states that actors redefine their system and they “use their system’s definition in studying and changing the system” (Leydesdorff 2001: 15).

In conclusion of the discussion on Leydesdorff (2001), describing the contemporary government, industry, and the university relations, Leydesdorff (2001) focuses on the complexity of the entire system. He argues that contemporary science production system is characterized by non-linearity, unpredictability, uniqueness of each case, and the dependency of each case on its context. According to him, the triple-helix theory views the internal complexity of each helice as a necessary condition that allow each helice to deal with the relevant environment and thus survive and grow, and consequently the entire system survive. This is consistent, but not identical, with Leydesdorff and Etzkowitz’ (2003) argument that the mismatches in the system make frictions that create opportunities for innovation, which is the most important thing in science production process. Furthermore, central to the triple-helix theory is the idea that power could be gained when different actors learn from each other according to their expertise in knowledge-intensive societies (Hohmann 2016). As these descriptions and ideas are supposed to describe conditions existing in the actual world and the descriptions see them as positive and necessary to survive, then the theory appraises the status quo. Furthermore, it does not problematize power relations.

Although Leydesdorff (2001) provides a reflexive perspective from sociology to strengthen the economic evolutionary perspective, the reflexive perspective he brought remains not clear and did not bring life to his triple-helix theory. He focused too much on describing the complexity of the institutions and their functions, and maybe he exaggerated in pretending that

they are too complex. He did not use concepts (like Bourdieu's concepts habitus, the field, and capital) that enable us to analyze motivations of actors, directions of change of particular social organizations, and power relations in society. In addition to helping in empirical research, concepts like habitus and the field give spirit to broad pictures of society as they enable us to understand how and why actors take certain decisions (as discussed below). The reflexivity that Leydesdorff (2001) brought remained limited and marginal as he did not focus on it enough as he did on the complexity of the institutions.

At the heart of the triple-helix theory is the argument that the special contribution of the three helices cannot be reached except through the interaction of the three helices (Etzkowitz 2006; Leydesdorff and Etzkowitz 2003), which means the following. The system of contemporary science production achieves a level of innovations that could not be achieved if only two helices interact or if three helices work each alone without interactions. Only through the interaction of the three helices could such a high level of innovations be achieved. The interaction of the three helices involves that each helix transforms by taking part of the role of the other (Etzkowitz 2006; Etzkowitz 2000) and each helix is supposed to learn from the other helices according to their expertise (Hohmann 2016), which is something regarded as very useful by the triple-helix theorists. Thus it is a functionalist logic based on the idea that the whole is greater than the sum of its parts. This means that the sum of the individual non-interacting elements/parts is less than the "whole", which is an organic combination of the parts interacting together.

Leydesdorff and Etzkowitz (2003) argue that one of O'Malley et al.'s (2002) critiques of the triple-helix is that it is too flexible and that everything can be subsumed under it. "The problem with the Triple Helix is that its general comments about interactivity and institutional reconfiguration cannot be modelled more precisely, so investigation ends with a metaphorical explanation" (O'Malley et al. 2002, quoted in Leydesdorff and Etzkowitz 2003: 59). I agree that the triple-helix theory is abstract. Different research findings are often consistent with the triple-helix theory. However, I would argue that the theory is not as amorphous as O'Malley et al. (2002) suggest.

The theory draws attention to the interactions of the three helices and their consequences, including the institutional changes they are associated with and it provides models that theorize the operational principles for these institutions. However, it does not offer concepts that help

understanding the direction of change or the interests and motivation of the participant parties. It offers a good description of the broad picture and of the complexity of the interaction dynamics between the three helices. Furthermore, it focuses on that the fact that each party take part of the role of the others. Thus, it might help in guiding some empirical research and setting insightful research questions. For instance, it might help researchers who want to conduct empirical research that describe some specific aspects of, or the entire, system of contemporary science production. Thus, the scope of research the theory can help in is limited. This is because the theory is descriptive and normative, and consequently it appraises the status quo. However, since the theory is abstract and appraises the status quo, it is important to understand it and the commercialization of the university in the light of the broader context, which is shaped by neoliberalism.

As Harvey (2005) argues, “Neoliberalism is in the first instance a theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong private property rights, free markets, and free trade” (Harvey 2005:2). In a neoliberal economy, governments support capitalists’ interests while claiming that they are contributing to the welfare of the public. However, Harvey (2005) maintains that protecting the interests of capitalists is often in direct opposition to the public interest. For example, while neoliberal policy decreases inflation, it makes work conditions less secure, weakens labor unions, and decreases social protection. Neoliberal policy allows for more free trade, yet it gives strong advantages to large capitalists since it reduces restrictions such as tariffs that protect both local industry and less advantaged groups (Harvey 2005). More generally, neoliberalism increases inequalities. Burawoy (2007) offers a similar view on neoliberalism. He argues that, “Over the last twenty-five years earlier gains in economic security and civil rights have been reversed by market expansion (with their attendant inequalities) and coercive states, violating rights at home and abroad. All too often, market and state have collaborated against humanity in what has commonly come to be known as neoliberalism” (Burawoy 2007: 27).

Unlike Harvey and Burawoy, Hayek is a proponent of neoliberalism; indeed, Hayek is one of the economists with whom the neoliberal theory is most associated. Hayek’s economic philosophy is similar to the above description of neoliberalism; however, he stresses some particular aspects of neoliberalism and actively promotes its agenda. Hayek (2005) argues that

socialists pretend that socialist planning eliminates the power of individuals in individualistic systems and that it does so for the benefit of society. However, Hayek argues, socialists do not realize that by centralizing power in the hands of one decision maker who can carry out a single plan in whatever way he/she wants, they actually heighten that individual's power. Furthermore, the power a wealthy employer has over his employee (in an individualist system) is less than the power a bureaucrat has over his employee (in a centrally-planned system). Thus, for Hayek, the competitive system is the only system that is created to minimize the power exercised by one individual over another. Furthermore, since effective competition more generally is seen as the best way to guide human action, competition and free markets are central to Hayek's argument (2005).

Neoliberalism is an economic and policy paradigm that supports a mature form of capitalism—global capitalism. I argue that, for capitalism to continue growing, it is important for global trade to continue growing as well. One of the best ways to do this is to reduce trade restrictions and national protections. In addition, for the spirit of freedom and competition to continue expanding, it is important to impose legal restrictions that protect intellectual property rights, converting knowledge into a commodity, and to do all that is possible to broaden the site of trade. This is exactly what neoliberalism advocates.

Habermas (1975) argues that capitalism is a contradictory system. Governments must serve the interests of capitalists, resulting in the continuous marginalization of the general public and the lower classes. Habermas' point (1975) about the contradictions of capitalism is strikingly similar to Harvey's (2005) description of neoliberalism. Thus, criticisms of neoliberalism declare that public policy tends to serve the interests of big business while largely ignoring the interests of the general public and lower social classes. This background sheds light on discussions about the entrepreneur university, neoliberalism, and their relation to the public.

With the commercialization of the university, the question of public good arises. The neoliberal paradigm suggests that economic development is good for the general public (Harvey 2005). Typically, the government and private sector embrace this argument that the transformation of the university enhances economic growth (Etzkowitz 2006; Leydesdorff and Etzkowitz 2003), and consequently improves public welfare. Proponents of the entrepreneur university have viewed it as good for the public, and they attached a moral value for supporting it (Shore and McLauchlan 2012). However, the arguments against the entrepreneur university

indicate that it is a threat to the integrity of the university and that universities should remain a source of social critique (Brooks 1993; Pelikan 1992). From this perspective, the entrepreneur university contradicts public interest. There is clear a relationship between neoliberalism, the entrepreneur university, and the triple-helix theory. Triple-helix theory works to conceal one of the most important characteristics of contemporary commercialized universities: to serve the interests of business people<sup>3</sup> and put the neoliberal policy paradigm into operation. Promoting business interests and implementing neoliberal paradigm are intertwined because the latter maintains the former. The triple-helix theory declares that the most important thing in contemporary science production is the special contribution the three helices make, a contribution that can only be achieved through the interaction of the three helices. In addition, when proponents of the triple-helix discuss empirical points about contemporary science production, it becomes clear that the new main condition in contemporary commercialized universities is the strong government intervention to foster economic development. The theory suggests that this government intervention in contemporary commercialized universities promotes economic development. Thus, the triple-helix theory supports the commercialization of science and the entrepreneur university.

In this subsection, I discussed the triple-helix theory more deeply, discussed some of the implications and potential consequences of the transformation of the university and I described the relationship between the commercialized university, the triple-helix theory, and neoliberalism. In the following subsection, I will discuss a particular critique of the commercialized university: the issue of integrity.

### **2.1.3 Science and the Integrity of Universities**

Before the commercialization of universities, scientists were believed to have social interests. For example, Barnes and MacKenzie (1979) argue that scientists always have instrumental and

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<sup>3</sup> The logic of capitalism is concerned with profit and capital accumulation only. While capitalists, or business people, might have other interests, profit is their main interest. The profit seeking and other interests of business people are not clear-cut, stable, or homogenous; they might have different types and forms. For example, some business people give priority to short-run profit over long-run profits while others do the opposite.

social interests. Instrumental interests are interests in prediction and control, i.e. technical procedures in the scientific process itself, whereas social interests are:

interests in the resolution of a certain particular set of puzzles and problems; in the continuance-in-use of central techniques, competences and theoretical structures; in the uncovering of areas of applicability for such techniques, competences and structures; perhaps in the maintenance of the group's image as a specialism with notable existing achievements; certainly in the availability of continuing opportunity for activity and the exercise of skills by members of the group (Barnes and MacKenzie 1979: 53).

These social interests particularize instrumental interests and can influence the direction of scientific research. Furthermore, Kleinman and Vallas (2001) argue that the influence of industry on the university is not a novel threat but predates the contemporary commercialization of the university. Thus, as suggested above, proponents of the commercialization of the university argue that scientists have always been “interested.”

It is, however, problematic to combine the strong financial interests of the contemporary commercialized university with these social interests. The adverse consequences of these social interests are to an extent neutralized through the university's tenure system. According to Polanyi (1962), tenure secures the career of professors and is, thus, supposed to protect their independence. In contrast, the strong financial logic of the commercialized university and the lack of funding for basic research can restrict the independence of professors in a way that the tenure system is incapable of dealing with. One of the negative consequences of this is that it has become difficult for professors working within the neoliberal global economy to criticize their own universities (George 2012). This is because, in the commercialized university, faculty members depend on industry funding, which is less secure than the grants they used to receive from the university before it became commercialized. Since industry can easily decide not to fund particular faculty members, it might create pressure on faculty to avoid criticizing their university and its policy recommending strong industry interference.

It is important to explore the issue of the integrity of the university and how it has been questioned. For example, since the 1968 French student revolt, radicals in France have started to realize the significance of the role of universities, research centers, and advertising in shaping and influencing the construction of identities, ideals, and consumption patterns (Seidman 2008). At this time, thinkers increasingly recognized that universities and media had become effective tools that strong groups could use to reach their goals, because the domain of conflict had shifted



from the economy to culture and politics (Habermas 1975). Thus, if universities have a more intensive role in economic development and are closely aligned with the neoliberal paradigm, they might work to promote ideals that are consistent with neoliberalism. Universities might disseminate knowledge that presents capitalism in appealing ways and legitimizes consumerism. This could be done through several means. One of them is the triple-helix theory itself, as it promotes the neoliberal paradigm and related business interests.

Universities will, of course, change over time, just as any institution does. Transformation itself, therefore, should not be regarded as a threat to the integrity of the university. The incorporation of research, in addition to teaching, into the university's mission is one such transformation. According to Jencks and Riesman (1968), the incorporation of research as an academic mission happened gradually. Jencks and Riesman (1968) call this transition the rise of the university (before the incorporation of research, institutions of higher education were called colleges; when research was incorporated, they were called universities). Though the first PhD was awarded in 1861 at Yale, it is only in the 1880s that a modern university was founded in the United States.

This first academic revolution (Etzkowitz et al. 2000) was grounded in the idea that research is a complement of teaching. Both basic and applied research complement teaching, but this is more so for basic research, because it advances fundamental knowledge. Basic research is "Research that advances knowledge of the fundamentals of ... [knowledge and science] and develops general theoretical explanations" (Neuman 2000: 505). Applied research, on the other hand, is "Research that attempts to solve a concrete problem or address a specific ... [application oriented] question and that has a direct, practical application" (Neuman 2000: 504). Basic research is carried out to increase our understanding of fundamental principles and we may only see its contributions after several generations have passed.

Basic research is a component of a liberal arts education. According to Axelrod (2002), a liberal arts education combines a breadth of knowledge with specialized knowledge and enhances critical thinking, autonomy, resilience, intellectual creativity, and communication skills. It allows individuals to understand and tolerate diverse ideas and thoughtfully participate in community life. For Axelrod (2002), a liberal arts education involves not only teaching but also research, and specifically basic research.

Similarly, Giroux (2013) points (but he uses the term higher education instead of liberal education) that higher education should include science that intend to discover the world, all humanities, social sciences, and critical thinking. The university should be a critical institution aiming at enhancing intellectual vision, curiosity, imagination, adventuresome, communal responsibility, and struggle for justice.

Habermas (1992) also highlights a transformation within universities, which I consider as the first revolution according to Etzkowitz et al.'s (2000) distinction. Habermas (1992) compares universities during the 1990s with a model he calls the idea of the university. This model is based on the university of the 19th and early 20th centuries and is characterized by a focus on critical thinking and philosophy. In this model, philosophy worked as a unifying force that encompassed all the other disciplines. In contrast, universities of the 1990s combined the idea of the university with institutions that provided professional training to students to prepare them for professional jobs. In the universities of the 1990s, the strong differentiation between the different disciplines resulted in philosophy losing its role as a unifying discipline.

Furthermore, according to the idea of the university model, to be able to continue functioning, its members (or representatives) should share a way of thinking. Habermas (1992) believes that this was impossible in the 1990s as faculty members and their areas of expertise diverged. Despite this, he believes that the university will continue to function because professors can never work alone, even though they spend most of their time doing tasks alone, as in the lab or library. Intending to present the outcome of their work in a seminar or write an article for publication means they want to share the outcome of their intellectual labor with each other (as peers). Thus, professors share two things: the intention to share and participation in the procedures of sharing. According to Habermas (1992), this has allowed universities to continue to function. In my view, the contemporary commercialization of universities, discussed further below, is a different transformation from the one mentioned by Habermas (1992). The transformation Habermas highlighted does not involve dependence on industry funding or serving the interests of profit-seeking organizations.

The second academic revolution Etzkowitz et al. (2000) identify incorporated economic development into the university mission. This discouraged basic research to an extent, and thus universities started to depart from their original mission. In their work, Etzkowitz et al. (2000) show that, under the direct influence of neoliberal policy, and following governments and

proponents of commercialization and industry's advocacy, universities' orientation shifted to applied research, at the expense of basic research. This has led to a deterioration in student's general academic competence, when compared to the benefits of a liberal arts education.

In terms of the professoriate, and in connection with Habermas' (1992) comments on sharing, though university professors continue to share attitudes and even some activities, Kleinman and Vallas (2001) argue that the contemporary commercialization of the university has led to increased stratification. Professors who have strong relations to markets or market-related activities become more advantaged than those who do not. This is seen in the higher salaries these professors receive, their greater access to university resources, and the higher level of "institutional recognition." In contrast, professors working in areas related to the social welfare functions of the state, for example, are disadvantaged. Kleinman and Vallas (2001) point to studies in Britain, Canada, and the US that indicate that new university policies result in cutbacks in humanities and social science. Thus, there is a relationship between the increasing power of a segment of professors and the decreasing power of the other segment. Kleinman and Vallas (2001) also argue that professors in the hard sciences receive more funding than social science professors; however, social science professors are more autonomous than hard science professors in choosing their research topics.

The marginalization and lack of funding social science professors receive might inhibit universities from producing science that is useful for the public. Harding (1991) argues that the natural sciences should be conceptualized as part of critical social science. She argues that some writers believe that only natural science disciplines that use quantitative analysis and a positivist approach meet the standards to be called "scientific." Consequently, natural science disciplines are regarded as more powerful and prestigious. Harding points out that this view prevents science from growing in a way that would benefit all human beings. For science to grow usefully, it is important to know the values, roots, and consequences of scientific research. These criteria guide the direction of science growth and shape the results of research. Knowing how these criteria influence science is the task of social science not natural science. Therefore, much can be gained by social and natural scientists working together (Harding 1991). However, as social science disciplines and professors, who do not have strong relations to markets, receive less funding in contemporary entrepreneur university (Kleinman and Vallas 2001), it will be

difficult for social science to play the important role of making science more useful for society, as recommended by Harding (1991).

On the same line, Hohmann (2016) points that in contemporary entrepreneur universities, as described in the triple-helix, where the new role of the university and the cooperation between the university and industry are supposed to contribute to economic growth, economic interests influence the research that is going to be done and its framework. Furthermore, as economic growth is a target, the activities of, and the interactions between, the parties involved in science production have the risk to be implemented in an economic context in which the economic perspective is dominant and non-economic issues are marginal (Hohmann 2016).

The Canadian Association of University Teachers (2013) argues that the attempts of industry to direct university research increased intensively during the last two decades. Furthermore, the Canadian Association of University Teachers (2013) points that frequently donors who fund centres or teaching programs want to have a say in academic issues as hiring, scholarships, and awards. As senior administrators know that their universities are underfunded, they frequently accept these demands instead of responding to them as inappropriate demands that undermine academic integrity.

According to the Canadian Association of University Teachers (2013), to solve the problems and consequences of the entrepreneur university, the implementation of seven “Guiding Principles for University Collaborations” are necessary to protect academic integrity and mission at any university having collaborations and agreements with government and industry.<sup>4</sup> The Canadian Association of University Teachers (2013) used these principles in assessing collaborative agreements at twelve Canadian universities that had collaborations with

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<sup>4</sup> The following are the seven principles: “1. Protect academic freedom and institutional autonomy in research, teaching, publication, service, and extramural speech. 2. Protect academic integrity in the research and educational functions of the university and its faculty, postdocs, students, and professionals. 3. Protect the university’s commitment to the free and open exchange of ideas and discoveries. 4. Protect against real, potential, or perceived conflicts of interest, which compromise academic integrity. 5. Ensure transparency. 6. Academic staff shall play the central role in decisions regarding the initiation, development, implementation, monitoring, and assessment of donor and other collaborative agreements. 7. Ensure that the structure of employment for researchers protects academic freedom and academic autonomy, and that it does not compromise the structure and preponderance of tenured and tenure-track faculty employment” (Canadian Association of University Teachers 2013: 3).

government and industry. Research findings indicated that in the majority of the collaborative agreements at the twelve universities, the universities had allowed many violations of their academic integrity and they allowed industry donors to hold positions that should be held by faculty and university administrators.

Heller (2016) argues that the influence of the private corporations and the neoliberal discourse on contemporary universities is very strong. Contemporary universities are underfunded and, although they are still mainly funded publicly, private funding influence them to operate more like private corporations. This involves the use of total quality management and the scrutiny of all the teaching and research activities taking place within the university. The result is a decline in detached teaching and research in humanities, social sciences, and natural sciences. Furthermore, in many contemporary universities, most of the teaching is done by non-tenured faculty. “The objective it seems is to reduce the tenured faculty to the same level, i.e. fully dependent wage workers” (Heller 2016: 15).

Giroux (2013) and Lieberwitz (2017) also criticized the attempt of the entrepreneur university to eliminate tenure. Lieberwitz (2017) particularly argues that part of the corporatization process that happened in American universities was hiring many non-tenure track faculty. This argument by the three researchers (Giroux 2013; Heller 2016; Lieberwitz 2017) show another negative impact of neoliberalism on contemporary universities. Tenure secures the career of professors and makes them independent (Polanyi 1962), and thus it is vital in protecting an important characteristic of the integrity of the university, that is independence.

Arguing that non-tenured faculty are similar to fully dependent wage workers, Heller (2016) reveals an important result of commercializing the university. Fully dependent wage workers have no agency and they are controlled by their management. So, if faculty become like wage workers, they will produce science in the direction dictated by the university administration only, which will probably be a single direction. Furthermore, this direction of scientific research will probably serve the interests of corporations. However, if faculty members are protected by tenure and not treated like fully dependent wage workers, they will work more creatively and each individual faculty member will work in a direction that he chooses and consequently faculty members will work in different directions. This will maintain the broad scope of science and will get it to continue getting broader. Furthermore, these different directions of scientific research

will make some balance between the different research areas of each discipline and between different disciplines.

Giroux (2013) has another argument that connects proper higher education with democracy. Giroux's (2013) argument is similar to those of many opponents of the entrepreneur university. He argues that the university should continue being a critical institution providing a higher education aiming to enhance intellectual vision, curiosity, imagination, adventuresome, communal responsibility, and struggle for justice. However, according to him, this kind of higher education is in danger from contemporary entrepreneur ideals. In addition to this he adds that what are in danger are not only the values of higher education, but also civil society and democracy (Giroux 2013).

Giroux's (2013) point is that democratic values and social protections are essential to have democratic life. The civic and formative cultures that are needed to make democratic values and social protection possible are threatened. He argues that this is because public spheres that used to be concerned with communal concerns now became consumption spaces.

However, the conflict between proponents and opponents of the entrepreneur university is severe as proponents have an ethical stance as well. According to Shore and McLauchlan (2012), proponents of the commercialization of science have attached a moral value for supporting it. They did not see the neoliberal entrepreneurial model as imposed on them. Rather they expressed a belief in the morality of the entrepreneur model. Shore and McLauchlan (2012) argue that the new heroes of the university exemplify the Schumpeterian typical entrepreneur. The "individualistic operators who display a strong sense of agency, who take management into their own hands, and who take it upon themselves to put to use the wealth of untapped research in universities" (Shore and McLauchlan 2012: 283).

The arguments by Shore and McLauchlan (2012) show that proponents of the commercialization of science embody entrepreneurial norms and they think through the neoliberal entrepreneur logic. They do not see the neoliberal paradigm as imposed on them and thus they do not see it as something they might criticize. This makes the difference between them and the opponents of the commercialization of science very big.

#### **2.1.4 Summing Up**

There is a clear relationship between the neoliberal paradigm, the entrepreneur university, and the triple-helix theory. The entrepreneur university and the contemporary interaction of the three helices are a result of a specific historical development, which included the Bayh-Dole Act among other events and developments, in addition to the neoliberal paradigm. The neoliberal paradigm gets governments to reduce public funding to universities. Contemporary neoliberal governments encourage universities to seek funding from the private sector. The triple-helix is the theory used by contemporary scholars to understand contemporary science production and it is very normative, descriptive, and it appraises the status quo.

The triple-helix theory does not problematize power relations. It does not provide concepts, as Bourdieu's capital and exchange rate for example, that help in analyzing actors' motivations and directions of change. Leydesdorff's (2001) triple-helix describes the contemporary government, industry, and the university relations and interactions in detail and depth. It focuses on the complexity of the entire system. The triple-helix theory considers the internal complexity of each helice as a necessary condition that allows each helice to deal with the relevant environment and thus survive and grow, and consequently the entire system survive. Leydesdorff and Etzkowitz (2003) see the mismatches in the system as important for creating opportunities for innovation, which is the most important thing in science production process. Furthermore, central to the theory is the idea that power could be gained when different actors/helices learn from other actors/helices according to their expertise (Hohmann 2016). As these accounts and ideas of the triple-helix theory described conditions existing in the actual world and the theory sees them as positive and necessary to survive, then the theory appraises the status quo, which is influenced by the neoliberal paradigm, as mentioned above.

As the triple-helix theory appraises the status quo, I agree that it works to conceal one of the most important characteristics of contemporary commercialized universities: to serve the interests of business people and put the neoliberal policy paradigm into operation. Promoting business interests and implementing neoliberal paradigm are intertwined because the latter maintains the former.

There is an infusion of the industrial norms to the university and the industrial/corporate model pervaded all aspects of the university (Lieberwitz 2017) and a strong pressure on the university to be isomorphic with industry (Kleinman and Vallas 2001). Higher education is

supposed to preserve the university as a critical institute in which science is a way to discover the world and is supposed to enhance critical thinking, intellectual vision, curiosity, imagination, adventuresome, communal responsibility, and struggle for justice. This style of higher education is in danger from contemporary entrepreneur ideals (Giroux 2013). Furthermore, the entrepreneur university attempted to eliminate tenure (Giroux 2013; Lieberwitz 2017), and in many contemporary universities, most of the teaching is done by non-tenured faculty. “The objective it seems is to reduce the tenured faculty to the same level, i.e. fully dependent wage workers” (Heller 2016: 15). Tenure is very important as it secures the career of professors and makes them independent (Polanyi 1962), which is very important to maintain the integrity of the university.

As economic growth is a target for the entrepreneur university, in the context of contemporary science production process, economic interests affect the research that will be conducted and the framework in which it is conducted; furthermore, there is a risk that the science production process takes place in an economic context, in which the economic dimension prevails and non-economic issues become marginal (Hohmann 2016). However, the problem is that proponents of the entrepreneur university do not see things this way, rather they see the entrepreneur university as good for the public, and they attach a moral value for supporting it. They did not see the neoliberal entrepreneurial model as imposed on them, rather they expressed a belief in the morality of the entrepreneur model (Shore and McLauchlan 2012). It seems they have internalized the neoliberal and entrepreneurial ideals.

More empirical and focused research is needed. This research has two important goals. First, since the literature discusses broad institutional changes, there is a need for an empirical study that is focused and concrete. Second, the triple-helix theory needs further assessment through an empirical study with a new scope. My research does both. My study is concrete. It seeks to examine the creation of the GIFS. Moreover, it assesses the triple-helix theory through a new lens. As previously mentioned, this is because there are no empirical studies that consider all of the four elements needed to fully understand the commercialization of research: 1) an institute that was meant from the beginning to operate through the interaction of the three helices; 2) an institute that is contemporary; 3) an institute that is global; and 4) a study that offers the perceptions of the informants and participants. The GIFS is consistent with these four aspects. Aspects one and three are highly relevant to the triple-helix theory and the entrepreneur



university. Aspect one, the operation of the three helices together, is central to the triple-helix theory. Aspect three, the institute's global outlook, is relevant to the entrepreneur university since it is a global phenomenon and to the neoliberal paradigm, which is also a global paradigm and propels the commercialization of the university. Aspect two, the institute's contemporary nature, will provide updated research findings. Aspect four, the importance of including the perceptions of the participants, is significant in qualitative research as it reveals how the participants see the phenomenon under study. I use these four aspects to assess the triple-helix theory through an empirical study with a new broad scope that captures several dimensions of the theory.

In this section I reviewed the literature to highlight the significance of my study by putting it in its wide context. In the following section I describe the theoretical framework of my research.

## **2.2 Theoretical Framework: Bourdieu's Habitus and the Field and Campbell's**

### **Institutional Change Model**

This research will be guided by: 1) Bourdieu's concepts of habitus and the field, as discussed in *Practical Reason* (1998) and *Sociology in Question* (1993); and 2) Campbell's institutional change model, as discussed in *Institutional Change and Globalization* (2004). This section will explore the work of these two authors one after the other in two subsections. The subsection of Bourdieu is divided into two smaller subsections.

#### **2.2.1 Bourdieu's Habitus and the Field**

This subsection is on Bourdieu's habitus and the field theory and it consists of two short subsections. In the first subsection, I discuss a number of the basic concepts of Bourdieu's habitus and the field that are relevant to my research. In the subsection that follows, I present and discuss Bourdieu's critique of functionalism. Since the triple-helix theory has functionalist assumptions, it is important to see what Bourdieu has to say about functionalism.

##### **2.2.1.1 Basic Concepts of Bourdieu's Habitus and the Field**

Bourdieu's habitus and the field provides research tools that help to investigate and explore the main concepts of my empirical research: the factors, motivations, and social processes that led to

the creation of the GIFS. These concepts are based on, and generated by, the context in which the institute was created; the policy and goals of the entities involved; and the perceptions, interests, and actions of the individuals involved. In this empirical context, capital, interests, power relations, and the actions of the subjects under investigation are the main focus of analysis. A good way to explore them is using Bourdieu's habitus and the field concepts of the space of social positions, space of dispositions (habitus), space of position-takings, capital, field, and exchange rate. As discussed below, these concepts are analytical tools that help answer the following questions: how can we think about different types of capital and how can we measure them? How can we scientifically identify the interests of social actors? Taken together, these concepts constitute a coherent understanding of the points mentioned above and lead to a broader understanding of the web of relations in society and how they affect different individuals.

In *Practical Reason*, Bourdieu (1998) argues that the "space of social positions," or social space, is an abstraction/construction where individuals occupy different positions according to their possession of two main forms of capital: economic capital and cultural capital. "Capital" refers to the resources, or qualifications, a social agent possesses that give him/her power and distinction according to volume (or amount) and kind. Economic capital refers to wealth while cultural capital refers to habits and knowledge. Importantly, economic and cultural capital are not the only kinds of capital; there are various other kinds: political capital (private access to public goods and services); symbolic capital (honor and prestige); and social capital (social ties and networks) (Bourdieu 1998). Yet for Bourdieu, the possession of economic and cultural capital is the most important. Thus, individuals, or social agents, occupy different positions in social space according to the sum amount of capital they possess and to how much of each of these two capitals they possess.

The habitus works as an intermediary between the space of social position and real choices that must be made. The "habitus" is the generative and unifying principle that translates the relational characteristics of the positions of social space to a lifestyle, i.e. a unique set of choices about practices, goods, and persons. Bourdieu (1998) defines the concept of habitus as follows:

Habitus are generative principles of distinct and distinctive practices—what the worker eats, and especially the way he eats it, the sport he practices and the way he practices it, his political opinions and the way he expresses them are systematically different from the industrial owner's corresponding activities. But habitus are also classificatory schemes,

principles of classification, principles of vision and division, different tastes. They make distinctions between what is good and what is bad, between what is right and what is wrong, between what is distinguished and what is vulgar, and so forth ... (Bourdieu 1998: 8).

The habitus explains unity of style, which is the unity of choices of persons, goods, and practices made by an agent or a group of agents who occupy similar positions in the space of social positions.

The “space of position-takings” refers to the choices social agents make in different areas of life, such as food, politics, fashions, music, and sport. Together, these constitute something like a lifestyle (Bourdieu 1998). For Bourdieu (1998), the position in social space is translated into space of position-takings through the mediation of the habitus.

Another key concept is that of “field.” In *Sociology in Question*, Bourdieu (1993) argues that “‘Fields’ present themselves synchronically as structured spaces of positions (or posts) whose properties depend on their position within these spaces and which can be analysed independently of the characteristics of their occupants (which are partly determined by them)” (Bourdieu 1993: 72). The larger social space includes several fields, such as politics, philosophy, religion, academia, sports, and the economy. One field differs from another partly because of the particular set of stakes and interests it defines and offers, “which are irreducible to the stakes and interests specific to other fields (you can’t make a philosopher compete for the prizes that interest a geographer)” (Bourdieu 1993: 72). However, there are some general laws of fields; in other words, there are some invariant laws shaping all fields. One of these general laws is that there is always a struggle between newcomers who try to improve their position within the field and the dominant agents who try to protect and maintain their position while fighting any potential competition.

Bourdieu (1998) mentions that the social position of social agents determines the way they represent “space and the position-takings in the struggles to conserve or transform [the position they occupy in the social space, which is also the structure of the distribution of different kinds of capital they have]” (Bourdieu 1998: 12). This issue of whether to conserve or transform a certain kind of capital is crucial. It corresponds on the empirical level to the decisions social agents take to launch a new business, leave a job, get an education, found an institute, or get married from a specific social class. These decisions are dependent on the exact

social context at the times the decisions are made. More specifically, they are dependent on what Bourdieu calls the “exchange rate.”

Bourdieu (1998) defines the “exchange rate” as the relative value of the different kinds of capital available. One example of how an exchange rate can be modified is the ability of some bureaucrats to control the scarcity of some academic degrees, which open access to dominant positions within the bureaucratic field, and consequently controls the relative value of these degrees and degree-holders’ corresponding positions. If these bureaucrats modify the difficulty of accessing, and earning, some academic degrees, they modify the exchange rate of this form of cultural capital.

Furthermore, while social agents or institutions who possess a sufficient amount of a certain kind of capital struggle to occupy dominant positions within their field, their stake (or goal) is also to conserve or transform the exchange rate. They try to conserve or transform the exchange rate to increase the volume (total amount) of their capital, and they do this in a way that maximizes their capital:

One of the stakes of the struggles which oppose the set of agents or institutions which have in common the possession of a sufficient quantity of specific capital (especially economic or cultural) to occupy dominant positions within their respective fields is the conservation or transformation of the “exchange rate” between different kinds of capital and, along the same lines, control of the bureaucratic instances which are in a position to modify the exchange rate through administrative measures (those, for example, which can affect the rarity of academic titles opening access to dominant positions and, thus, the relative values of those titles and the corresponding positions). (Bourdieu 1998: 34).

The exact way the exchange rate is fixed (to serve a social agent’s interests) depends on the relative value of the different kinds of capital in the social space, or the exchange rate, at that particular time. Thus, agents cannot fix the exchange rate without being influenced by the current exchange rate at the time of their attempt. However, Bourdieu (1998) made it clear that actors do not act upon entirely rational basis. Instead, they act upon intuition, and this is the difference between his habitus and the field theory and rational choice theory.

The concepts of “capital” and “exchange rate” can be elaborated further by defining and elaborating a related concept: “statist capital.” Bourdieu (1998) argues that the state is the peak of a process of capital concentration. This includes the instrument of coercion capital (the army and police), economic capital, cultural capital, and symbolic capital. The concentration of these capitals in the state enables it to be the owner of a meta-capital called statist capital. This is a

unique capital that grants power to all the other kinds of capital and their holders. The statist capital enables the exercise of power in all fields and it has a strong role in changing and fixing the exchange rate, which is crucial.

One important aspect in Bourdieu's habitus and the field theory is that it clearly indicates that there is a relationship between agents' positions in the social space and how they see what is good and bad for society. This means that agents' position in the space of social positions does not only influence their own career decisions, including decisions about launching a new business or pursuing an academic degree; it also influences their attitudes and decisions about improving society. Since individuals' career decisions and attitudes toward improving society are both related to individuals' positions in the space of social positions, we can argue that there is a relationship between individuals' career decisions and their attitudes toward improving society. The implication here is that individuals typically believe that their appropriate career decisions are also good for society. This aspect of Bourdieu's habitus and the field theory shows the complexity of individuals' motivations. In light of this, it is important to study the motivations that led to the creation of the GIFS, the institute under investigation here.

### **2.2.1.2 Bourdieu's Critique of Functionalism**

The triple-helix theory is grounded in functionalist assumptions. Bourdieu's criticism of functionalism is similar to my criticism to the triple-helix theory, below. Thus, it is important to include Bourdieu's critique here as part of the theoretical framework of this study.

Given that the triple-helix theory is grounded in functionalist assumptions, power structures and processes, social change, and actors' interests and motivations are not central to it. Bourdieu (1998) considers functionalism a substantialist analysis that intends to be structural, but is not. He writes that the "substantialist and naively realist reading considers each practice (playing golf, for example) or pattern of consumption (Chinese food, for instance) in and for itself, independently of the universe of substitutable practices, and conceives of the correspondence between social positions (or classes, thought of as substantial sets) and tastes or practices as a mechanical and direct relation" (Bourdieu 1998: 3).

Bourdieu (1998) mentioned that substantialist analysis considers the activities and preferences of certain individuals or groups at a certain time as if they are substantial traits and inscribed forever. He said that substantial analysis as such leads to errors while comparing

different societies or successive periods of the same society. “In short, one has to avoid turning into necessary and intrinsic properties of some group (nobility, samurai, as well as workers or employees) the properties which belong to this group at a given moment in time because of its position in a determinate social space and in a determinate state of the supply of possible goods and practices” (Bourdieu 1998: 4).

Bourdieu (1998) then started discussing the concepts of space of social positions, habitus, and space of position-takings. He mentioned that social agents who are close to each other in social space tend to share many things and make similar choices. This is a major argument in his theory and it is important to keep it in mind when trying to understand his critique of functionalism.

What Bourdieu’s critique of functionalism means is that individuals’ positions in social space influence their activities and preferences. Individuals’ activities and preferences are not important in themselves because they are not intrinsic to any specific group. Activities that, in the past, aristocrats practiced might now be practiced by the working class. Thus, to analyze social behaviour, we need to understand how social agents who are close to each other in social space tend to share many things and make similar choices. This involves understanding other important concepts of Bourdieu’s habitus and the field theory, like capital and exchange rate, mentioned above (in section “2.2.1.1 Basic Concepts of Bourdieu’s Habitus and the Field,” Chapter 2).

One of the indications that the triple-helix theory is grounded in functionalism is that one of the major arguments of the triple-helix theory is that each of the three spheres (government, industry, and the university) is transformed when it takes on the role of one of the other spheres (Etzkowitz 2006). This is a functionalist logic. The main logic of functionalism relates to how society’s different components complement each other and how they are able to adjust if one of them changes so that they all continue complementing each other.

Thus, Bourdieu’s critique of functionalism is based on the idea that functionalist theories intend to be structural but are not; rather, they are descriptive and do not pay enough attention to social change. This critique provides a perspective for understanding the triple-helix as discussed below. In the next subsection we will move to the other part of the theoretical framework of this study, Campbell’s institutional change model.

### **2.2.2 Campbell's Institutional Change Model**

In *Institutional Change and Globalization*, Campbell (2004) discusses how institutional change takes place, and how we can understand it better. The book critically discusses various theoretical schools that attempt to theorize institutional change, and integrates these attempts to create a more comprehensive framework. Campbell provides some theoretical concepts that inform empirical research on institutions by showing how they could be analyzed.

Campbell (2004) differentiates between well-established organizations and institutions. A well-established organization consists of “a group of people that produces goods or services” (Campbell 2004: 4), such as a restaurant. Institutions, on the other hand,

are the foundation of social life. They consist of formal and informal rules, monitoring and enforcement mechanisms, and systems of meaning that define the context within which individuals, corporations, labor unions, nation-states, and other organizations operate and interact with each other. Institutions are settlements born from struggle and bargaining (Campbell 2004: 1).

Institutions, therefore, constitute the environment surrounding organizations and within which organizations operate. For example, a restaurant operates within a set of institutions: the rules formulated and implemented by the government regarding restaurants' health, labour, and other practices; and the taken-for-granted cultural practices (contemporary and local) about how to treat restaurant customers and employees.

The relationship between organizations and institutions is strong, and they influence each other. Using Campbell's terms, the research centre my research explores is an organization. Building on Campbell's (2004) conceptualization of organizations and institutions, institutions constitute the wider context of organizations that led to their creation, and also constitutes the dynamics and cultural patterns that influenced the founders while they were creating these organizations. Understanding how organizations are founded and how they operate involves understanding the institutions within which they are located. Furthermore, as institutions are not fixed (or static), understanding them involves understanding how they change over time. Organizations embody and concretize institutional change.

I use Campbell's theory to understand, on a theoretical level, what institutions are, and what their different dimensions are (Campbell 2004). This will provide me with a set of analytical tools to help identify the different empirical factors, motivations, and social processes that led to the creation of the centre. Furthermore, by understanding what institutions are, how

they change, and what the general results of institutional change are, I will have some insight into how institutions influence organizations. I will use these insights as a theoretical lens to inform my empirical research, which seeks understanding the relations between the centre/organization and its institutional setting.

DiMaggio and Powell's (1983) work is also useful in this regard. The authors study organizations and their tendency to become more similar and isomorphic. In "The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields," they argue that organizational change happens not because organizations seek competitiveness or efficiency, but because they seek isomorphism and homogeneity, i.e. they try to mimic other organizations. DiMaggio and Powell (1983) discuss the factors behind this type of isomorphism. Their work highlights some of the important dynamics of organizations and draws attention to the importance of isomorphism in studying organizations. Consequently, my empirical research, which seeks to identify factors, motivations, and social processes that led to the creation of the centre, the GIFS, examines whether isomorphism had a role in the centre's foundation.

When understanding institutional change, it is also important to remember that institutions have different components. Campbell (2004) argues that these various components frequently have contradicting or conflicting logics, which contribute to frictions. Entrepreneurs and decision makers sometimes try to resolve this friction by changing one (or more) of the institution's dimensions to make it more consistent with the others. They do this on a more or less routine basis. This is another way in which institutional change takes place. In terms of my empirical research, this raises the question of whether friction between institutional components was strong while the GIFS was being created? How did it happen? What were the conflicting components?

Campbell (2004) also refers to Scott's (2001) classification of institutional dimensions. Institutions have three basic dimensions or pillars: the regulative pillar consists of the laws and formal rules that constrain behaviour; the normative pillar consists of the principles that prescribe the goals and the appropriate ways for achieving them; and, finally, the cultural-cognitive pillar consists of the culturally shaped, taken-for-granted, assumptions about the real world and the frames through which it is perceived.

The difference between the normative pillar and the cultural-cognitive one might appear slight. However, Campbell's typology of the different types of ideas shows that this is not true.



According to Campbell (2004), there are four different types of ideas: paradigms, public sentiments, programs, and frames. Programs and paradigms are cognitive ideas, whereas frames and public sentiments are normative ideas. Cognitive ideas are outcome oriented, whereas normative ideas are not. That is, cognitive ideas consist of descriptions and analytical models about cause-and-effect relationships, whereas normative ideas are attitudes, values, and identities.

There is another level for classifying the different types of ideas. Ideas can be on the background of policy debates as taken-for-granted assumptions. They can also be on the foreground of policy debates, i.e. explicit policy problems and solutions (Table 2.1).

**Table 2.1: Campbell’s Typology of Ideas**

	Concepts and Theories in the Foreground of the Debate	Underlying Assumptions in the Background of the Debate
Cognitive (Outcome Oriented)	<b>Programs:</b> Ideas prescribed by elite to enable corporate managers, politicians, and other decision makers to have a clear course of action.	<b>Paradigms:</b> Ideas as assumptions by elite that constrain the range of the programs available for decision makers, politicians, and corporate managers.
Normative (Non-outcome oriented)	<b>Frames:</b> Ideas like concepts and symbols that are used by decision makers to legitimize their programs for their constituents (or for the public).	<b>Public Sentiments:</b> Ideas as assumptions by the public that constrain the range of legitimate programs available for decision makers.

Source: adapted from Campbell, 2004.

Campbell (2004) further elaborated on this classification when he described the actors “who embrace, fabricate, manipulate, and carry” (Campbell 2004: 101) these different types of ideas: for programs, the actors are decision makers, like corporate managers, bureaucrats, and politicians; for frames, the actors are framers, like campaign managers, advertising firms, and

political handlers; for paradigms, the actors are theorists, like academics and intellectuals; and for public sentiments, the actors are constituents, like the public, investors, voters, courts, and business and political elites. Brokers are a final set of actors. They are public relations experts, pollsters, and members of the media or think tanks and their job is to connect, link, and transfer different kinds of ideas from one realm to another (Campbell 2004). As seen in Table 2.1, Campbell (2004) argues that decision makers frame their programs to make them consistent with the public sentiment, making the programs seen legitimate in the eyes of decision makers' constituents. This draws attention to the importance of the step of framing in institutional change. In my empirical research on how the centre/the GIFS was created, this argument draws attention to the question of whether framing happened or not? How? And who were the constituents?

Campbell (2004) argues that paradigms constrain institutional change in subtle ways. This is because paradigms are usually taken for granted and hard to document. Paradigms constrain change through structuring discourse. By this, Campbell means a system of concepts, rules of logic, and languages that people use in communication. According to Campbell, if we accept the proposition that people's reality depends largely on their perception, and that these perceptions are structured partially through discourse, then the structure of a particular paradigm's discourse limits the perceptions of those participating in that paradigm and consequently limits the alternatives available.

In other words, if perceptions are limited to what we can articulate, and if only certain ideas are capable of being articulated as a result of the limited availability of concepts, metaphors, symbols, analogies, and linguistic rules in the dominant discourse, then paradigms influence decision making and institutional change by constraining the range of programs that can be imagined and articulated in the first place (Yee 1996, quoted in Campbell 2004: 108).

When new programs are implemented, they are usually mediated through already existing structured discourses. For the new programs to be successfully implemented, they need to be translated in a way that is consistent with the old discourse. After new programs are implemented, and after a period of time when they become institutionalized, they might develop a long-lasting decision making and institutional legacy (Goldstein 1993, quoted in Campbell 2004). This is because, after new programs are institutionalized, they create constituents who benefit from the programs and defend them and resist alternatives (Pierson 1993, quoted in

Campbell 2004). This process creates a decision making and institutional legacy, which becomes self-reinforcing.

The concepts as programs and paradigms are research tools that helped me conduct my empirical research. These concepts provide one way to classify the decision makers who were involved in creating the GIFS, and classifies their activities. The relationships between decision makers and their activities, which Campbell (2004) explores in his theory, demonstrate some of the complexities of institutional operations and change, as is evident in previous empirical case studies. These relations inform my empirical research by providing explanations that might help interpreting similar events.

In this chapter, I reviewed the literature to provide a wide context for the significance of the study. Furthermore, I formulated a theoretical framework using the work of Bourdieu and Campbell. This will serve as a research tool to help investigate how the GIFS was founded. The next chapter discusses another basic tool of the study: methodology. This chapter demonstrates how I used sampling, data sources, techniques, and analysis to answer my research question.

## **CHAPTER 3: METHODOLOGY**

This chapter discusses the methodology used in my research. Given the nature of my research question, this study uses qualitative data analysis. I describe all the methods used in the research and the logic that integrated them together to answer my research question. The chapter is divided into six sections. The first section is about my research approach and sampling; the second discusses the techniques I used; the third discusses the rationale; the fourth describes the operationalization; the fifth elaborates on data analysis; and the sixth discusses the validity assessment.

### **3.1 Approach and Sampling**

Qualitative research can explore how a phenomenon happens, and what are the meanings, perceptions, and experiences of the participants. It focuses on how people create meanings and relationships, how they develop perceptions, and how they understand their experience (Mason 2002; Neuman 2007). According to Morrow (1994), “qualitative researchers tend to be concerned with the interpretation of action and the representation of meanings” (quoted in Adler and Clark 1999: 395). Furthermore, it is concerned with how people construct identities and how discourses and social processes work (Mason 2002). The qualitative approach does all this “... by using methodologies that celebrate richness, depth, nuance, context, multi-dimensionality and complexity” (Mason 2002: 1). Qualitative approaches have an excellent capacity to produce strong arguments to explain how a phenomenon happens in specific contexts (Mason 2002; Neuman 2007). Quantitative researchers, on the other hand, “normally focus on the relationships between or among variables, with a natural science-like view of social science in the backs of their minds” (Adler and Clark 1999: 395). I used qualitative data analysis rather than quantitative analysis since this research is an attempt to interpret and understand the factors, motivations, and social processes, which are associated with actions and experiences rather than measurements of variables and relations between them. As discussed earlier, my research question is: Does the triple-helix theory explain the factors, motivations, and social processes that led to the creation of the University of Saskatchewan’s Global Institute for Food Security (GIFS)?

In my research design, I planned to use mainly a snowball sample to recruit GIFS informants, since it is consistent with the qualitative approach I followed. The snowball sample involves a researcher soliciting references or recommendations for potential informants from every informant interviewed. The goal of using snowball sample for the GIFS was to identify my main informants: the GIFS founders and other key individuals at the provincial level; GIFS founders and other key actors at PotashCorp; and GIFS founders and key players and scientists at the University of Saskatchewan. Since I did not possess the knowledge that would have allowed me to identify all key individuals within each of the three helices, I hoped their colleagues would help me identify them. However, in the end, I did not use the snowball sampling technique to identify GIFS informants because I was able to identify them through members of my dissertation committee and using the information available on different websites.

### **3.2 Techniques**

I used two main methods for my data collection: in-depth, semi-structured (or qualitative) interviews and document analysis. In total, I interviewed 14 informants with whom I conducted 19 qualitative interviews. In the thesis, I cited 12 informants with whom I conducted 17 qualitative interviews. Before each interview, I provided informants with an overview of the study and its objectives and consent form to sign should they agree to participate. The following are the details of the different components of the research.

For my GIFS informants, I interviewed 13 informants with whom I conducted 18 interviews. In the thesis, I cited 11 informants with whom I conducted 16 interviews. I used pseudonyms for my GIFS informants to protect their identity.

Furthermore, I interviewed former GSA president and co-founder of the University of Saskatchewan's Academic Integrity Committee, Izabela Vlahu.<sup>5</sup> She allowed me to cite her name in the thesis instead of using a pseudonym. The information about the interviews is summarized in Table 3.1.

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<sup>5</sup> The Academic Integrity Committee was founded to oppose the commercialization of the university in the global sense of the word and its immediate goal was to oppose TransformUS. I interviewed Vlahu as she had important insights in the debate on academic freedom and provided some of these insights in a 2014 public speech on academic freedom (Vlahu 2014).

**Table 3.1: The Interview Process**

	<b>Number of informants interviewed and number of interviews done</b>	<b>Number of informants and interviews cited in the thesis</b>
<b>GIFS informants</b>	13 informants with whom I did 18 interviews	11 informants with whom I did 16 interviews
<b>The Academic Integrity Committee informant</b>	1 informant with whom I did 1 interview	1 informant with whom I did 1 interview
<b>Total of all my informants</b>	14 informants with whom I did 19 interviews	12 informants with whom I did 17 interviews

Qualitative interviews are generally fluid and flexible and are not structured. During an interview, a researcher should listen carefully to what his interviewees say and use this as a guide to know what question to ask next (Mason 2002). However, it is also possible to use qualitative interview questions guides to help the researcher remember the most important questions. I used the same interview guide with all my informants, changing the specifics of the question to match each informant’s affiliation and position. I did not have a chance to ask all the questions to all my informants. The following is my qualitative interviews’ questions guide:

1. From the standpoint of your institute, why was the GIFS created? (The term “institute” was substituted with: the University, the Province of Saskatchewan, or PotashCorp according to the affiliation of the informant.)
2. What documents influenced your understanding of why the GIFS was needed?
3. What do you think about these reasons?
4. What are the obstacles that made creating the GIFS difficult?
5. What are the factors that helped create the GIFS, or made it possible to create it?
6. Did you draw on models of other institutes that are similar to the GIFS while planning and founding it?
7. What were the priorities?
8. How did you interact with the other two helices? (The other two helices were specified with each informant according to his/her affiliation).

9. What were the goals of the GIFS at the beginning of the process of founding it? If they have changed, how did they change?
10. What were the main disagreements about founding the GIFS? How did you resolve them?
11. How did you choose the location of the GIFS?

The following documents were used for the document analysis: the Type B Centre document, which includes the proposal that was sent to the University Council requesting approval to establish the GIFS; the GIFS Memorandum of Agreement; President MacKinnon's book, *University Leadership and Public Policy in the Twenty-First Century: A President's Perspective*; two reports by PotashCorp (a Summary Integrated Report and an Annual Report); and six mass media articles about the hostile takeover attempt of PotashCorp by BHP Billiton.

In my research design, I planned to use qualitative interviews to seek answers to questions about the factors, motivations, and social processes that influenced the development of the GIFS. This is because the participants' perceptions can uncover, and offer an entry point to, many elements of these factors, motivations, and social processes.

The purpose of the document analysis was mainly to seek answers about the factors behind the centre's foundation. I did not expect the document analysis to reveal much information about motivations and social processes. However, while collecting and analyzing the data, I realized that the distinction I made between qualitative interviews and document analysis, in terms of which questions each kind of source was supposed to answer, was false. The three aspects (factors, motivations, and social processes) are very much overlapping. One dimension of this overlap is that motivations depend on perceptions about the factors. In other words, how agents (individuals) perceive their interests, contexts, and environments, and consequently how they perceive the factors that lead to a specific condition or goal, are partially related to how their motivations are constituted. Thus, I analyzed the data I collected through the two techniques to answer all the aspects of my research question.

### **3.3 Rationale**

There are several reasons for using a plurality of research methods like I do in this thesis. Greene et al. (1989) identify five of them. First, triangulation, which seeks convergence and insurance of validity of the research findings. Second, complementarily, which aims to study overlapping and

different dimensions of one phenomenon. In addition, it seeks to achieve an elaborate and rich understanding of that phenomenon. Third, development, where the first method is used to inform and guide the question and the implementation of a second method. Fourth, initiation, where the aim is to discover paradoxes and to analyze the consistencies and discrepancies evident in the results gained from different methods to find fresh insights and perspectives. Frequently, this purpose is not a planned intent but rather emerges over the course of an investigation. Fifth, expansion, where the aim is to study multiple components of a phenomenon and to have large breadth and scope.

This research project combines triangulation and complementarity. Triangulation is required in any sociological research project; the more convergence there is between data from different sources, the more accurate the research findings are. Triangulation and complementarity are somewhat similar to assessing validity, and assessing validity is essential in virtually any sociological research (validity is discussed in a separate section below). Complementarity is required in my research project because it examines several and overlapping dimensions of a phenomenon: the three aspects (the factors, motivations, and social processes) that led to the creation of the institute (the institute is a phenomenon). While analyzing data and writing the thesis, I used complementarity and triangulation in both of my research findings chapters, Chapters 4 and 5.

### **3.4 Operationalization**

It was important to operationalize and discuss the three aspects of my research question: the factors, motivations, and social processes. In the research design, I operationalized factors as policies and instructions by higher executive authorities. Some policies might have explicit instructions decision makers should follow (founders and participants in creating the GIFS), while other policies might provide greater freedom for decision makers to implement the policy in the way they found suitable.

Motivations are the reasons that drove my informants to participate in the creation of the GIFS and how they see their engagements, efforts, and rewards during the process. This aspect is usually informed by symbolic interactionism theory, which assumes that people create perceptions of each other and the social environment while interacting with others and act accordingly (Neuman 2007). The GIFS was created through social processes. These include



planning and initiating efforts, organizing these efforts while the centre was being founded, the implementation procedures, and how the founders resolved the problems that faced them.

While collecting and analyzing data, I realized that the factors and the motivations were overlapped more than what I thought they would while I was designing the research. Furthermore, I realized that the social processes that led to the creation of the institute were more difficult to determine than the factors and the motivations.

### **3.5 Analysis**

Interviews were analyzed. I examined them for recurring and significant themes, which included focusing on the underlying meaning of the text, i.e. the implicit themes. I coded the recurrent themes and eventually I used the set of codes, which I developed, to analyze all my data from the interviews and the documents. The result of this was, for example, that some of the GIFS goals that I analyzed were confirmed by many informants and/or documents. This is also an example of how I did triangulation. Furthermore, I read my entire collection of data using the concepts of the two theories that guided my research, Bourdieu's habitus and the field and Campbell's institutional change model, as analytical tools that help me to investigate and explore the main concepts of my empirical research: the factors, motivations, and social processes. Then I wrote the analysis and findings.

My key ethical consideration was to protect the identity of my informants. Consequently, I used pseudonyms rather than my informants' actual names. However, it is still difficult to protect their identity because the centre was founded by such a small number of people, and informed readers might be able to guess who the informants are.

### **3.6 Assessing Validity**

Mason (2002) argues that researchers can maximize validity by choosing appropriate techniques: "judgments of validity are, in effect, judgments about whether you are 'measuring', or explaining, what you claim to be measuring or explaining" (Mason 2002: 188). I selected my research techniques (qualitative interviews and document analysis) with this in mind. I considered three additional strategies to ensure validity.

First, assessing validity is similar to using a plurality of research methods for triangulation and complementarity, as mentioned above. Rubin and Rubin (2005) highlight the

importance of using a plurality of methods while studying controversial topics: “when you are studying controversial issues, you want to obtain all sides” (Rubin and Rubin 2005: 68). Rubin and Rubin (2005) are referring to complementarity and their point is relevant to my research, as my topic (founding the research centre, with the trend of science commercialization in the background) is controversial. Comparing the findings I got from the two sets of data gathered from the two techniques I used in my study (qualitative interviews and document analysis) allowed me to assess the validity of my analysis. Second, I also compared the research findings with the literature.

Third, and finally, Mason (2002: 191) highlights the importance of demonstrating how a researcher interprets the data collected:

validity of interpretation in any form of qualitative research is contingent upon the “end product” including a demonstration of how that interpretation was reached. This means that you should be able to, and be prepared to, trace the route by which you came to your interpretation.

With this in mind, I quoted the interviews at length to show readers the descriptive part of my research and so to allow them to see how I reached my interpretations and conclusions. I also included these long quotes because my plan for this research was to focus on the perceptions of my informants. The perceptions of the informants can be understood through their narratives, which appear in the portions of the interviews I quoted.

In this chapter I discussed my research methodology by describing the methods and techniques I used and justified the reasons behind choosing them. The next chapter moves on to the story of founding the GIFS.

**CHAPTER 4:**  
**THE GLOBAL INSTITUTE FOR FOOD SECURITY (GIFS):**  
**FACTORS AND GOALS**

This chapter discusses part of the research findings on the factors, motivations, and social processes that led to the creation of the GIFS. The chapter is divided into two sections. The first section discusses the factors and conditions that led to the creation of the GIFS, and the second section discusses the goals of the GIFS. My major claims are that the GIFS embodies a new policy at the University of Saskatchewan. Furthermore, funding from PotashCorp was a major factor behind the creation of the GIFS and how it was created. In the end, the GIFS serves the interests of PotashCorp.

The data used in this chapter and the next one derive from my interviews with 11 informants, with whom I conducted 16 interviews, and the analysis of a number of documents listed below. The names used here are pseudonyms, not the actual names of the informants. The affiliations of the 11 informants I cited are the following: one from the Government of Saskatchewan, one from PotashCorp, four from the University of Saskatchewan at large, and five from the GIFS.

Bert, who I interviewed in February 2015, worked for the Government of Saskatchewan. Thomas worked for PotashCorp, and my interview with him took place in February 2015. Then I had one e-mail correspondence with him in April 2016 since I had follow up questions to ask. Russell worked for the University of Saskatchewan and I interviewed him once in March 2015 and then I interviewed him on the phone in April 2016. Paul also worked at the University and I interviewed him on the phone in September 2015. Furthermore, I interviewed Jason in November 2017 and Ester in December 2017; both are from the University. I chose these informants because they were knowledgeable about the involvement of their respective institutes in founding the GIFS.

Leonardo worked at the GIFS, and is knowledgeable about the GIFS' work during the 2013 calendar year, and I interviewed him once. My interview with him took place in October 2013. Christopher currently works at the GIFS and has since October 2014. I interviewed him three times, in May, June, and August 2015. Furthermore, the following three informants are currently affiliated with the GIFS: Ronald, whom I interviewed in November 2017; Robert,

whom I interviewed in November 2017; and John, whom I interviewed in December 2017 through Skype. This was followed by an e-mail correspondence later that month for clarification.

The documents used in the analysis are Peter MacKinnon's book, *University Leadership and Public Policy in the Twenty-First Century: A President's Perspective* (2014), the GIFS Proposal written by Dr. Karen Chad (2012) in the Type B Centre document, the Memorandum of Agreement by the GIFS, two reports by PotashCorp (a Summary Integrated Report and an Annual Report), and six mass media articles about the hostile takeover attempt of PotashCorp by BHP Billiton.

#### **4.1 Factors and Conditions that Led to the Creation of the GIFS**

Before discussing the factors and conditions that led to the creation of the GIFS, I present some background about the university governance system using information Paul provided. I interviewed Paul to ask him about some points in MacKinnon's book (2014). This background was necessary for understanding some aspects of the factors and conditions that led to the creation of the GIFS, which I present below in six major points that are related and connected to each other.

In the following paragraphs, I describe the University of Saskatchewan's governance system. There are three governance bodies at the University of Saskatchewan: The Board of Governors, the University Council, and the University Senate. According to Paul, the University Council at the University of Saskatchewan is equivalent to what most other universities call the Senate. And the body that is called the Senate at the University of Saskatchewan does not exist at most other universities. The University of Regina is an exception to this general rule (Paul, personal communication, September 11, 2015).

According to Paul, the Senate of the University of Saskatchewan is a body of representatives from around the province who meet twice a year and do not have any formal decision making responsibilities. The Senate is supposed to express the university's strong connection to the province. And even though it does not have formal power, it can have significant influence as an advisory body (Paul, personal communication, September 11, 2015). This information is consistent with the definition on the University of Saskatchewan website about the University's governing bodies (University of Saskatchewan 2016b).

I asked Paul why the governing structure of University of Saskatchewan and the University of Regina are different from most Canadian universities. He provided the following answer. The University of Saskatchewan was created only two years after the Province of Saskatchewan was created, and it was intended to be the province's university. It was important for the province to have a body that could be the province's voice in university affairs. He clarified that he was not saying that this was the only reason, but it is a reflection or an illustration of the close connection between the university and the province (Paul, personal communication, September 11, 2015).

MacKinnon became the President of the University of Saskatchewan in 1999 (University of Saskatchewan 2017b), a position he held for thirteen years (University of Saskatchewan 2017b; MacKinnon 2014). In his book, MacKinnon (2014) mentioned that the Federal Government's expenditure on Post-Secondary Education has shifted towards investing in targeted research; the Provincial Government has followed suit. This trend is known in the literature as the commercialization of science and the entrepreneur university.

The first of the six factors and conditions that led to the creation of the GIFS is the university model of pre-eminence and the recent importance of university ranking. MacKinnon (2014) described this point in his book. He distinguished between two distinct goals universities could seek: to become the people's university or to strive for pre-eminence. Becoming the people's university means focusing on providing the community with good services and affordable tuition (MacKinnon 2014). He wrote that "Many university employees, and others who would invoke 'the people's university' nickname in the years to come, did so for defensive or ideological reasons that placed high value on local service and low cost, and low value on competitiveness, quality, and reputation beyond provincial borders" (MacKinnon 2014: 12). As for pre-eminence, it means to try to make the University one of the best and most prestigious universities in the country. He mentioned that the University of Saskatchewan wanted to pursue both directions and tried to balance these two objectives. However, sometimes this resulted in an ambiguity of mission (MacKinnon 2014).

In the first half of the century, the University opened several colleges and schools that allowed it to become one of fifteen medical-doctoral universities in Canada. This was a successful move toward pre-eminence. However, in the second half of the century, the ambiguity of mission MacKinnon mentioned was reflected in the University's attempts "to be all things to

all people or stretching itself too thin” (MacKinnon 2014: 12), which was a step in the direction of the people’s university. The research success of the strongest colleges and schools reflected the concept of pre-eminence, but colleges and schools that were much less successful from a research standpoint did not reflect this concept, as they were less ambitious for themselves and for the University (MacKinnon 2014).

At the beginning of the 2000s, university rankings became much more important on a global level; thus, pre-eminence became much more important. According to MacKinnon (2014), commercialization and the recent importance of university rankings were not the brainchild of the University of Saskatchewan administration. Instead, the importance of competition between universities increased due to some global changes in the higher education system. It is not something the University of Saskatchewan chose. In addition, the criteria of success, or pre-eminence, are set by global players and rankings; the University of Saskatchewan has no control over these criteria. There is a strong pressure on the university to compete with other universities. Despite this pressure, the university administration still has the choice to focus on the pre-eminence model and do its best to succeed according to these global standards or not (MacKinnon 2014).

MacKinnon (2014) also mentioned that attracting private funding and partnerships has become inevitable in contemporary universities, and it is increasing the role of presidents to attracting these funds. However, he recommended developing regulations to control the potential complications connected to attracting private funding, such as the problem of conflict of interests (MacKinnon 2014).

The second factor that drove the founding of the GIFS was the identification of the signature areas and the decision to develop them further. MacKinnon (2014) mentioned improving the signature areas in a wider context. He discussed the issue of low productivity growth in Canada and developed a strategy consisting of several points to solve it; improving the signature areas was one of them.

MacKinnon’s (2014) mentioned that the Competition Review Panel indicated in its 2008 report that, during the previous 25 years, Canada’s productivity growth had been lower than that of most industrialized countries. The Panel mentioned that the reason behind the low productivity growth was Canada’s relatively weak performance in the production, diffusion, and transformation of knowledge and the utilization of knowledge through commercialization.

MacKinnon referenced other sources that confirmed that Canada had problems in its science policy as early as the 1980s (MacKinnon 2014).

MacKinnon (2014) provided a strategy to develop the University of Saskatchewan's policy to improve the University and to enable it to address the problems facing Canada. Three of the most important points of his strategy are, first, ensuring the University met top national and international standards for medical-doctoral universities. This involves setting stricter rules for tenure and promotion and implementing systematic reviews and announcing the results (MacKinnon 2014).

The second part of his strategy was to identify areas of strength (i.e. signature areas) and invest more in them to confirm their success and pre-eminence. MacKinnon (2014) said this was the most controversial point but that it was crucial to improve the position of the university within university rankings and to become more successful according to the global standards and criteria of academic excellence. He added that the idea of treating areas of strength and areas of weakness in the same way at universities "was an unfortunate misapplication of the principle of equality" (MacKinnon 2014: 20). Based on the evidence MacKinnon provided, we can conclude that the result of this policy is that these weak areas get less attention and lower levels of investment and so might deteriorate more.

The third point of MacKinnon's strategy is to centralize planning. According to MacKinnon, the University administration should have more power and should use this power to do more central planning. This should help the University improve its ranking and its success according to international criteria. It would, furthermore, allow the University to help Canada to improve its productivity growth through improving the use of knowledge in commercialization (MacKinnon 2014).

Russell confirmed the importance of signature areas in the new strategy, or policy, of the University. Russell said that the actual genesis of the GIFS can be traced to the University's identification of six signature areas in June 2010.<sup>6</sup> These six signature areas were: agriculture, food, and bio-products for a sustainable future; water security; energy, minerals, and the environment; synchrotron science; health; and Aboriginal engagement. Identifying agriculture as

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<sup>6</sup> Russell did not specify June 2010; this information comes from the University's webpage (University of Saskatchewan 2017c).

one of the University's six signature areas made creating the GIFS possible (Russell, personal communication, March 20, 2015).

Ester confirmed the importance of signature areas as well and she highlighted it very much:

So to me is this that if the university has aspirations to be a top research intensive university it must be able to sit at the global tables of selected areas that are going to make a difference in the world, you need to be able to, ahhh people need to see you as a global leader. And are they going to see you, ahhh is it a hundred things? Nobody can be the global leader of a hundred things. So if you are going to be research intensive, you have to, what does it take for you to do that, and one of the biggest indicators is that you are at that the global tables helping to solve some of the toughest issues of the world. So, we identified, we said yes we want to be research intensive so we decided ammm which areas we actually could be. So you may want to be at the global tables, you have to be at least have some degree of strength to be able to know that you can get there. So we identified the whole area of agriculture as one area where we knew we were extremely strong. So the opportunity to be one day at those global tables was very good. And again that is one of the hallmarks, if you are known around the world, people come to you because they know that's the place. That's one of the criteria of being a research intensive university is others look to you to make a difference in the world (Ester, personal communication, December 4, 2017).

The third major condition or factor that led to the creation of the GIFS was the collaboration between MacKinnon with PotashCorp. Russell and Christopher also mentioned this. Russel said that, in 2011, President MacKinnon, who had been in his position since 1999, began thinking about 2012, his last year at the University of Saskatchewan (he stepped down on June 30 of that year) and his legacy. He had a conversation with PotashCorp about how it could make a difference at the University of Saskatchewan. Because the signature areas were already defined, MacKinnon was able to choose one of those areas, i.e. agriculture and food production, and asked PotashCorp to contribute to this area. Through conversations with Bill Doyle, the CEO of PotashCorp at that time, MacKinnon came to understand PotashCorp's business and what was important to it. He also thought about Saskatchewan's environment and eventually was able to ask PotashCorp, through Bill Doyle, to support a Global Institute for Food Security. MacKinnon was able to show PotashCorp that there was an overlap between the University's expertise (and its willingness to develop its expertise areas further) and PotashCorp's interests (Russell, personal communication, March 20, 2015).

In addition to this overlap of interests, the University was able to secure funding from PotashCorp because Dallas Howe, who was the Chair of the Board of Directors of PotashCorp at



that time, and Peter MacKinnon had a good relationship. Howe and MacKinnon knew each other because Howe had been the Chair of the Board of Directors of the University of Saskatchewan from February 2005 to December 2005 (Russell, personal communication, March 20, 2015).

Russell continues. PotashCorp's funding to create the GIFS had a significant impact on how it was ultimately created. Without the PotashCorp's donation, the University of Saskatchewan might have created an interdisciplinary research centre on food and agriculture, but it would have been very different from what is now the GIFS. (Russell, personal communication, March 20, 2015). Christopher confirmed this. At the beginning, PotashCorp thought simply to donate to the University of Saskatchewan since donations to big universities can create lasting legacies more than many other types of donations, such as investing in a community building. Conversations between MacKinnon and Doyle convinced PotashCorp to donate to the University to enhance PotashCorp's specific objectives. Eventually, this was narrowed down to the issue of food security (Christopher, personal communication, 2015).

The fourth factor in the creation of the GIFS is PotashCorp's long-term interest in food security. Russell, Thomas, and Christopher all mentioned this point. According to Russell, it might be surprising for some people that PotashCorp provided CDN \$35 million for a Global Institute for Food Security. They might think that PotashCorp, as a mining and fertilizer company, would probably want to create a mining research institute. However, PotashCorp recognized that it is part of the agriculture and food production system. It realized that its business does not depend only on mining and fertilizing, but on developing its broad market (which depends on agricultural productivity and knowledge about agriculture and fertilizers) as well. PotashCorp realized that it was in its own business interest to attach its name and its resources to food security research. Russell said: "So it is food and the need of people for food that actually drives their business." Furthermore, PotashCorp realized that the University of Saskatchewan was strong in crop production, soils, and food policy analysis. Thus, it made sense to invest in it (Russell, personal communication, March 20, 2015).

Thomas, on the other hand, said that PotashCorp was supporting its customer base and its key shareholders. PotashCorp has created long-term interest in food security, meaning providing people with an opportunity to have sufficient agricultural output to feed themselves and to fulfill their other basic needs. According to Thomas, PotashCorp was looking for ways to maintain its long-term food security strategy (Thomas, personal communication, February 24, 2015).

Christopher confirmed this point. He mentioned that global food security became an important theme for PotashCorp as an international fertilizer company. Food security was relevant for PotashCorp, which started to be more a knowledge-based company and part of the agri-business community, instead of just a mining company. Thus, one of their objectives was to get farmers to increase their agricultural productivity. The theme “global” is relevant because PotashCorp is an international company and they wanted to invest in something that could have global impact (Christopher, personal communication, 2015).

The fifth factor driving the creation of the GIFS is related to Saskatchewan’s resources, its historic role in agriculture, and how the Government of Saskatchewan responded to changes, including the recent ones. Bert mentioned that, from the perspective of the Government of Saskatchewan and industry, a series of critical and strategic events were relevant to founding both the Crop Development Centre (CDC)<sup>7</sup> and the GIFS. After World War II, it was important to produce a sufficient amount of wheat to make enough bread to contribute to global food needs. In Canada, there was a consensus that Saskatchewan should play an important role in growing enough food for the global population, as it comprises 44% of Canada’s agricultural land. The Federal Government and the Government of Saskatchewan cooperated and succeeded in promoting Saskatchewan as the bread basket of the world. Later, in the late 1960s and early 1970s, the Government of Saskatchewan started to think that it is cultivating too few crops and that it is time to start diversifying and the CDC was founded in 1971 as a step towards achieving that goal (Bert, personal communication, February 11, 2015).

Bert pointed out that in 2009/2010, the Government of Saskatchewan began to reflect about the world population. The world population is expected to reach nine billion by 2050, which will require 70% more food production from the same land. Premier Brad Wall thought that, since Saskatchewan had helped provide food for the world after World War II, it should continue having an important role in agriculture on a global scale by helping provide enough quantity and good quality of food in the future. Saskatchewan will not be able to produce food for the entire world, but it can certainly play a major role. PotashCorp also got involved and joined the Government of Saskatchewan. Both thought that Saskatchewan had the necessary

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<sup>7</sup> The CDC is a field crop research organization established in 1971. Its primary goal is to increase economic returns for farmers and the Western Canadian agriculture industry by developing crops (Crop Development Centre 2014).

ingredients (i.e. the land and the fertilizer) to take agriculture production to the next level. All the province needed was transformative technology (The term transformative technology will be explained in section “4.2 Goals of the GIFS”) (Bert, personal communication, February 11, 2015).

Consequently, Premier Wall, who had been in his position since 2007, announced in his 2011 electoral platform that, if his Saskatchewan Party won the elections, the Government of Saskatchewan would participate in founding a new global institute for food security. Bert mentioned that Premier Wall was involved in the very early phases of creating the GIFS, when the founders were exploring the concept. Soon after, he handed the file to Dr. Alanna Koch, the Deputy Minister of Agriculture (Bert, personal communication, February 11, 2015).

Christopher has the following to say about this point. The Government of Saskatchewan was also motivated to invest in a new institute for global food security to have a lasting legacy and to be able to demonstrate to taxpayers that it made good investments, but to a lesser degree than PotashCorp. Most likely, both wanted to invest in the GIFS because they hoped to create something that people could point to and say it happened because of the investment of PotashCorp and the Government of Saskatchewan. One of the Government of Saskatchewan’s main goals was to improve farming’s margin of profitability through agricultural innovation at the GIFS. This would be a great success for the Government of Saskatchewan because it would raise its political reputation. Wall’s Government of Saskatchewan wanted farmers to feel wealthier and so to elect it again, which is a good political motivation (Christopher, personal communication, 2015).

The sixth factor is the role of the Government of Saskatchewan in preventing PotashCorp from being taken over by BHP Billiton. In the second half of 2010, this attempted takeover became a central topic in media and political discourse. BHP offered PotashCorp a takeover bid of US \$39 billion (Goodley 2010) and, in August, PotashCorp refused it (CBC News 2010; Goodley 2010). The financial market platform, Dealogic, indicated that BHP’s US \$39 billion offer was one of the largest on record in Canada (Goodley 2010).

PotashCorp called the bid grossly inadequate (CBC News 2010; Mills 2010; Goodley 2010). However, Bill Doyle kept the door ajar for future offers and he said that he was not against sales in general, rather he was against BHP Billiton’s offer as it was opportunistic, and was like stealing PotashCorp (Mills 2010). Then, BHP stated that it would recommend its offer

directly to PotashCorp shareholders (CBC News 2010; Goodley 2010). The Government of Saskatchewan assigned the Conference Board of Canada to review BHP's proposed takeover of PotashCorp (CBC News 2010). The Conference Board concluded that the BHP takeover of PotashCorp might cut Government of Saskatchewan's revenues by at least CDN \$2 billion over a ten-year period (CBC News 2010; Austen 2010). Although the Conference Board's study also stated that BHP's proposed takeover could also generate benefits for the province, most of these benefits would happen later on, whereas the costs of the takeover would materialize early on. The Government of Saskatchewan used the Conference Board's study in its evaluation of the BHP bid but the final decision over its approval lied with the Federal Government (Austen 2010).

Opposition Liberal MPs stated that Ottawa should block the BHP takeover bid (CBC News 2010). Similarly, Premier Brad Wall energetically rejected that bid because it did not afford net benefits to Saskatchewan or Canada as a whole (CBC News 2010). Moreover, Saskatchewan ministers went to Ottawa to campaign against the takeover bid (CBC News 2010). Likewise, Premier Wall announced that Manitoba, Alberta, New Brunswick, and Quebec were also opposing the bid (CBC News 2010). Simultaneously, it became clear that China's SinochemCorp could not make a competing takeover bid for PotashCorp (CBC News 2010).

Equally important, Premier Wall said that, if the Federal Government accepted the bid, he would consider introducing a resource transfer tax on BHP (CBC News 2010). Then, Premier Wall wrote a letter to Industry Minister Tony Clement requesting the Federal Government to protect the national strategic interests of Canada by rejecting the BHP takeover bid (CBC News 2010). Finally, in November 2010, the Federal Government rejected the BHP Billiton hostile takeover of Saskatchewan PotashCorp (CBC News 2010; Northern Miner 2010; Toronto Star 2010) and then, BHP Billiton withdrew its takeover bid (CBC News 2010).

Explaining why the Federal Government rejected the bid, Minister Clement said that he believed that the BHP bid offer would not improve economic activity in Canada. He also mentioned that the Federal Government only approved foreign investments that had clear benefits for Canada (Toronto Star 2010). A timeline of the 2010 BHP-related events is presented in Table 4.1.

**Table 4.1: Timeline of 2010 BHP-related Events**

August 17, 2010	PotashCorp refused a takeover offer from BHP Billiton
August 18, 2010	BHP mentioned that it will recommend its offer directly to PotashCorp shareholders
September 2, 2010	The Government of Saskatchewan assigned the Conference Board of Canada to review the BHP proposed takeover of PotashCorp
October 4, 2010	The Conference Board of Canada said that the BHP takeover of PotashCorp might cut the Government of Saskatchewan revenue by at least CDN \$2 billion over ten years
October 15, 2010	The Reuters news agency announced that the Chinese SinochemCorp cannot make a competing takeover bid for PotashCorp
October 20, 2010	Liberal MPs announced that Ottawa should block the PotashCorp takeover deal
October 21, 2010	Premier Brad Wall rejected the BHP takeover bid because it did not afford net benefit to Saskatchewan or Canada
October 25, 2010	Saskatchewan ministers went to Ottawa to campaign against the takeover bid
October 29, 2010	Premier Wall announced that Manitoba, Alberta, New Brunswick, and Quebec were opposing the bid
October 30, 2010	Premier Wall said that if the Federal Government accepted the bid, he would consider introducing a resource transfer tax on BHP
November 2, 2010	Premier Wall wrote a letter to Industry Minister Tony Clement requesting the Federal

	Government to protect the national strategic interests of Canada by rejecting the BHP takeover bid
November 3, 2010	The Federal Government rejected the BHP Billiton hostile takeover of Saskatchewan PotashCorp
November 14, 2010	BHP Billiton withdrew its takeover bid

Among my interviewees, Christopher emphasized the key role of the Government of Saskatchewan in preventing PotashCorp from being taken over by BHP Billiton. Russell confirmed this interpretation, though in a slightly different way. Christopher said that many important things took place behind the scenes before the arrival of Dr. Maurice Moloney as the Executive Director of the GIFS. Two of the main incidents behind the scenes were the conversion of PotashCorp from a Crown Corporation to a publicly traded organization, which was a very important step for the Province, and the Government of Saskatchewan’s decision to save PotashCorp from being swallowed by BHP Billiton. According to Christopher, these two incidents, and the fact that PotashCorp has turned out to be an internationally successful company pushed Government of Saskatchewan officials to ask PotashCorp to put something back into the province, something like a lasting legacy (Christopher, personal communication, 2015).

Christopher explained that the Government of Saskatchewan was formed by a conservative party when it prevented BHP Billiton from taking over PotashCorp. However, he argued that that Government was conservative and not really right-wing, in Adam Smith’s sense of the word. Smith advised to sell in any case where shareholders would benefit from the sale. The Government of Saskatchewan was not this right-wing. The Federal Government was conservative at that time as well and embraced what Christopher called a “selective protectionist policy.” He said a real protective industry policy would not allow selling any companies to foreigners. However, he considered the Canadian policy to be selectively protectionist because it prevented selling the large companies only. The goal, therefore, was to keep a cohort of large Canadian-owned and headquartered companies because one of Canada problems is that it does not have many; it is mostly home to branch plants. The Government of Saskatchewan followed a

similar policy, making decisions according to Canada's specific needs. Premier Wall's decision to save PotashCorp from being swallowed by BHP Billiton was consistent with Canada's general policy (Christopher, personal communication, 2015).

Russell detailed this point in our interviews, adding that he did not think that PotashCorp was repaying favours to the Government of Saskatchewan. He did, however, say there is a possibility that BHP Billiton's attempted hostile takeover and the provincial government's strong mobilization against it may have played a role in creating the GIFS. However, he said this would need further investigation. When BHP Billiton attempted to take over PotashCorp, Wall himself intervened to prevent it. The BHP Billiton takeover failed because the Federal Government ruled that there was no net benefit to Canada; however, the Federal Government ruling on that was most certainly influenced by Premier Wall. Russell thought it was possible to imagine that the Premier extracted some commitment from PotashCorp to fund research or to invest in the Province somehow as a recognition of the Province's intervention. Although it is hard to assess the potential link between this episode and the creation of the GIFS, Russell stated that "it is all about relationships," meaning that good relationships and trust among the three partners facilitated the creation of the GIFS (Russell, personal communication, March 20, 2015).

Interview data from Christopher and Russell is consistent with the media reports cited above. More specifically, Russell confirmed media reports regarding the fact that the attempt failed because of the decision of the Federal Government; however, the Government of Saskatchewan was proactive and played an important role in pressuring the Federal Government to make this decision.

Based on the available evidence, we can only hypothesize that the role of the Government of Saskatchewan in preventing the BHP Billiton takeover helped improve already existing relationships between PotashCorp and the Government of Saskatchewan, relationships that then create the GIFS. Furthermore, my research indicated that the funding from PotashCorp to create the GIFS was a major factor in creating the institute in the way it was created.

#### **4.1.1 Analysis of the Factors and Conditions**

My research findings indicate that the new policy of the University of Saskatchewan was also one of the main factors behind the creation of the GIFS and the GIFS embodies it. The new policy of the University as MacKinnon and other supporters of commercialization recommended,

can be summarized with the following four points: improving signature areas, improving the position of the University within university rankings, increasing central planning, and attracting private funding and partnerships.

Creating the GIFS was part of the process implementing this new policy. As agriculture, food, and bio-products for a sustainable future was identified as one of the University's signature areas, creating a food security institute became one of the best ways to implement this new policy and to improve the reputation of the University as a result. The GIFS is supposed to achieve the new policy's goals. Indeed, they share similar logics as both are based on the notions of commercializing science and investing in research areas that are already strong.

My data analysis indicates that the University's new policy differentiates between two types of sciences. The first one includes the signature areas and some other disciplines that are relevant to the new policy (and so supports what is most likely to become more globally successful), and the second type of science includes the disciplines that will not help the University of Saskatchewan to become more successful according to global criteria. This is because MacKinnon mentioned that signature areas are identified to give more priority to developing them, as I mentioned above.

Looking through Bourdieu's lens, the two types of sciences are both the same kind of capital, cultural capital. However, in the empirical case of the GIFS, they have very different values. I will therefore consider them as two different types of the same kind—cultural capital. I will call the first one the “globally high status science” and the second one the “ordinary science.” The globally high status science became more valuable than the ordinary science because of the global trend of the commercialization of science and the entrepreneur university, and MacKinnon's decision to follow this trend (i.e. to focus on the activities that will make the University more successful). There is a change in the exchange rate and the relative value of the different types of capital. This encourages the University administration to conserve the globally high status science capital and transform an amount of the ordinary science capital to the globally high status science capital (as it has a higher value) since this will increase the volume (total amount) of their capital.

In his book, MacKinnon (2014) explained the importance of focusing on improving the University's signature areas but he did not say how to improve the weak areas that need improvements. According to his strategy, these weak areas receive less attention and investment;



although he did not explicitly mention this in the book, this is the outcome of his strategy. Obviously some faculty at the University of Saskatchewan oppose MacKinnon's new policy because their departments have been adversely affected by the trend of commercialization. Some others might oppose it because they are supportive of the model MacKinnon called the people's university. Many others, of course, support this new policy.

Using the lens of Campbell's (2004) institutional change model sheds some light on the data we analyze here. According to Campbell (2004) institutions have different components. The various components frequently have contradicting or conflicting logics, which contributes to friction. Entrepreneurs and decision makers try to resolve this friction by changing one dimension to make it more consistent with the others. This is one of the ways in which institutional change takes place. Using Campbell's (2004) lens in our empirical case, the policy of the commercialization of the University is one component of the contemporary institution within which the University of Saskatchewan operates. Another component of this institution is the model of the University that is opposite to the commercialized university expressed in many faculty members at the University of Saskatchewan.

The logic of the model of the commercialized university and the logic of its opposite model are necessarily contradictory and conflicting. One of the ways to change one component, to make it more consistent with the other, is using a force that is stronger than both. This force is the pressure from Canada's particular problem of low productivity growth (national level) and the contemporary importance of the university ranking system and competition through global criteria (global level). These problems are stronger, and have a much wider context, than the University of Saskatchewan. And it is this larger context within which MacKinnon tried to frame his policy.

Campbell (2004) distinguishes between programs and paradigms. Programs are elite ideas that allow corporate managers and politicians to have a clear course of action. Paradigms are ideas as assumptions by elites that constrain the range of programs available for decision makers, politicians, and corporate managers. Programs are formulated by decision makers such as corporate managers, bureaucrats, and politicians. Paradigms are formulated by theorists like academics and intellectuals.

The GIFS is a program in Campbell's (2004) sense. The GIFS was an idea that was implemented and actualized and through it a clear course of action became possible. As an

institute, the GIFS's goals are more specific than goals of the new policy of the University, which the GIFS embodies. Furthermore, the GIFS has a structure and a number of employees. Through its specific goals and structure, the GIFS made a clear course of action possible. Consequently, decision makers who played a role in creating the GIFS as Brad Wall, Bill Doyle, Karen Chad, Ernie Barber, and Peter MacKinnon (the roles of these individuals will be discussed further below) are program creators in Campbell's (2004) sense. Peter MacKinnon is a paradigm creator as well. This is because he created the new policy of the University, as mentioned above, which is considered a paradigm in Campbell's (2004) sense. MacKinnon's new policy of the University is a paradigm as it was framed through research, and it looked more as academics' and intellectuals' work, furthermore he created his new policy of the University in his capacity as an academic and as the University President. So, following Campbell (2004), MacKinnon was a paradigm creator, not just a program creator.

The triple-helix theory is a paradigm and the scholars who developed it are paradigm creators in Campbell's (2004) sense. MacKinnon's new policy of the University and the triple-helix theory are consistent. MacKinnon's new policy is a policy for the practices of the entrepreneur university and the triple-helix theory justifies the practices of the entrepreneur university. MacKinnon's new policy of the University was based on an analysis of certain global and Canadian conditions. The theory of the triple-helix is also based on analyzing global conditions but it is abstract to an extent that some scholars consider it a theory. So the triple-helix theory is broader than the new policy of the university. That is why the triple-helix theory is more of a paradigm than MacKinnon's new policy of the University is in the sense of Campbell's (2004) use of the term. We might think that by creating his new policy of the University, MacKinnon was building on the paradigm of the triple-helix, not creating a new paradigm.

The importance of using Campbell's (2004) concepts in this particular piece of analysis is that they show us the relation between the GIFS, the new policy of the University, and the triple-helix theory from a theoretical institutional perspective. The new policy of the University and the triple-helix theory are paradigms and the GIFS is a program in Campbell's (2004) sense. In our empirical case, the relations are as follows: the new policy of the University is one of the main factors behind the creation of the GIFS and the GIFS embodies the policy. The triple-helix justifies the practices of the entrepreneur university and the new policy of the University.

Campbell argues that paradigms constrain the range of the programs available for decision makers. We can build on this by arguing that programs are the implementations of paradigms. Thus, there is a relation between both as both need each other. For institutional change to happen, programs need to be based on some ideas created by theorists and intellectuals, which are paradigms. And paradigms need to be implemented through programs. Furthermore, Campbell's (2004) concepts enable us to see MacKinnon's sophisticated role. As a GIFS founder, he is a program creator, and as a policy creator, he is a paradigm developer.

Campbell (2004) draws attention to the fact that new paradigms need to be consistent with old ones. MacKinnon's policy was very different from the previous one. However, MacKinnon's (2004) discussion of the history of the University of Saskatchewan shows that the University included both the people's university model and the pre-eminence model. He demonstrated that both models survived at the beginning but that, with recent changes to universities, the result of having both models led to an ambiguity of mission. For MacKinnon, because there are uncontrollable global forces creating pressures on the University of Saskatchewan, the right decision (or option) is the pre-eminence model. The only way to survive and succeed is to use the pre-eminence model, which is based on trying to succeed based on global criteria.

Campbell (2004) points out that when new programs are implemented, they create constituents that defend them. In the case of MacKinnon's policy, multiple sources point out that some faculty at the University of Saskatchewan defend MacKinnon's policy because they belong to departments and colleges that benefitted from it. This created polarization about the issue of the commercialization of science and the entrepreneur university. The importance of this is that the GIFS (which embodies MacKinnon's policy) was created in this polarized environment.

This polarization meant that the friction between MacKinnon's policy logic and the logic of the opposing policy was strong. I hypothesize that this is one of the reasons of why MacKinnon needed to be very decisive in adopting his policy. MacKinnon's decisiveness is clear in his book where he described his policy explicitly, explained why it is important, and argued that it is the only way to improve the University. His decisiveness is also clear in his willingness to found the GIFS, which embodies the new policy of the University. An important aspect of MacKinnon's policy is central planning, which is a decisive policy aspect by its nature. Central planning involves the University administration knowing what they want and having the right to

pursue these goals instead of a more decentralized management system. The GIFS embodies the University's new policy; it was partially created as a result of MacKinnon's decisiveness in adopting the University's new policy, which includes a decisive aspect: central planning. This happened in an environment that is very polarized regarding the larger policy that supports the GIFS.

The factors and conditions that led to the creation of the GIFS shaped the goals of the GIFS. This is what we will turn to in the next section.

#### **4.2 Goals of the GIFS**

The GIFS had several goals that were set by the founders from the three helices. My research identified five main goals. Many of them were confirmed by more than one informant.

The first goal was set by the Government of Saskatchewan. It was to create more economic opportunities for the citizens and taxpayers of Saskatchewan, especially those in the agriculture sector. Bert, from the Government of Saskatchewan, mentioned this goal. He explained by saying that it was meant to help farmers remain competitive in the global market (Bert, personal communication, February 11, 2015). Leonardo, my GIFS informant who is knowledgeable about the GIFS' work during the 2013 calendar year confirmed Bert's comments. Leonardo said that, for the Government of Saskatchewan, the goal of the GIFS was to strengthen bioscience and the bioscience cluster to improve the province's economy (Leonardo, personal communication, October 17, 2013). John also confirmed this and he mentioned that, from the Government of Saskatchewan's perspective, GIFS's goal was to contribute to economic development in the province, through job creations and new exports (John, personal communication, December 2017).

Christopher also confirmed this goal, though he described it slightly differently. He said that, in a more general sense, the Government of Saskatchewan wanted to create a strong provincial economy to be able to provide the social services that the citizens expect. This was possible to do through the GIFS because agriculture is a significant part of Saskatchewan's economy. For example, increasing the efficiency of wheat by just 2-3% would translate to billions of dollars of additional revenue. Thus, investing in improving agriculture is profitable (Christopher, personal communication, 2015).

In terms of the second goal, the world population is expected to be nine billion in 2050. The Government of Saskatchewan wanted to contribute to solving the problem of producing enough food for these nine billion people and so wanted to invest in agriculture research and development. Bert and Leonardo mentioned this as a goal of the GIFS from the perspective of the Government of Saskatchewan (Bert, personal communication, February 11, 2015 and Leonardo, personal communication, October 17, 2013).

PotashCorp also wanted to contribute to solving this problem. Doyle (2011) mentioned in his CEO letter in the 2011 Annual Report that PotashCorp's management focus on superior long term financial performance. Through strong financial success and good resource management PotashCorp can participate in serving the world not just the interests of PotashCorp and its stakeholders. PotashCorp executives want to improve economic and social progress and increase global food security. Doyle (2011) mentions that the increasing world population was a major challenge and that, in this context, improving crop yields became very important. In another report, PotashCorp (2012) mentions that, in 2012, PotashCorp devoted up to CDN \$45 million to partnerships supporting global food security issues. This included their contribution to the GIFS, Free the Children, and the Trinidad Model Farm (PotashCorp 2012). This is consistent with Robert's view that contributing to solving the problem of producing enough food for a growing world population was a goal of GIFS for each of the three helices: the Government of Saskatchewan, PotashCorp, and the University of Saskatchewan (Robert, personal communication, November 30, 2017).

The third goal was to do new agricultural research to develop transformative technologies that would take agricultural production to the next level. This involves improving crop yields, quality, and their resistance to climate change and diseases. Bert, Russell, the GIFS Proposal in the Type B Centre document, and Christopher all mentioned this.

Bert explained what he meant by transformative technologies. He said that the current process of science production in Saskatchewan can create incremental increases in yield and quality. However, what the Government of Saskatchewan, industry, and the University of Saskatchewan are looking for with the GIFS are major improvements in agriculture research that can lead to significant increases in quality and quantity of food production (Bert, personal communication, February 11, 2015).

According to Russell since Premier Wall had travelled extensively, he knew that the success of the whole province, including its Government, depended on the Government's success in developing good global markets. Consequently, the Government of Saskatchewan recognized the importance of the world to the Province and recognized the importance of understanding Saskatchewan as part of the global food system. Furthermore, it recognized how critical research was in improving productivity. The idea was to get more income dollars per acre. The Government of Saskatchewan was already investing significantly in agricultural research, but at some point it realized that it should create an entity that would further sharpen the research that was already being done. The Wall government was looking for methods to improve crop and plant technologies and transformational technologies to increase crop productivity and yields (Russell, personal communication, March 20, 2015).

This goal was confirmed by the University's official documents as well. In the GIFS Proposal (the GIFS Proposal is in the Type B Centre document, which is discussed with the Memorandum of Agreement in the Appendix), Chad (2012) stated that the GIFS would invest in strategic research that would result in transformative innovation. This was one of the specific points she mentioned in terms of the GIFS' mission.

On this point, Christopher mentioned that one of the Government's main goals was to improve the margin of profitability of farming through agriculture innovation produced by the GIFS (Christopher, personal communication, 2015).

The GIFS' fourth goal is a two-fold objective oriented toward PotashCorp: 1) to increase the agricultural productivity of PotashCorp customers; 2) and to gain a competitive advantage through providing useful research. Thomas mentioned this, as did the GIFS Proposal (in the Type B Centre document), the Memorandum of Agreement, and three other informants (Russell, Leonardo, and Christopher), each one in a slightly different way.

In the following paragraphs I present the information Thomas provided in our interviews. He said that this main two-fold goal is a long term goal. Regarding the first component of this goal, Thomas mentioned that, since it exports 99% of its products, PotashCorp's main customers are outside Canada. Their main products are potash, nitrogen, and phosphate. Their main customers are China, India, Indonesia, Malaysia, and Brazil. The first two countries are particularly important. PotashCorp has a strong interest in increasing its customers' agricultural productivity as this in return will enable them to buy more PotashCorp products. So there is no

direct relationship between the success of the GIFS in doing research (which is the goal of the GIFS) and an increase in sales of PotashCorp products (Thomas, personal communication, February 24, 2015). Thomas meant that an increase in the agricultural productivity of PotashCorp customers is the indirect link between the GIFS' success in doing research and an increase in sales of PotashCorp products.

More specifically, Thomas mentioned that PotashCorp was looking to increase their customers' agricultural productivity in the following ways: 1) the research findings of the GIFS could be transferred to the clients' countries, to be used directly; 2) the institutes in the clients' countries could use and build on the GIFS' research findings; and 3) institutes in the clients' countries could imitate the GIFS model and create similar research centres. The GIFS and the new research centres in these countries could then collaborate (Thomas, personal communication, February 24, 2015).

Thomas' third point on how to increase agricultural productivity of PotashCorp customers in their countries was also confirmed in Chad's (2012) GIFS Proposal (in the Type B Centre document). She mentioned that the GIFS would create links with other research institutes around the world in the area of food supply and share Saskatchewan's knowledge with them. This is one of the points in the GIFS' mission.

In terms of the GIFS' specific research goals, Thomas mentioned that PotashCorp wanted the GIFS to focus on soil health and plant breeding. This is because PotashCorp works in the soil health business and plant breeding is important for increasing agricultural productivity (Thomas, personal communication, February 24, 2015).

The Memorandum of Agreement also confirmed the fourth goal. PotashCorp branding and advertising through the GIFS was significant in the Memorandum of Agreement, which states that PotashCorp has the right to design a tagline that will mandatorily be attached to the GIFS name.

Russell also confirmed this fourth goal. He said that, by recognizing that it is part of the agriculture and food system, PotashCorp realized that it is in its business interest to attach its name and its resources to food security research at the University of Saskatchewan (Russell, personal communication, March 20, 2015). Leonardo confirmed this fourth goal to an extent. He mentioned that PotashCorp did not set specific goals except that it wanted the science produced by the GIFS to be world class (Leonardo, personal communication, October 17, 2013).

For his part, Christopher mentioned that PotashCorp's aim was to develop new agricultural technology or seeds through the GIFS that might help farmers increase their yields and thus improve their economic cycles. After a while their income would improve enough to be able to buy fertilizers from PotashCorp. So the target was not to develop technologies that would improve PotashCorp's fertilizers, but to improve farmer's economic situation (Christopher, personal communication, 2015).

Christopher then gave a hypothetical example to demonstrate his idea about helping farmers improve their economic cycles through improved agricultural technology. The farmer in Christopher's example is poor to an extent that, although he/she needs fertilizers, he/she cannot buy fertilizers from PotashCorp. In concluding his example, Christopher said that through agricultural technology, the farmer has been building up a cycle of surplus, and PotashCorp does not make any money from this. The farmer's surplus can be turned into either money or increased investment in farming. In both cases this surplus will provide the farmer with more money, which will enable him/her to start buying fertilizers from PotashCorp at some point. This way the farmer will become a PotashCorp customer and will be moving toward higher productivity. Fertilizers from PotashCorp will help the farmer increase his/her productivity and profits further and so he/she will be able to become a regular PotashCorp customer (Christopher, personal communication, 2015).

The GIFS' fifth goal is to elevate the level and profile of the University of Saskatchewan's research and improve its reputation on a global scale in terms of its capacity to contribute to food security sustainability. Chad (2012) mentioned this point specifically in the vision of the GIFS in the Proposal. Chad (2012) described the vision as follows: "The Global Food Security Institute will place the University of Saskatchewan among global leaders in integrating science and policy research and innovation to contribute Saskatchewan-led solutions for sustainably feeding a hungry world" (Chad 2012: 214). One of the GIFS' assessment criteria is the success of the GIFS in securing external funds and partnerships. The importance of this assessment criterion is that it demonstrates how the vision should be actualized.

Jason and Ronald also confirmed the existence of this goal and said that the goal of the GIFS was to raise the level of the research profile of the University (Jason, personal communication, November 16, 2017; Ronald, personal communication, November 21, 2017). Ester also confirmed the existence of this goal and mentioned that the GIFS was a way to



improve the reputation of the University of Saskatchewan on a global scale (Ester, personal communication, December 4, 2017).

Christopher also mentioned this goal. For the University, the GIFS was a way to invest in a project that would attract both more talent and well established professors with outstanding research programs to the University, which will improve the status of the University as a research university (Christopher, personal communication, 2015). Senior administrators sought to make the GIFS a special and lasting Institute, one that the University could use as an example of its potential. The administration wanted the GIFS to attract funds above and beyond the money already provided by PotashCorp and the Government of Saskatchewan (Christopher, personal communication, 2015).

#### **4.2.1 Analysis of the Goals**

It is useful to conclude this section with a brief evaluation of the three helices, beginning with the Government of Saskatchewan and Bert. According to my data analysis, most of the information I got from Bert was consistent with the information I got from the rest of my informants and documents. However, most of the information he provided was general. He did not say many important things that were specific to the Government of Saskatchewan, nor did he share information that was otherwise difficult to access.

One of the most important points Bert mentioned was that one of the GIFS' goals is to do new agricultural research to develop transformative technologies that take agricultural production to the next level and bring major improvements, rather than incremental change. Russell, my University informant, also confirmed this point. This was important because it shows that the purpose of the GIFS is to make a radical departure from research that only brings gradual changes.

Bert is the only informant who told me explicitly that he was not going to tell me about the GIFS activities. That said, the brief history of the GIFS he did share, combined with his insistence on speaking about the CDC, although I told him that I wanted to interview him about the GIFS, shows that he wanted to present the Government of Saskatchewan as having a solid and specific perspective. He wanted to show that the Government of Saskatchewan connected past with present and builds on what previous governments had done. He wanted to underscore

the fact that all the Governments of Saskatchewan had a responsibility towards Canada and the world.

In terms of the information Thomas provided, the most important point is that from the standpoint of PotashCorp, the GIFS' main goal is two-fold. First, to increase the agricultural productivity of PotashCorp customers; second, to gain a competitive advantage through useful research. On this point, Thomas also said that there was not a direct relationship between the success of the GIFS in doing research and the increase in sales of PotashCorp products. This shows that PotashCorp has a long-term goal—gaining a competitive advantage. This long-term goal was possible through the new trend of the commercialization of science and the entrepreneur university. Without this trend, PotashCorp could not have set this long-term goal.

Thomas' point that PotashCorp wanted to gain competitive advantage through providing useful research has been confirmed by Russell, Christopher, and the Memorandum of Agreement, as indicated above. One of the advantages of investing this way is that, if the GIFS succeeds, it will continue to produce science for a long time and consequently will continue providing PotashCorp with this competitive advantage.

The fifth goal of improving the reputation of the University on the global scale, which Dr. Chad (2012) mentioned in the GIFS Proposal, expresses the goal of the GIFS from the standpoint of the University of Saskatchewan. Dr. Karen Chad was the Vice President of Research by the time of founding the GIFS; and her role in founding the GIFS is described below. Thus, from the standpoint of the University of Saskatchewan, the GIFS was created to achieve some of the goals the University set in its new policy (see p. 62 section "4.1.1 Analysis of the Factors and Conditions"); as a result, the GIFS can be seen as an embodiment of this new policy.

PotashCorp wanted to invest in science to increase their profit in the future. This was possible through the tendency of contemporary universities to act according to the logic of neoliberalism and to become increasingly dependent on private funding and corporate support in general (Heller 2016). Based on Burawoy (2007), Harvey (2005), and Heller (2016), we can conclude that the logic of the neoliberal paradigm favours private and individual rights over public interest and public institutes' ideals. Though neoliberalism supporters argue that the neoliberal paradigm results in improving human well-being in the long run, neoliberalism

decreases civil rights and the economic security of the public by promoting stronger free markets, global trade, and private property rights.

Following Harvey (2005), it is clear that neoliberalism justifies inequality in wealth and income distribution on the basis that it helps maintaining strong market incentives. Simultaneously, the continuing growth of large corporations is consistent with the logic of neoliberalism and is sought by their shareholders. Thus, it is not surprising that corporate norms penetrate universities and stimulate the commercialization of science and the advent of the entrepreneur university. This shift is possible in part because large corporations promote it and universities allow it to happen because they are increasingly dependent on private funding, especially in times of fiscal austerity. Academic integrity and detached teaching and research in humanities, social sciences, and natural sciences are typically opposed to neoliberalism and its logic (Heller 2016). One would argue that the same remark applies to basic research, i.e. basic research is opposed to neoliberalism and its logic. This is the case because academic integrity and basic research reveal the consequences of neoliberalism and resist the treatment of knowledge as a commodity, thus opposing the hegemony of market control (the relation between neoliberalism and the trend of the commercialization of science and the entrepreneur university and their effect on academic integrity is described in more details in sections “2.1.2 The Triple-Helix and Neoliberalism” and “2.1.3 Science and the Integrity of Universities”).

Using the lens of Bourdieu (1998), in this neoliberal context, PotashCorp wanted to convert economic capital into cultural capital with the aim of later converting that cultural capital back into economic capital to maximize profits. The goal of PotashCorp was to do this at a time when the exchange rate allowed it to delay its gains.

According to Bourdieu (1998), the exchange rate is the relative value of the different kinds of capital. Agents try to conserve or transform the exchange rate to increase the volume (total amount) of their capital, and thus they do this in a way that maximizes their capital most. However, how fixing the exchange rate (to serve a social agent’s interests) takes place depends on the relative value of the different kinds of capital in the social space, or the exchange rate, at that particular time. Agents cannot fix the exchange rate without being influenced by the current exchange rate at the time. In the case of the GIFS, a new condition came up and made it possible to invest in a new way and gain at the end. This new condition was the trend of commercialization of science and the entrepreneur university, which allows private sector

corporations to invest more in science and universities, in general, and the possibility of investing in creating the GIFS, in particular.

The new condition led to an increase in the value of cultural capital over time. It became, therefore, a good moment to convert economic capital to cultural capital with the aim of converting this cultural capital to economic capital again later to maximize economic capital. Using Bourdieu's (1998) concepts, this new condition represents a change in the exchange rate. The investment environment now encourages PotashCorp to invest in this new way (that is to convert the economic capital to cultural capital with the aim of converting this cultural capital to economic capital again at the end to maximize economic capital). The result will be an increase in economic capital in the future. (Applying the theory to our empirical case, we will also find that PotashCorp's contribution means that it started fixing the exchange rate on its own, but this is beyond the scope of this research.)

To understand the full story of the GIFS, we need now to move from the factors and goals to the practical level to examine the founding process, how the GIFS operates, and what was actually done to transform plans into an actual structure.

**CHAPTER 5:**  
**THE GLOBAL INSTITUTE FOR FOOD SECURITY (GIFS):**  
**FOUNDING PROCESS AND OPERATION**

This chapter discusses the second portion of the research findings on the factors, motivations, and social processes that led to the creation of the GIFS. The chapter is divided into three sections. The first section discusses the founding process and mechanism, the second section discusses the early operation period, and the third and last section concludes this chapter and the previous one. The major claims are that the funding from PotashCorp and the Government of Saskatchewan were possible because of the good relations between the leaders of the three institutes. These positive relationships facilitated the process of founding the GIFS and its ultimate realization. Furthermore, Dr. Karen Chad played a successful role in implementing part of the University's new policy, which made creating the GIFS possible. The data used in this chapter is the same sets of data I used in the previous chapter.

**5.1 The Founding Process and Mechanism**

The founding processes is important because it transformed the plans to create the GIFS to a real organizational structure. In this section I describe how the founders implemented the strategies, the obstacles they faced, and how they overcame these obstacles.

Russell provided some information on the dates on which important steps took place. He mentioned that it is never clear exactly when institutes like the GIFS were first created. However, the idea of the GIFS was conceived in February 2011. According to Russell, this is when the President of the University of Saskatchewan, Peter MacKinnon, and the CEO of PotashCorp, Bill Doyle, went to the Premier of Saskatchewan, Brad Wall, to convince him to create the GIFS. The three of them then agreed to create it. The GIFS was publically announced in November 2012. This is when the GIFS was born (Russell, personal communication, March 20, 2015).

According to Christopher, PotashCorp donated CDN \$35 million toward the foundation of the GIFS and the Government of Saskatchewan donated CDN \$15 million.<sup>8</sup> Later, Viterra

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<sup>8</sup> This part of the information is confirmed by many sources and thus considered general knowledge.

donated CDN \$2 million without designating which program it wanted to invest in, so its donation was for the GIFS in general. Viterra became a partner but not a founding partner, and it does not participate in managing the GIFS. It is neither on the board nor on the advisory committee. The question then became what the best way to use the money would be to achieve the best results for a public-private partnership like this (Christopher, personal communication, 2015).

### **5.1.1 Implementing the Strategy**

Obviously, the most important factor in the GIFS' creation was the willingness of PotashCorp and the Government of Saskatchewan to donate tens of millions of dollars. Christopher stated this explicitly (Christopher, personal communication, 2015). There were also a number of other interconnected factors that can be understood through the literature since they are related to the commercialization of science and the entrepreneur university. As we are examining the founding process now, it is important to see how and why this donation was possible and how other plans, or strategies, were implemented.

One of the most important reasons for why this donation was possible was the good relationship between the leaders of the three institutes, as Russell mentioned. Russell added that the good relations between the leaders of the three institutes were the main cause for PotashCorp and the Government of Saskatchewan's donations, furthermore, they helped the founders make day-to-day decisions about founding the Institute (Russell, personal communication, March 20, 2015). Russell described the good relationship between the founders of the GIFS, in our interviews, as the following. He mentioned that creating the GIFS was possible because Howe remained involved. Doyle was the CEO of PotashCorp and was the one directly involved in creating the GIFS. Along with MacKinnon, Doyle created the spark to get the GIFS rolling. However, the good relationship between MacKinnon and Howe helped to get the latter to nudge Doyle, who could then influence the Premier. So, creating the GIFS was possible because MacKinnon and Howe liked and trusted each other (Russell, personal communication, March 20, 2015). On top of this, there was a good relationship between CEO Bill Doyle and Premier Wall. These good relationships existed from the beginning and it was important to maintain them, which the GIFS founders succeeded in doing. Frequently similar things get done because of the strong relationship between the people involved. Russell confirmed that the GIFS was not

created because of any personal gain for any of the individuals mentioned (Russell, personal communication, March 20, 2015). So, it seems that when the Government of Saskatchewan decided to donate to the founding of the Institute, PotashCorp realized that the GIFS will be created and this encouraged them to donate.

Russell mentioned that the important individuals in PotashCorp who were also involved in creating the GIFS included Wayne Brownlee, Tim Herrod, and Denita Stann. He went on to name businessman John Cross, who was not employed by PotashCorp. He said that Cross was involved in founding the Institute and that his job was to help Ernie Barber create consensus among the three institutional partners. Cross, therefore, was informally involved with the Government of Saskatchewan, PotashCorp, and the University during the creation of the GIFS (Russell, personal communication, March 20, 2015).

Dr. Karen Chad also had a key role in the process of founding the GIFS from the outset. First, the University articulated the six signature areas, including agriculture, while she was Vice President of Research. Second, Chad had been involved in the creation of the Global Institute for Water Security. In other words, participating in the creation of the GIFS was not her first experience in setting up an academic institute. Third, for Russell, she was a “visionary” on many levels (Russell, personal communication, March 20, 2015). According to Russell, Chad is also extremely knowledgeable about why it is sometimes important to create new entities and organizations within a university to accomplish a specific goal. She had done research across Canada trying to determine why some universities were more successful in research than others. She indicated that identifying the signature areas and devoting effort to develop them was an important factor. Another major factor she identified was leadership, and especially, as she put it, “knock-it-out-of-the-park” leadership. For instance, it is important to have an internationally recognized scientist leading a research cluster. This scientist needs to be able to surround himself/herself with numerous people and lead them to create enough energy to be able to make a difference sufficient enough to be recognized globally. This means that the leader brings the team under a new entity (research centre) within the university (Russell, personal communication, March 20, 2015).

It is impossible for one scientist or even a number of independent scientists left to their own devices to make the University of Saskatchewan a household name on a global level. Becoming globally recognized is an extremely difficult task. Although the University of

Saskatchewan has many excellent agricultural scientists, it can make much more use of them if they are working under the umbrella of a new entity and a leader within the University. This will increase the University's global visibility. Karen Chad had a key leadership role in helping the University understand that even though there was a good College of Agriculture and Bioresources and a Crop Development Centre at the University, it still needed the Global Institute for Food Security to become globally visible in agricultural research (Russell, personal communication, March 20, 2015).

Russell described why and how the GIFS came to be an inter-college, inter-disciplinary, institute. Chad and MacKinnon knew that a food security institute could not be subsumed under any existing academic unit. He said that only half of the research done on agriculture and food was done in the College of Agriculture and Bioresources, and the other half was done in the Western College of Veterinary Medicine, the School of Public Policy, the Canadian Centre for Health and Safety in Agriculture, the College of Medicine, and the Departments of Engineering and Biology. Chad was very conscious of the fact that, if the University was going to create an Institute for Food Security, it would need to involve faculty and scientists from both the College of Agriculture and Bio-resources and the rest of the University. Clearly, someone like Chad, who could look at the University as a whole, played a major role in the creation of the GIFS. She was able to look at the University as a whole because of her position as the Vice President of Research and because of her vast knowledge base and way of thinking. Chad had the leadership required to design an inter-college, inter-disciplinary, institute like the GIFS (Russell, personal communication, March 20, 2015).

Russell also described the role of Dr. Ernie Barber, Dean of Engineering when the GIFS was conceived in 2011. Barber was involved in conversations about the GIFS with Dr. MacKinnon and Dr. Chad because of Barber's former post as the Dean of Agriculture and because of his continued interest in the concept of creating Centres and Centres of Excellence. Russell said that Barber was brought in 2011 to help Chad, who was supposed to create a clear vision for the GIFS (Russell, personal communication, March 20, 2015). Barber resigned as Dean of Engineering in 2012 and joined the GIFS on a part-time basis. He then became the Deputy Director of the GIFS, helping Dr. Roger Beachy, the first CEO of the GIFS, to breathe life into the Institute (Russell, personal communication, March 20, 2015).



In terms of the Government liaison with the GIFS, Russell said that when Wall, Doyle, and MacKinnon first imagined the Institute, Wall assigned the task of liaising with the GIFS to Minister of Innovation Saskatchewan, Rob Norris, a former employee of the University of Saskatchewan, where he had worked as co-ordinator of global relations.<sup>9</sup> This meant that Premier Wall made the Ministry for Innovation the principal point of contact between the Government of Saskatchewan and the GIFS. Later, however, the contact point was changed to become the Ministry of Agriculture (Russell, personal communication, March 20, 2015).

As mentioned above, the GIFS embodies the new policy of the University of Saskatchewan (see p. 62 section “4.1.1 Analysis of the Factors and Conditions”), which is consistent with the triple-helix theory and arguments in favour of commercialization. The GIFS was successfully created because of the strong relationship between the leaders of the three institutes, which the triple-helix theory highlights must work together to bring good results.

Cross was involved to bring consensus, Barber was involved to help Chad and Beachy because of his skills. Chad highlighted the importance of developing the signature areas and the importance of the leader.

To have a better understanding of how the GIFS was ultimately founded, and further understand the roles each of the individuals mentioned above played, it is important to understand obstacles to the founding of the GIFS and how they were solved. This is the theme of the next two subsections.

### **5.1.2 Obstacles**

Bert, my informant from the Government of Saskatchewan, was the only informant who said that there were no obstacles in the creation of the GIFS. This reflects the level of the conservatism of the Government of Saskatchewan. Since Bert was the only one with this view of the founding process, I do not address his views here. Instead, I base my analysis on views like those Russell expressed. Russell pointed out that, because they were doing something new and difficult, many things could have prevented the creation of the GIFS, in spite of the vision of the leaders mentioned above (Russell, personal communication, March 20, 2015).

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<sup>9</sup> Russell did not mention that Rob Norris was a former employee of the University. This information comes from *CBC News* (CBC News 2015).

I identified seven obstacles to the creation of the GIFS. The first obstacles (or difficulties) that the partners faced in the early phases of founding the GIFS related to how difficult the work was that needed to be done. According to Russell, when the three leaders agreed and decided to create the GIFS in February 2011, they thought that they would be able to announce it in May of the same year. However, the GIFS was only announced in November of 2012 (Russell, personal communication, March 20, 2015).

The second obstacle was that decision-making processes are distinct in each of the three helices involved in the creation of GIFS (government, industry and the university). Both Thomas and Russell mentioned this point. Thomas described this as being a more general difference between these three institutions. He said that in universities the process demands a high level of consensus. In companies, where structure is more hierarchical, decisions are made faster and without the same level of consensus as in universities. The decision-making process in governments is located somewhere between these two extremes (Thomas, personal communication, February 24, 2015). Russell confirmed this obstacle by saying that the three partners had different ways of working and accomplishing tasks (Russell, personal communication, March 20, 2015).

The third obstacle was that the three partners had different priorities and that each partner was concerned about the priorities of the other two. Thomas said that the University of Saskatchewan was worried that the Government of Saskatchewan and/or PotashCorp might interfere in the research performed by the GIFS and might threaten academic freedom. PotashCorp was worried that the majority of the research might be applicable to Saskatchewan only and would not be useful for its customers outside Canada. The Government of Saskatchewan was worried that the GIFS might work in research that was purely academic (Thomas, personal communication, February 24, 2015). Russell confirmed Thomas' comments and mentioned that the interests of the three partners were different and that was one of the obstacles (Russell, personal communication, March 20, 2015).

The fourth obstacle related to where the GIFS would be based. The different founders disagreed about whether the GIFS would be formally located within or outside of the University of Saskatchewan. Thomas described this issue as crucial. PotashCorp wanted to ensure that the GIFS had integrity and saw that being part of an academic institution (the University of Saskatchewan) would enhance the GIFS' perceived integrity. Thomas said that even if the GIFS

was part of a corporation it would not have had the same level of respect as if it were part of a university. If the public believed that there were corporate motives behind the research, they would not have as much confidence in that research. Being located within the university would boost the GIFS' perceived integrity and makes the public believe in its research, something PotashCorp believed was important (Thomas, personal communication, February 24, 2015).

Thomas stated that the University of Saskatchewan wanted the GIFS to be located within its institutional boundaries. The Government of Saskatchewan eventually agreed that the GIFS should be within the University, but at the beginning it did not want that, as it worried that the GIFS might be overwhelmed by the University in terms of priority setting. The Government wanted to make sure that the University would be able to generate research that was practical and not purely academic in nature (Thomas, personal communication, February 24, 2015).

Russell confirmed that this was an obstacle. He said that, at first, the Government of Saskatchewan did not want the GIFS to be located inside the University of Saskatchewan. The Government of Saskatchewan wanted the GIFS to be created as a standalone entity with its own Board of Governors and its own Act. In this scheme, the University would only act as a partner. Ultimately, although still not certain this was the best model to adopt, the Government compromised and reluctantly agreed on the idea of creating the GIFS as part of the University (Russell, personal communication, March 20, 2015).

Interestingly, however, Russell mentioned that PotashCorp did want the GIFS to be structurally part of the University. This point is consistent with Thomas' comments. Russell mentioned that at the very beginning, it was not very clear what PotashCorp wanted in that regard. Then, in October of 2011, PotashCorp became absolutely adamant that the GIFS had to be located within the University of Saskatchewan. This shift was a result of the work Ernie Barber and John Cross did to explain to PotashCorp's leaders that it could accomplish much more through a University-located Institute. Since that time, PotashCorp had always wanted the GIFS to be located within the University (Russell, personal communication, March 20, 2015).

The fifth obstacle was to find a scientific leader during the founding of the GIFS. Russell made this clear. This scientific leader had to be an expert in both agriculture and food security and be willing to step forward to lead implementation of the GIFS' vision. The University had many excellent agriculture scientists, but none of them worked in both agriculture and food security. The concept of global food security was not new at the time, but, from an institutional

standpoint, it was new at the University of Saskatchewan. No one was willing to leave his/her own Department to come and do the work of founding the GIFS on behalf of the University. It was not easy for many faculty members to understand the idea of creating another institute separate from the Colleges and Departments that already existed. Thus, there was no scientific leader when the GIFS was created (Russell, personal communication, March 20, 2015).

Russell continues. Karen Chad and Ernie Barber had some of the characteristics needed to lead the GIFS in the founding process and they were enthusiastic about it; however, neither had the necessary expertise in global food security. Roger Beachy, who was not attached to the University, was seen as knowledgeable about food security, which is why he was hired by the GIFS, though he was only hired after the GIFS had been created. Yet, although Beachy was not involved in founding the GIFS, he was partially involved at the very beginning when the Government of Saskatchewan and PotashCorp talked to him as a knowledgeable person in the area of global food security and requested some information on the activities that a food security institute should undertake (Russell, personal communication, March 20, 2015).

The sixth obstacle was how to make a governance system suitable for all the partners. Russell commented that the University of Saskatchewan was an autonomous institution governed by the University of Saskatchewan Act and that faculty and the administrators value their autonomy and academic freedom. However, in order for the University to succeed in creating a partnership with PotashCorp and the Government of Saskatchewan, it was necessary to give PotashCorp and the Government of Saskatchewan some decision making role in the GIFS' governance. Thus, the partners were creating an institute for which the University is legally responsible, but for which the other two partners are included in a meaningful way. In the end, they created a brand new governance system for a university centre (Russell, personal communication, March 20, 2015).

The seventh obstacle was that, early on in the process, there was some disagreement stemming from PotashCorp's attitude towards academic freedom. Russell explained that PotashCorp thought that the GIFS was only going to conduct research on soil science and soil fertility and thought that it would have a direct say regarding the choice of the research that would be carried out. Ultimately, however, PotashCorp understood that there was more value for PotashCorp if the GIFS' research was seen as independent rather than under their control, which could undermine the Institute's reputation in the research world. Convincing PotashCorp of this

fact took a great deal of effort. PotashCorp eventually understood how important academic freedom was to the extent that it insisted on including and defining this principle in the Memorandum of Understanding that formally led to the creation of the GIFS (Russell, personal communication, March 20, 2015).

As the obstacles were discussed, we need to move to discuss how the founders solved the problems they faced, so that we complete the picture of the GIFS founding process.

### **5.1.3 Overcoming the Obstacles**

Based on my data analysis, I identified five points (or factors) from the interviews on how the founders overcame the obstacles they faced while creating the GIFS. The first point was that the public and the research community in Saskatchewan, and not only the University of Saskatchewan, were supportive of the idea of the GIFS. Bert mentioned this. He added that the support of Saskatchewan's research community was possible because it is a strong community with prior accomplishments and science clusters (Bert, personal communication, February 11, 2015). Christopher confirmed this.

The second point is that the University of Saskatchewan senior administration supported the GIFS and were willing to provide extensive resources. Christopher said that pre-existing resources on campus contributed significantly to the GIFS. The University of Saskatchewan is probably one of the best campuses regarding investments in equipment and facilities for agricultural research. This was very important for the GIFS because it provided various types of resources at different departments that helped facilitate founding the GIFS (Christopher, personal communication, 2015). There is also a good deal of interest in agriculture in general on campus. Some professors in the computer science, for example, are interested in the analysis of agricultural data. It is a big plus for an Institute like the GIFS to be located in a place where there are significant levels of funding for, and interest in, agricultural research, otherwise it would have been difficult to get the Institute off the ground (Christopher, personal communication, 2015).

The third point is that some of the three partners' interests overlap. This point was mentioned by both Thomas and Russell. Thomas said that the reason why it was possible to create the GIFS was that the three partners knew from the beginning that creating the GIFS was an opportunity that might benefit each of them. They thought that they could create it as far as

they are conscious of the importance of the points on which they agree and are able to use this consciousness in a useful way. Consequently, the points on which the three partners disagreed (i.e. the obstacles in creating the GIFS) are extremely important (Thomas, personal communication, February 24, 2015). The three parties recognized that they did not have identical interests; however, they knew that the solution was to pursue their common interests and also to be aware that they had different models of decision making, as mentioned above. The only way to deal with this challenge was to be flexible and show mutual understanding. Furthermore, the partners realized that they all needed a governance structure each of them had confidence in and that would guarantee that each of their interests were equally represented. To be equally represented meant that each of them had a say in the GIFS' long-term goals and funding priorities. They hired McKinsey, a consulting firm, to help them develop the GIFS' new governance structure (Thomas, personal communication, February 24, 2015).

The fourth factor in overcoming the obstacles founding the GIFS faced was the McKinsey study. For Thomas, the McKinsey study, which was carried out before the Memorandum of Agreement was signed in November 19, 2012, established the governance structure the GIFS needed. For Russell, the study provided a governance structure suitable for the three partners and that was also the substitute for the scientific leader (that was absent during the founding processes). Thomas said that McKinsey studied various forms of governance structures for the GIFS. They proposed four or five structures for a GIFS located outside the University. McKinsey's job was to describe how these different institutional and governance structures would work. The University wanted the GIFS to be inside the University and so proposed institutional structures that it could support. Eventually the partners agreed on a Type B structure<sup>10</sup> similar to that of the Vaccine Infectious Disease Organization (VIDO)<sup>11</sup> at the University of Saskatchewan. This means that the GIFS would be located within the University but that it would also have its own board that would have the right to make decisions independently from the University (Thomas, personal communication, February 24, 2015).

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<sup>10</sup> Type B structure is defined below in the Appendix.

<sup>11</sup> The Vaccine Infectious Disease Organization was originally established in 1975 as the Veterinary Infectious Disease Organization. It started as a small agriculture-focused research organization and developed to become a world-class research centre working on vaccines to protect human and animal health (University of Saskatchewan 2017a).

Russell, for his part, never directly said that the McKinsey study solved the problem of finding a governance structure suitable for the three partners. He simply described some aspects of the governance structure that was eventually adopted. However, I knew from Thomas that the McKinsey study offered them the governance structure they were looking for.

The fifth point is vision keeping. Once again, Russell pointed to Chad's role in this. He said that Chad was a visionary regarding the form the GIFS would take, but she was also a vision keeper. Russell mentioned that during the process of founding the GIFS, the partners disagreed many times and they had difficult days. Chad used to say: "But the vision is beautiful, let us keep trying ... Let us not fail" and would then seek consensus and compromises. This helped bring the partners together again (Russell, personal communication, March 20, 2015).

Part of this vision keeping relates to the relationships between the three parties. Russell mentioned that the GIFS was possible to create because of a number of interconnected factors. He was quick to point out that the GIFS' creation was not accidental or haphazard, but required significant personal and institutional relationships. After PotashCorp and Government funding were received and the other resources made available, more relationship building was needed to actually put the Institute together. This relationship building was still taking place in 2015 when I interviewed Russell (Russell, personal communication, March 20, 2015). As Russell puts it:

After the partners agreed and decided to start creating the Institute, there was still a lot of things that have to be worked out. How are they going to do this and how are they going to accomplish that. Even today, the Institute is still facing the problem of the implementation of the plan. You still have to do the plan and you still have to live it. Today the Institute is still vulnerable. It is vulnerable because it is not easy. If it was easy, somebody else would have done it. And so we should take a lot of pride in the fact that we are doing it and I really believe that it can be successful. It started through relationships and it will be successful to the extent that the relationships are cared for. It is all about relationships. The relationships have got to be cared for. And then it will happen and it will keep happening (Russell, personal communication, March 20, 2015).

#### **5.1.4 Analysis of the Founding Process and Mechanism**

Based on the available evidence, we can argue that during the founding process, creating consensus when the GIFS partners (founders) disagreed was pivotal. While describing how the GIFS was founded, Russell mentioned that Cross was brought on board to bring consensus, though in response to my question about the factors that made creating the GIFS possible (i.e.

how they overcome the obstacles), he mentioned that Chad did an excellent job in bringing consensus by reminding the parties of their vision of the GIFS.

Russell mentioned the donation of PotashCorp was essential in creating the GIFS, and that this donation was mainly possible because of the good relations between the leaders of the three institutes, and specially the relationship between Dallas Howe and Peter MacKinnon. This positive network of relationships existed at the beginning and was maintained throughout the process. These relationships also helped the founders in making decisions on the day-to-day activities involved in founding the Institute and in the implementation process. The importance of these good relationships in creating the GIFS was clear because Russell spoke about them several times.

Creating the GIFS was possible because Dr. Karen Chad succeeded in convincing the University administration of the importance of developing new research centres with individual leaders, instead of just having independent scientists. This is one way to direct research toward centrally determined goals and thus shift to a central planning model. Chad, therefore, had a vision that allowed her to implement the University's new policy (see p. 62 section "4.1.1 Analysis of the Factors and Conditions") by turning it into a reality with the GIFS.

It is important to see the link between some of these research findings and the triple-helix theory. The argument that the special contribution of the three helices could not be reached except through the interaction of the three helices together (Etzkowitz 2006; Leydesdorff and Etzkowitz 2003) is at the heart of the triple-helix theory and one of the main arguments supporters of the entrepreneur university embrace (this argument is explained in section "2.1.2 The Triple-Helix and Neoliberalism" in Chapter 2). As mentioned before, one of the GIFS main and broad goals is to improve the reputation and status of the University of Saskatchewan (one of the aspects of this goal is attracting funding). This is also included in the University's new policy. Therefore, the GIFS embodies the new policy of the University of Saskatchewan. The new policy of the University is consistent with the model of the entrepreneur university and the triple-helix theory. I would like to add here that the Government of Saskatchewan, PotashCorp, and the University of Saskatchewan are the three institutes that the triple-helix theory recommends work together to bring the best results. Importantly, the leaders of each of these helices have good relations with the other two.



Thus, the policy behind the GIFS, its goals, and some of the factors that helped create it are all consistent with the triple-helix theory. Yet the triple-helix theory does have major shortcomings. For the most part, the triple-helix theory does not help explain how the GIFS was created. As well, the leaders in the three helices are also elites. The triple-helix theory does not highlight the importance of power relations and elitism in general, and does not draw attention to the importance of power in science production policy.

Bourdieu's habitus and the field theory, on the other hand, does problematize power relations in general and we can use its concepts to analyze science production policy. Bourdieu's habitus and the field provides several concepts, such as the concept of capital, which can be used to understand the different sources of power and the actions of social agents in general. This can be applied in studying science policy, as I did when I explained why PotashCorp provided its initial donation to found the GIFS. However, by appraising the special contribution of the interaction of the three helices together (without specifying who this contribution benefits), the triple-helix theory justifies the status quo, the entrepreneur university, and the commercialization of science instead of explaining them from a critical standpoint.

Looking through Campbell's (2004) institutional change model lens sheds further light on the limits of the triple-helix theory. Campbell (2004) argues that paradigms are elites' ideas as assumptions that constrain the range of programs available for decision makers and that they are created by academics and intellectuals. Since the triple-helix theory is created by academics or intellectuals, and since it justifies the commercialization of the university, instead of fully explaining it from a critical standpoint, it is considered paradigm in Campbell's (2004) use of the term.

The elite network that helped create the GIFS is very important. The logic of the elite network is consistent with the concept of improving the University's signature areas, as dictated by the University's new policy, because the concept of power is crucial in both. Improving the signature areas result in strengthening disciplines and areas that are already stronger than others. In the elite network, powerful people trust each other more, and this helps them to succeed further. This is one of the results of founding the GIFS that the triple-helix theory does not focus on.

To have a broader understanding of the founding process and the transformation of plans and goals into an actual structure, it is important to understand the early operation period of the GIFS. This is what we will turn to now.

## **5.2 The Operation of the GIFS**

This section includes a discussion of the early period of the GIFS' life and consists of two parts: the first discusses the GIFS under Dr. Roger Beachy's directorship (January 1 to December 31, 2013) while the second part discusses the GIFS' operation under Dr. Maurice Moloney's leadership (since October 1, 2014).

### **5.2.1 The Operation of the GIFS during the Beachy Era**

The discussion in this subsection about the operation of the GIFS during the Beachy era, includes information from Leonardo and Christopher's narratives. Leonardo is knowledgeable about the GIFS' work from January 1, 2013 until December 31, 2013. Christopher is the pseudonym of another informant at the GIFS who described the operation of the GIFS during Beachy, although he is more knowledgeable about the GIFS' work since October 1, 2014. I use Leonardo and Christopher's narratives to discuss the goals the GIFS set for itself, the management style, some of the work or accomplishments done during the Beachy era, and obstacles to the effective operation of the GIFS in its early operation era.

Leonardo mentioned that there are two levels of the GIFS' goals: organizational-operational goals and science goals. He stated that the science goals are improving agriculture research and bioscience. He did not specify further (Leonardo, personal communication, October 17, 2013). Analyzing Leonardo's narrative helped me identify three operational-organizational goals. The first operational-organizational goal is to facilitate research through supporting science team formation. The second operational-organizational goal is marketing and studying the consumers/public needs, the process of knowledge transfer, and the process of informing consumers to enable them to make informed decisions. The third operational-organizational goal is to invest more money in the projects that have the greatest promise of delivering an end-use benefit (Leonardo, personal communication, October 17, 2013).

Leonardo detailed the first operational-organizational goal as follows. He mentioned that the science team formation that the GIFS plans to carry out does not draw on the typical team

model that combines some agriculturalists and some relevant natural scientists in one team. Rather, the GIFS is planning to change the way university faculty and scientists do research. Instead of doing research alone, the GIFS wants scientists to work together in teams. Leonardo said that typical science team formation is usually very limited in breadth and diversity and it is hard to find one team that includes a plant breeder and a social scientist working together. The GIFS wanted to overcome these limits and create a new way of thinking about research teams that leads to the formation of broader, more disciplinarily diverse teams (Leonardo, personal communication, October 17, 2013).

Leonardo explained the second operational-organizational goal as follows. He said that there is often a separation between science and the consumer, which is acceptable in some fields where the target is to make entirely new discoveries. However, agriculture is one field where there should be no separation between science and consumers, as scientists should anticipate consumers' reactions to know what is potentially acceptable in terms of new food products. Furthermore, it is important to know farmers' attitude towards a new crop variety and whether they will buy it. It is important to know what would it take (money, time, and type of effort) to help a farmer understand the benefits and disadvantages of the new variety or product to be able to decide to buy or not (Leonardo, personal communication, October 17, 2013).

Leonardo continued. He said that thinking about knowledge delivery is essential. How will the knowledge created at the GIFS be delivered from the science laboratory to the consumer? Will it be delivered through big multinational companies or small companies that were founded on the basis of these new innovations? This process of knowledge transfer is an important gap in the food system world that the GIFS wants to fill and deal with in a different way (Leonardo, personal communication, October 17, 2013).

To conclude this discussion of the second operational-organizational goal, Leonardo indicated that it is important for the GIFS to be aware of the marketing issues and include them in its research to make sure that new products will be accepted once they are commercialized. Leonardo said that social scientists should do this work (Leonardo, personal communication, October 17, 2013).

The third operational-organizational goal is a typical consequence of the second. After studying the market and informing consumers, the GIFS should invest in the projects that have

the greatest potential to delivering an end-user benefit (Leonardo, personal communication, October 17, 2013).

Leonardo also described how these goals were set. He said that because the GIFS was founded through the funds of the Government of Saskatchewan and PotashCorp, decision makers at the GIFS were not entirely free to set the GIFS' goals. The GIFS is not entirely autonomous and it is different from the Natural Sciences and Engineering Research Council of Canada (NSERC) projects, which are based on providing researchers with grants to conduct their own research with their own objectives and research topics. In setting up the GIFS, the Government of Saskatchewan's goal was to strengthen bioscience and the bioscience cluster so as to improve Saskatchewan's economy and to improve agriculture science production to help solve the global food crisis. PotashCorp did not set specific goals except that it wanted the science, and in particular the bioscience, produced by the GIFS to be world class. Consequently, due in part to its governance and funding structure, these goals became the GIFS' goals as well. However, neither the Government of Saskatchewan nor PotashCorp dictated to the GIFS how it should achieve these goals; rather, they gave the GIFS freedom to reach these goals as it saw fit (Leonardo, personal communication, October 17, 2013).

Leonardo stated that three steps were taken to engage research teams during the Beachy era. First, in the first year, the GIFS decided to choose its priorities in terms of research areas. Second, it started to identify and hire scientists who could work in these areas. Third, it identified the research projects that it would support. This third step was the longest process of the three. Leonardo said that the GIFS team would take this step year after year (Leonardo, personal communication, October 17, 2013).

Leonardo said that identifying the research projects involved asking faculty/scientists for research ideas. The first year, 28 research projects were received. After examining the research projects, seven were selected, each of which involved a team of researchers and scientists. The GIFS was willing to enroll some external committees (from Germany, Australia, the USA, and other parts in Canada) to review the seven research projects. Then the GIFS will use the reviews to choose up to three projects to fund (Leonardo, personal communication, October 17, 2013).

Christopher mentioned that the issue of managing the University community's expectations was one of the GIFS' main problems before Moloney became the Director. He said that this problem made it difficult to operate the GIFS effectively. Faculty at the University of

Saskatchewan thought that the CDN \$50 million would be spent at the University, enriching the research programs of various faculty in several departments. This meant that the money would be given out in the form of grants. After hearing that such a large sum was involved, professors immediately started to think that there was a new source of funding for their research. The GIFS at that time used to make calls for proposals and selected some projects for funding accordingly. This actually created even greater expectations, because everyone kept thinking that he/she could have some funding. The GIFS' calls for proposals were not part of the GIFS' strategic plan; rather the GIFS realized that, as it started working, it should do some work and have some influence (Christopher, personal communication, 2015).

### **5.2.2 The Operation of the GIFS during the Moloney Era**

The discussion in this subsection is based on information from Christopher. This includes the goals, strategy, and the management style of the GIFS during the Moloney era. Since it was still early in the GIFS' operation, this period is considered a late period of its founding process.

Moloney became the Executive Director and CEO in November 2014. The GIFS chose three research areas to work in: seed biology, roots and soil, and computational agriculture. The GIFS found one of the top scientists in seed biology working on a special technique for propagating seeds that would work for all the major crops the GIFS is interested in. It found another scientist who was one of the world leaders in root-soil interaction, who joined the GIFS in early 2016. The GIFS is still looking to find an appropriate scientist to lead the computational agriculture research area (Christopher, personal communication, 2015).

When I asked Christopher about the main logic that connects all the different research that would take place at the GIFS, he said that the main logic is to develop technologies that could benefit both Saskatchewan and, in a slightly different way, countries in the developing world. These technologies would have a double use for the developed countries, either to increase yield or improve quality. In the developing world, the technologies would enable poor farmers to double their productivity (Christopher, personal communication, 2015).

He confirmed that increasing yield and productivity is the first priority, and improving quality is the second. The world population, he said, is increasing, so without increasing yield, improving quality will not be helpful because food will not reach enough people (Christopher, personal communication, 2015).

Christopher explained Moloney's role in changing the GIFS' strategy. He said that when Moloney became the Director, he carefully examined the data available and thought about the best plan. At that time the GIFS was more like a funding agency that scientists looked to fund their research. Moloney looked at the GIFS' finances and realized that how the GIFS was working would exhaust its funding without achieving its objective. That was counter to PotashCorp and the Government of Saskatchewan's objectives; they wanted their investment in the GIFS to bring a lasting legacy and reputational value. Christopher said precisely this: "When Moloney arrived, he had a look at this and said that if the GIFS continue doing that, it will have only about five years of life and then it will all be over because all the money will be spent" (Christopher, personal communication, 2015).

According to Christopher, Moloney did three things that distinguished the period he was the Director from the preceding period. These are: 1) confirming the strategy and defining the budget; 2) creating a real institute structure; and 3) bringing funds through matching programs and collaborators (Christopher, personal communication, 2015). First, in terms of creating a clear, specific, and well documented strategy ("confirmed strategy") and defined budget, Christopher pointed out that the mission and objectives of the GIFS were constituted from the beginning. However, there was no confirmed strategy during the Beachy era. Moloney, on the other hand, created a confirmed strategy when he came. Christopher said that Beachy was only in Saskatoon five days a month, and so did not run the GIFS on a day-to-day basis. As a result, it was hard for Beachy to make decisions on how to invest the money the GIFS received (Christopher, personal communication, 2015). During Beachy there were many ideas that might have allowed the GIFS to reach its objectives, but the ideas were not converted into a confirmed strategy. This resulted in a mission drift at the GIFS, i.e. instead of focusing on the mission, many other things were being done (Christopher, personal communication, 2015).

According to Christopher, there is a difference between being opportunistic and being strategic. Strategic means forward planning, whereas, opportunistic is responding to other people's offers. During the Beachy era, the GIFS could not put a strategic plan in place and so became opportunistic (Christopher, personal communication, 2015). To create a strategy, Moloney decided to condense all the ideas floating around the GIFS into a few key elements or practical goals that the GIFS wanted to achieve. Moloney also considered these to be how to judge the success of the GIFS. He specified three key points: how much money the GIFS

attracted; the quality and quantity of publications, patents, and intellectual property rights; and how many agricultural companies decided to work with the GIFS (Christopher, personal communication, 2015). Christopher said that thinking about how to achieve these goals is the start of a strategic plan. Performance evaluation should follow and should be repeated every two years. The GIFS will then be expected to produce science, but this would only be possible in three years. Moloney rewrote the strategic plan of the GIFS and the Board of Directors approved it (Christopher, personal communication, 2015).

In terms of the GIFS' budget, Christopher mentioned it was only under Moloney's leadership that the GIFS started to have a clear budget. The budget is related to and part of the GIFS' strategy and defines how much money the GIFS wants to spend in its different expenditure areas. Under Moloney, the budget consisted of spending certain amounts of money on the three research areas and certain amounts on travelling, commercialization, and publicity. Furthermore, Moloney had the right to say that he would not spend any more money on something specific, as all the funding for that area of research was spent. Thus, the GIFS started to have a confirmed strategy and a clear budget during Moloney's leadership (Christopher, personal communication, 2015).

The second distinguishing factor during the Moloney's era was that a clear institutional structure was created. Christopher said that Moloney was firm that the GIFS should start having a real institute structure. By this he meant an entity with staff and the ability to make decisions, not just a funding agency as it was when Moloney first arrived at the GIFS (Christopher, personal communication, 2015).

Christopher mentioned that the GIFS is not completely autonomous; it is a semi-autonomous institute and it has a kind of corporate governance. Furthermore, the GIFS still uses a lot of the University's budgeting systems and is a Type B Centre. Christopher stated that neither PotashCorp nor the Government of Saskatchewan could force the GIFS in a particular direction. Though there is a member from PotashCorp and a member from the Government on the GIFS Board of Directors, they are not allowed to represent PotashCorp and the Government. They are supposed to identify with the GIFS as a whole and act in a way that benefits the whole Institute. While on the Board they should assess any ideas and proposals according to whether they will allow the GIFS to grow and thrive (Christopher, personal communication, 2015). The Memorandum of Agreement includes this point. This means that it was not something that

Moloney instituted. Nevertheless, during the Moloney era, the GIFS started to have a real structure and the ability to make decisions according to a clear strategy. This strategy is a reflection of the Institute's transformation into a real entity, rather than just a funding agency as it was before Moloney arrived, as mentioned before. This strategy was created and implemented during the Moloney era and is more consistent with what the GIFS founders planned and expressed in the Memorandum of Agreement. This is what Christopher meant, although he did not use the term Memorandum of Agreement here.

Furthermore, based on Christopher's comments, it is clear that the GIFS' goals and the goals of the three partners (the Government, PotashCorp, and the University) are not identical. However, the GIFS' goals benefit each of the three partners and contribute to their success. One of the major factors that drove the creation of the GIFS was related to creating a lasting legacy. Creating a lasting legacy was beneficial to the three partners, but each of the three partners have other particular motivating factors. By changing the GIFS from a funding agency to an entity with a real structure, Moloney supported the GIFS' transformation into an agency that will last, which is important for the three partners to achieve their goals.

The third distinguishing characteristic of the Moloney's era was attracting funds through matching programs and collaborations. Christopher pointed out that it was important to save money for the GIFS. This could be done by matching any funds the GIFS pays for research (i.e. getting additional funds equal to what the GIFS provides), and getting more private sector companies to collaborate with the GIFS (Christopher, personal communication, 2015).

According to Christopher, Moloney was fully conscious of the importance of matching. Moloney thought that the number one financial rule was that, for every dollar the GIFS spent on research, it had to bring in one dollar from somebody else. This is an effective way to double the GIFS' resources, and it is possible through the Federal Government's matching program, or policy: any money that is invested in industrial science (i.e. money for research that helps the private sector) will be matched one-on-one. This means that the Government will pay the GIFS the same amount of any money the GIFS receives from industry to do research. Thus, for every dollar the GIFS paid for research, there will be two dollars for research available (Christopher, personal communication, 2015). Christopher confirmed that matching programs had existed before Moloney came, but that the GIFS was not exploiting them. If the GIFS spent some of the old money (i.e. the money that was paid at the beginning to found the GIFS—the CDN \$15



million from the Government of Saskatchewan and CDN \$35 million from PotashCorp) to do research, the GIFS should ask the Federal Government for matching funds. Christopher thought that the Federal Government would probably agree to provide this money. He added that, in this case, the GIFS should not ask the Government of Saskatchewan for matching money since the province had already contributed to founding the GIFS (Christopher, personal communication, 2015). On the other hand, when the GIFS received new money from the private sector to spend on research, it should ask the Government of Saskatchewan for matching money, and the Government of Saskatchewan would probably agree on providing this matching money (Christopher, personal communication, 2015).

A very good thing about matching is that through it the GIFS can do research that is worth CDN \$1 million, but only costs the GIFS CDN \$500,000. According to Christopher, the fund that created the GIFS was supposed to be exhausted in five years. Taking advantage of the matching program would make the GIFS' time horizon ten years instead of five years. This gave Moloney the opportunity to search for other money because he will have enough time to demonstrate the GIFS' success. Thus, the plan of the GIFS when I interviewed Christopher in 2015 was to continue raising money, CDN \$20 million in the next two or three years and then another CDN \$20 million in the next five years (Christopher, personal communication, 2015).

It is also possible to triple the GIFS' financial resources, meaning that, for every dollar the GIFS receives and spends on research, it will receive two additional dollars. This could be done in two ways. First, when the GIFS receives new funding from industry, the Federal Government might join the Government of Saskatchewan in matching the funds. Second, scientists could themselves apply for further funding. This will require the GIFS to attract top quality international scientists. Once these scientists receive some funding from the GIFS to spend on research, the GIFS could apply for matching money from the Provincial Government, and the scientists could also to apply for external funding for their own research and publications at funding agencies like the Natural Sciences and Engineering Research Council (NSERC) and the Canadian Foundation for Innovation (CFI). They are always expected to do this; if they are successful scientists, they are supposed to succeed (Christopher, personal communication, 2015).

In fact, the GIFS does expect funds to be tripled. This can be seen with the two research leaders the GIFS has hired so far. Funding their research has three steps. First, the GIFS gave them CDN \$5 million from its own money; second, they were directed to apply for matching

funding of 5 million dollars from the Federal Government through Genome Canada or the Canada Excellence Research Chair (CERC); and third, they were expected to apply for additional funding for their own research and publication to build up their research program (Christopher, personal communication, 2015).

These matching programs are consistent with, and confirm, Etzkowitz et al.'s (2000) argument. They argued that public funding in Britain became dependent on whether or not it would contribute directly to the economy. Both the matching programs and the case Etzkowitz et al. (2000) describe, which I see as describing the trend of the entrepreneur university and the commercialization of science in North America and West Europe more generally, have the tendency to favour organizations that produce industrial science and both embody the concept of the commercialization of science and the entrepreneur university.

Christopher continued his discussion of matching programs by detailing that the Federal Government provides matching funding through several organizations, including NSERC, CFI, and Genome Canada. Genome Canada has a program that matches a contribution from another source, one-on-one dollar. However, any scientist can apply to Genome Canada without matching, i.e. without receiving money from another source (Christopher, personal communication, 2015). Christopher mentioned that these matching programs are neither a law nor a rule. The GIFS and other research centres still need to compete to be awarded these matching funds. He then commented that the GIFS is strong and is able to succeed in these competitions (Christopher, personal communication, 2015).

Regarding collaboration, Christopher mentioned that there is a difference between two types of private sector funding. Christopher called the first one simple contributions. These are philanthropic contributions the private sector makes to a research centre (like the GIFS), without specifying what they want the research centre to do with the funds. It is, to be sure, understood that funders only fund research centres whose research they appreciate. Christopher called the other type of private sector funding collaboration. This involves private sector companies providing funding for research centres and asking them to do research in specific areas. An example of this is Syngenta, the agri-business company, which donated CDN \$5 million to the GIFS and requested that the GIFS research bread making quality in wheat. Increasing funds coming from collaborating with the private sector is one of the important things Moloney wanted to do (Christopher, personal communication, 2015).

According to Christopher, during Moloney's time as Director, the GIFS faced new obstacles and problems. They were different from the ones the GIFS faced during the Beachy era. According to Christopher they were: 1) managing the growth of the GIFS, 2) recruiting qualified scientists, and 3) the lack of endowments (Christopher, personal communication, 2015).

First, managing the GIFS' rapid growth. Christopher stated that managing growth during Moloney's era was a potential problem because the GIFS was going to grow very rapidly and it was assumed that the number of partners might also increase. The interests of the three founding partners were sometimes different, and with the inclusion of more partners, managing these kinds of disagreements would become more difficult (Christopher, personal communication, 2015).

As for recruitment, Christopher mentioned that during the Moloney era, the plan was to recruit top quality, internationally renowned scientists. However, actually doing this was definitely challenging (Christopher, personal communication, 2015).

Third, the lack of endowment. Christopher said that sometimes institutes like the GIFS are funded through endowments. Endowments are a very good way to fund research centers since nothing is spent from the capital; only dividends, or interests, are spent. This way a centre never runs out of money. However, the problem is that this type of funding is not available in Canada as there are not many millionaires who are prepared (or willing) to donate large amounts of money. What is possible in Canada is receiving more philanthropic contributions and then matching them with public funds. This is what Moloney tried to do (Christopher, personal communication, 2015).

When Christopher told me this, I asked him about something I had read in MacKinnon's book (2014). I mentioned that, while discussing science policy in Canada, MacKinnon (2014) argued that business leaders in Canada are inclined to avoid risk much more than business leaders in the US. Christopher told me immediately that that was absolutely true in business in general. Furthermore, he confirmed my statement by saying that Canada is a much more conservative business climate than the US. Furthermore, Christopher mentioned that he thought that even among very wealthy business people in Canada, there is less philanthropy compared to the wealthy business people in the US (Christopher, personal communication, 2015). As a result,

funding research centres in Canada is more difficult than in the US. Furthermore, there is pressure on research centres managers to exploit any funding policies as matching programs.

When I asked Christopher about the factors that helped the GIFS overcome the obstacles it faced and operate effectively, he decided to talk about what he thought of as an indication of the GIFS' success. He said that the GIFS got another award from the Federal Government, which is CDN \$37.2 million. He said that that was announced last week (referring to the beginning of August 2015). Christopher also said that the Premier came to visit the GIFS last week (referring again to August 2015) and he was very supportive. He said that it is always good when the government is positive about someone's work (Christopher, personal communication, 2015).

### **5.2.3 Analysis of the Operation**

As mentioned before, the PotashCorp's fund was crucial in creating the GIFS. It was possible for PotashCorp to invest in the GIFS because of the new environment created by the University's new policy (see p. 62 section "4.1.1 Analysis of the Factors and Conditions"), which is part of the global phenomenon of the commercialization of science and the entrepreneur university. Using Bourdieu's (1998) terminology, new conditions like this represent a change in the exchange rate. I would like to add here that this new condition is also expressed in the matching programs the Government of Saskatchewan and the Federal Government provided, which is also an aspect of the broad trend of the commercialization of science and the entrepreneur university. The matching programs as Christopher described them indicate that both governments have a tendency to favour organizations that produce industrial science, which is consistent with Etzkowitz et al.'s (2000) British example of the trend toward the commercialization of science.

There is a big difference between the GIFS' management under Moloney's leadership and during the Beachy era. Leonardo's narrative presented management during Beachy as neither organized nor coherent. The few points the GIFS management were conscious of were that food is a system and that the GIFS' goals included marketing and changing the way research is conducted at the University of Saskatchewan to make it more dependent on teams rather than individual work. This management, under Beachy, also seems too ambitious without having a clear implementation strategy, just like the implementation strategy that was applied under Moloney.

Management during the Moloney era understood the partners' targets and goals and was more realistic than the management during the Beachy era. Management under Moloney understood that the target of the Government of Saskatchewan and PotashCorp was to ensure that the GIFS had a lasting legacy. For the University, on the other hand, the target was to attract more top quality scientists, produce advanced level science, and improve the University's signature areas to become more visible globally. For the GIFS during Moloney's leadership, the main means to reach these targets was to make use of the matching funding programs. This is a realistic strategy because the management was aware of these programs and their larger system and wanted to benefit from them. However, management under Beachy's leadership was trying to change the system of the university by changing the way research is conducted to make it more dependent on teams rather than individual work. The matching programs that management during Moloney's leadership era decided to exploit are one of the most important expressions of the trends of the commercialization of science and the entrepreneur university, which both the Government of Saskatchewan and the Federal Government supported.

Christopher argument that one of the GIFS' obstacles during the Moloney era was managing growth shows that the GIFS' management at that time intended to expand the GIFS and believed that it was possible to do so. However, the management during the Moloney era worried that they might expand too much or in the wrong way. This also confirms my argument that the GIFS under Moloney's leadership embodied the trends of the commercialization of science and the entrepreneur university. The trend of the commercialization of science involves the government's support of industrial science, as Etzkowitz et al. (2000) indicated was the case in Britain. Through the matching programs, the Federal Government and the Government of Saskatchewan supported industrial science centres like the GIFS, which provided the GIFS with the means to expand.

Christopher's indication that the lack of endowment was one of the obstacles the GIFS faced and MacKinnon's (2014) argument that business leaders in Canada are inclined to avoid risk, much more than business leaders in the US, show that one of the obstacles standing in the way of the commercialization of science model in Canada is its conservative business climate (conservative here is used to refer to a tendency to avoid risk). This is true because the commercialization of science model is based on the interaction of the three helices (government, industry, and the university) and the most dynamic industry climate is not conservative.

However, at the same time, Canada needs the GIFS and similar centres because of Canada's low productivity growth (MacKinnon 2014).

Knowing whether the researchers at the GIFS enjoy academic freedom is a major point. However, it is beyond my research scope. In fact, points 6 and 7 of the Recitals of the Memorandum of Agreement<sup>12</sup> are contradictory in terms of academic freedom. Point 6 states that the research personnel at the GIFS will be required to carry out assigned tasks, while point 7 states that the research personnel at the GIFS must enjoy academic freedom. Clearly, being required to carry assigned tasks means that there is some restrictions on academic freedom.

The Board of Directors of the GIFS has a great deal of power, and, as members of the Board of Directors, so too do the three founding partners (the Government of Saskatchewan, PotashCorp, and the University of Saskatchewan). Three of the six members of the Board are nominated by the three founding members—one member per founding partner—and these three constitute the Executive Committee. The other three members of the Board of Directors are identified by the Governance and Nominating Committee and recommended to the Board (i.e. recommended to become Board Members) by the Executive Committee. The Governance and Nominating Committee is comprised of a representative from each founding partner. Thus, the three founding partners enjoy a high level of the management authority, as expressed in the Memorandum of Agreement, the most important contract of the GIFS.

Assuming responsibility, risk, and liability, the University's Board of Governors fulfills the role of the owner of the GIFS. Thus, in the end, the GIFS is part of the University. This is what PotashCorp wanted, as this is the way by which the GIFS and its research will be most respected. At the same time, according to the Memorandum of Agreement, PotashCorp has the right to design a tagline that must be attached quite prominently to the GIFS' name in print and electronic communications, as well as in signage. Furthermore, there is no obligation on the part of PotashCorp to contribute the full amount it promised; it might stop at any point. PotashCorp, therefore, benefits from their involvement with the GIFS; the GIFS is inside the University and part of it, and the name of PotashCorp is always attached with the GIFS.

The GIFS is part of the University of Saskatchewan; in addition, some of the scientists at the GIFS might be faculty of the University of Saskatchewan. The GIFS as a whole and these faculty, who work at the GIFS as well, might work in industrial science because the matching

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<sup>12</sup> The Memorandum of Agreement is discussed in the Appendix.

programs and Moloney management encourage them to do so. Furthermore, because of Moloney management, scientists will be encouraged to look for funding from the private sector for their own research. This way, they play a role similar to business people who look for profits. This is consistent with the literature on commercialization. Etzkowitz et al. (2000) argue that searching for funding and generating income had become part of the university's job since the onset of the trend toward the entrepreneur university and the commercialization of science. Etzkowitz (2006) argues that while the three helices (government, industry, and the university) interact, each one of them is transformed by taking a portion of the other partners' role. PotashCorp plays neither the role of the University nor the Government, as the literature suggests, but it does rely on the University to increase its competitive advantage. Furthermore, Lieberwitz (2017) also mentioned that the industrial norms infused to the university and that the industrial/corporate model pervaded all aspects of the university. Thus there is similarity between the GIFS and the models in the literature on the triple-helix, the entrepreneur university, and the commercialization of science.

### **5.3 Chapter Conclusion**

To conclude this and the previous chapter, one of the major factors that made creating the GIFS possible was PotashCorp's donation, which was at least in part a result of the good relations between the leaders of the three institutes, and especially the relationship between Dallas Howe and Peter MacKinnon.

Furthermore, creating the GIFS was possible because of Dr. Karen Chad's efforts in convincing the University administration of the importance of creating new centres with international leaders, instead of just having independent scientists. This shifted the focus of the research conducted at the University of Saskatchewan toward centrally defined goals, which is part of the shift toward a central planning model. All of this was possible because Chad had the skills necessary to implement the new policy of the University (see p. 62 section "4.1.1 Analysis of the Factors and Conditions").

Under Moloney's leadership, the GIFS' main means to reach its goals was to make use of the matching funding programs. Matching funding programs already existed and management during the Moloney era exploited them. Matching programs are one of the most important

expressions of the trends of the commercialization of science and the entrepreneur university, and they are supported by the Government of Saskatchewan and the Federal Government.

The Board of Governors of the University of Saskatchewan fulfills the role of the owner of the GIFS, which means that the GIFS is part of the University. This is exactly what PotashCorp wanted; according to Thomas, this is how the GIFS and its research will be most respected. Furthermore, PotashCorp insisted that its name must always be attached to the GIFS. This is an excellent way for PotashCorp to confirm that it is a partner at the GIFS and thus to have a competitive advantage in the market through providing research.

As mentioned before, one of the GIFS' major goals, from the standpoint of the University of Saskatchewan, is to improve the University's status and reputation. This is a broad goal and it includes several aspects, such as attracting private funding. This goal is also in line with the University's new policy. The GIFS was an expression of this new policy. The new policy is consistent with the triple-helix theory and the model of the entrepreneur university. Indeed, one of the reasons why it was possible to create the GIFS was the good relationship between the leaders of the three helices: Government of Saskatchewan, PotashCorp, and the University of Saskatchewan. These three helices are the three institutes that the triple-helix theory recommends work together to bring the best results (Etzkowitz 2006; Leydesdorff and Etzkowitz 2003).

Thus, the policy behind creating the GIFS, its goals, and some of the elements that contributed to its founding are consistent with the triple-helix theory, as I described above. However, for the most part, the triple-helix theory does not help explain how the GIFS was created. The triple-helix theory does not provide useful concepts such as the ones that Bourdieu's habitus and the field provides. Bourdieu's habitus and the field conceptualizes different kinds of capital and draws a relationship between the social agents' possession of different volumes and ratios of these kinds of capital, and these agents' behaviour. Agents' behaviour is conceptualized on one level in the theory as their willingness to conserve or transform some of their capital. The motivation and action engagement in my empirical research corresponds to the willingness to conserve or transform capital in Bourdieu's habitus and the field theory.

Since it does not include these kinds of concepts, the triple-helix theory does not fully analyze social conditions, motivations, and processes. Consequently, the triple-helix theory does not have the tools to analyze who is benefitting from a particular action. By pretending that the results the triple helices reach cannot be reached except through the interaction of the three



helices, the triple-helix theory justifies the trend of the entrepreneur university and the commercialization of science, instead of explaining it from a critical standpoint.

This is how the GIFS was created. In the next chapter I conclude this research by highlighting the main research findings, answering the research question explicitly, assessing the triple-helix theory, and providing solutions.

## **CHAPTER 6: CONCLUSION**

This chapter takes the above analysis one step further to highlight the main research findings, answer the research question explicitly, assess the triple-helix theory, and provide solutions. Research findings indicated that, for the most part, the triple-helix theory does not help in explaining how the GIFS was created; it does, however, help in explaining some aspects of how the GIFS was created, but it exaggerates the importance of these aspects.

In the first section of this chapter, I highlight the main research findings. In the second section, I assess the triple-helix theory and explain why Bourdieu's habitus and the field theory and Campbell's institutional change model are more helpful than the triple-helix theory in explaining how the centre was created. The third section looks for solutions and is divided into three subsections. In the first subsection, I provide an analysis that leads to a prediction. The second subsection describes the limitations of my research and discusses questions I set for future research. In the third subsection, I provide some policy recommendations.

### **6.1 Main Research Findings**

At the theoretical level, this dissertation starts with the triple-helix theory, which some assume explains the creation of the GIFS, mainly because it is a contemporary theory developed to analyze science production. Research findings indicated that, for the most part, the triple-helix theory does not help in explaining the factors, motivations, and social processes that led to the creation of the GIFS.

In this paragraph, I summarize the major claims and findings. First, the research findings indicate that the GIFS reflects recent trends toward the entrepreneur university and the commercialization of science, in which industry plays the major role. Second, the role of industry in creating the GIFS was strong. Third, the GIFS embodies the new policy of the University that, as expressed in President MacKinnon's (2014) book, was meant to transform the University. Fourth, the triple-helix theory does not provide concepts that help analyze the important role of industry in creating the GIFS. It does not provide concepts that help analyze how industry gained from the GIFS. An example of such concepts is the concept of capital provided by Bourdieu in his habitus and the field theory. Fifth, grounded in functionalist

assumptions, the triple-helix theory does not problematize power structures and processes. Sixth, the triple-helix theory does not provide concepts that help analyze actors' actual motivations. Seventh, while the triple-helix theory helps explain some aspects of how the GIFS was created, it exaggerates the importance of these aspects. Finally, the research findings indicate that the triple-helix theory justifies the commercialization of the university, instead of fully explaining it from a critical standpoint.

The GIFS was created in response to the implementation of the new policy of the University (see p. 62 section "4.1.1 Analysis of the Factors and Conditions"). Improving signature areas, or the idea of strengthening what was already strong, was at the root of the University's new policy and the creation of GIFS. Within the university, this policy changed power relations over resource allocation and recognition among different departments and colleges.

The other three points of the new policy of the University are also factors of founding the GIFS, as discussed above, and that is why it is safe to conclude that the GIFS embodies the new policy of the University. These four points, of the new policy of the University, are the activities that a university can and should do to be successful according to the criteria of the recent phenomenon of the entrepreneur university and the commercialization of science. Furthermore, these points are connected to each other.

All universities, including the University of Saskatchewan, need funds from the private sector because public funding decreased. Universities are evaluated according to their success in securing private funds and partnership, and this evaluation in addition to their position within university ranking became recently more important. Improving signature areas is one way to improve ranking and more central planning is needed to move in the direction of doing all these activities. This is one package and it is, to an extent, a departure from the other two models: the people's university, using MacKinnon's definition; and the university as a critical institution, aiming at enhancing some values and intellectual skills, as described above by many authors.

The people's university, according to MacKinnon (2014), means a university that serves its community through focusing on providing the community with good services and affordable tuition. The university as a critical institution, according to Giroux (2013), for example, is supposed to teach and enhance humanities, social science, critical thinking, intellectual vision, curiosity, imagination, adventuresome, communal responsibility, and struggle for justice. The

people's university and the university as a critical institution are not the same model, but they are not contradictory to each other, and the target in both is serving the community, the university as a critical institution is a more specific model. Thus they are overlapping and the two models could describe the same universities in reality, i.e. universities before the trend of the commercialization.

The role of PotashCorp in founding the GIFS was vital from the start, as it provided 70% of the original funding. Thus, the GIFS would not have been founded without PotashCorp money. In fact, my research findings suggest that creating the GIFS was also a goal of PotashCorp since the GIFS serves some of its strategic interests. The collaboration between Dr. Peter MacKinnon and PotashCorp before founding the GIFS was a very important factor for making the donation of PotashCorp possible. This collaboration indicated that the good relations between business and the university existed from the beginning, and probably among other reasons because of the new policy of the University, and the GIFS is a new embodiment of the policy.

Based on Harvey (2005), we can argue that neoliberalism appraises inequality in income and wealth distribution on the basis that it helps sustaining competition at work and in the market, which is good for economic growth. The continuing growth of private sector corporations is consistent with the logic of neoliberalism and is a target of the corporations' shareholders. Consequently, it is expected that corporations continuously try to expand and thus corporate norms penetrate the university and support the commercialization of science. One of the reasons of why this change was possible was that large corporations encouraged it and universities allowed it to happen as public funding decreased. Academic integrity and detached teaching and research in humanities, social sciences, and natural sciences are typically opposed to neoliberalism and its logic (Heller 2016). One would argue that the same argument is valid for basic research, i.e. basic research is opposed to neoliberalism and its logic. This is because basic research and academic integrity reveal the implications and consequences of neoliberalism and oppose the usage of knowledge as a commodity. Consequently, they resist the hegemony of market (the relation between neoliberalism and the trend of the commercialization of science and the entrepreneur university and their effect on academic integrity is described in more details in sections "2.1.2 The Triple-Helix and Neoliberalism" and "2.1.3 Science and the Integrity of Universities").

As mentioned above, as the triple-helix theory appraises the status quo, I agree that it works to conceal one of the most important characteristics of contemporary commercialized universities: to serve the interests of business people and put the neoliberal policy paradigm into operation. Promoting business interests and implementing neoliberal paradigm are connected because the latter preserves the former.

In addition, the good relations between the leaders of the three institutes, MacKinnon, Premier Wall, Howe, and Doyle, helped them to succeed in making day-to-day decisions. Doyle was the CEO of PotashCorp and was the one directly involved in creating the GIFS but Howe remained involved.

Furthermore, creating the GIFS was possible because of the significant role of Dr. Karen Chad. The university articulated the six signature areas, including agriculture, while she was the Vice President of Research. Then Dr. Chad's had an important role in demonstrating and implementing how the university can gain from identifying the signature areas. She had done research across Canada trying to know why some universities were more successful in research than others. One of the points she found out was the importance of having an internationally recognized scientist leading a research cluster. This scientist needs to be able to surround himself/herself with a number of scientists and lead them to create enough energy to be able to make a difference that could be recognized globally. This means that the leader brings the team under a new entity (research centre) within the university, and hence creating centres became the way to get use of identifying the signature areas. Furthermore, Dr. Chad was very successful in keeping the vision when the partners and founders of the GIFS disagreed during the founding process. She used to bring partners together again through compromises and consensus.

The GIFS, therefore, embodied the new policy by the University of Saskatchewan, which was consistent with the intention of both the Government of Saskatchewan and PotashCorp to forge a legacy within the University. When MacKinnon (2014) discusses the GIFS in his book, he first highlighted the importance of partnerships and mentioned that, in contemporary societies, questions and issues that are important for the public require research that is beyond the scope of the solitary researcher. He explains: "Larger multidisciplinary teams, often from different institutions, are involved, and the issues before them are of interest beyond the academy to government and industry whose engagement is required for the work to proceed" (MacKinnon 2014: 76). He goes on to provide three examples on partnerships, one of which is the GIFS.

Although MacKinnon mentions the growing world population as a broad problem to tackle, the creation of the GIFS clearly emerged as a partial implementation of the University's new policy. If the GIFS succeeded, the University of Saskatchewan's reputation as a research institution on a global level would improve, which would also mean that the University's new policy is successful and its implementation is possible. If the new policy of the University is successful and its implementation is possible, then it should be expanded.

On another similar level, MacKinnon (2014) uses the logic of his University's new policy to assess the GIFS' performance. At the beginning of his discussion, he states that the GIFS is still in its infancy and its success can only truly be assessed in the future. Nevertheless, he argues that "the feature of its early development that merits attention was the decision to retain McKinsey & Company to assist in developing the institute. Global consultants have resources that are not found in-house in universities, companies, and governments, and they are well placed to assist all three in transcending institutional interests" (MacKinnon 2014: 79). Here, MacKinnon (2014) argues that the decision to hire McKinsey & Company to help develop the GIFS is an indication that the GIFS is on the right track. His appraisal of this engagement with global consultants is based on the logic of the University's new policy, which he supports, and is also consistent with the triple-helix theory which appraises transcending institutional interests, boundaries, and capacities.

## **6.2 The Triple-Helix Theory versus Bourdieu's Habitus and the Field Theory and Campbell's Institutional Change Model**

The following argument that the special contribution of the three helices cannot be reached except through the interaction of the three helices (Etzkowitz 2006; Leydesdorff and Etzkowitz 2003) (this argument is explained in section "2.1.2 The Triple-Helix and Neoliberalism" in Chapter 2) is at the heart of the triple-helix theory. This argument is not helpful because the theory does not specify who this special contribution benefits. The triple-helix theory does a good job in describing some of the processes associated with the entrepreneur university and the commercialization of science model, for example, that each sphere is transformed by taking on the others' roles (Etzkowitz 2006) and that contemporary science production is based on the strong and complex interaction of the three helices. These two points are descriptive and do not go beneath the surface of the empirical data to analyze the phenomenon at hand. Furthermore, as

suggested above, by appraising the special contribution of the interaction of the three helices without specifying who this contribution benefits, the triple-helix theory justifies the status quo, the entrepreneur university, and the commercialization of science model, instead of explaining them from a critical standpoint. Moreover, as the triple-helix theory neither explains who benefitted from the creation of the GIFS nor what all the motivations behind the creation of the GIFS were, using the theory by itself does not help explore the consequences of the GIFS and, more generally, of the commercialization of science model. This is because the consequences of a policy or a new project are related to who benefits from it.

The triple-helix theory identifies four interrelated and simultaneous processes related to the entrepreneur university and the commercialization of science model. First, each helice is transformed internally. An example of this is the change within each helice, such as the new role of the university in economic development. The second is the influence of one institutional sphere upon another, bringing about transformation. The third involves institutionalizing and reproducing interfaces. This involves the efforts of groups, such as those found in Silicon Valley and others, to gather experts from the three spheres to share ideas and have discussions, with the goal of coming up with solutions that are difficult to reach without the interaction of agents from the three spheres. The fourth process involves the effect of these inter-institutional networks of government, industry, and the university on each other and on society at large.

The four processes that the triple-helix theory identifies are more sophisticated than the two descriptive points I mentioned above, i.e., that each sphere is transformed by taking on the others' roles and that contemporary science production is based on intense interaction among the three helices. That said, these four processes are also descriptive; they are not analytical or explanatory. The significance of these four processes is that they draw researchers' attention to the different processes of contemporary science production (known as the entrepreneur university model) that can be studied. Taken together, these six points are descriptive. This makes sense; the triple-helix theory is grounded in functionalist assumptions that underscore the descriptive aspects and pay much less attention to the concepts of power structures and processes, social change, and actors' interests and motivations. These, however, are precisely the concepts that could answer my research question.

In his critique of functionalism, Bourdieu (1998) considers it a substantialist analysis that intends to be structural, but is not. He writes that the "substantialist and naively realist reading

considers each practice (playing golf, for example) or pattern of consumption (Chinese food, for instance) in and for itself, independently of the universe of substitutable practices, and conceives of the correspondence between social positions (or classes, thought of as substantial sets) and tastes or practices as a mechanical and direct relation” (Bourdieu 1998: 3).

The triple-helix theory has the same limits of functionalist theories in that it is descriptive and normative. Moving beyond functionalism, Bourdieu (1998) argues that individuals’ positions in social space influence their activities and preferences, meaning that individuals’ positions in social space also influence their motivations. Furthermore, in his habitus and the field theory, Bourdieu (1998) explains the relation between individuals’ positions in social space and their activities and preferences. Thus, Bourdieu’s habitus and the field furnishes the concepts that help analyze motivations.

I used Bourdieu’s (1998) concept of capital, which is one of the key concepts of Bourdieu’s field theory, to better understand PotashCorp’s decision to fund the GIFS. On the empirical level, PotashCorp wanted to pay money to invest in science to increase their profit in the future. Following Bourdieu, PotashCorp wanted to convert economic capital into cultural capital with the target of later converting that cultural capital back into economic capital to maximize profits. The goal of PotashCorp was to do this at a time when the exchange rate allowed it to gain.

The theoretical concepts of Campbell’s (2004) institutional change model inform empirical research on institutions by showing how they could be analyzed. That is why Campbell’s (2004) institutional change model complements Bourdieu’s habitus and the field in my work. The concepts and arguments Campbell (2004) provided include the differentiation between organizations and institutions; how institutions constitute the wider contexts of organizations; a conceptualization of the different components of institutions and how they are conflicting; the concepts of programs, paradigms, and frames; and how paradigms constrain imagination and perceptions.

These concepts and arguments constituted some of the tools and lenses which I used in analyzing my empirical data, as mentioned before. The triple-helix theory mentioned the term “institutions” frequently, but it did not provide useful concepts to analyze these institutions. It focused on describing the interactions of the three helices in contemporary science production institutes. It did not provide concepts, such as the ones Campbell (2004) provided, to help



understand the different components of institutions and how different actors (for example, managers, decision makers, and academics) play different roles in creating different types of ideas. These detailed and analytic concepts (Campbell 2004) highlight the processes of change and conflict in the wider contexts surrounding the creation of the GIFS, which are institutions in Campbell's schema. The triple-helix theory does not go deep enough in explaining these changes and conflicts and so does not provide the tools needed to fully explore how the GIFS was created.

I also applied Campbell's (2004) institutional change model to an empirical example from the GIFS—the conflicting logics of the policy of the commercialization of the university and the model of the University that is its opposite, as expressed by many faculty members. According to Campbell (2004), institutions have different components. These various components frequently have contradicting or conflicting logics, which contributes to friction. Entrepreneurs and decision makers try to solve this friction by changing one dimension to make it more consistent with the others. In our empirical case, I argued that MacKinnon was decisive in framing a policy that supports the commercialization of science model and that he tried to change the university through this policy, although many faculty members were opposing the commercialization model. Following Campbell (2004), this is a change of one component (or dimension) of the institution to make it more consistent with the others to solve the friction.

In the case of the GIFS, contemporary global competition between universities and the recent importance of the university ranking system, Canada's lag in productivity growth, and reduced public funding for universities created pressures on the University's administration. Taken together, the entrepreneur university, the commercialization of science, and the triple-helix theory (which supports the model) constitute a paradigm, following Campbell's (2004) use of the term. That is, they create a solution for these pressures, but the paradigm also constrains the range of options available. This is because the paradigm is a relatively coherent model that offers a predetermined solution to a particular problem (i.e. the commercialization model).

Consequently, descriptions of the entrepreneur university made by its proponents, including MacKinnon (2014), imply that it is the only possible way the contemporary university can cope with the pressures mentioned above. Thus, the entrepreneur university model and the broader paradigm in which it is embedded constrain policy imagination and limit the perceptions of university administrators, academics, and the public. University administrators followed the

entrepreneur university model before MacKinnon became president of the University of Saskatchewan so it was an institutional and ideological structure that constrained his decisions. By choosing to adopt the entrepreneur university model at the University of Saskatchewan and writing a book supporting it, MacKinnon (2014) was also limiting the range of policies that can be imagined and articulated to address the pressures I list above.

The importance of using the concepts of Campbell's (2004) institutional change model is that they draw attention to the relationship between policy paradigms and both the institutional and ideational constraints facing individual and collective actors. MacKinnon was constrained by the dominant paradigm but his agency and the decisions he made also constrained the development of research at the University of Saskatchewan. More concretely, his decision to adopt the entrepreneur university model constrained the policy options available at the University of Saskatchewan.

The importance of my analysis is that it reveals a wider set of conditions that pressure university administrators to adopt the entrepreneur university model. This will help commercialization opponents (or entrepreneur university model opponents) to sympathise with university administrators who support commercialization, but it will also enable them to be more effective in their attempt to eliminate the adverse results of commercialization since they will understand the roots of the problem better.

### **6.3 Final Considerations**

After analyzing the case and answering the research question, it is important to take the research one step further and contribute to the problem of the commercialization of science and the entrepreneur university. The contribution involves some predictions, questions for the future, and policy recommendations. This section includes three subsections: 1) Looking at the Future; 2) Research Limitations and Questions for Future Research; and 3) Practical and Policy Recommendations.

#### **6.3.1 Looking at the Future**

Looking at the future, one could claim that commercialization as it is currently practiced will continue creating pressures on professors and university administrators that result in avoiding (or neglecting) basic research areas and disciplines. However, different scholars see the future

differently. Lieberwitz (2017) and Giroux (2013) are both opponents of the commercialization of the university and they look at future differently. Lieberwitz (2017) points that in the US and UK university faculty compete together and work in individualistic contexts, which prevents them from having the solidarity needed to collectively resist the commercialization of the university. According to her, this is because faculty in the US are stratified as tenure and non-tenure and in the UK they are stratified as research active and non-research active according to the Research Excellence Framework (which evaluate university research according to criteria of a policy that recommends integrating business and university activities).

In contrast, Giroux (2013) is more optimistic and thinks that a real departure from the neoliberal paradigm and the entrepreneur university will probably happen. He argues that youth all over the world are protesting against neoliberalism. He also points that the continuous protests in the US, Canada, Spain, and Greece cannot be considered just short-term projects aiming at improving the situation, rather they are political movements. Furthermore, he is recommending supporting and intensifying these movements (Giroux 2013).

However, it is important to note at this stage of the discussion that proponents of commercialization have never argued that basic research is not important. They just keep praising the benefits of commercialization including attracting funding from the private sector, improving the university's reputation and ranking by focusing on improving signature areas and planning to do those activities that help the university become successful according to contemporary global criteria, and improving knowledge transfer.

An implicit argument in favour of commercialization might be that commercialization does not eliminate basic research completely. However, the activities of the entrepreneur university and the commercialization of science model, which include focusing on improving signature areas and attracting funding from the private sector, push professors, scientists, and university administrators to give priority to a list of activities that does not include basic research areas. Signature areas are different from university to university, and it is common that signature areas at many universities might not include basic research areas. Attracting funding from the private sector definitely involves giving a lot of priority to applied research areas. As a result, basic research receives less attention. For example, theoretical physics, pure mathematics, philosophy, many areas in sociology, and many areas in arts are not relevant to the private sector.

Since research is competitive, scientists, students, and university professors need to focus and work very hard. They are under immense pressure to forget and neglect basic research areas and disciplines and instead focus on attracting funding from the private sector. This is the case especially when there are no counter policies that encourage professors to work in basic research areas. Furthermore, these pressures might prevent professors and administrators from worrying about the adverse results of neglecting basic research areas and disciplines.

A University Council or administrator decision alone will not close down basic research disciplines and areas. Instead, researchers who conduct basic research might stop working because students will be discouraged to join them, as the former President of the Graduate Student Association's, Izabela Vlahu, statements suggested (Vlahu 2014; Vlahu, personal communication, January 31, 2017).

Private sector corporations face a good deal of pressure to invest in the entrepreneur university through projects like the GIFS. The model on which the GIFS is based could maximize profits for private sector corporations. As the entrepreneur university model is already existing, and as private sector corporations compete, there is a pressure on them to continue investing in this model. Each corporation knows that its competitors might invest in the entrepreneur university, creating the conditions that maintain the entrepreneur university model.

One might argue that the rules of supply and demand are enough to support research in basic research disciplines and areas and will protect them from disappearing. That is, if basic research decrease over time, after some time, there will be an obvious need for them. This need will create demand for the science production of basic research areas and disciplines, which will generate incentives for scientists, students, and university professors to work in basic research areas and disciplines. This will, in turn, create the balance needed to preserve basic research areas and disciplines.

This is a false argument. Pure mathematics, theoretical physics, philosophy, some areas in arts, and some areas in sociology do not directly contribute to industry. If work in these disciplines and areas diminishes, there will not be demand for it in the near future. It will be a long time before society realizes that these areas were contributing something useful. For example, sociology contributions frequently reveal social inequalities that the elite might want to hide. Industry people and the entrepreneur university supporters might think that a decrease in funding to the humanities and social science will not lead to a deterioration in a liberal arts

education. These groups are busy competing against each other and have priorities that do not include supporting a liberal arts education. Consequently, they might continue pushing in the direction that reduces the importance of humanities and social science departments, which will lead to a deterioration in liberal arts education.

Thus, there are many factors and conditions that maintain the entrepreneur university and the commercialization of science model. There are pressures on professors and administrators at universities to avoid basic research areas and disciplines as a result of the commercialization model. This is true, but how true is it? Further research is required to know the extent to which professors avoid basic research areas.

### **6.3.2 Research Limitations and Questions for Future Research**

A limitation of my research is that it is a case study based on a research centre at one university only and so its findings could not be generalized to other universities and research centres.

I set three main research questions for future research. The first question relates to what extent the commercialization model prevents professors and scientists from doing basic research and from enjoying their academic freedom. This is an important and overarching question that includes two smaller questions. The first smaller question asks what the structures and processes are that influence scientists' research questions in a specific research centre, like the GIFS for example. The second smaller question looks at the effects of commercialization in general (this could be done by comparing the number of basic research supported by the NRC before commercialization and after it) or if basic research decreases over time or not.

Studying how scientists' research questions at a specific research centre are influenced is important but is not always feasible. When I decided to study the GIFS, my research question was "In the case of the Global Institute for Food Security at the University of Saskatchewan, does the triple-helix theory explain the social processes and structures influencing the research and commercialization agendas of agriculturalists?" If I remove the theoretical aspect from the question and keep the empirical aspect only, the question becomes: "In the case of the Global Institute for Food Security at the University of Saskatchewan, what are the social processes and structures that influence the research and commercialization agendas of agriculturalists?" Quite a long time after I informed the GIFS of my project, the management of the GIFS changed its mind. They informed me that the GIFS leadership had discussed my proposed research and they

had come to the conclusion that they would not be able to accommodate my research at the GIFS. The GIFS management said that the decision was in part a result of Dr. Beachy's decision not to extend his contract with the GIFS, meaning that the GIFS would go into a bit of a slower development period until a permanent Executive Director was recruited. The management said that this would not likely happen until well into 2014.

So the management of the GIFS said that only part of their decision was due to Dr. Beachy's decision to leave the GIFS. Consequently, I changed my research question to what it is now, to explore how the GIFS was created. Since my first question on the structures and processes that influence scientists' research questions was refused, I think that a similar refusal could happen to other sociologists hoping to conduct research on similar centres. One of the characteristics of research centres like the GIFS is that their knowledge and activities are private. This is because private sector corporations are founding partners and privatizing knowledge is part of the entrepreneur university and the commercialization of science model. Another very similar incident is that I only received part of the McKinsey study and was denied access to the rest of it as mentioned below (in the Appendix: The GIFS Proposal). This confirms that centres like the GIFS restrict access to, and privatize, knowledge.

This is also confirmed by what happened in the Canadian Association of University Teachers (2013) study. At the beginning the CAUT study chose twenty Canadian universities, that had collaborations with government and industry, and decided to evaluate the collaborations agreements. The agreements were not public and the majority of the universities refused to give copies of the agreements to the CAUT. Then the CAUT formally requested this information, under access to information legislation, which took some time and eventually they got the access. The CAUT could not analyze all the agreements as some of them were not involving ongoing research, rather they were just contracts to name programs or buildings after donors; in addition, some other agreements were intensively redacted. Eventually the CAUT analyzed twelve agreements.

So these Canadian universities denied the access of the CAUT at the beginning and also some of their agreements were intensively redacted. This is very similar to what happened to me. Given what is mentioned in the literature about commercializing science in general, and these two incidents, we can conclude that when universities collaborate with industry, they probably

act according to some norms of industry, and privatize some of the knowledge that is supposed to be public.

My first research question might be seen as more important than my current research question. That is why I encourage sociologists to try to use this research question in future research on other centres and at universities where there is significant industry funding, though there is a chance that they might be refused access to data.

The second question I set for future research is whether the entrepreneur university and commercialization of science model are the only way to improve the production, diffusion, and transformation of knowledge in Canada to improve “productivity growth” (the problem MacKinnon (2014) referred to in his book).

The third question I set for future research looks at what the effect of the trend of the entrepreneur university and the commercialization of science on students joining basic research disciplines and areas in different universities during the period of the shift toward the entrepreneur university and commercialization of science model might be. This is an important and overarching question that includes several smaller questions. What are the enrollment patterns of students joining basic research disciplines and areas in different universities? Is it decreasing, increasing, or the same? What are the perceptions of students and faculty in basic research disciplines and areas about why other students and faculty do not join these areas? What are the attitudes of students and faculty in basic research disciplines and areas about the phenomenon of the entrepreneur university and the commercialization of science?

### **6.3.3 Practical and Policy Recommendations**

It is important that university administrators help researchers ask questions about what the structures and processes are that influence scientists’ research questions (including centres like the GIFS and departments that receive significant levels of industry funding).

I also recommend that commercialization proponents and opponents have more effective communication. Commercialization proponents are stronger than commercialization opponents and, as mentioned above, there are many factors that pressure them to continue in this direction and not to worry much about the arguments commercialization opponents put forward. However, the arguments of commercialization opponents are important and based on facts and significant concerns that should be addressed.

The Academic Integrity Committee is an example of a group of commercialization opponents at the University of Saskatchewan.<sup>13</sup> It is evidence that there are contemporary opponents to commercialization, beyond the authors in this study. Commercialization opponents like the members of the Academic Integrity Committee are willing to engage and do activities beyond writing. Such a group enables its members to know each other and share information and research, and also to share this knowledge with people beyond the group, which is something I recommend.

Another example is the CAUT effort. The CAUT will work to encourage universities to use the “Guiding Principles for University Collaborations” to negotiate and improve any offending statements in existing agreements with government and industry and also to use the principles as a template for new agreements (Canadian Association of University Teachers 2013).

I am recommending a number of items. If the following steps take place, new and effective solutions might appear. First, university administrators must give researchers more academic freedom to study science production (i.e. if researchers want to study research centres, university administrators should support them to have more freedom in their research). Second, more effective research on the phenomenon of the entrepreneur university and commercialization of science is necessary, perhaps inspired by the questions I set above (in section “6.3.2 Research Limitations and Questions for Future Research”). Third, proponents and opponents of commercialization should start to communicate more effectively. Fourth, opponents must network to share their research and ideas and to improve lobbying across universities and nations.

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<sup>13</sup> The Academic Integrity Committee was founded by several founders including Dr. Howard Woodhouse and Izabela Vlahu. According to Vlahu, the Academic Integrity Committee was formed to oppose the commercialization of the university in the global sense of the word. She explained that the principal purpose of the Committee is to raise awareness on all issues related to the university that are of public interest. The purpose of the Committee is written in its manifesto on its Facebook page (Vlahu, personal communication, January 31, 2017).

She also said that the Academic Integrity Committee is not formal. The Committee is self-established, and not ratified in any way by any other entity. Its structure is not defined, and its membership is not subject to any restrictions, anyone can join and withdraw at will. That was what Vlahu said (Vlahu, personal communication, January 31, 2017).



The new solutions that might appear could be several and diverse. Our perceptions and imaginations (including mine) now are constrained, using Campbell's (2004) sense of the word, because of a lack of knowledge, which might partially be because of the paradigm that restricts and privatizes knowledge. For example, there might be other solutions for Canada's low productivity growth and other solutions for knowledge transfer, instead of the strong trend toward commercialization. Furthermore, the pressure arising from the recent importance of global universities ranking might be overcome if many strong research universities join together and announce that they decided to create new university policies that attempt to protect basic research disciplines and areas, and explain why this is important. Over time, this might change the social reality and the global university ranking criteria might change to include a new criterion about attempts to preserve and improve basic research disciplines and areas. For this to happen, a lot of new research should be conducted.

Further research on the entrepreneur university and the commercialization of science, appropriate communication, and an alliance among the opponents of commercialization could lead to the formulation of more creative solutions based on solid knowledge.

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## APPENDIX

This appendix consists of short summaries of two documents: the Type B Centre proposal, which is the proposal of founding the GIFS, and the Memorandum of Agreements.

### **The GIFS Proposal**

I received a copy of the Type B Centre document from the Secretary of the GIFS early in my research. She did not use the term Type B Centre to describe the document. She just described the document as the package that went to the University Council. Later, I learned about the Type B Centre document from one of my informants, then another informant gave it to me (the same document I got from the Secretary). It was called “2012 April Council–Establishment of GFSI Type B Centre”.

The Type B Centre document consists of several smaller documents. First, a letter from Bob Tyler, the Chair of Planning and Priorities Committee, dated June 21, 2012, requesting the approval of the University Council to establish the Global Food Security Institute (the name of the GIFS at that time) as a Type B Centre. Second, a proposal by Dr. Karen Chad to establish the Global Food Security Institute, dated March 2012. Third, an evaluation of the University Library’s collection in support of the University of Saskatchewan Global Food Security Institute. Fourth, a collection of letters supporting the Global Food Security Institute.

There are two sets of page numbers on the Type B Centre document. One of the page numbers sets is on the top of the page. It does not start on page one on the first page of the document; it starts at p. 211, and it is a continuous series through all the smaller documents included in the larger Type B Centre document. (Probably it was part of McKinsey’s study, of which I only received part and was denied access to the rest.) The other set of page numbers is at the bottom of the page. It is not continuous through all the smaller documents in the larger Type B Centre document; rather it starts and ends in each one of those smaller documents. In my citations, I used the first set at the top of the page.

The proposal by Karen Chad (2012) starts with an executive summary. In the Executive Summary, the theme of global food security challenges was repeated frequently and was key. Questions under this theme included: how to expand the quality and supply of food for the next century to save a growing global population, and how to guarantee that food reaches those who



need it. Furthermore, Chad (2012) mentioned that the University of Saskatchewan's national and international record in agriculture-related research led it to consider agriculture, food and bioproducts for a sustainable future, as one of its six signature areas.

Chad's definition of food security relates the availability of food for the global population in both good and bad times. Moreover, she argued that food should be safe and healthy and its price should reflect the needs of both producers and consumers.

The Vision of the GIFS was stated in the Executive Summary as follows: "The Global Food Security Institute will place the University of Saskatchewan among global leaders in integrating science and policy research and innovation to contribute Saskatchewan-led solutions for sustainably feeding a hungry world" (Chad 2012: 214).

The mission of the GIFS was included after the Executive Summary of the proposal, under the subsection "Academic Plan":

The Global Food Security Institute will demonstrate a commitment to responsible stewardship of Saskatchewan's food production resources. The Institute will attract new investments and new partnerships to enhance Saskatchewan's research expertise to confront global food security issues through innovative research, training, knowledge exchange and policy development. The GFSI will focus on optimizing the global food supply system to make the best use of natural resources and deliver the best nutrition. This research will be anchored in wheat, pulses and adjacent prairie crops; we promote our advances to other crops around the world (Chad 2012: 216).

Chad provided the following points to specify the mission.

- Afford the University of Saskatchewan researchers an environment that encourages innovation, leadership, and inter-disciplinary innovation.
- Invest in strategic research that will result in transformative innovation in science, technology, and policy in the following areas: "1) natural resource management; 2) agricultural production; and 3) food processing, distribution and consumption" (Chad 2012: 216).
- Create links with other research institutes and clusters around the world that work in the area of global food supply system and share Saskatchewan's knowledge with them.
- Engage in international dialogues with strong leaders and partners in industry, government, and the public to improve the role of Saskatchewan and Canada in the global food system and in supplying inputs for food production.

- Encourage the inclusion of global food security topics and issues in the University of Saskatchewan’s curricula “to become a premier destination for undergraduate and graduate students” (Chad 2012: 216).

I identified four major themes from analyzing the GIFS Proposal, including the mission specification points mentioned above:

- A) Attract funds, increasing commercialization, and securing partnerships;
- B) Develop and intensify research in agriculture-related and food supply areas, and focus on innovation and technology;
- C) Be ethically responsible towards the global problem of food security;
- D) Enhance the reputation of the University of Saskatchewan and the province of Saskatchewan.

These themes are consistent with most of what is written above in the chapters describing and analyzing the GIFS. The themes in the GIFS Proposal and those that emerge in my informants’ narratives are not identical but they are consistent about what the GIFS is. There are differences between the documents and the informants since each document is written for a particular reason and each one of my informants spoke about the goals of the GIFS from the standpoint of his or her institute (i.e. what the GIFS would bring to it) and the experience of his or her institute in creating the GIFS.

The definition of a Type B Centre is provided on the University of Saskatchewan’s website. Type B Centres are centres involving activities beyond one college and/or involving substantial resources. They require authorization from the appropriate Deans, Vice President (usually the Vice President of Research), and Provost’s Committee on Integrated Planning before pursuing the approval of the Council. These centres are structurally “part of the University and are subject to University management and control” (University of Saskatchewan 2016a) and they report to a designated Dean or an appropriate Vice President (usually the Vice President of Research) (University of Saskatchewan 2016a).

Chad (2012) mentioned that the GIFS and its achievements will be assessed by the University of Saskatchewan’s Vice President of Research. She listed the criteria on which the Institute will be assessed:

- The success of the GFSI in securing external funding and partnerships;
- Successful recruitment of new faculty, graduate students and post-doctoral students working in the area of food security;

- The degree to which GFSI acts as a catalyst for innovative solutions, technological applications and public policy development to address global food security challenges and serves as the go-to place for informed policy advice and discussion;
- Increased recognition of the University of Saskatchewan by governments, industry, business, and producers and other relevant institutions and agencies—in Canada and beyond—as a credible knowledge resource for innovative research, training, and policy;
- Growth in the quality and quantity of academic programs and scientific and policy aspects of research, development and training in the food security domain;
- Growth in commercialization of new technologies and products;
- Growth in the reputation of our province, its farmers and its businesses, as innovative and secure suppliers of food commodities and inputs to the global food system and as reliable stewards of natural resources for the global public good; and
- Advancement of the Province as a trusted trading partner by leveraging partnerships with trading countries of interest to Saskatchewan and Canada (Chad 2012: 230).

These eight criteria are the most important points in the GIFS Proposal, as the criteria on which an institute or a program are assessed constitute a very practical way to understand them. These points are also concrete.

I classified these criteria into four categories, all related to food supply:

- A) Commercial dimension (attracting funds, growing commercialization, and securing partnerships);
- B) Human resource development;
- C) Public policy and research, innovation, and technology development;
- D) The global recognition and reputation of the University of Saskatchewan and Saskatchewan as a province.

Category A includes points 1, 6, and 8; category B includes point 2; category C includes points 3 and 5; and category D includes points 4, 7, and 8.

The way these criteria are listed is indicative of the priorities of the Institute. Point 1 is a commercial theme, indicating that attracting external funds and creating partnerships to get funding is basic and has a high priority in evaluating the Institute. The Institute will later have to attract and depend on external funding. Point 8, the last point, overlaps in categories A and D, integrating the commercial theme and the recognition and reputation theme. Point 8 is also a

specific kind of recognition and reputation, i.e. recognition and obtaining trust as a trading partner. This is the concluding criteria point.

One of the ways to interpret the fact that the first criterion is commercial is that it is the Institute's most basic theme; everything else should follow it and depend on it. The last criterion (point 8), or the concluding criterion, is a recognition of the need to be commercially successful to continue attracting funds. Thus, commercial success is connected to attracting further funds. All the other criteria points in the middle (points 2-7) are important goals but they also help to achieve the goal of the concluding criteria point. Consequently, this ordering of priorities reflects, and is consistent with, a very neoliberal, and commercial, logic and strategy. These are the most important points in the GIFS Proposal. We will turn now to the discussion on the Memorandum of Agreement.

### **The Memorandum of Agreement**

The Memorandum of Agreement is dated November 19, 2012. The Global Institute for Food Security (the author of the Memorandum of Agreement) mentioned at the beginning that the Government of Saskatchewan, PotashCorp, and the University of Saskatchewan will be referred to as the three "Founding Members" and that the agreement will be in effect from the day it is signed for an initial period of seven years, unless terminated earlier.

There are seven points in the Recitals of the Memorandum of Agreement:

- 1) The founding members want to create a global institute for food security at the University of Saskatchewan.
- 2) The GIFS will be developed to respond to increasing global food demands. The GIFS will develop and deliver advanced technological, economic, nutritional, and environmental enhancements to improve the entire global food supply system.
- 3) The GIFS will support future global food security by adopting Saskatchewan-led solutions:
  - Doubling Saskatchewan's crop production.
  - Refining the global food supply system's efficiency and quality.
  - Ensuring safe usage of environmental resources.
  - Improving local and global application of leading-edge, high-efficiency agricultural technologies.

- Nourishing the success and profitability of all business related to food system.
- 4) The GIFS will be founded and managed in consistence with the Articles and Schedules of this Agreement, which took into consideration the pre-work and preparation done by the founding partners and consultants.
  - 5) The founding members are conscious of the need to increase the funding base of the GIFS to ensure its sustainability. They wish to do this through attracting further funds from donors and partners from the public and private sectors.
  - 6) The GIFS will be a mission driven organization and consequently its research personnel will be required to carry out assigned tasks that align with the GIFS' vision and mission. The tasks will be described in individual letters of appointment.
  - 7) Academic freedom is important for the effectiveness and success of the GIFS, and thus research scientists, faculty, graduate students, and other research personnel at the GIFS are subject to the University of Saskatchewan's academic freedom policy (Global Institute for Food Security 2012).

Furthermore, the GIFS is designed to cooperate with other research institutions. This was mentioned directly under "Article 2 Governance" of the Memorandum of Agreement: "The Institute will require utilization of relevant entities, experts, facilities and equipment available in the local/Saskatchewan research cluster(s), or through national and/or international partnerships and affiliations with other research institutions" (Global Institute for Food Security 2012: 2).

Article 2 Governance and Schedule B in the Memorandum of Agreement include important information on the structure and governance of the GIFS. The GIFS is a Type B Centre and is subject to all the University's relevant policies. The Board of Directors of the GIFS will report to the University Board of Governors through the President of the University. The University Board of Governors will fulfill the role of owner of the Institute, and it will assume the responsibility, risk, and liability for the Institute.

The Board of Directors of the GIFS will consist of six Members (or Directors):

- One Member nominated by the Government of Saskatchewan.
- One Member nominated by PotashCorp.
- One Member nominated by the University of Saskatchewan.
- Three Members from the public and private sector who must have international stature.

Each Board Member (or Board Director) nominated by one of the three Founding Members must be acceptable to the other two Founding Members. These three Members also constitute the Executive Committee. The other three Members of the Board of Directors are identified by the Governance and Nominating Committee and recommended to the Board by the Executive Committee.

The Governance and Nominating Committee is comprised of a representative from each Founding Member. “[The Governance and Nominating Committee] will set criteria for board membership, develop a recruitment process, identify and recruit candidates to serve on the Board of Directors, and evaluate the performance of the Chair and the Board” (Global Institute for Food Security 2012: 20). However, the Members of the Governance and Nominating Committee are not Board Members. The Governance and Nominating Committee is also responsible for developing a procedure for appointing the Chair of the Board of Directors; this process must involve the whole Board.

The Board of Directors of the GIFS appoints the Executive Director (who is also the Chief Executive Officer). Furthermore, the Board of Directors sets its own bylaws and policies, which enables it to set its framework and strategic direction, and has the power and authority to hire staff, create new contracts and agreements, and spend funding and administrative money.

The Executive Director (the Chief Executive Officer) is the GIFS’ academic leader and is responsible to the Board of Directors of the GIFS for the “general supervision of the Institute’s business and effective execution of its business plans” (Global Institute for Food Security 2012: 3). The Executive Director’s other roles and responsibilities are defined by the Board of Directors.

Another important governance body is the International Scientific Advisory Panel. The International Scientific Advisory Panel’s role and responsibilities are defined by the Executive Director and approved by the Board of Directors. However, it is anticipated that the Panel will provide independent science advice for the Executive Director and the Board of Directors (Global Institute for Food Security 2012). According to the Global Institute for Food Security (2018), the International Scientific Advisory Panel provides independent advice on science quality at the GIFS, new research opportunities, knowledge transfer, and potential local and international partnerships.

Furthermore, in the Memorandum of Agreement, the Global Institute for Food Security (2012) mentions that there is the potential for the establishment of other advisory committees, like “market needs advisory committee.” Other types of these committees would focus on specific areas in science, policy, or innovation. The Board of Directors would decide on and approve the exact roles and responsibilities of the advisory committees.

The governance structure and governance framework should not be materially modified without the approval of the Board of Directors, upon the recommendation of the Executive Committee. Changes in the number of Board Directors are considered material modification. “This includes the additions of new donors with Board representation in accordance with the terms of this Agreement” (Global Institute for Food Security 2012: 3).

Article 2 Governance includes some important reporting obligations as well. These reflect the type and level of authority of the Board of Directors. The GIFS management should provide the Board of Directors a quarterly report about the GIFS’ financial position and performance within the last 45 calendar days of each fiscal quarter. The GIFS management should report to the Board of Directors within 30 days, or other time period set by the Board of Directors, about whatever issues the board requested information about.

Furthermore, the GIFS management should submit its annual report to the Board of Directors within the last 90 calendar days of the Institute’s fiscal year. The annual report should include: annual externally audited financial statements that indicate the Institute’s level of progress in achieving its goals; all of the Institute’s financial information; a detailed description of the Institute’s activities and programs; “and the results of any internal performance assessments and/or external peer reviews regarding the national and international impact of the research, training and scholarship conducted at the Institute” (Global Institute for Food Security 2012: 4).

The branding and advertisement of PotashCorp through the GIFS was very important in the Memorandum of Agreement. It appeared in the second point in section “4.1 Naming and Tagline” under “Article 4 Naming, Branding, Publicity and Intellectual Property Related to Naming, Branding, and Publicity.” The Memorandum states that only PotashCorp has the right to design a tagline for the GIFS. This tagline must be prominently attached to the GIFS name “in all Institute signage, print and electronic communications. It shall be of a quality, size, and prominence to clearly reflect the name and tagline, and the importance of the Institute. The initial

tagline selected by PotashCorp shall be: ‘PotashCorp—A Founding Partner’” (Global Institute for Food Security 2012: 5). This point on branding and advertisement is one of the most important ones in the Memorandum of Agreement because it gives PotashCorp an important and clearly stated privilege. Furthermore, it confirms the narratives of several informants as to the Institute’s fourth goal. This is the two-fold goal of increasing the agricultural productivity of PotashCorp’s customers and gaining a competitive advantage through providing useful research. Another similar point in the Memorandum of Agreement is point 5 in section 4.1:

PotashCorp shall be offered by the Institute, and have the first right of refusal on, naming of all major infrastructure and programs constructed, developed or delivered specifically with Article 3 founding members’ core Institute funding. Without precluding currently unidentified future opportunities, this could include naming of rooms, buildings or laboratories; Institute graduate fellowship programs and Institute research chair programs; or naming as “lead” or “title” sponsor of major periodic conferences or forums hosted by the Institute. For greater clarity, this is not intended to preclude new donor recognition, including donor naming rights, as outlined in Article 6 (Global Institute for Food Security 2012: 6).

Moreover, the Memorandum gave PotashCorp further rights by directly indicating that it can provide the funds in installments in more than one way; that it can decide whether to continue funding based on the performance the GIFS; and that there is no obligation to provide the rest of the funding that it promised to provide.

(1) Subject to Section 3.4(2), PotashCorp will provisionally donate to the Institute a gift in the sum of \$35 million over a period of seven years (fiscal years ending April 30, 2013 to 2019), subject to an annual review of the Institute including Section 2.5 reporting requirements being met and satisfactory performance against objectives and defined metrics [Schedule “D”]. The PotashCorp gift may be structured such that funds are provided evenly over the seven year period, or proportionally matched with the growth/ramp-up of the Institute and its expenditures, or by some other agreed upon manner. PotashCorp will notify the Board of its desired contribution structure annually at a time that corresponds with the approval of annual operating and capital budgets, provided that PotashCorp receives 30 calendar days’ notice of such timing requirements.

(2) Subject to Section 2.5(2), upon review by PotashCorp of the annual reporting materials provided to it by the Institute, it will decide whether or not to make annual gifts to the Institute under section 3.4(1). Any annual gift agreed to by PotashCorp will be provided in equal quarterly instalments throughout the Institute’s next fiscal year, or by some other agreed upon manner. In the event of an unsatisfactory annual review or as otherwise provided in this Agreement, PotashCorp will provide 80 calendar days’ notice of its intention to discontinue making any further gift instalments.

(3) For greater certainty, PotashCorp is not obligated to make any gift to the Institute. At its sole and unfettered discretion, PotashCorp will determine whether or not it contributes a gift during any fiscal year (Global Institute for Food Security 2012: 5).



The points and arguments discussed above are the most important in the Memorandum of Agreement, as they reflect the rights of the founders and of the GIFS management.