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The WTO and technological development of transition economies: the ‘crucial case’ of Kazakhstan

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Since my intention is to say something that will prove of practical use to the inquirer,

I have thought it proper to represent things as they are in real truth,

rather than as they are imagined.

The Prince. Niccolò Machiavelli (1952, p. 48)

ABSTRACT

After the dissolution of the Soviet Union, former communist republics started the process of integration into the global economy by joining the World Trade Organisation (WTO). To become members, transition economies were forced to adopt a broad array of commitments which went well beyond the boundaries of the formal WTO agreements, including the need to deregulate foreign direct investments (FDI) and to transform the former closed, centrally planned economies into open market economies. Although the WTO had little knowledge of the nature of such a transition, and could not predict the results of the reforms, it presented these demands as an opportunity to turn these countries into knowledge-based economies. For the governments of transition economies this provided an imagined future and they started to implement reforms advocated by the WTO based on this sociotechnical imaginary. This research seeks to understand whether implementation of radical reforms by the governments of transition economies to pursue an imaginary, formed by the neoliberal rhetoric of the WTO, was an adequate course of action. This is a qualitative single case study research project, which uses a crucial-case research design to verify that the hypothesis holds across a cluster of cases to which it is applied.

There are three major aims of this thesis: the first is to explore the impact of accession to the WTO in the context of its demands to transform former closed, centrally planned economies into open market economies. This perspective has been largely ignored by innovation policy literature to date. I argue that such a task represented a paradigm-shifting undertaking, the main challenge of which lay not in changing formal structures, but in making them fit with the long-established informal, tacit elements of the system, such as codes of conduct, practices, norms, routines, and values. The second aim is to carry out an empirically detailed and contextually attuned examination of the feasibility and effectiveness of governmental policies, based on the imaginary of transforming former centrally-planned republics into knowledge-based economies through establishment of open market relationships and attraction of FDI. Finally, it has been my intention to conduct rigorous, in-depth research which explores the process of international technology transfer through FDI as a method of catching-up by economies in transition.

This thesis contributes to the field in three main ways. Firstly, the analysis provides a critical appraisal of WTO policies applied to former centrally planned economies. The research shows that changing the mindsets of domestic actors was paramount in transitioning because their values, codes of conduct, norms, practices, and routines were formed over the course of decades of socialist rule which proved to be incompatible with the ways things are done under open-market relationships. Secondly, this research empirically refutes neoliberal claims by the WTO that the entry of multinationals into a host country’s market automatically leads to occurrence of spillover effects. I argue that successful integration into supply chains of multinationals requires developing entrepreneurial spirit and incentivising capability building of domestic firms. The inability of domestic firms to supply high-quality intermediate inputs prevents the relocation of value-added, knowledge-intensive stages of production processes of multinationals into the host country, limiting their activity to last-stage assembly and the exploitation of the country’s natural resources with no evidence of positive externalities to local firms. Thirdly, this thesis contributes to our understanding of the relationships between policymaking and innovation by shifting attention from scientific actors and institutions towards the specificities of the pathways of technological development, shaped by how the authorities envision the country's future. I show that by following the recommendation of the

WTO as a guideline for technological development, transition economies overlook real problems while focusing on imaginary goals.

This thesis is dedicated to my dear wife, Natalya, who has always encouraged me to pursue my dreams.

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TABLE OF CONTENT

ABBREVIATIONS

FDI	Foreign Direct Investment
FsQCA	Fuzzy-set qualitative comparative analysis
GDP	Gross Domestic Product
GERD	Gross Domestic Expenditure on R&D
GNP	Gross National Product
IPR	Intellectual Property Rights
KZT	Kazakhstani Tenge
OECD	Organization for Economic Cooperation and Development
R&D	Research and Development
USSR	Union of Soviet Socialist Republics
WTO	World Trade Organisation

1. INTRODUCTION

1.1. Background

I was inspired to embark upon this research journey after I spent many years closely witnessing the attempts of Kazakhstan's authorities to turn a former centrally-planned, closed economic system into a knowledge-based, outward-oriented market economy. My prolonged employment by the Committee on Economic Policy, Innovative Development and Entrepreneurship of the Senate of the Parliament has not only shaped my research interests, but also enabled me to realise the importance of the questions my colleagues and I had been working on. We saw that despite the fact that Kazakhstan experienced severe social and economic problems after the collapse of the Soviet Union, the authorities had placed technological development high on their agenda and were eager to implement the necessary institutional and organisational reforms required to achieve the ambitious goal of turning the country into a new benchmark of successful innovative development. The problem was, however, that neither we, nor the representatives of the executive branch had any real knowledge of what needed to be done in order to catch-up with industrialised market economies. As Kern (1992, p. 6) puts it: "Reformers in the socialist nations can observe the features of market economies which serve as something of a blue print for their efforts, but they have little clear guidance about how to bring such institutional structures into existence in their own countries. The situation is akin to that of a person armed with a blueprint of a "dream home," but without any carpentry skills". Accordingly, in the absence of guidelines, knowledge and tangible plans for how to spur technological development in former centrally-planned economies and turn them into booming market economies, policy-makers had to act on abstract ideas, anecdotal evidence and personal instincts. While the task of providing answers to all these questions was long overdue, I decided to devote myself to finding ways of improving the technological performance of economies in transition.

My attention was particularly drawn towards the impact of accession to the WTO, not only because of the magnitude of the effects it produced on the former centrally-planned economies, but also because at the outset of transition, the governments of former Soviet republics commonly viewed membership of the organisation as a free ride towards catching-up in technological development. Since the rules of the WTO require acceding countries to adopt a hands-off approach towards multinationals, membership of the organisation is associated with a significant increase in the flow of inward FDI. Despite being unable to use various investment measures, such as local content requirements, under the regime of the WTO, governments of transition economies strived to gain membership in the organisation in order to attract multinationals, which according to conventional wisdom, bring new technologies, marketing techniques, managerial skills and financial capital to host countries. Accordingly, in December 1998 the Kyrgyz Republic became 133rd member of the WTO, the first among the countries of the former Soviet Union. Kyrgyzstan's officials managed to complete negotiations in a little more than two years, which became the fastest in the history of the organisation. While the terms of accession were extremely burdensome, Kyrgyzstan's authorities decided that the benefits would outweigh the downsides of accession. After all, acceding countries are often forced to accept the terms and conditions imposed by the WTO, mainly due to the importance of being part of a global trading system, but also as a result of the intransigence of WTO member states (United Nations 2001). However, by following the path of economic reforms insisted upon by the WTO the attempts by the government of the Kyrgyz Republic to bring levels of technological development up to those of industrialised market economies were unsuccessful. According to assessments of the World Economic Forum

(2013) the Kyrgyz Republic was ranked 145th out of 148 countries by development of innovations. Not only did Kyrgyzstan's accession demonstrate that the terms of accession to the WTO are unfavourable for latecomers and those lacking bargaining power, but it also made me realise that there are certain pitfalls that needs to be thoroughly examined.

I was primarily interested in finding out how the governments of transition economies have performed their functions during the process of transformation, not so much because I was a civil servant myself, but more because of my firm belief that it was the most important factor affecting the outcome of accession to the WTO. Despite the fact that no proper research was ever conducted to estimate the consequences of an abrupt transition towards market relationships, WTO officials strongly encouraged the governments of former centrally-planned economies to accelerate the process of accession by arguing that delays significantly increase the level of obligations placed upon the applicant country (WTO 2018). Moreover, even though there was no knowledge on how to transform former Soviet republics, the recommendations of many respectable economists had a strong bias towards market fundamentalism – the belief that when markets are left to operate on their own, they can solve most economic and social problems (Becker and Becker 1996). However, the outcomes of Kyrgyzstan's fast accession to the WTO clearly demonstrated that market forces do not solve all economic and social problems on their own, and that targeted governmental intervention was needed. While Kyrgyzstan's unsuccessful experience contained a valuable lesson, it did not provide an answer to the question what the governments of transition economies should focus on while they perform their functions.

1.2. Aim and research questions

My main intention was to conduct research that would be of practical use to policymakers in all former centrally-planned economies. The task was challenging, considering that innovation policy remains one of the most neglected dimensions in the field of innovation studies. Smits et al. (2010, p. 417) argue: "Until now scholars in innovation studies did not pay sufficient attention to innovation policy as an object of research. Phrased differently, policy is considered as a trivial application of 'other' knowledge but not a field of knowledge in itself". Since innovation policy literature is based on the assumption that policy-makers need to intervene only when the system does not function well, that is when systemic problems occur, the scarce studies that exist in this subject area consist mainly of theoretical attempts of different authors to identify various problems that may affect a system's proper functioning. However, while such knowledge might be useful when the innovation system is well-established, in situations where a fully-functional innovation system is yet to be established because a country undergoes transition from centrally-planned to market relationships, policy-makers need something more empirically grounded than a checklist of potential systemic problems. In my opinion, for policymakers in transition economies, a story that used 'the force of example' would be a better source of information for making well-informed decisions than context-independent knowledge based on theoretical deliberations or statistical analysis. As Abbott (1992, p. 79) puts it: "A social science expressed in terms of typical stories would provide far better access for policy intervention than the present social science of variables". Therefore, I aimed to tell a story which not only would depict experience of transition economies but would also leave ample scope for readers to make their own interpretations and to draw their own conclusions on how the governments of former centrally-planned economies should perform their functions in order to catch-up with industrialised market economies.

The choice of research questions was dictated by the aim of this thesis to produce practical recommendations for policymakers in transition economies based on context-

dependent knowledge. While formulating the research questions I also aimed to contribute to the scarcely developed body of innovation policy literature by identifying system-level problems inherent to former centrally-planned economies. King et al. (1994, p. 15) argue that ideally "a research project should pose a question that is 'important' in the real world" and "make a specific contribution to an identifiable scholarly literature by increasing our collective ability to construct verified scientific explanations of some aspect of the world". The three main research questions are as follows:

1. In what ways does the interplay between the formal arrangements the governments of transition economies had to set up in the process of reforms, and the long-established informal elements, embedded in the mindsets of domestic actors affect the transformation of former centrally-planned economies into open market economies?

2. *How did the governments of transition economies envision technological development and was their strategy efficient in terms of turning former centrally-planned economies into open market economies?*

3. *To what extent did joining the WTO enable transition economies to benefit from FDI spillover effects and what are the system-level factors that may inhibit integration of domestic research and development (R&D) and industrial players into global value chains?*

1.3. Structure of the thesis

Moving forward, the second chapter articulates the research design applied and provides rationalisations for all major decisions involved in planning this research project. First, I discuss the usefulness of different methodological approaches in relation to my research goals, analyse their limitations, and clarify why I chose to use a single-case research design for answering the research question raised in this thesis. I also provide an explanation of how a single case research design can be implicitly comparative and present a solution which enables the establishment of generalisable causal patterns across a population of cases based on the examination of a crucial case. After that, I describe epistemological and ontological assumptions, underpinning the choice of methodology and the way I interpret findings of this thesis. I then outline the process of data collection, explain the selection criteria of the interviewees, and provide a detailed account of the methods and tools used to analyse the data. Lastly, I discuss the methodological limitations of this research project by explaining why I opted to solely conduct elite interviews.

Chapter three brings together theoretical and practical debates about how accession to the WTO influences the technological performance of acceding countries. The chapter starts with an overview of catching-up economies motivations' for joining the organisation. Given my interest in transition economies, I further provide a detailed review of how terms of accession affect latecomers to the WTO and those lacking bargaining power by showing that in the absence of criteria that would specify the extent of the demands that can be made by incumbent members, they were pushed for commitments that go well beyond the boundaries of formal WTO agreements. I then discuss the tendency of researchers to focus almost exclusively on examining the effects produced by the rules stipulated in the formal WTO agreements and explain how it affects our understanding of the real consequences of accession to the WTO. After that the literature review shifts the focus towards examining international technology transfer literature and its ambiguity regarding the factors determining the existence

of spillover effects. Finally, the discussion in this chapter turns to examination of the prescriptions of the Washington Consensus, underpinning the demands of the WTO to establish open market relationships and deregulate FDI from the perspective of innovation policy literature.

Chapter four examines how the Kazakhstan's government allocated financial resources on development of new technologies through 'borrowed' policy instruments in an attempt to shift to a new model of technological development. I start this chapter with a review of a model of technological development adopted in the Soviet Union, highlighting the fact that it was designed to fit with socialist values and principles. I then explain how a mismatch between the formal arrangements that the government set up in the process of transition towards a new model of technological development and well-established informal elements affected the ability of the system to incentivise conduct of near-market research, which was required for the production of competitive outputs in open market conditions. Further, the chapter describes how the adoption of commercialisation of technology policies, typically used by mature market economies in order to bring technology to the marketplace affected development of technologies in the country. The discussion then analyses attempts by the government to create centres of research excellence in order to incentivise multinationals to relocate their knowledge-intensive activities to Kazakhstan. The chapter finishes with overview of policies put in place to create an environment that would make scientific research more relevant to the needs of industry.

Chapter five analyses how the regulatory environment, established by the authorities in accordance with requirements of the WTO, influenced the development of new technologies. The chapter starts with explaining how the centrally-planned regulatory framework was viewed by market-oriented economists, why the government was encouraged to accelerate the pace of reforms and what they imagined the results would be. I then discuss why the authorities adopted top-down approach while pursuing the sociotechnical imaginary, shaped by the WTO and how a collision of former and new rationales of public sector managers affected establishment of effective regulatory environment. Afterwards, I describe the attitude towards entrepreneurship in society and explain how the practice of conducting inspections and issuing permissions influenced capability building of domestic firms. Following that, the discussion turns to the analysis of the effectiveness of the measures undertaken by the government in order to turn Kazakhstan into a major export-based economy. I conclude this chapter with a review of the attempts of the government to achieve outward orientation of the national economy by turning the country into a platform for export operations of multinationals.

Chapter six reviews the attempts of the government to accelerate the transformation of Kazakhstan into a knowledge-based, export-oriented economy by replacing weak and sluggish market forces with targeted state intervention. First, in order to explain why the authorities developed reformist attitudes and adopted interventionist style of governance towards coordination of socio-economic processes I examine how they envisioned Kazakhstan's future. I then analyse how integration of domestic firms into supply chains of multinationals, operating in oil and gas sector through imposition of local content requirements influenced their capability building. Afterwards, this chapter reviews how the programme of industrialisation, aimed at reducing the dependency of the national economy on foreign capital was coordinated by the government. The discussion in this chapter then turns to the examination of the practice

of using state procurement as a method of spurring technological development in the absence of domestic rivalry. Finally, I analyse how support of national champions influenced the establishment of backward linkages with domestic firms.

Chapter seven brings together the findings of this thesis. In this chapter I summarise the key policy implications for transition economies, present the theoretical contributions, discuss limitations of this research, and present some suggestions for future studies which can enhance the current research.

2. METHOD AND RESEARCH DESIGN

2.1. Introduction

This is an exploratory qualitative research, which has been designed to gain an understanding of the impact of accession to the WTO on the innovative performance of transition economies. The use of a single case research design was dictated by the necessity to engage in a contextual examination of whether the transformation of formal structures, as insisted upon by the WTO, fitted well with long-established informal constraints. As such, the specificities of a selected case are used here in order to overcome the main drawback of single case studies – ability to produce reliable generalisations. This chapter explains that a country can be singled out from a relatively large number of homogeneous cases and analysed within the theoretical and empirical context of that set of countries. I argue that a clear-cut distinction of transition economies from market economies ensures the representativeness of its cases, enabling me to identify generalisable causal patterns across a cluster of cases. Furthermore, I show how a crucial-case research design can be used to produce a robust generalisation, based on a hypothesis that questions the adequacy of WTO policies in relation to transition economies.

This chapter aims to explain all major decisions involved in planning this research project and to provide rationalisations for those choices. In section 2.2. the discussion outlines the way research goals shaped the design of this project and clarifies my philosophical stance. Section 2.3. describes how a hypothesis can be verified using a single case research design. Section 2.4. reviews the process of data collection and analysis. Section 2.5. explores the methodological limitation of this research project.

2.2. Choosing a research strategy

There are two contrasting methodological approaches, scholars adopted to examine how accession to the WTO affects the technological performance of different countries. A quantitative share of the research is represented by attempts to explain the relationships between specific terms of accession to the WTO and their impact on particular industries, drawing from a large amount of cases (Kyle and McGahan 2012; Falvey et al. 2006; Belloc and Pagano 2012). The emphasis in these studies is on statistical inter-relationships between variables rather than on a detailed understanding of different aspects of accession and the specificities of national contexts. In general, isolation from context and a high degree of abstraction limits the applicability of the quantitative approach to testing only very general theories. Moreover, quantitative approaches overlook the causal complexity inherent to innovation processes. This is a critical drawback because innovation processes require a multi-causal explanation where the importance of various determinants is specified. These determinants should support and offset each other, as opposed to operating independently (Edquist 2005). The remainder of the literature is focused on finding causal relationships between accession to the WTO and innovative performance through contextual examination of experiences of individual countries (Suttmeier and Yao 2004; Das 2003; Fomin et al. 2011). The problem of these studies is that the case-oriented strategies tend to individualise the experience of each particular country. As a result, the findings of the conducted research are difficult to extrapolate to other cases. Esping-Andersen (1997, p. 179) notes: “the point of generalisation is economy of explanation – to be able to see the forest rather than the myriad of unique trees”. While the studies that utilised both approaches contributed to our understanding of how membership in the WTO influences technological development of

acceding countries, they had certain methodological limitations, which I aimed to overcome by means of the research design.

At the beginning of this research journey my overall goal was to examine how accession to the WTO influenced technological performance of economies in transition, and as a result my initial research had the ambitious aim of including all former Soviet Union republics in the analysis. This stemmed from the intention to produce a reliable generalisation, which is crucial for proper understanding of social phenomena. Michael Porter (1990) after analysing a number of studies based either on single case research designs or bilateral comparisons concluded that their findings lack in robustness, which became evident when these cases were analysed within larger set of countries. Inclusion in the analysis of all former centrally-planned economies would have brought the overall number of cases to 15, thereby allowing for very robust generalisation. At the same time, I assumed that a relatively small number of cases would enable me to engage in a contextual examination of the consequences of accession to the WTO, necessary for unravelling causal complexity. The problem with the simultaneous examination of 15 cases was that conventional quantitative and qualitative techniques fall short when applied to analysing an intermediate-N set of cases. A qualitative approach is applicable only to a very small number of cases because it tends to analyse simultaneously a large amount of causal conditions. When the number of cases increases, the researcher faces the problem of unmanageable complexity (Ragin 1987). In contrast, quantitative analysis based on only 15 cases would lack statistical significance. Besides, if multiple regression models try to include complex assumptions, they rapidly exhaust the available 'degrees of freedom' (Ebbinghaus 2005). Attempts to choose a method that would fit well with the research goals of this thesis made me realise that trade-offs and compromises in the design of my study would be inevitable.

I tried different research strategies in order to find out which one would be best suited for analysing available data and producing reliable generalisations. Initially, I intended to overcome the limitations of traditional qualitative and quantitative methods when applied to analysing an intermediate-N set of cases by using fuzzy-set qualitative comparative analysis (fsQCA). FsQCA is based on the application of algorithms of Boolean algebra also known as the algebra of logic (Ragin 1987). It was developed as a middle way between qualitative and quantitative approaches, a bridge between complexity and generality. One of the most important features of fsQCA is that it treats cases holistically. In fsQCA cases are compared with each other not as separate variables but as sets of causal conditions. Comparison of cases as configurations fosters the preservation of their identity and specificity during the shift from a within-case to cross-case level of analysis. Such a holistic approach is extremely important because overall performance of an innovation system depends not so much on performance of its individual components as on how these components interact (OECD 2003). An especially important feature of fuzzy-set analysis is the opportunity to calibrate independent variables (Ragin 2000). A calibration procedure provides the researcher with the opportunity to measure causal conditions in a variety of degrees and allows them to reflect on the qualitative characteristics of a variable. Calibration demonstrates membership of a variable in specified set and should be done using the substantive and theoretical knowledge of the researcher. The main goal of fsQCA is to identify the most appropriate configurations of conditions that are best able to explain the outcome of interest. For this purpose, each case is represented as a combination of causal and outcome conditions, or in other words, as a combination of independent and dependent variables. Variables are calibrated through qualitatively defined anchors. All cases, including the empirically non-observed, are compared with each other in a so-called "truth table". Afterwards, the data matrix is logically simplified through the

application of algorithms of Boolean algebra. Finally, analysis assesses the consistency and coverage of each of the produced statements. Despite all the benefits of fsQCA, including its ability to produce robust generalisations, I was open to the possibility that other research methods might be a better option.

As my research project progressed, I realised that despite its limited ability to produce reliable generalisations, conducting single case qualitative research was the only possible option. Research design is not an autonomous domain and needs to be altered in the process of discovering new perspectives on the research problem at hand. As Mills (1959, p. 128) puts it: "Controversy over different views of 'methodology' and 'theory' is properly carried on in close and continuous relation with substantive problems… The character of these problems limits and suggests the methods and conceptions that are used and how they are used". While conducting the research, it became apparent that there was one important issue that needed to be explored in-depth in order to formulate a viable hypothesis explaining why former centrally-planned economies experience significant difficulties during forced transformation into open market economies. Specifically, I wanted to examine how participants of innovation processes perceive the 'rules of the game' of a new paradigm as I did not accept the premise that transition was simply a matter of changing formal institutional and organisational arrangements. I could not concur with the assertion of market-oriented researchers that command regime was an aberration of capitalism, the aim of which was to experiment whether market forces can be replaced with planning procedures (section 3.2.). Neither could I consent with the claims of market fundamentalists that market forces on their own can solve all problems of transition economies (Becker and Becker 1996). I realised that a centrally-planned regime was a fully-functional system that was based on socialist values and principles that defined not only institutional and organisational structures, but also shaped informal elements such as norms, practices, routines, and codes of conduct. Hence, by examining perceptions of various actors I wanted to verify my assumption that forced transition went wrong because it was viewed in a very narrow sense of changing formal arrangements, which led to a mismatch between formal and informal set-ups.

Before proceeding further, I will clarify my philosophical stance. After all, the sciences emerged from philosophy, and in the past philosophy was considered the central mode of intellectual inquiry. Moreover, epistemological and ontological assumptions inevitably shape the way we understands our research questions, affect the choice of methods we use and define how we interpret our findings (Crotty 1998). As Saunders et al. (2009) put it: "The researcher who is concerned with facts, such as the resources needed in a manufacturing process, is likely to have a very different view on the way research should be conducted to the researcher concerned with the feelings and attitudes of the workers towards their managers in that same manufacturing process". Ontological assumptions provide a philosophical grounding for deciding what constitutes the nature of social reality (Blaike 2010). My ontological assumption is idealism. I believe that our perception of an external independent reality is subjective as it is mediated by different social constructs and ideas. Epistemology is concerned with the nature of knowledge, its possibility and criteria we use for ensuring its adequacy and legitimacy (Ibid.). My epistemological assumption is constructionism, which views reality as being constructed through social interactions. The constructivist perspective seeks to discover how encounters of people with the physical world and their interactions with other people create reality through their interpretations of these events. In this thesis I adopted an interpretivist perspective as a research paradigm. The primary focus of research undertaken within interpretivist paradigm is the way people interpret reality through social constructions such as language, documents, shared meanings, etc.

2.3. Verifying a hypothesis through a single case analysis – the crucial-case method

Although the necessity to switch to a conduct of a single case qualitative research by the very definition conflicted with my initial intention to produce a reliable generalisation, I aimed to overcome its inherent limitations by making the analysis implicitly comparative. In my early research design, the goal of causal generalisation was given precedence over the goal of historical interpretation (section 2.2.). Accordingly, I was worried that the necessity to switch to single case research design might imply the need to compromise on the ability to produce a robust generalisation. Indeed, many single case study researchers want to examine specific cases because of their intrinsic value and therefore explicitly reject empirical generalisation as an appropriate goal. For instance, Eysenck (1976, p. 9) rather convincingly argues: "Sometimes we simply have to keep our eyes open and look carefully at individual cases – not in the hope of proving anything, but rather in the hope of learning something!". While the debate over the role of generalisation in social inquiry is somewhat impossible to resolve, it is still possible to point out why it is so difficult to produce robust generalisations based on a single case. The key reason why single case studies are rarely suitable for making stable generalisations is simply because they are not designed to be comparative. Comparisons are crucial for making robust generalisations as they allow to "…control (verify or falsify) whether generalizations hold across the cases to which they apply" (Sartori 1991, p. 244). Therefore, I intended to make this research implicitly comparative and to seek explanations not in the details intrinsic to the national experience of a selected case, but in the factors that form causal patterns across a cluster of similar cases.

Homogeneity of the contexts of former centrally-planned economies and their clear-cut distinction from market economies were the key factors that enabled me to conduct analysis in such a way as to make it implicitly comparative. One of the main reasons why single case studies can rarely become implicitly comparative is because concepts that qualitative-oriented researchers usually seek to understand make the national contexts to which they are applied too unique and heterogenous to be studied in a comparative perspective. In other words, when being altered to include an implicit comparison, single case study studies often experience the 'travelling problem' – the phenomenon that occurs when a concept constructed for one country is not really useful or meaningful when applied to another country (Sartori 1970). The most common response to the 'travelling problem' is to modify a concept in such a way as to make it broader and hence increase its scope of application. Unfortunately, such modifications often lead to the 'conceptual stretching' – a mismatch between the concept and the case to which it is applied, that reduces the ability of the concept to relate successfully to substantive questions (Ibid.). However, neither the 'travelling problem' nor the 'conceptual stretching' would be an issue if all countries descended from the Soviet Union were incorporated into an implicit comparative framework. The fact that for more than seven decades former centrally-planned economies were part of a single country that was also paradigmatically different from market economies provided me with an opportunity to formulate a hypothesis in a very precise manner without worrying about mixing apples and oranges.

While the aforementioned specificities of former centrally-planned economies would enable me to include fifteen countries into implicit comparative framework without resorting to conceptual vagueness, I had to be extremely careful while formulating a hypothesis. The main reason for that is because there is no theory on transition (Turley and Luke 2011, Becker

and Becker 1996, Stiglitz 1994, Levine 1992, Lavigne 1995). As Papava (2005, p. 14) puts it: "It may be stated without reservation that there is no economic theory of transition at all… It must be emphasized that, from the standpoint of Western economists, even the problems of centrally planned development, not to mention those of transition to market, have always been considered a temporary deviation from the generally accepted capitalist norm. For this reason, thinking of transitionary problems is to them nothing but a waste of time". Due to the lack of well-established and verified theory, linking multiple problems experienced by the former Soviet republics during forced transition to market relationships to the specificities of the centrally-planned regime, I analysed and articulated which of its features still have influence on innovation processes (section 3.2.). I expected that by undertaking this step I would put analytical constraints on any of my own inclinations to draw the attention of the reader away from the factors that explain causality across all cases, and towards details intrinsic to the national experience of a selected representative case. Moreover, since my research was entering uncharted waters, I realised that I need to employ a research design that would allow me to verify conclusively and unequivocally that my hypothesis holds across an entire population of cases to which it will be applied.

Upon examination of the literature and the data available in the preliminary investigation, my attention was drawn to the fact that market fundamentalists assume that the centrally-planned regime was nothing more than an experiment of the Soviet authorities aimed to replace market forces with planning procedures. Since transition economies are viewed as aberrations of capitalism now turning into 'fully-fledged' market economies, the role of informal constraints, embedded in minds of participants of innovation processes was completely disregarded (section 3.2.). Accordingly, many respectable scientists and decision-makers in international organisations suggested it would be best to focus exclusively on the speedy transformation of formal organisational and institutional set-ups. For instance, Nobel laureate Gary Becker and historian Guity Nashat Becker (1996, p. 259) argue: "The very different paths taken toward market economies by the ex-communist nations provide a remarkable laboratory on how to transform centrally planned economies. The evidence from these experiments is loud and clear: It's best to introduce large changes rapidly without waiting to discover the "right" sequence of reforms. Moving quickly allows the transformation to be guided mainly by the spontaneity of innovative market forces rather than by government planners or technocrats…". However, I was convinced that the centrally-planned regime was a fully developed, well-functioning system (section 3.2.). I believed that socialist values and principles not only defined the formal arrangements pertained during the Soviet era but also had a strong influence on formation of informal, tacit elements of the system such as practices, routines, and codes of conduct. Unlike formal arrangements, informal constraints are extremely sticky and path dependent. Therefore, I hypothesised that the reason why transition economies experience difficulties in the process of accession to the WTO is because formal organisational and institutional set-ups adopted in the course of forced market-oriented reforms do not fit well with long-established informal elements embedded in the mindsets of domestic actors.

The most definitive way to verify that a hypothesis holds across a cluster of cases to which it is applied is to use the crucial-case approach. The idea that a particularly informative single case can be employed in order to prove or disprove a hypothesis that describe causality in a broader population of cases was first introduced into social sciences by Harry Eckstein (1975). The crucial-case approach is based on selection of a case that represents the most- or

least-likely scenario for a given proposition and is therefore strongly biased towards exhibiting a certain outcome. A most-likely case has an extremely high probability of validating the outcome predicted by the proposition under investigation. If the outcome predicted by the proposition does not occur, it provides a strong disconfirming evidence. A least-likely case has an incredibly low probability of validating the outcome predicted by the proposition under scrutiny. If the outcome predicted by the proposition is found to be valid, it provides a strong confirmatory evidence. A classic example of a least-likely case is Michels's (1962) study of oligarchy in large-scale organisations. Michels hypothesised that the key reason why the society is dominated by those few at the top is because oligarchy is an intrinsic feature of any complex social system. The study examined horizontally-structured political parties with strongly expressed commitments to extension of democracy. By showing that the organisations which had extremely low probability of being oligarchical were in fact undemocratic in their internal structure, he proved the ubiquity of oligarchy in bureaucratic, hierarchically organised entities. A corresponding example of a most-likely case is Jung's (2012) study of relationships between power sharing and democratisation in civil war-torn countries. According to Jung, the United Nations and other international actors that provide external oversight of peace-building operations have viewed short-term peace-making and long-term democracy promotion as non-conflicting, sequential objectives that could be achieved through establishing power-sharing institutions. Bosnia and Herzegovina was the most likely candidate for long-term democracy promotion among countries under oversight of international mediators due to the largest extent of power sharing. The author through detailed examination of dysfunctional institutions of Bosnia and Herzegovina shows that as a result of rigid power sharing arrangements, military stalemate turned into political stalemate, obstructing democratisation efforts in the long run. As can be seen from the examples provided, a case can be considered crucial only if characteristics of that case are central for confirming or refuting a hypothesis.

In order to verify my hypothesis that the main reason why former Soviet republics experience significant difficulties during the forced transition to market relationships is a mismatch between newly introduced formal arrangements and well-established informal constraints, I selected a country that would most-likely avoid facing such problems. Much to my surprise, Kazakhstan, my home country, represented a crucial case in relation to my hypothesis for two reasons. The first is that Kazakhstan's accession lasted nineteen years and became the longest in the history of the WTO. Since Kazakhstan's institutional and organisational set-ups were transformed more gradually then in any other transition economy that accessed the WTO, it had the biggest potential to avoid systemic problems, caused by a mismatch between the formal and informal elements of the system. It can certainly be argued that the policies of some post-Soviet nations could have accelerated the process of adaptation of the mindsets of people to new political, social, and economic order more than actions of other former centrally-planned economies. In reality, people's minds are not something that are so easily affected by governmental policies, and therefore little could have been done in this respect. Nobel laureate, Douglass North (1990, p. 6) notes: "Although formal rules may change overnight as the result of political or judicial decisions, informal constraints embodied in customs, traditions, and codes of conduct are much more impervious to deliberate policies". The second reason that makes Kazakhstan a crucial case is that WTO officials claim it benefited the most from the accession (WTO 2018[1]). Since it is claimed that Kazakhstan is the most successful case, it is most likely that hypothetical problems associated with a mismatch between formal arrangements and informal constraints would not manifest themselves. Therefore, if it were found that Kazakhstan failed to avoid the problems caused by a mismatch of formal set-ups and informal elements, it is likely that other transition economies would experience similar problems as well. Therefore, it would be reasonable to claim that tendency

of the WTO to disregard differences in the contexts of former centrally-planned economies and market economies by imposing prescriptions of the Washington Consensus on every acceding country is fundamentally wrong.

2.4. Data collection and analysis

At the core of this thesis are insights drawn from an extensive number of interviews with the key actors involved in the evolution, design, and implementation of innovation policies. The fieldwork was undertaken over a period of two years. Overall I conducted 73 semi-structured face-to-face interviews and organised 5 dedicated discussion workshops. Interviews were conducted in face-to-face interactions as it was shown through a series of experiments that quality of data derived from telephone interviews is usually inferior (Bryman 2012). Three participants were interviewed twice, two persons were interviewed four times. The majority of interviews were digitally recorded. The recorded interviews were transcribed in full length. Aside from formal interviews, numerous discussions, informal interviews and clarifying consultation sessions were held with both interviewees and other people. All the interviews and discussion workshops were carried out by me personally. Interviews were conducted in Russian because it is the universal language of communication in all countries of the former Soviet Union and the mother tongue for a vast majority of the population of Kazakhstan. Quotes from interviews have been translated by me. This thesis has been assessed against the University of Edinburgh's Research and Research Ethics Committee's self-audit procedure for ethical review and deemed not to require further ethical review (Appendix). Interviews were conducted only after obtaining informed consent from participants. Other data sources used in this thesis were publicly available and not ethically sensitive.

Organisations	Interviewees
Senate of the Parliament	Mikhail Bortnik, Senator, Member of the Committee on Economic Policy, Innovative Development and Entrepreneurship
Senate of the Parliament	Askhat Kuzekov, Senator, Member of the Committee on Economic Policy, Innovative Development and Entrepreneurship
Ministry of Investment and Development	Yerlan Khairov, Vice Minister
National Agency of Technological Development	Sanzhar Izteleuov, Chairman of the Board
National Export and Investment Agency "Kaznex Invest"	Borisbiy Zhangurazov, Chairman of the Board

The National Agency on Development of Local Content	Kairat Bekturgenev, Chairman of the Board
Kazakhstan Industry Development Institute	Aydin Kulseitov, Chairman of the Board
The National Chamber of Entrepreneurs "Atameken"	Nurzhan Altaev, Deputy Chairman of the Board
East-Kazakhstan's Chamber of Entrepreneurs "Atameken"	Igor Shatskiy, Director
East Kazakhstan's Department on Natural Monopolies Regulation and Competition Protection	Kairat Urazbayev, Director
Ulba Metallurgical Plant	Nurlan Musin, Chief Executive Officer
JSC Azia Avto	Erzhan Mandiyev, President
D. Serikbayev East Kazakhstan State Technical University	Oleg Gavrilenko, Vice-Rector on Science and International Cooperation
Technology park "Altay"	Duman Tastanbekov, Director

Table 2.1. Interviewees

In-depth, elite interviews were my primary data sources. Interviewees for this thesis were selected on the basis of their involvement in decision-making processes, knowledge of subject and seniority within the public, quasi-public and non-governmental sectors. By conducting interviews with individuals involved in devising the national strategy for technological development and who bore responsibility for the transformation of the innovation system (table 2.1.), the research aimed to obtain vital information on decision-making processes undocumented in official sources. I was particularly interested in conducting interviews with representatives of the Ministry of Investment and Development and four main governmental agencies, charged with implementation of Kazakhstan's strategy technological development (diagram 2.2). The primary data sources also included interviews with informants from academia, industry, and business community. I opted for semi-structured interviews because structured interviews are more suitable for quantitative approaches where it is important for the researcher to maximise the reliability of measurement of key concepts

(Bryman 2012). Meanwhile, semi-structured interviews allow some flexibility, in comparison with structured interviews, due to an ability to vary the sequence of questions and the tendency to keep asking further questions in response to significant replies. I paid specific attention to information provided by four key informants – Oleg Gavrilenko, Borisbiy Zhangurazov, Nurzhan Altaev and Aydin Kulseitov (table 2.1.). As key informants they possessed special knowledge and had access to observations and perspectives denied to others. Therefore, I tried to ask them open-ended questions in order to give them an opportunity to talk about things they considered important. Aberbach and Rockman (2002, p. 674) note: "Elites specially – but other highly educated people as well – do not like being put in the straightjacket of close-ended questions. They prefer to articulate their views, explaining why they think what they think". Such tactics proved to be highly effective because they did not try to avoid difficult questions and sought to focus my attention on the most problematic matters, brining fresh insights to this research project.

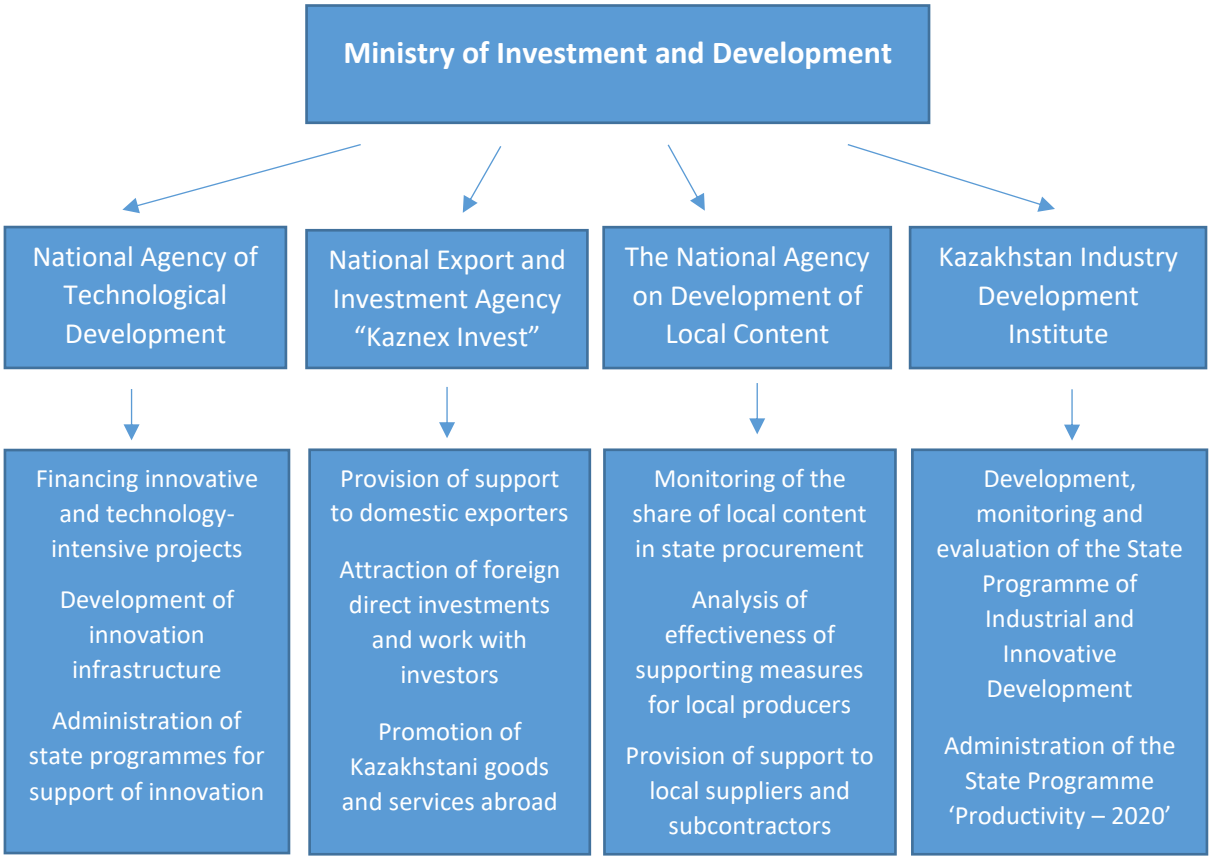

Diagram 2.2. Governmental agencies, responsible for technological development.

Source: Official websites of governmental agencies.

Since negotiating access to elite interviewees represents a challenging task for many researchers, I thought it would be proper to share some observations that may prove helpful. The key reason why qualitative research involving elites is rarely undertaken is because obtaining access to interviewees is usually problematic. Indeed, Thomas (1993) reports spending two years trying to negotiate access to two executives in a large manufacturing company. Nevertheless, I found that elites tend to collaborate enthusiastically if the researcher is capable of convincing them in his/her ability to use the respondent's input in such a way as to make a worthwhile contribution to knowledge. This is because normally elite interviewees

have a lot of things to say and participation in a research project provides them with an opportunity to draw attention to the issues that they believe are overlooked or misinterpreted by mass media. This is especially relevant for countries like Kazakhstan, where freedom of the press is heavily curtailed and media content reflects only mainstream views, formed by the established ideology (section 4.3.). I figured that the best way to convince elite interviewees that I possess the required level of competence was to send them in advance a list of preliminary interview questions. While such strategy seemed risky, as it would ruin my chances of ever gaining access if elites found my questions dull, vague, or predictable, my expectations were very high because I intended to proceed only after having undertaken several important steps. What I did not expect, however, was that well-elaborated interview questions had a signalling value, for as one respondent pointed out, the evident effort put behind their preparation had clearly indicated that the goal of the enquirer was to seek knowledge, rather than pursue some ulterior motive, such as establishing contacts that could have been used for personal gains.

There were several steps that I needed to undertake in order to make sure that the choice of preliminary interview questions would persuade the elites to participate in my research project. Firstly, I conducted an excessive number of interviews with regular respondents of various backgrounds to understand which questions to ask elite interviewees and how exactly to formulate them. This was vital because despite my understanding of the 'real world of policymaking', knowledge of local context and academic involvement, I could not clearly identify systemic problems without getting feedback from different stakeholders. Secondly, I analysed every media interview in which potential respondents recently participated. Not only it enabled me to identify the focal points which they consistently tried to bring up, but could not discuss in-depth due to the format of media interviews, but also allowed me to demonstrate the level of my preparedness by incorporating references to these interviews into the questions. Thirdly, I examined thoroughly the national legislation in order to find out where exactly lay boundaries of responsibilities of governmental agencies that elite interviewees represented. The importance of this step is easy to overlook, but I was aware that the responsibilities of different governmental agencies frequently overlap and high-ranking officials might be reluctant to answer questions if they think that they mostly fall under the authority of another governmental agency. Finally, I included in the list some questions that would enable elite interviewees to discuss in-depth impact produced by the organisations they represent. My assumption was that by doing so I would ease the process of negotiating access to the elites as they would more likely agree to participate in the research project if the interview would provide them with an opportunity to promote values and interests of the entities they represent in academic circles. I approached the process of selecting interview question with extreme diligence because I relied on their depth and soundness in gaining access to elite interviewees rather than on my status, connections, or luck.

On many occasions it was evident that the choice of interview questions rather than any other factor influenced the decisions of the elites to contribute to my research. I would like to discuss two of such instances because they offer some interesting observations. In the first case I negotiated access to the Deputy Chairman of the Board of the National Chamber of Entrepreneurs. Initially, the list of questions was passed to the Press Secretary, who informed me that the Deputy Chairman has a terribly busy schedule and arranging a research interview would be impossible. However, I was assured that the Deputy Chairman would receive the list, so that he could decide which department would provide me with a written response. That

seemed as an acceptable compromise because I needed data, possessed solely by the Chamber. Obvious downside of a written response would be inability to ask clarifying questions or change them because of what a respondent would have said. Much to my surprise, I was contacted the next day and face-to-face interview with the Deputy Chairman was organised. The second occasion I wish to discuss is related to how my interview with the Vice Minister of Investment and Development was arranged. Originally, I aimed to interview another high-ranking official, who decided to decline my request. Nevertheless, in our phone conversation he offered his help in arranging an interview with a person whom he thought would be better suited to answer my questions. Within just one hour an interview with the Vice Minister was arranged. As the meeting was organised so fast, the Vice Minister never saw the interview questions, which is why some questions caught him off guard, making him very defensive and creating a distrustful atmosphere. The fact that the questions cornered him was confirmed a few hours after the interview was over, when his secretary contacted me and asked to send them the list of interview questions. When I asked why, she explained that the Vice Minister found the questions very tough and would like to be prepared in case if one day mass media would start asking similar questions. What is interesting about these two cases is that they demonstrate that sending questions in advance may benefit a researcher in several ways. Firstly, a researcher can gain access to otherwise unavailable data because busy elites may choose to provide a written response, which is a popular option for large organisations and governmental agencies. Secondly, elites who for some reasons are reluctant to participate in a research project can find a suitable substitute among their junior colleagues if they think that the interview questions raise important issues. Thirdly, the knowledge of what issues would be raised may help interviewee to prepare for tough questions that may otherwise sound confrontational and undermine attempts to establish a trusting environment.

I opted to rely solely on quality of research questions in the process of negotiating because gaining trust of elite interviewees was as important as gaining access to them. It is frequently assumed that the researcher's own status and connections is what largely defines whether the process of gaining access to elite interviewees would be successful (Vaughan 2011). And surely, my long-term civil service employment provided me with many useful contacts, which meant that using them would be the easiest way of arranging interviews. However, I realised that pulling the strings would not produce a good impression on elite interviewees, which was vital for getting access to sensitive information. In Kazakhstan, too many things depend on connections and tendency of people to rely mostly on personal networks seriously annoys those in senior positions whose achievements are of their own (as is evident in my interviews with the Senator Bortnik and the Director of East-Kazakhstan's Chamber of Entrepreneurs). So, knowing that, I decided to let the quality of interview questions to speak for themselves in gaining access. That worked out perfectly not only because most of my requests were approved, but also because casually mentioning common acquaintances and civil service background during the interview, rather than in the process of negotiating access produced a very positive effect on participants and enabled me to gain their trust. The fact that I was identified by interviewees as one of them was indicated not only by their willingness to discuss the most sensitive matters, but also by various subtle signs, such as their tendency to refer to other elites by mentioning solely their first names instead of full names or the titles of their official positions (note my interviews with the Vice-Rector and the Chairman of the Board of National Agency for Technological Development). While that might not seem as important a detail in the context of other countries, in Kazakhstan it was a distinctive sign that I gained

their trust because elites in conversation with an outsider would never refer to other people in senior positions only by their first name.

The secondary data has been collected from surveys, official statistics, periodical publications, and public records. I paid specific attention to the annual Addresses of President Nursultan Nazarbayev to the nation, which serve as guidelines for the government and reflect his visions for Kazakhstan's development. While I used statistical data in this research, I was aware of its limitations. Official statistics in Kazakhstan are often criticised for being an unreliable source of information. A recent scandal with statistical data happened on the eve of 10-year anniversary of Kazakhstan's new capital, Astana. Statistical reports published in May 2016 show 880 thousand people living in Astana. However, in July 2016, a couple of days before the city's anniversary celebration, akimat (the municipal government) of Astana announced that millionth inhabitant of the city was just born. Akim (mayor) of Astana congratulated the parents of new-born and in front of the press handed over to them keys from new apartment as a gift. The fact that population of capital somehow increased by 120, 000 people in just two month was met with plenty of scepticism amongst citizens (Bekmaganbetov 2016). While it is assumed that international statistics are more reliable, one high-ranking official clarified to me that it is still largely based on data provided by Kazakhstan's Committee on Statistics.

Aydin Kulseitov, Chairman of the Board of Kazakhstan Industry Development Institute, comments on the accuracy of statistical data:

> It is claimed that approximately 75 percent of works and services in oil production are localised. In services up to 80 percent. But in fact, we understand that in oilfield services the numbers are much smaller. When a completely foreign-owned company simply register here, it is already regarded as local. Although competences do not transfer, and all profits go abroad. On the subject of goods: localisation allegedly reaches from 30% up to 60-70%, but we know what is happening here... [refers to well-known fact that certificates of origin CT-KZ were issued with violations] That is to say, I do not vouch for the accuracy of the statistical data that we have. (Aydin Kulseitov, interview, 17th March 2016)

Deputy Chairman of the Board of the National Chamber of Entrepreneurs "Atameken", Nurzhan Altaev argues:

> Official statistics show that we are doing great, and we have an exceedingly high share of local content. Ask any national company, they will claim that they have 80-90% of domestically produced share. Although, what is really happening is when they purchase from Kazakh SP [sole proprietorship] or Kazakh LLP [limited liability partnership], it is immediately regarded as local content. The SP and LLP buy everything from abroad: equipment, components, building materials, etc. It is all imported. (Nurzhan Altaev, interview, 29th July 2016)

Sanzhar Izteleuov, Chairman of the Board of National Agency for Technological Development also elaborates on the accuracy of statistical data:

> The definition [of innovation] in the State Programme of Industrial and Innovation Development is that it is a new or improved product or service and that's

> it. Therefore, anyone who launches new product in Kazakhstan is considered as an innovator because of this definition. Out of 100 allegedly innovative firms only 30 really are. So, you can safely disregard the other 70. (Sanzhar Izteleuov, interview, 26th July 2016)

To analyse collected qualitative data I followed well-established analytical procedures. In this research project data collection and primary analysis were conducted in conjunction with each other. I followed a standard set of sequential analytical moves suggested by Miles et al. (2014), which included the following stages:

- Assigning codes to initial set of materials obtained from interviews, observations, media-coverage, document analysis, etc.
- Sorting through coded materials to isolate similarities, common sequences, patterns, and relationships between variables.
- Taking identified patterns out in the next wave of data collection to use it as a focusing device.
- Gradually elaborating assertions and generalisations that explain discerned consistencies.
- Comparing the obtained assertions and generalisations to existing theories.

In order to analyse collected qualitative data further I used mind mapping software as an auxiliary analytical tool. In qualitative research it is difficult to find an analytical path due to an abundance of data (Miles 1979). Therefore, I used Mind Genius – a mind mapping software which helped me to visualise, structure, and brainstorm my ideas. A mind map is a diagram created around a central concept, drawn as an image in the centre of a page, to which associated representations of ideas in the form of branches and sub-branches are added. Since the diagram represents an image that depicts the interplay among different ideas, it enables a researcher to visually examine various causal relationships, analyse the validity of the arguments, and keep track of developing ideas. Although it is possible to use hand-drawn maps, computerised mind maps are more convenient. Firstly, computerised mind maps usually integrate with Microsoft Office, which enables user to export project data and mind maps to Word, Excel, Outlook, and PowerPoint. Secondly, they make the process of alteration more flexible. Thirdly, they allow to use hyperlinks and search function. The process of mind mapping is very intuitive and does not require high level computer skills. However, traditional set of sequential analytical moves described above should be followed first in order to produce parsimonious assertions and generalisations, which then could be effectively visualised in the diagram.

Triangulation was a crucial part of data collection and analysis because the primary data for this research was drawn exclusively from elite interviews. It is frequently argued that power imbalance between inquirer and interviewee is both an inevitable and problematic characteristic of elite interviews (Richards 1996). Specifically, the power imbalance is considered to constitute a significant risk because elites may take control over the interview process and express their dominance by ignoring questions, making pre-emptive statements or simply saying whatever they want (Lilleker 2003). However, I have managed to establish trust and a sense of equality with the interviewees due to the fact that for many years I have been employed by the Senate of the Parliament and did not feel threatened by the power of elites. The interviews were conducted in the atmosphere of mutual respect and I detected no attempts on behalf of the interviewees to establish their dominance. I was perceived by interviewees not only as their colleague, but also as a person who understands the underlying contexts and would

not try to misinterpret their words. Therefore, triangulation was meant not to minimise power imbalance but to ensure the validity of data. I realised that sometimes the responses of elite interviewees were influenced by the interests of entities they represent. This was particularly noticeable in interview with the Vice Minister of Investment and Development when he tried to deny the fact that the industrialisation programme failed to achieve its goals. It was not something I did not expect because interviewees have motives of their own and they are not bound to be objective and tell researchers the truth (Berry 2002). Such moments were easy to detect not only because I was experienced civil servant, but also due to triangulation. As evident from many interviews I either asked subjects the same questions or asked their opinions about insights provided by other interviewees (note my interview with the Vice-Rector). This helped me to analyse data because I was able to triangulate respondents' views not only with secondary data but also with the opinions of other elite interviewees.

Since my intention was to produce robust generalisations encompassing all countries of the former Soviet Union, I conducted data analysis through the prism of cross-case patterns that can be observed in other transition economies. Gerring (2007) argues that examination of a single case should also necessitate conduct of a cross-case analysis, or at least encourage the researcher to keep in mind a broader set of cases because otherwise it becomes impossible to answer the primary question all case studies should answer, and that is 'what is this a case of?' For me, bearing this question in mind was absolutely crucial because there was no theory on transition that would put analytical constraints on my reasoning and therefore I might be inclined to include in my analysis factors that were intrinsic to the case study under observation but irrelevant to other economies in transition. Therefore, I kept reminding myself that this research project was never about examining solely the case of Kazakhstan, as from the very beginning I was interested in unravelling causal relationships between the poor economic and technological performance of transition economies and their accession to the WTO. I also had to remember that the only reason why I chose to examine the case of Kazakhstan was because it was the crucial case that would enable me to verify my hypothesis encompassing all transition economies while conducting in-depth contextual analysis. However, I realised that the validity of extrapolation from the case of Kazakhstan to the parent universe hinged not so much on the fact that it was a crucial case, as on cogency of my interpretation, something achievable only if I analysed the case in a comparative context. Therefore, every factor that I discovered in the process of examination of case of Kazakhstan served as a peg or a signpost that upon implicit comparison helped me to establish generalisable causal patterns across all economies in transition.

2.5. Methodological limitations

From the very beginning of this project I was aware that making research in social science inevitably implies the need to make compromises. The famous French mathematician, Henri Poincaré, once remarked: "natural scientists always discuss their results while social scientists discuss their methods" (Bierstedt 1977, p. 43). The necessity to discuss methods in social sciences stems from the fact that every researcher needs to make certain trade-offs while designing their project. The biggest compromise I had to make was related to the representativeness of interviewee participants because I chose to conduct only elite interviews. The reason for that was ethical concerns regarding safety of interviewees. When it comes to rights of expression and freedom of speech, Kazakhstan is ranked as one of the least free countries in the world, holding only 22 out of 100 aggregate freedom scores (Freedomhouse 2019). At the beginning of this research I tried to interview different groups of people in order

to get diverse first-hand feedback. However, I realised that due to a lack of knowledge about what can safely be said publicly, some interviewees could jeopardise themselves if this thesis became publicly available. On one occasion, a participant became extremely nervous at the end of the interview and asked me whether he could be imprisoned for the things he said. Therefore, I decided to interview only members of the elite, and to delete all the interviews in which participants endangered themselves. While I was concerned about the safety of interviewees, I felt comfortable about interviewing the elites because they are used to being asked their opinions and know what can be said without consequences.

Another methodological limitation of my research relates to the necessity to mediate the transfer of meanings from one language and, more importantly, one context to another. Primary data for this research was collected in Russian and therefore needed to be translated into English. The main difficulty in performing such a task lay not in finding linguistic equivalents in two languages but in providing the reader with valid equivalencies in terms of conceptual meanings. Every language has zones of "intermittent untranslatability" (Ricoeur 2004, p. 6), caused not so much by the difference in vocabulary and syntax as by the difference in cultural heritage and history. Consequently, my task was to find comparable meanings that would replace untranslatable concepts, thereby bringing the context closer to the reader. Because of my familiarity with the nuances of both languages and understanding of the context of transition economies I was able to provide communication between informants and the reader, which makes my intervention legitimate. In many instances, however, my intervention was not only legitimate but also vital because cultural, historic, economic, social, and political differences between the republics of the former Soviet Union and the Western world are paradigmatic. Owing to these differences, many things that need not to be explained in one setting, require thorough articulation in another. The problem was that since interviews were conducted in their native language, respondents felt no need to be explicit about things that would be obvious to any other member of their society. For example, as can be seen in my interview with the Chairman of the Board of National Agency for Technological Development, the informant felt no need to clarify to me that corruption was a byword for the jobs in the government, the quasi-public sector, the customs and the traffic police. My intervention was necessary because for the reader from the Western world, such jobs would not necessarily be associated with corruption. While my main task was to make primary data clear to the reader, I also wanted to minimise my intervention in order to avoid any potential bias. Therefore, I provided explanations to information that was implicit in the statements of respondents in comments to each interview.

2.6. Conclusion

Since it is generally assumed that the centrally-planned regime was merely a deviation from generally-accepted path adopted by market economies, the WTO encouraged governments of transition economies to focus exclusively on transforming their formal set-ups. The use of a single-case research design in this thesis allows to emphasise paradigmatic difference of norms, values, codes of conduct and practices intrinsic to former centrally-planned economies from that of market economies, needed for providing a detailed explanation of why the imposition of the WTO requirements caused a mismatch between formal set-ups and well-established informal constraints. While normally it is impossible to generalise from a single case study, the fact that transition economies represent a fairly homogenous cluster of countries with clear cut differences from market economies makes this research implicitly comparative, thereby providing reference points for establishing generalisable causal patterns across a number of cases. Moreover, I argue that a crucial case research design can be used in

order to produce a robust generalisation on the basis of a hypotheses that the key impediment for successful transformation lies not in the task of changing formal structures of transition economies, but in making them fit with long-established informal constraints, entrenched in the mindsets of domestic actors.

3. LITERATURE REVIEW

3.1. Introduction

The purpose of this chapter is to review the theoretical basis upon which empirical, theoretical, and practical contributions of this thesis are made. Section 3.2. addresses some common misconceptions about the centrally-planned regime by describing the arrangements that pertained during the Soviet era. Section 3.3. examines what the literature provides with regard to impact of the rules governing the process of accession to the WTO on technological development of latecomers and those lacking bargaining power. Section 3.4. scrutinises how the literature has addressed the very controversial topic of the spillover effects associated with FDI. Finally, section 3.5. reviews how rationales for governmental intervention are conceptualised in innovation systems studies and neoclassical economic theory.

3.2. Command economy – an aberration of capitalism or a fully functional system?

The specificities of the model of technological development, adopted by the Soviet Union are frequently examined independently of the goals for which they were created, leading to misinterpretation of the command economy as an aberration of capitalism. Although the literature is full of detailed descriptions of how the Soviet model of technological development had functioned, the reasons why it was adopted in the first place are rarely discussed. The United Nations Economic Commission for Europe (2012, p. 51) explains the specificities of the innovation system of the Soviet Union in the following way: "The National Innovation System of centrally planned economies had a number of unique characteristics. New knowledge generated by basic research was transferred in a planned manner to applied research institutes, design offices, pilot factories, and, in the end, to final production. The main producers of knowledge, i.e., R&D organisations, were isolated from both education and industry. State resources were allocated in a centralized manner to achieve specific goals, but the role of bottom-up initiatives was virtually non-existent". It is evident from this quotation that while the emphasis is placed on the most salient organisational features of the command system, no real attempt is made to explain the reasons why they were adopted. Such descriptions are ubiquitous, which is why so many researchers are inclined to make false assertions about the nature of the centrally-planned regime. For instance, Shields (2012, p. 12) argues: "The planned economy was an historical anomaly, an aberration, an experiment that has been tried, found wanting and rejected". In reality, the establishment of the command regime was neither an experiment, nor merely an attempt to replace market forces with planning procedures, but rather the result of a conceptually different paradigm of development, adopted by the Soviet Union in order to achieve the goals of socialism.

The main goals of the socialist society were eradication of inequality, speculation, unemployment, and exploitation. Therefore, the operation of the entire centrally-planned system, including functioning of its formal set-ups as well as informal, tacit elements such as practices, routines, and codes of conduct were adapted to fit with the socialist values and principles. It aimed to overcome one of the main problems of capitalism – the accumulation of wealth in the hands of a few. Due to this flaw in the market relationships model, the most deprived 20 percent of the world's population account for only 1.3 percent of total private consumption expenditure, while the richest 20 percent account for 86 percent (UNDP 1998). In market economies "technology is created in response to market pressures - not the needs of poor people, who have little purchasing power" (UNDP 2001, p. 3). For instance, according to the Global Forum for Health Research (1999) only 10 percent of all investments made by both public and private sectors are used to research health problems of 90 percent of the world's

population whereas 90 percent of all funds are spent on research into health problems that concern only 10 percent of the people. In contrast, the innovation process in the Soviet Union was targeted towards the needs of most of the population, rather than its wealthiest part. Considering that the model of technological development adopted by the Soviet Union was designed to fit the values of the socialist society, it makes more sense to talk about two conceptually different models of technological development rather than simply assume that the Soviet model was an aberration of capitalism. The Soviet Union's model of technological development can be described as science-push, which sharply contrasted with market-pull model adopted by market economies.

Market-oriented researchers have a tendency to disregard how the main purpose of adopting the science-push model was to pursue the communist values and principles, which led them to draw spurious causal links between technological performance and specificities of the model of technological development adopted by the Soviet Union. Different researchers put forward different arguments about why certain specificities of the innovation system of the Soviet Union made it inferior to the one adopted by the market economies. Essentially, focus was placed upon different features of the science-push model vis-à-vis its ability to produce high-end consumer products, while the fact that the choice of the model of technological development was defined by the goals of socialism was completely ignored. So, Siemaszko (1982) argues that the absence of competition and isolation of manufacturers from users impeded the progress of technological innovation in the Union of Soviet Socialist Republics (USSR). Hanson (1982) mentions that the inability of production units to switch their sphere of operation in accordance with their own vision, disincentivised the introduction of new technologies. Berry (1982) asserts that the technological development of the Soviet Union was held back by the tendency of industrial players to ignore improvements in the manufacturing process that would benefit the customer, but which increase labour input or cost for the producer. To sum up, criticism of the Soviet regulatory framework was usually based on how "in the Soviet system…the drive for technical progress comes not from a competitive market, but from central government" (Zaleski et al. 1969, p. 404). However, the science-push model was there not to increase labour productivity or enable manufacturers to produce high-end consumer products, but to deliver cheap, accessible goods which could be equally distributed among the entire population while providing as many jobs as possible in the process of their manufacturing. Neither competition between different production units, nor feedback relationships between manufacturers and consumers would improve the ability of the system to achieve the goals for which it was designed.

While market-oriented researchers attributed the Soviet practice of separating R&D players from industries and end-users to a linear understanding of the innovation process, the reality is that the innovation process was deliberately fragmented in order to exclude pressures exerted by consumer demand and downstream implementation concerns. The organisational arrangements of the science-push model make little sense from the point of view of market-oriented researchers. Hanson and Pavitt (1987, p. 24) argue: "One feature of the Soviet organizational structure for RDI [research, development and innovation] is its fragmentation… Frequently, at least in the past, a Soviet industrial design bureau, for example, would design a machine without having any information about the particular machine-building enterprise at which that machine might first be made, let alone the enterprises where it might eventually be used". Since the centrally-planned economy is generally considered to be a non-system, attempts were made to explain the fragmentation of the innovation process in the Soviet Union

by claiming that the government had a linear understanding of innovation. Linear thinking, based on the assumption that the creation of new technologies consists of fixed sequence of phases with basic research at the beginning of a causal chain, followed by applied research, resulting in the production and diffusion of innovations is indeed a widespread phenomenon among policy-makers (Velasco 2015, Tait and Williams 1999). Accordingly, Cooper (2010, p. 367) states: "In the U.S.S.R. the innovation process was always understood, implicitly by government officials and often explicitly by economists, as a linear process". Such an argument, however, does not take into consideration the fact that the science-push model aimed to achieve the goals of a socialist society. The Soviet Union did not experience a shortage of viable technologies because the lack of practicality in the outputs of academic institutions was compensated by imitative and adaptive R&D, which in the Soviet Union was performed on a large scale basis (Hanson 2003). At the same time, due to the fragmentation of the innovation process under the organisational paradigm of the science-push model, scientists were able to pursue research objectives without being held back by matters of commercial practicality or downstream implementation concerns.

In the Soviet Union research was pursued with little regard to limitations of industrial players or considerations of commercial practicality because science was viewed as a means of solving only strategically important goals. The science-push model provided the authorities with total control over innovation processes, enabling them to pursue the goals they considered crucial. Graham (1993, p. 201) mentions: "Soviet strengths in "big science and technology" in areas such as atomic weapons and space technology came from centralized government control over resources and personnel, a degree of control, possessed by few other governments". The lack of commercially viable components in research outputs of Soviet scientists was compensated by imitative and adaptive R&D, conducted by science production associations. Science production associations – the locomotives of Soviet R&D – were heavily engaged in frugal innovation; the process of reducing the complexity and cost of an original good and its production. A fully-fledged science production association usually included a research institute, a design unit, experimental production facilities, and production plants. Different products purchased from abroad were used as prototypes and reverse engineered in order to create cheaper equivalents in which nonessential features were removed (Hanson 1982). As Berry (1982, p. 91) puts it: "the whole Soviet R and D system was set up to do just this: to adapt Western technology for production in Soviet conditions". Owing to frugal engineering of consumer products, it was possible to keep the budget of civil R&D relatively low. Accordingly, while the ratio of gross expenditure on R&D (GERD) to gross national product (GNP) in the Soviet Union was about 4 percent, more than 70 percent of the R&D budget was spent on space and military research (Freeman 1995). Although the view of science as a means of solving only strategically important goals was the main reason why the Soviet Union lagged far behind Western countries in terms of sophistication of consumer products, it also enabled Soviet scientists to focus on 'big science and technology' in areas such as space exploration, nuclear power and military technology.

Another prominent feature of the science-push model of technological development which makes little sense when being examined from the standpoint of market-oriented researcher is the fact that getting the science right was more important than brining technology to the marketplace. The structure of incentives and the organisational framework in the Soviet Union were designed to pursue scientific objectives with little regard to goals and potential limitations of industrial players or end-users (Amann 1982). The reason for that is because the

innovation process in the Soviet Union was adapted to economic relationships which were based on central planning rather than market principles. The central government acted as a sole mediator of science-industry relationships, controlled the supply of inputs and allocated outputs to end-users, whether industrial or individual consumers. There was no need to pass on all achievements of R&D to the customers because materialism and consumerism contradicted the values of a socialist society. However, it was extremely important to create an environment that would incentivise researchers to contribute to the goals of a socialist society. Accordingly, while production and distribution stages were heavily controlled by the government, R&D activities were much less so. Neither ministries nor other central planning agencies were in position to determine research priorities or to terminate questionable lines of investigation which often reflected pet interests of individual researchers (Ibid.). Moreover, in the Soviet Union successful completion of projects was not compulsory, because the key indicator of fulfilling the requirements of the plan was utilisation of the research organisation's budget (Berry 1982). Not being exposed to time pressure under the science-push paradigm meant that researchers were able to engage in the pursuit of risky research projects, the strategic value of which was expected to be high.

The specificities of technological development of the Soviet Union were the result of a strict adherence to the communist values and principles that not only defined its formal organisational and institutional structure, but also shaped the system's informal, tacit elements such as routines, practices, and codes of conduct. It is important to emphasise the fact that the science-push model was neither a failed experiment of Soviet authorities, nor the result of a linear understanding of the innovation process. Rather it was a well-elaborated system that was designed to pursue the goals of a socialist society by enabling participants of innovation processes to get the science done right, to focus on 'big science and technology' and to create technology that responded to the needs of most of the population. Adopted ways of doing things influenced the interaction process and shaped values and attitudes of researchers, industrial players, and end-users. Most of them sharply contrasted with the ones inherent to market relationships. For instance, Amann (1982, p. 16) remarks: "Research institutes are pervaded by an academic ethos or 'ivory tower attitude'. Since the projects initiated by the institute often reflect the pet interests of individual researchers (frequently corresponding to the subject of doctoral theses of the junior staff) there is no rational trade-off between novelty and commercial practicality and in extreme cases R and D personnel actively resist alterations to their designs suggested at enterprise level". Over the course of decades of the central planning regime, routines, practices, and codes of conduct become deeply rooted in the minds of participants of innovation processes. This is something that should not be ignored because it caused some serious policy errors in managing the transition. As Pickel (1993, p. 147) notes, the view that "the old communist order has collapsed, leaving only ruins to be cleared out of the way for a complete new construction of a market system" is naïve because "while political regimes and 'economic systems' can collapse and vanish, the people with their knowledge, habits, practices, affiliations, informal networks and organizations remain". Instead of being viewed as a non-system which is struggling to turn itself into a 'fully-fledged' open market economy, the command economy should have been treated as a distinct paradigm of socio-economic development which not only had now-gone formal structures, but also informal constraints that still remain.

3.3. Accession to the WTO

A growing number of developing countries have embarked on investment promotion measures as a policy priority, offering costly financial incentives in order to attract FDI. According to conventional wisdom, FDI play a key role in closing the technology gap between industrialised and developing countries through the international diffusion of technical knowledge. Smith (1993, p. 190) argues: "…in the contemporary world, knowledge and technological innovation are produced by an organized R&D industry. This requires elaborate and expensive infrastructures: sophisticated laboratories, legions of highly trained specialists, and extensive education systems. The associated costs may make competitive R&D activities difficult, or even impossible, in all but the most wealthy advanced societies". Indeed, it is well-established that new technological advancements are largely made in the developed countries. In 2013, the share of the world's gross domestic expenditure on R&D by high-income and upper middle-income economies constituted 69.3 and 25.8 percent, respectively, while that of the lower middle-income and low-income economies was only 4.6 and 0.3 percent, respectively (UNESCO 2015). Consequently, various studies suggest that the outcomes of R&D, conducted in industrialised countries trickle down to developing nations mainly through FDI. According to the estimations of Held et al. (1999), multinationals carry out about 80 percent of global trade in technology along with the bulk of private R&D. As a result, the governments of countries aiming to catch-up in terms of technological capabilities place attracting FDI high in their agendas, often providing foreign companies more favourable conditions than those granted to domestic companies.

Since the regime imposed by the WTO requires governments of acceding countries to adopt a hands-off approach towards multinationals, membership in the organisation significantly increases the inflow of FDI. In theory, the governments of host countries may unilaterally introduce changes in regulations, tariffs, taxation or use selective law enforcement in order to gain more benefits from the presence of multinationals, thereby negatively affecting their own interests. However, risks for investors would be much lower if their rights were guaranteed by a multilateral binding agreement rather than by a treaty with a host country. Investment protection measures of the WTO include prohibiting different practices commonly used by host governments in order to nudge multinationals into cooperation with domestic firms, such as local content requirements. Therefore, membership of the WTO can "increase the perception of a safer investment climate with a strong rule of law and the protection of property rights, similar to the negotiation of international and bilateral investment agreements" (UNCTAD 2013, p. 82). Accordingly, a number of statistical studies show that accession to the WTO positively correlates with an increase in the flow of inward FDI. For instance, analysis of data from 168 countries for the 1971-2012 period conducted by Dreher et al. (2015) shows that membership of the WTO and other investment-related international organisations considerably increased the flow of inward FDI. Similarly, after conducting statistical analysis of data of 122 developing countries from 1970 to 2000 Buthe and Milner (2008) conclude that those nation states that have joined the WTO experience significantly higher FDI inflows. Despite the binding nature of WTO commitments, developing countries aiming to catch-up in terms of technological capabilities with industrialised economies access the organisation in order to harness the benefits of FDI for sustainable development.

Whilst in theory membership of the WTO is expected to unequivocally benefit the technological development of acceding countries, in practice there are many complexities involved, the impact of which can be easily overlooked. As it is shown in the case study

presented by Fomin et al. (2011), purposeful governmental intervention might be necessary in order to help domestic firms to overcome consequences of accession to the WTO. When China joined the WTO in 2001, it had the biggest DVD manufacturing industry in the world. DVD players use codecs - programmes capable of encoding/decoding a digital data stream. Before 2001, Chinese manufacturers used MPEG-2/H.263 codec without paying royalties. After joining the WTO, Chinese manufacturers found out that they needed to pay patent fees amounting to some 10-20% of the cost of DVD units, leaving them with marginal profits. Indigenous companies lacked the capability to create an alternative codec standard. As a result, the Ministry of Information Industry established the Audio Video Coding Standard Workgroup, consisting of 192 members. More than one fifth of the workgroup members were multinationals. However, key members, contributing to the most essential patents in the Audio Video Coding Standard Workgroup, were public entities, including universities and research institutes. Even though the Chinese government managed to unite the efforts of the various actors, the workgroup was only able to present a new codec, which became an usable alternative to the dominant MPEG standard by the end of 2006. Despite experiencing a number of difficulties while developing the Audio Video Coding Standard, "the Chinese state showed its willingness to develop a long-term perspective, to review and learn from experiences, and to make major investments" (Williams et al. 2011, p. 722). What should be kept in mind, however, is that being one of the most dynamically developing economies in the world, and having immense bargaining power and strong governmental control over economic actors, China's capacity to overcome the complexities of joining the WTO was far greater than that of any other catching-up country.

The terms of WTO accession can become especially burdensome for latecomers and those lacking bargaining power, due to the nature of the rules governing the conduct of the negotiation process. The nature of the process of WTO accession is best described in the words of Grynberg and Joy (2006, p. 711): "WTO officials are fond of saying that the multilateral trading system is a rule-based system. Yet the accession process has no rules, except precedent and power, and is the very antithesis of what the members publicly state to be the intention and design of the WTO". The process of accession to the WTO consists of two substantive phases. During the first phase, the applicant country submits a Memorandum on the Foreign Trade Regime, which provides a detailed summary of the country's policies that affect international trade and investment flows. In the second phase, members of the Working Party, which includes all interested members of the WTO, conduct bilateral negotiations with the applicant country. However, since any unresolved issue between the applicant country and any single WTO member can halt the entire process, acceding countries are placed in a highly disadvantageous bargaining position. Trying to improve their access to the markets of acceding countries, incumbent members often impose extremely burdensome demands without taking into consideration how it may affect the economy of the acceding country. Since there are no guidelines that would specify the extent of the demands that can be made by incumbent members, or criteria according to which applicant's level of commitment can be judged, the terms of accession depend largely on the bargaining power of negotiating parties and economic interests of particular WTO members. Accordingly, members of the Working Party can abuse their power over the applicant country in order to obtain considerable concessions in their own interest (Grynberg et al. 2006). Allegedly flexible terms of accession for developing countries such as longer transition periods or smaller commitments are "undermined by the realities of negotiations, where the developing countries are routinely subject to bullying and deceit"

(Chang 2004, p. 688). Typically, the requirements of the incumbent members go well beyond the boundaries of the WTO agreements and have become known as WTO-plus demands.

Whilst it is the WTO-plus demands that impose the most significant compliance costs on acceding countries, the literature focuses almost exclusively on examining the side effects of formal WTO agreements. Normally, attempts by the incumbent members to obtain concessions from acceding countries during membership negotiations mean pressing them for commitments which extend far beyond the boundaries of formal WTO agreements (Jones 2010). Nevertheless, the bulk of the literature on international technology transfer consists of cross-country evaluations of the effects produced by specific formal WTO agreements e.g. the impact of intellectual property rights (IPR) enforcement caused by the commitment to the Agreement on Trade-Related Aspects of Intellectual Property Rights. In these studies researchers generally assume that accession to the WTO consists solely of bringing the national legislations into compliance with the norms stipulated in formal WTO agreements (Falvey and Foster 2006, Watson 2011). Evidently, the obligations stipulated in the specific WTO agreements represent a convenient reference point for conducting cross-country comparisons. However, such studies can only take us so far and can mislead the reader into overlooking the pitfalls of the accession process. The explanatory power of cross-country comparisons of the effects produced by formal WTO agreements is greatly diminished by the fact that the commitments stipulated in these agreements constitute the tip of the iceberg of the demands faced by applicant countries. In this respect, Przeworski (1987, p. 35) convincingly argues: "A consensus exists that comparative research consists not of comparing but of explaining. The general purpose of cross-national research is to understand". Accordingly, the research efforts should move away from cross-country evaluations of the side effects produced by formal WTO agreements to a detailed analysis of the compliance costs imposed by the WTO-plus demands of its incumbent members.

One of the reasons why it is the WTO-plus demands that affect acceding countries the most is the imperative requirement imposed on latecomers to adopt a hands-off approach to FDI. Although the Agreement on Trade-Related Investment Measures that came into force in 1995 prohibited use of certain investment measures, such as local content requirements, it contains no specific provisions regarding trade balancing rules, domestic sourcing, technology transfer or export performance requirements. Nevertheless, during accession incumbent members of the WTO usually insist upon full deregulation of FDI. WTO members justify the enforcement of a hands-off approach on the basis of an argument that deregulation and creation of a 'fair-play environment' enables catching-up countries to attract more FDI, thereby facilitating international technology transfer. Moreover, the WTO recommends that catching-up economies focus on attracting FDI because various international technology transfer studies show that multinationals have played a crucial role in building up the national industries of now-developed countries. For instance, Saggi (2002, p. 357) argues: "Many governments have increasingly recognized that multinational firms serve as conduits of superior technology, as well as of management techniques. This realisation stems from the success of countries such as Malaysia, Singapore, and Thailand that rely heavily on FDI and from a quest for the sources of their success, which include international technology transfer and local investments in infrastructure and education that facilitate absorption of technology". What such studies do not mention, however, is the fact that the Asian tigers as well as other now-developed countries in preceding waves of industrialisation were not bound by the WTO rules. In the past these countries used a wide range of FDI regulatory policies in order to achieve industrialisation, including: insistence on joint ventures with domestic firms, limits on ownership, barriers to brownfield investments (take-overs of domestic enterprises by foreign investors) and so on

(Chang 2004). Therefore, Rodrik (2002) argues that as the Asian Tigers only had to pay a small fraction of the costs of integration into the global value chain during their formative industrial growth, it would be wrong to mark them out as exemplars of modern globalisation. The WTO, in seeking to follow its own agenda, intentionally overlooks the fact that in the past, now-developed countries used a wide range of measures to regulate foreign investment and uses neoliberal rhetoric in order to deregulate FDI.

Another important WTO-plus demand which has significant compliance costs is that an acceding country must establish a market economy with minimal level of governmental intervention into economic activity in order to become a member. Even though the rules of the WTO do not prescribe what type of economic system the applicant country should have, being classified as a non-market economy results in deadlock and delays the negotiation process. The United Nations (2001, p. 34) states: "While the WTO Agreements do not have an explicit requirement that a member must have fundamentally a market economy, such a requirement is being imposed de facto by existing members as part of the leverage they have in the accession process for new members". Acceding countries have to demonstrate their adherence to the principles of the WTO by letting market forces determine prices, reducing the extent of governmental intervention and removing control over certain sectors of the economy. Moreover, most existing members press actively for the reforms that also pave the way to brownfield investments such as privatisation of state-owned enterprises, provision of information on privatisation programme, etc. The implementation of such radical reforms in a compressed time frame might be a challenging task not because legal institutions have to be changed, but because of path-dependency and inertia of the mindsets of different actors who follow implicit guidelines such as well-established practices, codes of conduct, tendencies to trust, entrepreneurial culture, risk averseness, cooperative spirit, etc. Chaminade and Edquist (2010, p. 103) argue: "The government can play a significant role in the development of the formal rules whilst in most cases this role is marginal when the most tacit elements are to be influenced (culture, firm routines, social networks, etc.)". Due to the need to adapt both formal and informal institutions the WTO-plus demands to establish a market economy with minimal level of governmental intervention might represent a massive undertaking for a country acceding to the WTO due to the fact that informal institutions are sticky and impervious to change.

The important question that needs to be answered here is whether the reform package imposed by the WTO benefits all acceding countries. Charnovitz (2015) mentions that incumbent members use the promise of membership to influence applicant countries to make changes to their economic policies. He clarifies that the normative reason used to justify this approach is that putting in place these changes will both help the applicant country, as well as benefit exporters and investors of incumbent members. The literature, however, is ambiguous on whether or not a hands-off approach to foreign investment is beneficial. On the one hand, the international technology transfer literature is full of optimistic appraisals regarding the impact of FDI liberalisation (Romer 1993). On the other hand, Chang (2004, p. 700) notes: "however 'liberal' a country may be towards foreign investment, a targeted and performance-oriented approach works better than a hands-off approach, which is recommended by the developed countries today". The same ambiguity can be found in relation to an argument whether establishing market economy relationships with a minimum of public intervention is beneficial for catching-up countries. According to OECD (1999, p. 16, my italics), "Deregulation is a subset of regulatory reform and refers to complete or partial elimination of

regulation in a sector *to improve economic performance*". In contrast, Gu and Lundvall (2006) argue the tendency of different international organisations to regard a market economy system with a minimal level of governmental intervention as a benchmark model is misleading because certain elements that worked well in one innovation system will not necessarily have the same impact on economic performance in another system. In order to estimate whether the claims that deregulation of FDI and establishment of market economic relationships unequivocally benefit catching-up economies are correct, this research aims to examine experiences of former command economies, as they have undergone the most significant change during the process of accession and, following the WTO reasoning, should have benefited from it the most.

3.4. FDI spillovers

Earlier literature suggests that domestic firms can benefit not only through vertical (inter-sector) spillovers, but also through horizontal (intra-sector) spillovers. Theoretically, multinationals may generate positive externalities to domestic competitors within the same industry through three channels: labour turnover, competition, and demonstration/imitation. Labour turnover is the first channel through which the presence of multinationals may benefit domestic firms. Multinationals tend to put significant efforts into training local employees. Domestic firms are not burdened by the expense associated with employees' training and therefore have the potential to pay higher salaries and lure trained workers away from rival multinationals (Lindsey 1986). Hence, well-performing domestic firms gain the opportunity to hire former employees of multinationals who have obtained knowledge and experience of working with superior technology (Fosfuri et al. 2001). The second channel is related to the possibility of the occurrence of positive externalities as a result of competitive challenge. The intensified competition induced by multinationals on the market of the host country may force indigenous firms to adopt new technologies, update production methods, or use existing resources more efficiently given that domestic firms have a sufficient level of competence (Blomström and Kokko 1998). A final channel refers to the technological upgrade of local firms through imitation (by indigenous firms)/demonstration (by multinationals). Adopting new technologies can be costly and can also contain unforeseen risks for domestic companies. Uncertainty over the results and costs of obtaining new knowledge may discourage local firms from updating their production techniques. However, technologically advanced domestic firms may imitate the practices of multinationals by using cutting-edge technologies and management techniques, thereby improving their technological performance (Zhang and Li 2014). While theoretically horizontal spillovers are possible, the assertions about positive effects produced by the presence of multinationals are based on various interpretations of aggregate data or cross-sectional surveys with no evidence to support causal claims (Djankov and Hoekman 2006, Hoekman and Javorcik 2006).

Whereas the claims about occurrence of intra-sector spillovers have been refuted by more recent studies, they played their part in building up the expectations of the governments of acceding countries regarding the impact of FDI on technology catch-up. Policy-makers are often cautious about deregulating FDI due to reasonable concerns that competition with multinationals may supress the development of domestic firms. However, technology transfer studies offer various hypotheses regarding the potential channels of intra-sector spillovers, rationalising WTO-plus demands to deregulate FDI and allowing policy-makers to overcome their concerns. As Cox (1981, p. 128) puts it: "Theory is always for someone and for some purpose". In reality, however, spillover effects occurring within the same industry, would improve the performance of the local competitors of multinationals, which provides multinationals with strong incentive to prevent technology leakage (Javorcik 2006). For

instance, if host country has weak IPR protection, multinationals usually choose to locate production that requires specialised complementary assets in that country, making imitation too costly to profit from (Zhao 2006). While it is assumed that domestic firms may update manufacturing technologies in order to meet competitive challenges, Aitken and Harrison (1999) show that competition with multinationals crowds out domestic firms by attracting demand away from their indigenous rivals. The suggestion that domestic firms might attract trained workers away from rival multinationals is refuted by Sinani and Meyer (2004), who argue that multinationals attract the best workers from domestic industries by offering higher salaries. Besides, multinationals may impose non-competition clauses on key personnel (Hoekman and Javorcik 2006). Accordingly, Rodrik (1999, p. 37) mentions: "Today's policy literature is filled with extravagant claims about positive spillovers from FDI, but the evidence is sobering". Statements about technology transfer within the same industries are based on unconfirmed hypothesis and mostly serve as normative reason in WTO rhetoric in order to force deregulation of FDI.

Potentially, backward and forward linkages represent the most probable channels for technology spillovers. Vertical technology transfer takes place in downstream and upstream industries when multinationals transmit technology to domestic suppliers or customers in the production chain. Multinationals create backward linkages with indigenous firms by purchasing intermediate inputs locally or forward linkages by selling technologically advanced products to domestic companies. Multinationals have no incentive to prevent vertical technology transfer because improving the productivity of local suppliers of inputs and services may reduce sourcing costs (Hoekman and Javorcik 2006, Saggi 2006). Moreover, establishing vertical linkages with local firms allows multinationals to avoid being held-up by any single supplier (Blalock and Gertler 2008), cut logistics costs (Javorcik and Spatareanu 2011), and to adapt their products to the local market and receive tax concessions or other benefits from host governments. In theory, multinationals may upgrade a host economy towards the higher end of the value chain by integrating indigenous firms into worldwide production networks and transferring their knowledge of world markets (Lipsey 2002). Radosevic (1997, p. 386) mentions: "FDIs are a potentially powerful channel of integrating an SI [system of innovation] into global networks and influencing its structural change. They enable, though do not ensure, the creation of linkages with domestic suppliers and the introduction of modern technology". Hoekman and Javorcik (2006) argue that unlike the mixed results on horizontal technology transfer, the evidence on benefits of vertical integration has been consistently positive.

Governments of catching-up countries put significant effort into attracting multinationals, believing that they might establish vertical linkages with domestic companies. Apart from accessing the WTO and joining different binding international treaties, catching-up countries offer generous financial incentives to foreign investors. For example, in order to convince Fiat to locate their plant in Serbia, the government subsidised approximately €105,000 per job in 2008 (Jovanovic 2015). Similarly, in the mid-1990s Brazil tried to attract investments in automotive manufacturing by offering incentive packages in the range of $54,000 to $340,000 per job (World Bank 2005). Needless to say that such offers exceed incentive packages provided to domestic firms. However, in their pursuit of FDI policy-makers often neglect the need to build capabilities of domestic firms, facilitate collaboration between actors or improve regulatory environment. As a result, domestic firms might not be able to meet the quality standards required in order to become a part of supply chain of a multinational (Gage and Lesher 2006). Accordingly, Javorcik and Spatareanu (2005, p. 47) argue: "In the

face of difficulties associated with capturing spillover effects and the multitude of factors that can influence the extent of spillovers in each economy, we caution researchers about drawing generalized conclusions about the existence of externalities associated with FDI in developing countries". Although in general multinationals are inclined to establish linkages with local suppliers, their entry to host countries does not guarantee that domestic industries will be integrated into the global production chains.

There is no consensus among scholars about the factors that determine the existence and magnitude of spillover effects. Statistical data has been interpreted in many different ways in order to demonstrate the existence of causal links between certain aggregate-level characteristics of firms, industries or countries and occurrence of FDI spillovers. To illustrate this point, it might be useful to examine how researchers interpret data in order to draw causal links between the degree of foreign ownership in investment projects and technology transfer. For instance, Dimelis and Louri (2002) examining a sample of 4,056 manufacturing firms operating in Greece in 1997 found that the technology transfer to domestic firms increases with the degree of foreign ownership. The authors argue that parent firms have no inhibition to transfer more advanced technology to its affiliates if the foreign share over investment projects is larger. In contrast, Takii (2005) analysing the Indonesian manufacturing between 1990 and 1995 came to the conclusion that the magnitude of spillovers was smaller in industries with high foreign ownership because parent firms could easily control personnel assignments in wholly or majority-owned affiliates and therefore prevent diffusion of firm-specific knowledge. Among the factors that supposedly define the magnitude of spillovers, the literature identifies: the age of domestic firms (Gorodnichenko et al. 2007), level of absorptive capacity (Chen et al. 2011), technology gap (Kinuthia 2016), degree of competition (Sjöholm 1999), human capital (Ali et al. 2016), and the existence of preferential trade agreements between countries (Javorcik et al. 2004). However, in the absence of a verified and well-established conceptual framework such studies lack robustness. As Lipsey and Sjôholm (2005, p. 40) put it: "If country and industry differences are important to the impact of inward FDI on host countries, the main lesson might be that the search for universal relationships is futile". Determinant factors of spillover effects do not operate in isolation. Moreover, a specific cause may have contradictory effects depending on other conditions. Therefore, the research efforts in this thesis are shifted towards examination of system-level explanatory factors by conducting contextual analysis of policies and circumstances that inhibit spillover effects.

3.5. The Washington Consensus and innovation systems approach

Demands to establish open market relationships and deregulate FDI, as discussed earlier in this chapter, were a part of broader WTO agenda aiming at the imposition of the neoliberal principles of the Washington Consensus on the global level. The Washington Consensus refers to a set of economic policy prescriptions for developing countries, considered to constitute the 'best-practice' reform package consisting of 10 rules, including trade liberalisation, adoption of a hands-off approach to FDI, privatisation of state enterprises and deregulation (Williamson 1990). More generally, the Washington Consensus promotes market relationships, openness to the world and minimal level of governmental intervention. The neoliberal ideas embodied in the Washington Consensus were imposed on all acceding developing countries through the WTO policies regardless of their level of economic prosperity, aspects of historical development or institutional specificities (Stiglitz and Charlton 2005, Peet 2009). Obviously, implementation of neoliberal prescriptions stipulated in the

Washington Consensus was an extremely challenging undertaking for former centrally-planned economies, not so much because of the necessity to change formal set-ups, as due to the task of making them fit with long-established elements such as codes of conduct, practices, norms, routines and values. It is a well-known fact that informal elements embedded in the mindsets of domestic actors are extremely resilient to change (North 1990). Therefore, radical transformation of formal structures would cause a mismatch between formal set-ups and informal constraints. Nevertheless, it was assumed that the imposition of the ideas of the Washington Consensus would unequivocally benefit transition economies. As Serra et al. (2008, p. 3) put it: "the Washington Consensus has come to be associated with 'market fundamentalism', the view that markets solve most, if not all, economic problems by themselves". While no evidence was provided that implementing of the ideas of the Washington Consensus would benefit economies in transition, the WTO insisted upon their radical transformation.

Being an active promoter of the ideas of the Washington Consensus, the WTO ensured that the governments of transition economies embarked enthusiastically on implementing its prescriptions by forming sociotechnical imaginaries. The concept of national sociotechnical imaginary is coined by Jasanoff and Kim (2015, p. 4), who describe it as "collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology". The concept allows to draw attention to the fact that policies can be built upon visions of attainable futures rather than knowledge or tangible plans and serves as a metaphor of a policymaking process in real life. After the collapse of the Soviet Union there was no theory or guidelines on how to transform former centrally-planned systems into market economies (Turley and Luke 2011, Becker and Becker 1996, Stiglitz 1994, Levine 1992, Papava 2005, Lavigne 1995). The reason for this was twofold. On the one hand, during the communist era attempts by the Soviet economists to discuss transition towards a market economy would have caused serious repercussions because it would imply consent with the capitalist system of values. On the other hand, the theory of transition was not a subject of concern for Western researchers as they viewed a centrally-planned regime as a non-system (section 3.2.). After the disappointing results of perestroika such imaginaries seemed both promising and viable. Turley and Luke (2011, p. 371) argue: "At the outset of transition… expectations of almost everything, from the time period involved to the amount of external assistance and FDI flows to the accrued benefits from transition, were excessive". Despite the fact that neither the governments of transition economies nor the WTO had a tangible plan on how to transform former centrally-planned economies into functioning market economies, the reality of policymaking is that their decisions were often based on imaginaries rather than knowledge and tangible plans.

One of the key reasons why policy-makers in transition economies continue to rely on the sociotechnical imaginaries, shaped by the WTO, is because neither economic theory nor innovation systems literature offer clear answer on what exactly needs to be done in order to catch-up with industrialised market economies. In the absence of this knowledge, policy-makers in transition economies had to act based on abstract theories, anecdotal evidence, and personal instincts. The WTO, however, offered to follow a path of socio-economic development based on the visions of an imagined future which implementation of prescriptions of the Washington Consensus would entail. Due to a lack of knowledge about the way open market relationships work, policymakers in former centrally-planned economies were easily manipulated by promises of desirable futures. For example, WTO's Deputy Director-General Alan Wolff asserts: "Far-reaching economic reforms are taking place in a number of countries

following the dissolution of the Soviet Union. A number of countries in the region have consolidated the gains of domestic economic reform and are building on them by their integration into the world economy. To achieve this, they have joined or are taking steps to join the multilateral trading system, created, and maintained by the World Trade Organization… The dividends of the WTO accession process can be seen in Kazakhstan, which joined the WTO in 2015. Its negotiations for accession, accompanied by an extensive domestic economic reform program, resulted in the country's transformation from a Soviet planned economy to a modern, knowledge-based economy. Any can visit Kazakhstan for themselves, as I have, and see the transformation in progress" (WTO 2019). Following their own agendas, mature market economies and intergovernmental organisations engaged in developmental efforts use neoliberal rhetoric in order to convince the governments of transition economies to introduce reforms that provide a competitive advantage to multinationals and developed market economies.

The ideas of the Washington Consensus were challenged by proponents of an innovation systems approach, who criticised the idea of borrowing 'best-practice' policies and refuted the rationale for governmental intervention based on neoclassical economic theory. The Washington Consensus policy framework is grounded strongly in neoclassical economic theory (Fine et al. 2001). Neoclassical economists assumed that innovations are the product of a linear process, consisting of fixed sequence of phases. In their view, the innovation process was narrowed down to basic research at the beginning of a causal chain, followed by applied research, resulting in the production and diffusion of innovations. Private actors have a tendency to underinvest in R&D, which leads to 'market failure' (box 3.1.). Therefore, policy-makers need to intervene in order to allocate resources optimally and achieve equilibrium. Over the last few decades such a viewpoint was extensively criticised by the proponents of the innovation systems approach – an approach that has emerged as a challenge to the Washington Consensus and neoclassical economic theory and brought a different perspective on the role of government (Lundvall 2007). Firstly, proponents of the innovation systems approach pointed out that neoclassic economic theory does not clarify what should be the optimum level of investments or what specific areas require intervention (Chaminade and Edquist 2010). Furthermore, it was argued that new technologies can develop outside the formal R&D system through different forms of collaboration and learning by doing (Edquist 2001). Instead of studying the effects produced by actions at the level of individual actors (e.g. customers, research institutes, universities, governmental bodies, financial organisations), the innovation systems approach focuses on system-level explanatory factors such as system activities (Liu and White 2001) or, more recently, system problems (Edquist 2005). The innovation systems approach shifts attention away from market failure towards system failure – a set-up in which interplay among actors and institutions does not provide the right incentive to encourage the innovation process (Smits et al. 2010). Accordingly, policy-makers are supposed to intervene in those situations when the system is not operating well, that is when systemic problems occur (Hommen and Edquist 2008). Secondly, proponents of the innovation systems approach refute the practice of imposing 'best-practice' reform packages. For instance, Lundvall et al. (2006, p. 16) argue: "Another reason to apply the innovation systems perspective is that it helps to avoid naïve borrowing of 'best-practice' policy across national borders. What seems to work well in one systemic context might not do so in another". Although the major weaknesses of the prescriptions of the Washington Consensus were convincingly demonstrated by the innovation systems approach, policy-makers tend to follow the sociotechnical imaginaries created by the WTO.

	Neoclassical theory	NSI approach
Basic premise	Existence of an optimum Perfect information (assumption that knowledge is generic, codified, easily accessible and productive)	Non-optimality of system Asymmetry of information (the notion that knowledge can be tacit, specific to firm or industry, is costly to create and diffuse)
Focus	Optimal allocation of resources Isolated units (firms, customers)	Collaboration between actors Networks
Policies targeted	R&D policy	Innovation policy (includes labour market, industry, science, education, technology, energy, social, environmental policy, etc.)
Basic rationale for intervention	Market failure	Systemic problems
Purpose of intervention (examples)	Provide public goods Increase incentive of private sector to engage in R&D Shift focus of profit-oriented firms from short-term to long-term goals Overcome uncertainty of firms to invest in risky technologically advanced projects	Solve problems in the system Encourage networking Assist transition Improve firms' access to knowledge Facilitate emergence of new technologies by building innovation infrastructure
Strong sides	Clarity of argument Abundance of science-based indicators for the analysis	Attention to context Holistic understanding of the innovation process
Weak sides	Linear view of innovation process Lack of attention to institutional framework	Extremely problematic practical implementation Lack of systematic data for analysis of efficiency of policies

Box 3.1. Theoretical frameworks of neoclassical theory and NSI approach

Source: Based on Chaminade and Edquist 2010, Hauknes and Nordgren 1999, Smith 2000, Woolthuis et al. 2005.

While the innovation systems approach demonstrates the major weaknesses of the Washington Consensus, it offers no alternative path that could be taken by the governments of the economies in transition. The irony of the situation is that it is proponents of the innovation systems approach who (unlike neoliberalists) strongly believe that governmental policies is the main factor that defines innovative performance. For instance, Nelson and Rosenberg (1993, p. 512) argue: "Of course much of the current interest in national systems of innovation reflects

a belief that the innovative prowess of national firms is determined to a considerable extent by governmental policies". Nevertheless, the attempts of innovation policy studies to formulate guidelines for policy-makers consist of purely theoretical attempts to conceptualise potential systemic problems that may require governmental intervention (box 3.2.). Even when empirical materials are provided, they tend to be merely illustrative and depict primarily the experience of the developed market economies (Chaminade et al. 2012). Although the checklist of potential systemic problems is exhaustive, it can hardly be used in real policymaking. The systemic problems identified in these studies are broadly linked either to the evolution of the system over time or the functioning of the elements of the system, including institutional arrangements, organisational set-ups, and networking patterns. An examination of the systemic problems needs to be context-specific because what might be considered a systemic problem in one context may not necessarily be one in another. Chaminade et al. (2012, p. 1477-1478) argue: "From the policy perspective, there might be a research infrastructure problem if, for example, the universities lack capabilities to conduct research; if there are not R&D centres; if the links between university and industry are ill developed, etc. What the literature seems to ignore is the fact that the mere existence of weak links between universities and industries, for example, might not constitute a (systemic) problem in a country where the main economic activities are not based on research". Considering that the national contexts of transition economies are vastly different to that of developed market economies, the systemic problems experienced by them are likely to be different as well. Accordingly, this thesis aims to conduct context-specific examination of transition economies in order to find out what systemic problems their governments need to take into consideration.

Potential systemic problems in the NSI-policy framework

- **Infrastructure provision problems**

The infrastructure provision problems refer to the inadequate scale and scope of physical infrastructure (transport, roads, airports, harbours, accommodation, etc.), network infrastructure (information and communications technology infrastructure, telecoms, mobile broadband, etc.) and scientific infrastructure (research labs, technical institutes, testing facilities, regulatory agencies, libraries, etc.). The technological competitiveness and capabilities of national firms depends first and foremost on adequate provision of infrastructure since it affects the ability to absorb knowledge, diffuse and apply new technologies, generate skills, and form international linkages.

- **Transition problems**

Transition problems are related to the inability of national firms to adjust to technological paradigm shifts. Most firms tend to focus only on specific technologies that they use in their production cycle. Competence building in one narrow area of expertise limits the ability of firms to develop capabilities in other areas. Therefore, such firms may encounter technological problems when they face the necessity to adjust to change in market demand or have to adapt to emergence of new technological opportunities. Adoption of new technologies implies high degrees of uncertainty that can deter firms from the necessity to change. Moreover, the emergence of new paradigms is difficult to foresee. Consequently,

the problem of transition is especially acute for small firms that have limited resources and lack technological competence in other areas.

- **Lock-in problems**

Lock-in problems arise from inertia and path-dependency of technology systems. For instance, national firms might be locked into existing technologies due to substantial and irreversible technology-specific investments they have made in past. Path dependency, therefore, hinders adaption of new technologies because by switching to new technological paradigm, firms would cannibalise the value of their own investments. Similarly, whole technological systems also may 'lock-in' on existing technologies, impeding the emergence and diffusion of more efficient new technologies. However, breaking the 'path' of an entire technology system is an exponentially more difficult task because it is embedded into a system's essential components, such as skills, procedures, engineering routines, physical infrastructure, plant design, social organisation and so on.

- **Capability and learning problems**

Capability and learning problems occur when domestic firms lack competences (technological, human, or organisational). Insufficient capabilities of firms limit their absorptive capacity, flexibility, and ability to adapt to new technologies.

- **Hard institutional problems**

Hard institutional problems are rooted in inefficient functioning of national regulatory system. Formal institutional mechanisms include laws, regulations, technical standards, rules, etc. Together they define the context within which national firms operate. Institutional context plays a central role in the production, adoption, and diffusion of innovations. Institutional mechanisms influence the behaviour of national firms and shape their capabilities and technological opportunities.

- **Soft institutional problems**

Soft institutional problems are associated with difficulties that may arise as a result of an inappropriateness of tacit and informal rules such as political culture, social norms, habits, routines, established practices, and values. NSI approach pays special attention to the role of institutions in the innovation process. It should be noted that the implicit 'rules of the game' are even more path dependent and prone to inertia than formal institutional mechanisms.

- **Unbalanced exploration-exploitation mechanisms**

On the one hand, the problem of unbalanced exploration-exploitation mechanisms may emerge when a system generates diversity but lacks the instruments for an adequate selection process. In such cases, domestic industries may be involved in excessive variety generation with weak selection procedures. On the other hand, the system may have proper selection processes but lack the capability to generate diversity.

- **Network problems**

Network problems refer to the intensity and nature of interactions between various organisations in the NSI. Both inadequately strong and weak linkages seem to have a negative effect on the normal functioning of a system. On the one hand, weak connectivity among organisations within a system limits the ability of actors to coordinate research efforts, hinders investment opportunities, and prevents interactive learning. On the other

hand, extremely, strong ties lead to a blindness to what happens outside the network. Analysis of interactions between actors play central role in the NSI approach. However, without empirical examination it is exceedingly difficult to estimate which particular links matter most in a specific system.

- **Complementarity problems**

Complementarity problems refers to situations when the competences of the system do not supplement each other. Interactions between complementary technologies, functions and actors are vital for the proper functioning of a system. Poor connection between elements of the system inhibits learning process and limits ability to exploit the positive effects that may arise from the combination of complementary capabilities.

Box 3.2. Potential systemic problems in the NSI-policy framework
Source: Based on Chaminade and Edquist 2010, Chaminade et al. 2012, Hauknes and Norgren 1999, Smith 2000, Woolthuis et al. 2005.

3.6. Conclusion

This chapter reviewed, in detail, the theoretical and empirical literature underlying the key issues related to the accession of transition economies to the WTO. The first research gap that this thesis aims to address concerns the key misconception about the nature of transition, stemming from the fact that the centrally-planned regime is viewed by market-oriented researchers as an aberration of capitalism. The problem is that various analysts focused solely on distinct institutional or organisational features of the centrally-planned regime in order to demonstrate that its specificities made it inferior to market relationships. They argued that the Soviet model of technological development was a failed experiment by the authorities who had a linear understanding of innovation processes. What these researchers failed to consider is that the science-push model was not designed to increase productivity, improve collaboration among participants of innovation processes, or to effectively pass on the achievements of R&D to the consumers. It was adopted to achieve the goals of socialism, such as eradication of inequality, exploitation, unemployment, and speculation. Accordingly, not only formal set-ups but also informal elements such as practices, routines, and codes of conduct were aimed to fit with the principles and values of communism. Over the course of decades, the ways of doing things embedded deeply into mindsets of people and formed a path that became self-reinforcing and impervious to change. Therefore, while market-oriented researchers assume that transition represents merely a transformation of formal arrangements, the reality is that it represents a paradigm-shifting endeavour, the main difficulty of which lies in overcoming stickiness of informal constraints.

The second research gap identified here relates to the tendency of the literature to focus almost exclusively on examining the effects produced by the rules stipulated in formal WTO agreements. I show that whilst formal WTO agreements represent convenient reference points for conducting cross-country comparisons, their ability to advance our understanding of the consequences of accession for latecomers and those lacking bargaining power is limited due to the fact they constitute only the tip of the iceberg of the demands faced by applicant countries. The danger lies in the omnipresence of such studies, as it may delude the reader into thinking that the consequences of harmonising national legislation with the norms of formal WTO

agreements is the most significant obstacle that the acceding countries have to overcome. The reality is that progress in negotiations depends on the interests of incumbent members and the bargaining power of the applicant country, rather than the level of demonstrated commitment to the principles of the WTO. Therefore, acceding countries can be pressed for commitments far beyond the requirements of formal WTO agreements. Accordingly, this chapter posits that research efforts should be directed towards examination of the effects produced by WTO-plus demands. In the case of transition economies, particular emphasis should be placed on examining the effects produced by WTO-plus demands to establish open market relationships with the minimal level of governmental intervention and deregulation of FDI.

The third research gap this thesis contributes to relates to the ambiguity in international technology transfer literature regarding the factors determining the existence of spillover effects. I demonstrate that the assertions of different authors about positive externalities generated by the entry of multinationals are based on various interpretations of aggregate statistical data or cross-sectional surveys with no supporting evidence for causation. I argue that the attempts to draw causal links between isolated determinant factors and technological performance leads to contradictory conclusions due to the tendency of researchers to neglect causal complexity associated with international technology transfer. Attention here is drawn to the fact that contextual examination is important because different factors can combine in a variety of ways to produce a given outcome. As Ragin (1987, p. 24) puts it: "A president's popularity may increase as the result of military intervention in other areas of the world; it can also plummet. News about interest rates can cause the stock market to go up or down, depending on other economic news. Appeals to patriotic sentiments by political leaders are sometimes quite effective, depending on the timing and character of the appeal and the specific mix of national symbols used in the appeal. But they often fall flat". Therefore, this thesis aims to move away from aggregate-level evaluations of factors determining the occurrence of spillover effects, by conducting a contextual examination of the systemic problems that obscure technology transfer.

The fourth gap lies in the inability of research literature to provide a clear answer on what steps the governments of transition economies need to take in order to catch-up with industrialised market economies. This chapter shows that since there had been no attempts to develop a theory on transition, neither the WTO nor the governments of transition economies had a real understanding on how to transform former centrally-planned economies into fully-fledged market economies. Nevertheless, in the process of accession, transition economies were required to deregulate FDI and establish open market relationships as it was a part of a broader WTO goal to impose the neoliberal principles stipulated in the Washington Consensus on a global level. Although the assertions of the WTO that the reforms would unequivocally benefit transition economies were based on the visions of an imagined future rather than actual knowledge, policy-makers in transition economies enthusiastically embarked on their implementation, because in the absence of a clear understanding of what needed to be done, they had to act on the basis of abstract theories, anecdotal evidence and personal instincts. I show that problems with the ideas of the Washington Consensus, identified by the innovation systems literature were not only the naïve borrowing of 'best-practice' policies, but also inclination towards market fundamentalism – the belief that free market policies can solve most economic and social problems. However, while the innovation systems literature convincingly demonstrates that the focus should be shifted away from market failure towards system failure

as a rationale for governmental intervention, it does not provide clear guidelines on what needs to be done. I argue that this thesis needs to engage in a contextual examination of transition economies because the checklist of potential systemic problems that may require governmental intervention, as provided by innovation system literature, is based mostly on theoretical grounds and depicts the experience of only developed market economies.

4. GOVERNMENT AS ALLOCATOR OF FINANCES

4.1. Introduction

This chapter examines attempts of the government to accomplish a shift of Kazakhstan's innovation system from the Soviet era science-push to a market-pull model of technological development. I show that in pursuit of a national sociotechnical imaginary of turning Kazakhstan into a knowledge-based economy, the government adopted organisational and institutional set-ups inherent to open market economies and established a practice of allocating financial resources through 'borrowed' policy instruments. The concept of a national sociotechnical imaginary is employed in this chapter in order to provide a better understanding of how the transformation of Kazakhstan's innovation system was shaped by the neoliberal rhetoric of the WTO. The use of the sociotechnical imaginary concept explains how the necessity to conduct reforms was presented to the government in the form of an opportunity to build a knowledge-based economy, despite the fact that the WTO neither understood the problems of transition nor was interested in creating a plan on how it could be carried out. Attention here is drawn to the centrality of the role of government, and to the fact that transition is a paradigm-shifting undertaking that cannot be successfully conducted solely by transforming a country's formal organisational and institutional arrangements.

The argumentation in this chapter is organised as follows: section 4.2. shows that the authorities adopted the 'economy first, then politics' approach due to a conviction that neoliberal reforms, insisted upon by the WTO, would turn Kazakhstan into a knowledge-based economy. Here, I draw attention to the fact that in reality the WTO had no plan on how transition should be accomplished, but convinced Kazakhstan's authorities to follow the prescriptions of the Washington Consensus forming a national sociotechnical imaginary. Section 4.3. examines how a mismatch between well-established values of researchers and the formal institutional and organisational framework that the government set up in the process of transition towards a new model of technological development, affected the ability of the system to produce competitive outputs in open market conditions. The rest of the chapter considers policies put in place to establish a system, based on the national sociotechnical imaginary. Section 4.4. pays attention to government attempts to spur the output of commercially-viable technologies through the adoption of policies aimed at bringing technology to the marketplace. Section 4.5. analyses whether initiatives to allocate funds through technology parks encouraged multinationals to relocate their technology-intensive activities to Kazakhstan. Finally, section 4.6. reviews attempts by the government to make scientific research more relevant to the needs of industry by withdrawing itself from the role of a sole mediator of science-industry relationships.

4.2. 'Economy first, then politics'

The departure point of this chapter is a critique which is crucial for any further understanding of the problems associated with implementation of the demands of the WTO to transform the former centrally planned economies into open market economies. The critique concerns the key misconception regarding the nature of transition, stemming from the tendency of market-oriented researchers to view the command economy as an experiment of Soviet authorities, aimed to replace market forces with planning procedures rather than a fully-fledged, well-functioning system (section 3.2.). In reality, the centrally-planned regime was

established in order to achieve the very specific goals of socialist society, which include eradication of inequality, speculation, unemployment, and exploitation. The important part is that these goals shaped the values, beliefs, and attitudes of people. However, because the centrally-planned regime is viewed as just a market system in limbo, it is frequently assumed that transition towards open market relationships can be achieved simply through the transformation of formal institutional and organisational set-ups of the former communist countries. Accordingly, the WTO and other international organisations, promoting the ideas of the Washington Consensus (section 3.5.) have a tendency to build their agendas solely around the issues concerning transformation of formal organisational and institutional arrangements of the previously centrally-planned economies, while completely neglecting the existence of informal constraints entrenched deeply in the public mindset. What these organisations overlook is the fact that the ability of a system to function properly hinges on an interplay between consciously created formal set-ups and informal, implicit elements of a system that evolve spontaneously, such as codes of conduct, norms, practices, and routines.

The fact that changing the mindsets of people is an extremely challenging endeavour is evident from my interview the Vice-Rector on Science and International Cooperation of D. Serikbayev East Kazakhstan State Technical University, Oleg Gavrilenko, who points out that once the implicit 'rules of the game' of the science-push paradigm (section 3.2.) were accepted by participants of innovation processes, they continued to be followed despite radical transformation of formal organisational and institutional set-ups:

> The system that was built in the Soviet Union included academic institutions which were a source of knowledge. Then, there was a network of sectoral institutions. Also, there were science production associations. In Soviet Union they all constituted a chain that carried out innovations to a finishing point. Certainly, they had standards of efficiency. Not everything that was invented in academic institutions ended up being a final product. Nevertheless, the process was carried out in accordance with this chain, and science production associations were the final link where in fact industrial prototypes were created and then manufacturing was launched. This system still remains in people's minds and most people continue to work in compliance with that system. (Oleg Gavrilenko, interview, 7th July 2016)

The Vice-Rector draws our attention to the paradigmatic distinction between the science-push model and the market-pull model of technological development, and to the fact that its specificities led not only to establishment of formal organisational and institutional set-ups but also to formation of informal constraints. Accordingly, in the process of accession to the WTO, transition economies have to go through radical reforms, the main difficulty of which lies not in transforming formal arrangements, but in making them fit with the long-established informal elements of a system embedded in the minds of participants of innovation processes.

The implementation of WTO-plus demands to establish an open market economy implied the abandonment of the well-established science-push paradigm and was presented as an opportunity to build a knowledge-based economy. The science-push model of technological development fitted well with the goals of the socialist society and was accepted by participants of innovation processes. The organisational paradigm, insisted upon by the WTO prescribes limiting any governmental intervention in economic processes, rendering the old way of

developing technologies obsolete. The WTO possessed none of the knowledge required to develop a working plan for Kazakhstan's transformation into an open market economy because Western economists have not been concerned with the problems of transition (section 3.5.). Nevertheless, despite lacking a tangible plan on how to handle transition, the WTO made Kazakhstan's government follow the prescriptions of the Washington Consensus by asserting that the accession process has steered Kazakhstan on the path to building a knowledge-based economy. In the course of reforms, WTO officials repeatedly assured Kazakhstan's government that the establishment of a knowledge-based economy depends on a country's ability to follow given recommendations (WTO 2019). Due to the rhetoric of the WTO and reformist attitude of the authorities, an entire national strategy on technological development was built around this sociotechnical imaginary. Moreover, being convinced that the neoliberal reforms provide a credible solution to the problems of transition, Kazakhstan's government started to seek ways of ensuring that reforms are implemented exactly in the way envisioned by the authorities.

The strategy of Kazakhstan's authorities on building a system, based on national sociotechnical imaginary, was to demonstrate the country's political stability to foreign investors and ensure smooth implementation of the demands of the WTO by consolidating power around the President. In accordance with the recommendations of the WTO, attracting FDI was high on the Kazakhstan government's agenda. In order to attract FDI, the authorities intended to demonstrate political stability to foreign investors by delaying democratic reforms and concentrating power in the hands of the President. The OECD (2014, p. 63) recapitulates: "Kazakhstan justifies the expansion of presidential power with its "special way" theory, adjusting the "Asian model," in which political reform takes a back seat to economic growth – "first the economy and then politics". Accordingly, the vision of Kazakhstan's forthcoming development, based on national sociotechnical imaginary was formulated in the annual Addresses of the President to the nation and served as guidelines for respective state agencies. The responsibilities of state agencies for implementing the Presidents' vision of development are then detailed in different legislative acts, strategic programmes, and conceptions of development. While important for demonstrating the country's stability to foreign investors and implementation of the demands of WTO membership, unquestionable authority of the President also made the process of building up a system, based on the national sociotechnical imaginary impervious to input of stakeholders and bottom-up initiatives.

In the 2015 presidential elections, Nursultan Nazarbayev received 97.7% of the vote, winning a fifth term in office. Popular support enabled the President to consolidate the nation's resources behind his vision of Kazakhstan's sociotechnical development. Askhat Kuzekov, Senator, Member of the Committee on Economic Policy, Innovative Development, and Entrepreneurship argues:

> You know, it is not only in innovations, in many other matters we don't have centralised, non-departmental, state-level approach. President of our country has such approach, but I don't see such attitude anywhere below. Each one pulls the blanket over himself; everyone wants to grab something for himself. Each department, each ministry. And in the end, nothing really works. I am saying that during budget meetings when we discuss all these things, everything becomes very complicated and you can see there who is fighting for what. They simply want to grab money

> disregarding what will happen tomorrow. Sadly, there is lack of thoughts on what it will give to our economy and how to act in order to make big impact for development of Kazakhstan's economy in whole. (Askhat Kuzekov, interview, 1st August 2016)

My interview with Senator Kuzekov shows that the fear of social and economic instability, and to a lesser degree the personal charisma of Nursultan Nazarbayev and public approval of his political course, helped the President gain tremendous support from the voters. Ibrayeva and Nezhina (2013, p. 64) argue: "Political corruption and fierce competition for power and natural resources represent the most serious threats to the development and stability of the country. The lack of informal and formal checks and balances in the power system, weak accountability of public officials, a powerless Parliament, and corrupt law enforcement stall anticorruption measures in political and administrative circles in Kazakhstan. Many people fear that withdrawal of President Nazarbayev from the political arena in Kazakhstan may ignite power wars between elite groups, which monger for economic and political domination". Consolidation of power around the President became the primary reason for formation of top-down system lacking checks and balances. The biggest drawback of such a system is that, for public sector managers, the zealous pursuit of outcomes demonstrating the results of their work to the higher authority became the highest priority.

Despite possessing no knowledge about the nature of FDI due to the Soviet past, Kazakhstan's authorities had excessive expectations of their potential benefits. One of the main priorities of Kazakhstan's authorities was to facilitate integration of domestic R&D players into global research projects in order to accelerate development of new technologies. Due to the lack of knowledge about the causes of FDI spillover effects, stemming from the Soviet past, the authorities imagined that the entry of multinationals into the domestic market would automatically lead to the relocation of their knowledge-intensive activities into Kazakhstan and the integration of domestic R&D players into their research projects. Thus, in his Address to the nation the President stated: "To accelerate the transfer of knowledge and new technologies to the country, we need to fully use the potential of foreign direct investment" (Nazarbayev 2014). The President's vision of Kazakhstan's sociotechnical development was strongly influenced by the neoliberal rhetoric of the WTO, which emphasised that inflow of FDI is the key factor that defines Kazakhstan's ability to technologically catch-up with developed countries. The strategy 'economy first, then politics', adopted by Kazakhstan's authorities has been highly successful in terms of attracting investments. Political stability, achieved through concentration of power in the hands of the President guaranteed safety on investments, making Kazakhstan an incredibly attractive place for investments. Due to the massive flow of inward FDI, Kazakhstan became one of the three most rapidly growing economies in the world, after Qatar and China, with the annual real gross domestic product (GDP) average growth about 8% for the period 2000-10 (Ernst & Young 2012). Although Kazakhstan attracted a massive volume of FDI, there was no plan for how to facilitate integration of domestic R&D players into the global research projects because WTO rules protect multinationals from direct intervention – the only strategy known to the governments of post-Soviet states.

The Kazakhstan's strategy of technological catch-up was based on the recommendations of the WTO, which repeatedly emphasised the central role of FDI in the process of building of a knowledge-based economy. Speaking at an international conference on "Interconnectivity in Central Asia" held in Tashkent, Uzbekistan, WTO's Deputy Director-

General Alan Wolff asserts: "From a country with GDP per capita at USD 1,350 in 1996, Kazakhstan reached a level of per capita GDP at USD 8,900 in 2017, nearly a 600% gain. It has been estimated that Kazakhstan's WTO accession has resulted in welfare gains equal to 3.7% of its GDP. Much is due to the liberalisation of foreign investment in the services sectors following from Kazakhstan's WTO accession and improved access to the markets of non-CIS countries (WTO 2019). Accordingly, the government was given concrete targets on attracting multinationals. Vice Minister of Investments and Development, Yerlan Khairov comments:

> We have two tasks that the President has set: it's to attract over 100 billion dollars of foreign investments within 10 years period. The second task is to attract 10 large transnational corporations. *This is what we focus on!* (Yerlan Khairov, interview, 1st August 2016)

The Vice Minister was obviously very keen to execute the President's vision and report the results back as soon as possible. However, even considering top-down governmental hierarchy, such a position should have implied the need to develop and apply additional criteria to the task of attracting FDI. If the end goal is to build a knowledge-based economy, it is important to distinguish between brownfield and greenfield investments or multinationals that relocate knowledge-intensive activities from those limiting their production cycle to last-stage assembly.

The lack of knowledge on how to facilitate integration of domestic R&D players into the research projects of multinationals encouraged Kazakhstan's authorities to start 'borrowing' policy instruments used by mature market economies. The 'economy first, then politics' approach enabled the authorities to maintain unilateral control over the course of Kazakhstan's socio-economic development. A top-down approach to decision-making ensured that the reforms were implemented in the exact way envisaged by those at the top of the pyramid. The problem, however, was that the government did not have a plan on how to integrate domestic R&D players into the global research projects because the rules of the WTO protect multinationals from direct intervention of host governments (section 3.3.). Being unable to use its primary tool of power – direct intervention, the government started to 'borrow' policy instruments used by open market economies. The fact that Kazakhstani policies aimed at developing innovation initiatives were drawn largely from international experience was noted by the UNECE (2012) with a side remark that the local context which includes historical circumstances and institutional settings should have been taken into account. The government introduced a wide range of 'borrowed' instruments, such as innovation centres, special economic zones, taxation support policies, etc. No evidence was presented that these adopted policy instruments would be effective in the context of Kazakhstan. Moreover, for a significant period these new policy instruments lacked supporting mechanisms, hampering practical coordination and implementation of initiatives (Ibid.). While consolidation of power in the hands of the President ensured the transformation of Kazakhstan's organisational and institutional set-ups in the exact way as it was envisioned in the annual Addresses of the President to the nation and other strategic documents, it did not make the building of a system, based on national sociotechnical imaginary, more feasible.

An interview with Aydin Kulseitov, Chairman of the Board of Kazakhstan Industry Development Institute shows that even officials were sceptical about the practice of 'borrowing' policy instruments from other contexts, without establishing their effectiveness:

> We claim that attributes [of 'benchmark' economic systems] were established, but up until 2010 they didn't have supporting mechanisms. Let me explain why. Because back then legislation has defined what grants are, what their types are and what they are aimed at, what commercialisation is, how it is supported, what design bureaus are, how technology transfer is conducted, what analytical functions the government should perform and so on. The rules, prescribing what to do and how to proceed were formulated much later. In fact, an omission as you absolutely correctly noticed was that local authorities were not included in this system and they had to improvise. The law states that local authorities have the right to create their own legal entities which will be engaged in the development of innovations in that region. "Astana-innovation", "Shymkent-innovation" were created by trial and error, they tried to analyse what could be done. Some did well, some did poorly. (Aydin Kulseitov, interview, 17th March 2016)

It is quite clear from this interview that Kazakhstan's strategy of technological development was built around vague imaginaries rather than detailed plans. Explaining the concept they developed Jasanoff and Kim (2009, p. 123) specify: "Imaginaries, in our view, are not the same as policy agendas. They are less explicit, less issue-specific, less goal-directed, less politically accountable, and less instrumental; they reside in the reservoir of norms and discourses, metaphors, and cultural meanings out of which actors build their policy preferences". The WTO did not need to provide evidence that the reforms they insisted upon will ultimately turn Kazakhstan into a knowledge-based economy. Because Kazakhstan has a top-down system of governance lacking checks and balances, it was enough to point at certain direction and let the zeal of public sector managers to do the rest.

The next section will examine how a mismatch between formal set-ups and informal elements influences attitudes of stakeholders towards the 'rules of the game' of a system, based on the national sociotechnical imaginary.

4.3. Imposition of the 'rules of the game' of national sociotechnical imaginary

The adoption of a model of technological development, in which role of science is diminished to mere conduct of near-market research was a sensitive matter for domestic scholars. The science-push model of technological development, adopted by the Soviet Union, provided researchers with the opportunity to pursue their ambitions in 'big science and technology' because the practice of frugal engineering enabled the authorities to devote a larger share of resources to strategically important technologies (section 3.2.). In the context of transition to an open market economy, however, frugal innovations were unable to withstand competition with mature foreign products (Radosevic 1997). Therefore, the Soviet practice in which innovation process was deliberately fragmented in order to devote major part of resources to 'big science and technology' had to be abandoned. The government, however, did not attempt to mitigate the process of transition to a new model of technological development by addressing the expectations of researchers. As a result, the 'rules of the game', according to which the role of science is largely reduced to the conduct of near-market research were, rejected by many scientists, who started to seek other positions in different sectors of the economy. In Kazakhstan only one out of 60 Candidates of Science (level, classified by the United Nations Educational, Scientific and Cultural Organization as 'doctoral or equivalent') and one out of 37 Doctors of Science still pursue scientific carriers (Nazarbayev 2011). The

mismatch between the long-established system of values of researchers and the formal institutional and organisational framework that the government had to set up in the process of transition towards a new model of technological development caused the scientists to reject the new 'rules of the game' of a system based on national sociotechnical imaginary.

The science-push model of technological development not only enabled researchers to engage primarily into 'big science and technology' but also met their other expectations. Nurlan Musin, former chief executive officer of Ulba Metallurgical Plant recollects:

> I started as a design engineer at an experimental plant where I developed fodder equipment. After having read many materials I started to propose various [higher-end] designs. I was laughed at and was told just to make it certain way. Recalling this, I realise that our engineers who invented the first Sputnik satellite could create the best machines. Even cars. There was no need to make high-end cars for our citizens… Cars had to be produced within such a price range, in which a certain amount of population could afford it. Given the level of income of population, we could only produce low-end cars… The Soviet Union needed to survive. There was no need to create advanced, comfortable machines. Innovations were developing very well. They even had to be held back. (Nurlan Musin, interview, 18th July 2016)

Evidently, the opportunity to be a part of the innovation system that could produce affordable technologies, designed to meet the needs of majority of population was a source of pride for Soviet engineers. Moreover, it seems that the realisation that Soviet science possessed immense capabilities was an extremely rewarding feeling which provided participants of innovation processes with validation of the importance of their work. This is a very important factor to be taken into consideration because "Beliefs and values…are not just an explanatory ''add-on''; they are essential components of economic, ecological, demographic, organizational, and political explanations" (Thompson et al. 2006, p. 324). The process of transformation of former centrally-planned economies cannot be adequately explained without taking into consideration the well-established ideals, beliefs, and values of domestic scientists. Having no knowledge about the potential pitfalls of transition, the government assumed that researchers would automatically start performing tasks in the way it was envisioned by those at the top. The National Agency for Technological Development is a governmental agency, directly subordinate to the Ministry of Investment and Development. The primary task of the Agency is support of innovative activity in Kazakhstan. Sanzhar Izteleuov, Chairman of the Board describes how the role of scientists is imagined by the government:

> Scientist should pursue science, he should invent. Universities need to have an office of commercialisation whose task is to commercialise inventions and get patents. They should decide whether they need a patent or not and find application for this invention: sell the patent, make licence agreement, or receive royalties. This is his task. Scientist will always profit from such arrangement. (Sanzhar Izteleuov, interview, 26th July 2016)

It seems that the Chairman does not take into consideration the fact that since the role of science has changed so drastically, many researchers would not accept the 'rules of the game' offered by the authorities. Under the guidance of the WTO, the government focused solely on changing formal organisational and institutional set-ups, while the importance of informal constraints,

embedded in the mindsets of researchers was overlooked. The attitude of scientists toward the change of the role of science is summarised in the comment of the Vice-Rector on Science and International Cooperation of D. Serikbayev East Kazakhstan State Technical University, Oleg Gavrilenko:

> We have prioritised secondary things; we have prioritised money and lost our science. We have thrown science away. (Oleg Gavrilenko, interview, 7th July 2016)

The remark of the Vice-Rector demonstrates the challenging nature of a task of shifting from the science-push to the market-pull model of technological development, facing Kazakhstan's authorities. The way he describes the need to conduct near-market research draws our attention to the fact that the ideals, beliefs, and values of researchers, established over many decades, became extremely resistant to change. It is quite clear that research in Kazakhstan became no longer associated with either 'big science and technology' or production of affordable technologies that met the needs of masses.

Being established in a top-down manner, organisational and institutional set-ups inherent to a market-pull model of technological development did not fit well with the norms, values, and expectations of researchers, hampering the development of near-market research. Kazakhstan adopted the 'economy first, then politics' approach because centralisation of power enabled the government to demonstrate political stability to foreign investors and ensure the smooth implementation of the reforms in the way it was envisioned by the President. The civil society organisations and the mass media were heavily suppressed in order to maintain absolute governmental control over the system during implementation of radical reforms. Accordingly, for freedom of the press Kazakhstan was ranked 130th among the 140 countries listed by the World Economic Forum (2018). As Ibrayeva and Nezhina (2013, p. 44) put it: "The case of Kazakhstan is an illustration of the central role of government in transforming economic, political and social order with little input from the people and often against the will of the people". However, due to the lack of checks and balances in terms of the public accountability of officials, they tend to focus on their own targets, established in accordance with the vision of the President and disregarded the needs of stakeholders. Being convinced that by following the prescriptions of the Washington Consensus, Kazakhstan is on its way of turning into a knowledge-based economy, officials overlooked the fact that the ability of a system to produce competitive outputs in open market conditions first and foremost hinges on the creation of an environment that would incentivise scientists to conduct near-market research. As a result of the top-down implementation of reforms, the 'rules of the game' of the system, based on the national sociotechnical imaginary, offered no incentives that would motivate scientists to switch to near-market research.

The consequences of the tendency to disregard the needs of scientists in favour of pursuing their own plan targets can be illustrated by looking at the reforms, performed by the Ministry of Education and Science. In order to demonstrate to the higher authority that funds are allocated on competitive basis, the efforts of the Ministry were directed towards introducing additional stages to the procedures of allocating funds. However, due to the top-down manner of decision-making and the tendency to overlook the needs of researchers, new procedures leave no time for conducting research. The Vice-Rector on Science and International Cooperation of D. Serikbayev East Kazakhstan State Technical University, Oleg Gavrilenko

comments on how changes in procedures of allocating funds influence attitudes of the scientists:

> Look, the adoption of the budget [of the university] due to bureaucracy with allocation of funds normally gets delayed till March-April. In March-April money get transferred to Universities' accounts. For four months people are starving, sitting without salaries or they try to find some side job. Ok, money got transferred in March-April, but now they've launched system of expertise. The fiscal year ends in December, but due to the requirement to conduct expertise prior to submission, they changed procedures. Whereas earlier, five-ten years ago reports had to be submitted in December, nowadays terms are reduced. Until recently, it had to be completed by December 20th, later it became by December 10th. Now the Committee threatens that it will have to be done in October. Now count yourself. In reality, we cannot begin work until moneys are transferred. Let's assume that money got transferred by middle of April. We start in May. In October we have to write a report. We have only five months out of twelve for R&D. The rest of the time is spent on getting money, approval of report and submitting expertise. The term for conducting R&D shrinks. Instead of conducting R&D for 12 months we have only five. What kind of quality such research can have? This is without considering the impact of the law 'On state procurement' which also implies formalities and has time frames. In short, purchase of equipment detains for several months in the best-case scenario. Now the question is – where is R&D? As a result, all those funds allocated for science turn into money circulation instead of getting results… Even if we recall the Soviet Union with all its drawbacks, I remember that money was transferred on 1st of January. First prepayment we received on 20th of January. Reports were submitted in December. (Oleg Gavrilenko, interview, 7th July 2016)

There are two reasons why I consider this comment important. Firstly, the Vice-Rector raises a particularly important issue of how the attitude of the authorities towards science has changed over time. While in the Soviet Union research was considered as perhaps the most important strategic activity (section 3.2.), today it is treated as a liability and approached accordingly. Secondly, his comparison of old and new ways of doing things draws our attention to the consequences of the adoption of the 'economy first, then politics' approach. When the practice of funds allocation used by the Ministry of Education and Science is compared to the one used by the Soviet authorities, it becomes evident that the priorities of public sector managers have shifted from pursuit of the goals of the whole society towards following the agenda of one ministry.

Following the WTO's neoliberal rhetoric, the government prioritised integration of domestic R&D players into international scientific projects over development of near-market research. Neoliberal rhetoric emphasising the role played by FDI in the process of technological catching-up of newly industrialised states raised the expectations of Kazakhstan's authorities regards their strategy of technological development, which was based on attracting multinationals. Due to the lack of knowledge about the nature of international technology transfer, stemming from the Soviet past, the authorities assumed that the creation of a fair-play environment for multinationals would automatically cause relocation of their knowledge-intensive stages of production processes into the country, which would allow domestic R&D players to be integrated into the global research projects. Therefore,

Kazakhstan's strategy for compensating the lack of commercially-viable technologies was to focus on integrating domestic R&D players into the global research programmes, rather than creating an environment that would incentivise the conduct of domestic near-market research. In his Address to the nation "The Strategy Kazakhstan-2050", the President argues: "As the global experience demonstrates, recreating the whole innovative production cycle in a separate country means reinventing the wheel. It is a very expensive and not always fruitful, productive activity… Therefore we should establish a realistic and pragmatic strategy… we can actively participate in large-scale international R&D projects. This will enable us to integrate the efforts of our scientists with foreign R&D specialists on strategic innovative directions. Our aim is to become a part of the global technological revolution" (Nazarbayev 2012). The potential integration into the global research programmes became viewed as a free ride on the way of establishing a knowledge-based economy, rationalising the reduction of the government's responsibility for funding R&D. Accordingly, in 2013 Kazakhstan's GERD/GNP ratio constituted only 0.17 percent (UNESCO 2016). Drastic reduction of R&D funding caused further rejection of the 'rules of the game' of a system, based on national sociotechnical imaginary, by scientists.

The Kazakhstan Industry Development Institute is a governmental agency, directly subordinate to the Ministry of Investment and Development. The Institute is responsible for implementation of state programs of industrial development. An interview with Aydin Kulseitov, its Chairman of the Board reveals how the government perceived the prospects of domestic R&D players to succeed in near-market research:

> The problem is that even if we will make 2% [GERD/GNP ratio], money will not give effect. I repeat again, because we don't have players. Because when we speak about cooperation of science and business, our entrepreneurs say: very well, give us something. Scientists bring them 30-year old technologies [implies frugal innovations]. I experienced that myself. And those entrepreneurs say: "well, listen guys, let's be more serious, develop something new". They are not capable. Why old school is not capable? Because they don't have neither methods nor understanding what world requires... The issue here is in unpreparedness of our scientific school to be supplier of ideas and technologies. There were those who were saying: "let's fund the science, let's build technologies, let's give a bunch of money to our scientists and they will give us superb technologies". It won't work. (Aydin Kulseitov, interview, 17th March 2016)

What the Chairman fails to understand is that the shift from the science-push model to the market-pull model of technological development could not be accomplished overnight because mindsets of people are extremely resistant to change. It may take decades until domestic scientists will be able to switch to conduct of near-market research. The most important task the government should have focused on was not to let them loose their expertise and scientific knowledge. Responding to the argument of the previous interviewee on the reasons why scientists are not capable to produce near-market research outputs, the Vice-Rector on Science and International Cooperation of D. Serikbayev East Kazakhstan State Technical University, Oleg Gavrilenko comments:

> Here I disagree with Aydin. I agree that even if it was 2 percent [GERD/GNP ratio], there would be no effect. But I do not agree that the problem is in scientists. Yes, some of them are weak. But this problem is solvable. What really is missing is the time for research… A scientists should not spend the whole time waiting whether his research will be funded or not. Instead, he sits there for months, doing nothing. When

> a person does nothing, it only corrupts him. He gets used to do nothing and he continues on. As a result we get a person who in fact needs to be retrained. In the course of five years he was fooling around. He then realises that in order to avoid being held responsible he needs to circulate money and make financial documents look good. No one cares what is your input or whether you rewrote everything from your old papers. The matter of interest is money circulation. (Oleg Gavrilenko, interview, 7th July 2016)

What seems obvious here is that the government failed to preserve qualification of domestic scientists. While the government rationalises the reduction of R&D funding on the grounds of inability of domestic scientists to catch-up with foreign competitors in terms of output of commercially-viable technologies, the reality is that no actual attempts were made to create an environment that would facilitate near-market research. Complex procedures to allocate funds creates a lot of uncertainties, demoralising scientists who become unproductive in response.

In the absence of actual results in terms of successful integration of domestic R&D players into the global research projects, governmental officials strive to create an illusion of achieved progress by applying quantitative indicators inherent to open market economies to domestic context. The government had neither a plan nor the knowledge on how integration of domestic R&D players into the global research projects can be achieved. Nonetheless, in order to ensure the President that his vision for integrating domestic R&D players into global research projects was being implemented, the government set plan targets, based on criteria, typical for 'benchmark' economies, and focused on their implementation. Any deviations from 'best-practice' indicators were regarded as systemic problems that may inhibit the integration process. For instance, the 2010-2014 National Program of Forced Industrial and Innovative Development draws attention to the fact that the ratio of scientists, engineers and workers of pilot productions in Kazakhstan is 25:4:1, while in developed market economies it is 1:2:4. Similarly, the National Academy of Science (2014) reports that share of domestic expenditure on fundamental research, applied research, and experimental development was 30:54:16 respectively, while in developed countries it constitutes 15:25:60 respectively. The government chose to ignore the fact that targeting 'benchmark' indicators is not necessarily the best way of integrating domestic R&D players into the global research projects. On the other hand, targeting 'benchmark' indicators was perhaps the best way of demonstrating progress to the higher authority.

Due to the lack of a unified plan on how to shift from the science-push to the market-pull model of technological development, and the lack of public accountability of officials, different ministries interpreted the vision of the President in such ways that would enable them to demonstrate results to the higher authority. Various international organisations mention that in Kazakhstan initiatives of authorities, aimed at establishing a knowledge-based economy are hampered by inflexible mechanisms of coordination of activities of governmental agencies. For instance, OECD (2014) notes that although various coordination mechanisms were created in Kazakhstan, their functioning has been very formal which only reinforced top-down hierarchical relationships, confining the work of each ministry to the boundaries of their strategic plans. Accordingly, it is generally assumed that coordination mechanisms do not work properly because Kazakhstan retains top-down system of decision-making. However, the reality is that coordinated work would undermine the well-established practice of public sector managers to interpret national sociotechnical imaginary in ways that enables them to pursue

outcomes, accomplishing of which makes them noticed by the higher authority. In an attempt to draw attention to this particular problem, member of the Majilis (lower chamber of the Parliament), Dariga Nazarbayeva provided the following example: "The Ministry of Education and Science has seen seven Ministers to come and go since 2000. Each of them started his career with another wave of large-scale reforms. Neither of those reforms has been put through and showed a very modest result despite huge financial investments" (Interfax 2013). The tendency of officials to ignore potential benefits of coordinated work in favour of being able to demonstrate their personal input became a well-established practice in Kazakhstan, undermining attempts to build a system, based on the national sociotechnical imaginary.

Askhat Kuzekov, Senator, Member of the Committee on Economic Policy, Innovative Development and Entrepreneurship notes:

> In the past, the approach that every minister had was different from what it is today. Not purely departmental. Not narrow. A minister saw wider, thought broader. He knew exactly what his role was, where competencies of his ministry had. He also realised the necessity to concede if it was domain of another ministry or in which cases to work together. There is no need for ministers to become family friends and pay each other social visits, but they need to develop similar approach. At work they should be people of state, have state-level thinking. Unfortunately, I don't yet see it happening. Using administrative methods no one can unite two ministers. It won't happen until ministers understand it themselves, until they start looking at the big picture, think about the effectiveness of their work. (Askhat Kuzekov, interview, 1st August 2016)

It is vital to note that unlike well-elaborated plans, sociotechnical imaginaries leave room for interpretation. Sanzhar Izteleuov, Chairman of the Board of National Agency for Technological Development comments:

> Well, if you want to know the key problem – we do not have a unified innovation policy. It simply doesn't exist. There are elements of the puzzle that are not folded together. Consider the new State Programme on Industrial Innovative Development. The President is constantly talking about it. Even Oset Orientaevich [Minister of Investment and Development] constantly talks about it. But it dies somewhere at the level of the likes of Batyrkozha [Director of Department of Technological and Innovative Development of Ministry on Investment and Development]. *He has one vision; another one has another vision. There is no unity.* (Sanzhar Izteleuov, interview, 26th July 2016)

The Chairman correctly chose to use the word "vision" rather than "plan" when describing the way policy-makers formulate their decisions. The absence of a unified, step-by-step plan on how to shift from the science-push to the market-pull model impeded the process of transformation of Kazakhstan's model of technological development. Moreover, eventually the very idea that such transformation is necessary became discredited. Due to a well-known tendency of officials to interpret the national sociotechnical imaginary in such ways as to demonstrate their achievements to the higher authorities, even genuine attempts by officials to contribute to building up knowledge-based economy became viewed by stakeholders as attempts at self-promotion rather than an attempt to solve problems.

The following section explores in detail whether adoption of 'borrowed' commercialisation of technologies policies facilitated conduct of near-market research.

4.4. Commercialisation of technologies policies

The adoption of commercialisation of technologies policies illustrates the tendency of Kazakhstan's government to treat the symptoms while ignoring the causes of systemic problems. The lack of commercially-viable technologies in the outputs of domestic R&D players encouraged Kazakhstan's authorities to 'borrow' policy instruments used in 'benchmark' economies. Sharing his vision of the way to establish a knowledge-based economy, the President in his Address to the nation announced: "The development of a knowledge-based economy is, above all, the increase of the capacity of science in Kazakhstan. In this area we should improve legislation on venture financing, intellectual property protection, research and innovation support, as well as commercialisation of research. I charge the Government before September 1 of this year to develop and submit to the Parliament a package of relevant bills" (Nazarbayev 2014). Accordingly, in October 2015 the law of the Republic of Kazakhstan 'On commercialisation of scientific and (or) scientific and technical activities' was passed. What the authorities did not account for, however, is that the problem that arises from a shortage of commercially-viable technologies lies not in the absence of mechanisms of diffusing the results of R&D, but in getting those results in the first place. The primary reason why scientists do not engage in near-market research lies in a mismatch between expectations of stakeholders and the vision of the authorities. Nevertheless, the government chose to focus exclusively on adoption of 'best-practice' policies aimed at bringing technology to the marketplace while continuing to ignore the need to address the expectations of stakeholders.

Elaborating on how the fact that the mindsets of scientists are locked-in on the old ways of doing things affected the effectiveness of governmental funding, the Vice-Rector on Science and International Cooperation of D. Serikbayev East Kazakhstan State Technical University, Oleg Gavrilenko notes:

> So far, all the money spent on science by the Committee of Science [Department within Ministry of Education and Science] continue to generate some knowledge regardless of whether they will be of any use or not. And in the end what happens? We create some product and it goes on the shelf. It does not go into production. (Oleg Gavrilenko, interview, 7th July 2016)

The Vice-Rector stresses the fact that the Soviet practice of generating knowledge without considering downstream implementation concerns or commercial viability of technology is no longer acceptable due to Kazakhstan's forced transition towards open market relationships. However, it should be emphasised that the lack of commercially-viable outputs is caused not by the absence of mechanisms of diffusing the results of R&D. It is the result of the unwillingness and inability of scientists to switch to conduct of near-market research instantaneously. Commenting on the same phenomenon Sanzhar Izteleuov, Chairman of the Board of the National Agency for Technological Development states:

> We have an Institute subordinate to Ministry of Education and Science which has 4,000 patents. But if you review them, they are all trash. There is no commercial

> component. Out of 4,000 perhaps there is 1-2% that theoretically may work. (Sanzhar Izteleuov, interview, 26th July 2016)

It is important at this point to clarify the reasons for the tendency of different governmental agencies to neglect a mismatch between the mindsets of stakeholders and formal organisational and institutional arrangements. The Ministry of Education and Science is not largely concerned with addressing this problem because its responsibility lies solely with proper execution of procedures of allocating funds. Outputs are then measured in the number of patents and publications. The Ministry is neither accountable for the lack of near-market research nor for the shortage of commercially-viable outputs.

A lack of transparent governmental action as a result of the 'economy first, then politics' approach increased the departmentalism of governmental agencies, encouraging officials to focus on finding ways of taking control over state funds while neglecting the need to fix the real cause of system failure. Public policy studies (Zahra et al. 2000) generally assume that government is a uniform entity that acts in the interest of the governed. However, the functions and responsibilities of governmental agencies frequently overlap and conflict, inhibiting coordinated actions. Moreover, the likelihood of interdepartmental conflict increases exponentially in the absence of checks and balances in terms of public accountability of officials. In Kazakhstan competencies of the government in the domain of research, development, technology, and innovation are divided between two leading ministries: The Ministry of Education, and Science and the Ministry of Investment and Development. Both Ministries rationalised the need to control the commercialisation of technologies, albeit on different grounds, and strived to take charge of the allocation of commercialisation of technologies funds. As a result of adoption of the 'economy first, then politics' approach the priorities of the Ministries laid not in addressing the needs of stakeholders but in taking control over allocation of funds as it provides them with an opportunity to maximise budgets of their departments and the workforce under their supervision.

Sanzhar Izteleuov, Chairman of the Board of the National Agency for Technological Development shares his observation on negotiations between the two ministries:

> So, you want to know what the problem is. There is no consensus between Ministry of Education and Science and Ministry of Investment and Development. There is no clear boundary. Both, Ministry of Education and Science wants to control commercialisation and Ministry of Investment and Development wants to control commercialisation. I personally was a witness – neither previous ministers nor new minsters could not reach the agreement who is doing what. (Sanzhar Izteleuov, interview, 26th July 2016)

The Chairman here clearly wishes to provide his earlier point (interview with the Chairman) that there is no unified policy in Kazakhstan with a compelling example. At the same time, he inadvertently makes a remarkably interesting insider observation of how certain decisions are made within the higher echelon of the government. His observation allows us to conclude that the interest in controlling commercialisation of technologies is too strong to be explained solely by the ministers' devotion to duty. Askhat Kuzekov, Senator, Member of the Committee on Economic Policy, Innovative Development and Entrepreneurship explains why both ministries strive to be in control over allocation of funds on commercialisation:

> I believe that again all this is due to the large amount of budget money. Despite the fact that these are budget moneys, they are very strictly controlled. Speaking frankly, everybody will be terrorised by inspections, every budget penny will be checked. Nevertheless, people think that if they will have that money, then certain people will benefit from that. I think that this is how they see it. There is no notable depth in justifications, no hard evidence that tomorrow it will be used effectively and there will be strong impact on development of production, development of economy. In general, that is absent. All that matters is the amount of money. They think that if money will go through them, some part will stick to their hands as well. (Askhat Kuzekov, interview, 1st August 2016)

Senator Kuzekov provides very reasonable explanation as to why the commercialisation of technologies policies were lobbied at the first place. As I mentioned earlier the lack of commercially viable outputs in Kazakhstan is caused not by the lack of mechanisms of diffusing the results of R&D, but by the absence of near-market research. The Senator's argument makes perfect sense when we ask ourselves a logical question: why are there no attempts to influence scientists' attitudes towards near-market research but there is active struggle to control the mechanisms of allocating state funds.

Being 'borrowed' from the context of mature market economies, the commercialisation of technology policies did not fit well with the well-established practices of knowledge generation in Kazakhstan. The law 'On commercialisation of scientific and (or) scientific and technical activities' regulates allocation of funds through the centres of commercialisation, based in universities and research centres. According to information provided by representatives of Ministry of Education and Science, in October 2018, there were 43 offices of commercialisation created in different universities in Kazakhstan, but none in research centres. However, unlike Western universities that have always been engaged in R&D, Soviet universities carried out purely educational functions. R&D in the Soviet Union was performed by science production association and sectoral institutions, all of which were shut down in the course of reforms. Nowadays, university personnel consist mostly of former employees of the Academy of Science, who were previously engaged in purely academic research and have no experience in conducting R&D. Moreover, universities do not possess resources, infrastructure and skills to turn R&D outputs into commercially-viable projects. Bergek et al. (2010, p. 124) argue: "In turning inventions into economic outcomes the crucial 'middle term' is business development, which involves a range of complementary assets (skills and capabilities) that are crucial for, but not necessarily directly related to, innovation. These include the ability to finance capital investment programs, the ability to create efficient production systems on an adequate scale, the ability to recruit and coordinate appropriately skilled labour forces, the ability to construct and use marketing channels, and the ability to create and deploy logistics systems". Attempts of Kazakhstan's government to stimulate near-market research using 'borrowed' policy instrument seems to be an ineffective strategy, considering that personnel of universities possess neither resources nor expertise required for development of commercially-viable technologies.

The Vice-Rector on Science and International Cooperation of D. Serikbayev East Kazakhstan State Technical University, Oleg Gavrilenko, elaborates on how path-dependence affects attempts to stimulate the development of commercially-viable technologies using 'borrowed' mechanisms:

> Those people, who used to work in the network of Academy of Science, that is those who were engaged in producing fundamental knowledge, they now came to universities. Currently they make science. They execute projects funded by Committee of Science. There were simply no other personnel available… There remained only those people who represented the academic segment and they started to work in universities. Those people got used only to knowledge creation, i.e. fundamental research. Unfortunately, they were not trained to do anything else. Let's just say that commercialisation of some ideas is something novel and vague to them. They simply don't know how to do it. (Oleg Gavrilenko, interview, 7th July 2016)

The Vice-Rector makes a good point that unlike dismissed personnel of science production association and sectoral institutions which were shut down in the course of reforms, those people who worked in the network of Academy of Science were engaged solely in fundamental research. Whereas Western universities traditionally conduct R&D, Soviet universities had a purely educational function. Commenting on the usefulness of adoption of commercialisation of technology policies, Sanzhar Izteleuov, Chairman of the Board of National Agency for Technological Development, asserts:

> Scientists want to invent something and earn money with it. But they don't see that profit can be earned on patents, on licenses, on copyright, on know-how. They only see opportunity in the creation of a business. But this is impossible to do. Definitely impossible here. Even if it is possible, there is only a handful of people who can do it. Because firstly, a team needs people who can invent. Secondly, it needs people who know the market, people who know players, who will promote this product. If you don't have them, there is no sense to finance this project, no matter how brilliant the invention would be. What matters is whether there are people who are willing to pay for it. (Sanzhar Izteleuov, interview, 26th July 2016)

Considering university personnel's lack of experience in business development, it seems imprudent to assume that universities have the capability to turn the ideas of scientists into commercially-viable projects. Moreover, the adoption of commercialisation of technology policies impedes attempts to improve collaboration between science and industry since funds allocated on commercialisation of technologies enable scientists to continue the pursuit of their existing research projects without the need to actually engage in near-market research.

Due to the top-down nature of the decision-making process, the government adopted commercialisation of technologies policies in accordance with the vision of the President, while paying little attention to the fact that research efforts of domestic scientists are locked-in on the generation of purely academic knowledge and frugal innovations rather than conduct of near-market research. In the absence of any near-market research outputs that could be successfully commercialised, the goal for which funds are allocated cannot be achieved. Nevertheless, officials still needed to meet plan targets on utilisation of budgets because it indicates that the President's vision of Kazakhstan's technological development was being implemented. Under-utilisation of the allocated budget indicates that a governmental agency did not meet its plan targets, which usually results in different penalties. As a result, budget utilisation rather than achieving the goals for which funds were allocated for became a synonym of plan fulfilment. Since funds were being allocated with the sole goal of utilising budgets in mind, the decision-making process regarding the allocation of funds for scientific projects became particularly

corrupt, with kickbacks reported to reach up to 50 – 60 percent of the value of grants (Tastanova 2019). Needless to say that such research projects do not bring viable technologies to the marketplace. An investigation of projects funded by the Ministry of Education and Science from a $110 million loan from the World Bank showed that moneys are systematically allocated to outdated, commercially non-viable ideas that either copied existing foreign products or attempted to reintroduce 'off the shelf' old Soviet technologies (Kiselev 2016). The allocation of funds on commercialisation of technologies, despite the absence of near-market research outputs, facilitates the illegal lobbying of commercially unviable technologies.

Askhat Kuzekov, Senator, Member of the Committee on Economic Policy, Innovative Development and Entrepreneurship makes the following statement concerning the practice of fund allocation:

> In any case, when a person is in position to directly allocate funds and he feels that the size of funding, the number of grants and so on depend on him, he is tempted to use this money to his advantage. The corruption component is constantly there, all the time. (Askhat Kuzekov, interview, 1st August 2016)

Senator Kuzekov is certainly correct to claim that in the process of fund allocation the risks of systemic corruption are exceedingly high. What needs to be added is that systemic corruption is even more likely in the cases where it is known in advance that the goals for which funds are allocated cannot be achieved. It is quite obvious that production of commercially-viable technologies is hampered by the lack of near-market research. However, no efforts are made to incentivise researchers to engage in near-market research. Instead, funds are allocated on commercialisation of technologies regardless of the fact that the shortage of commercially-viable outputs is not caused by any lack of mechanisms of diffusing near-market research. Sanzhar Izteleuov, Chairman of the Board of National Agency for Technological Development argues that the government lacks an understanding of the impact of start-ups on university budgets:

> Our law on commercialisation suggests that scientist "Ivanov" reads lectures to students before lunch, engages in research after lunch, tries to invent something and in the evening creates start-up project. After launching this start-up, he goes to the National Agency for Technological Development and writes grant application. This all meant to be done by a single person… They intend to create start-ups in universities. These start-ups are risky ventures. Nine out of ten will fail. It will drain budgets of universities. They will have to start raising tuition fees for students and consequences will be irreversible. They don't understand it... This is utopian model. It will never work. (Sanzhar Izteleuov, interview, 26th July 2016)

It is true that perhaps the most overlooked risk that the adoption of the law 'On commercialisation of scientific and (or) scientific and technical activities' may pose is that it allows financing of start-up companies from budgets of universities. The fact is very serious, considering that illegal lobbying in R&D activities became a widely spread phenomenon in Kazakhstan (Tastanova 2019). In the absence of near-market research, the mechanism of diffusing the results of R&D may become a mechanism for draining money from the budgets of universities.

The next section examines attempts of the government to create centres of research excellence in order to incentivise multinationals to relocate their knowledge-intensive activities to Kazakhstan.

4.5. Technology parks

While focusing on the attraction of FDI, governments in developing countries frequently overlook the fact that the occurrence of spillover effects hinges on relocation of knowledge-intensive activities of multinationals into a host country. Multinationals possess superior knowledge that can potentially be transmitted to domestic industries in host countries. Therefore, it is frequently assumed that the entry of multinationals into a host country automatically leads to technology transfer. For instance, Romer (1993, p. 548) states: "One of the most important and easily implemented policies is to give foreign firms an incentive to close the idea gap, to let them make a profit by doing so…by creating an economic environment that offers an adequate reward to multinational corporations when they bring ideas from the rest of the world and put them to use with domestic resources". However, studies conducted in the field of international technology transfer show little evidence of such a relation because multinationals are reluctant to move knowledge-intensive activities to locations outside their home base (Patel and Pavitt 1991, Niosi 2010). As a result, the technology gap between affiliates of multinationals operating in a host country and domestic firms may be too small for technology diffusion (Kathuria 2010). Due to the WTO-plus demands to deregulate FDI, governments of host countries are not able to directly influence decisions of multinationals to relocate their knowledge-intensive activities. Therefore, the governments of host countries need to create an environment that would incentivise multinationals to relocate knowledge-intensive activities.

The Vice Minister of Investments and Development, Yerlan Khairov explains the efforts put in place to attract FDI:

> First of all, we built a system for attracting investments by mobilising external reserves, according to task given by President. Our embassies were given a specific directive to focus on economic issues. Ten special advisors were appointed and sent to key countries from where we expect inflow of investments. Also, at the central level we have an investment headquarters, subordinate to the Prime Minister. Ministry for Investments and Development was created. Then we have a National Agency Kaznex Invest. At the regional level the Investment Councils under each akim [governor] were organised. Vice-governors, specifically responsible for attraction of investments were appointed. There are also service centres for investors – branches of Kaznex in regions. Besides, we arranged the single-window system for investors – this is our Committee on Investments. However, we understand that investors choose not only centres – Astana or Almaty. In every region we created sectors of service for investors, based in public service centres. (Yerlan Khairov, interview, 1st August 2016)

The fact that the task of attracting FDI was assigned at different levels and across different governmental entities suggests that the authorities were convinced that the entry of multinationals into domestic market is strategically important for turning Kazakhstan into a knowledge-based economy.

Kazakhstan's authorities were convinced that by implementing the requirements of the WTO they could create an environment that would facilitate the inflow of technology-intensive FDI. Literature on international technology transfer emphasises that requirements of the WTO are designed to help acceding countries to attract technology-intensive FDI. For instance, Lall (1997) argues that the ability of countries to attract technology-intensive FDI hinges on the protection of intellectual property rights. Accession to the WTO implies joining the Agreement on Trade-Related Aspects of Intellectual Property Rights, which covers basically all spheres related to IPR, including some emerging areas and rights that have not been previously addressed by international legislation. IPR enforcement by the host country provides guarantees that mature foreign product will not be subjected to reverse engineering or other forms of duplicative imitation. Announcing policies against violation of intellectual property rights Nursultan Nazarbayev, the President of the Republic of Kazakhstan said: "I am confident such procedures will gather support and encouragement from international producers of high technology and science intensive goods and will create an additional inflow of foreign direct investment and diversify Kazakhstan's economy" (Nazarbayev 2006). Kazakhstan's authorities had planned to catch-up with frontier countries by conducting a series of reforms, that would encourage multinationals to relocate knowledge-intensive activities, including IPR enforcement, implementation of market-oriented reforms, and improvement of investment climate.

Proceeding on the basis that the enforcement of IPR protection leads to technology transfer, Kazakhstan's government initiated a series of reforms at the very early stage of accession to the WTO. In order to carry out executive and control functions over IPR, as well as general guidance in the field of intellectual property rights, including the protection of copyright, patents, and trademarks, the Committee on intellectual property rights of the Ministry of Justice was created in March 2001. In order to harmonise legislation with the norms of the WTO, in September 2001 the government adopted the resolution 'On approval of the Conception of protection of intellectual property rights'. Additionally, in July 2002, the National Institute of Intellectual Property of the Committee on Intellectual Property Rights of the Ministry of Justice was established. The institute examines requests on the protection of intellectual property, including inventions, utility models, trademarks, appellations of origin, industrial design, and plant varieties. In compliance with WTO requirements regarding IPR a Special Section of the Civil Code was elaborated. Besides, the laws on "Trade Marks, Service Marks, and Appellations of Places of Rules of Origin of Goods", "Copyright and Neighbouring Rights", "Protection of Selective Breeding Achievements" and "Legal Protection of Layout Designs of Integrated Microcircuits" were adopted (Abdimoldayeva 2001). Although Kazakhstan became a member of the WTO only in December 2015, enforcement of IPR protection was carried out in the early 2000s.

The absence of spillover effects after following the WTO recommendations forced the authorities to start seeking new ways of encouraging multinationals to relocate their technology-intensive activities in Kazakhstan. Dunning and Lundan (2008) identify the four most common motivations for investment: resource seeking, market seeking, efficiency seeking and strategic asset seeking. Potentially, countries with first-class research facilities and highly skilled human capital may become strategic targets for efficiency seeking and strategic asset seeking multinationals. In Kazakhstan, however, the activity of multinationals is mostly limited to last-stage assembly and extracting natural resources. The Global Competitiveness Report produced by World Economic Forum (2014) provides estimates of the impact of FDI on competitiveness of indigenous firms. The assessment is based on a survey question: to what extent does FDI bring new technology into your country? According to it, Kazakhstan was

ranked only 107th out of 144 countries in category 'FDI and technology transfer'. In order to improve the situation Kazakhstan's government had to reconsider the strategy of blindly following the instructions of the WTO. It is well-established that multinationals are likely to move knowledge-intensive activities abroad to locations that possess strategic assets and capabilities which they can exploit. For instance, Archibugi et al. (1999, p. 12) argue: "when companies decide to move part of their R&D and innovation centres abroad, they generally select the fields of excellence of the host countries. In other words, companies are more likely to go abroad to exploit the national capabilities of the country they are invading rather than to expand their own core competences". Therefore, in order to create conditions for transfer of technologies by multinationals, the government of Kazakhstan needed to create high-quality R&D centres, develop infrastructure and human capital.

According to the plans of the Kazakhstan's authorities, technology parks were meant to become the centres of research excellence, the performance of which would attract knowledge-intensive activities of multinationals. Owing to fragmentation of innovation processes, R&D efforts in the former Soviet Union were performed largely by science production associations and sectoral institutions. The major shortage of commercially-viable technologies experienced by Kazakhstan after the science production associations and sectoral institutions were shut down in the course of reforms, forced the authorities to look for alternative ways of organising R&D efforts. An examination of the experiences of mature market economies encouraged the government to focus available resources on 'borrowing' the practice of creating technology parks. Radosevic and Myrzakhmet (2009, p. 648) note that in Kazakhstan "There is an expectation that TPs [technology parks] could create an environment that is different from the rest of the economy, which would become a source of growth and whose effects would spread to the rest of the economy". It was imagined that technology parks will replace a missing link in the innovation process in the form of science production associations and sectoral institutions. The vision of the authorities was based on acknowledgement of the fact that due to specifics of the Soviet era science-push model of technological development neither Kazakhstan's industries nor universities possessed resources to support R&D efforts on the level that might be of interest to multinationals.

Commenting on the vision of Kazakhstan's authorities regarding the role of technology parks in the innovation system the Vice-Rector on Science and International Cooperation of D. Serikbayev East Kazakhstan State Technical University, Oleg Gavrilenko remarks:

> Technology parks were meant to become that bridge, to substitute sectoral institutions and science production associations. But they never did because the mechanisms didn't work. (Oleg Gavrilenko, interview, 7th July 2016)

The practice of frugal engineering conducted in the past by science production associations and sectoral institutions was no longer possible due to transition towards open market relationships. Therefore, Kazakhstan's government tried to establish new mechanisms of engaging in R&D efforts by following the 'best-practice' experience of 'benchmark' economies. Whereas expectations of the government were high, establishing centres of research excellence on the basis of technology parks was not an easy task, mainly because of a lack of qualified personnel capable of engaging in near-market research and a top-down approach to implementation. The concreate example of how a top-down approach influenced creation of centres of research excellence is provided by Duman Tastanbekov, Director of technology park "Altay":

> The building was renovated, and a fourth floor was built here. What for? This is budget money. They were allocated to development of innovations. What the fourth floor has to do with it? What do we need it for? It was a project of our university. Roof is made out of metal sheets. It is impossible to go in there because of the heat. In winter it is too cold. It took four years to put it into operation and last year we obtained exploitation permit. We refurbished it at our own expense so that it would pass sanitary and fire safety regulations. Amortisation constituted 37 million tenge [Kazakhstani tenge (KZT)]. That is where money went. Almost 400 million tenge [≈ $2.8 million USD]. The decision came from above, it was not bottom-up initiative. There was Resolution of the Government prescribing to build the fourth floor. The big forum with meeting of two Presidents was organised here. Perhaps that was the reason. There are many similar examples in other technology parks. (Duman Tastanbekov, interview, 20th July 2016)

Apparently, the process of establishing technology parks from the very beginning was executed in such a way as to pursue outcomes that would enable officials to demonstrate the results of their work to the higher authority rather than facilitate innovative effort.

In the opinion of researchers, the way near-market research was supposed to be conducted in technology parks would diminish the role of scientific research in the innovation process. The adoption of the 'economy first, then politics' approach empowered officials to focus on implementation of the national sociotechnical imaginary in the way they saw fit, while neglecting the need to engage in a dialogue with stakeholders. In order to accelerate Kazakhstan's transformation into a knowledge-based economy, the government integrated different elements of 'benchmark' innovation systems in top-down manner. The practice shows that 'borrowing' elements of an innovation system from other contexts is not always the best way of boosting technological development. For instance, Gu and Lundvall (2006, p. 298) argue: "It is fundamental that you cannot transplant single elements that work well in one national system to another and expect the same impact on economic performance". Nevertheless, in the absence of the need to justify its decisions the government proceeded with the idea of promoting innovations through technology parks. The government chose to overlook the fact that the 'borrowed' practice did not fit well with the norms and values of research scientists. In particular, the emphasis on getting the science right rather than bringing technology to the marketplace during the Soviet era left a strong legacy. The fact that research goals were pursued without being held back by matters of commercial practicality or downstream implementation concerns was particularly important to scientists. The way R&D efforts were supposed to be conducted in technology parks, however, represented a completely different system of values which was not acceptable to scientists who chose to pursue research carriers for an opportunity to engage in 'big science and technology'.

An interview with the Vice-Rector on Science and International Cooperation of D. Serikbayev East Kazakhstan State Technical University, Oleg Gavrilenko illustrates how a change of attitudes of officials towards the role of scientists in the innovation process made them reject the 'rules of the game' of sociotechnical imaginary:

> We tried to work with the technology park and directly with the National Agency on Technological Development. Now majority of scientists say: there is no way we will work with them again. Never. The National Agency on Technological Development makes announcements: please come, take funds, but nobody wants. Managers who work there are not always qualified and constantly change. Naturally, doctors of

> science, professors think highly of themselves. And here appears a young man and starts bossing them around: you need to submit me such and such document, you haven't done this, you haven't done that... (Oleg Gavrilenko, interview, 7th July 2016)

The fact that the socialist society prioritised input of scientists over concerns and limitations of other stakeholders led to the formation of an 'ivory tower attitude' of Soviet researchers (Amann 1982). Berry (1982, p. 59) mentions: "The fragmentation of the traditional system of R and D had led to a clearly hierarchical structure with the research institute looking down on the design bureaux and the design bureaux looking down on the factories". The conduct of research through technology parks, however, implied diminishing of the role of scientists in the innovation process. A flagship of Soviet industry - Ulba Metallurgical Plant, is one of the world leaders in terms of production of beryllium, tantalum, and niobium. Nurlan Musin, its former chief executive officer explains how important the system of incentives, adopted in the Soviet Union was for engineers:

> Earlier, in Soviet times, R&D efforts and the initiatives of engineers in terms of new ideas, introducing innovations into existing or new technologies were welcomed at every stage. Factories had enough funds and legal grounds to pay rather large bonuses and many engineers were successfully engaged in doing this because it gave them the opportunity not only to receive monthly salaries, but also to earn extra money for their families. Besides, it was considered honourable, it distinguished a person. Such people then grew up in the ranks… If you had attended a meeting of the Science Technology Council [governing body on the matters of scientific and technological development] of a university and then attended one held by the Science Technology Council of enterprise, you would have realised which council members worked more actively. At the enterprises Council, discussion could almost turn into a fight because everyone was emotionally invested. (Nurlan Musin, interview, 18th July 2016)

Under the science-push model of technological development, the innovation process was deliberately fragmented to enable scientists to pursue research goals regardless of interests of central planning agencies, industrial players, or end-users. The lack of practicality in the outputs of academic institutions was compensated through R&D efforts conducted by industrial players. However, while scientists occupied a higher place in the hierarchy, it seems that the interests of personnel of industrial enterprises were not infringed and they were also in favour of the way the science-push model functioned.

Apart from the top-down integration of 'borrowed' elements of 'benchmark' innovation systems, the government's failure to take into consideration the values of stakeholders manifested itself in a tendency to privilege the procedures of allocation of state funds over achieving of scientific results. Radosevic and Myrzakhmet (2009) argue that Kazakhstan's technology parks operate merely as business incubators for locally oriented firms, which are no more innovative than other domestic firms. One of the key reasons why technology parks are occupied with non-innovative firms is the unwillingness of scientists to undergo the bureaucratic procedures, required for getting funding. Scientists viewed such practices as unacceptable, as during the Soviet era the research process rather than following the procedures of allocating finances was the most important part of the innovation process. However, officials, responsible for allocation of grant money are not throwing up obstacles on purpose.

Procedures must be handled by the book or they run the risk of being prosecuted for embezzlement or other corruption-related crimes by various controlling agencies. The controlling agencies do not tolerate even the slightest breach of procedures because they are not responsible for development of innovations. The controlling agencies are infamous for their tendency to overstep their authority in prosecuting real or imaginary crimes in order to meet their targets. For instance, during Parliamentary hearings in November 2016 General Prosecutor Zhakip Asanov reported that half out of 9 thousand criminal processes carried out by the Economic Investigation Service were initiated illegally (Davidova 2016). Despite being centrally controlled by a top-down system of decision-making, governmental bodies pursue conflicting goals, causing a rejection of the 'rules of the game' of national sociotechnical imaginary by stakeholders.

The Vice-Rector on Science and International Cooperation of D. Serikbayev East Kazakhstan State Technical University, Oleg Gavrilenko comments:

> Mechanisms, offered by National Agency of Technology Development, including the one they offer through technology parks are not aimed at carrying out R&D process. Let me now explain why it is so. The main concern of officials who work there is whether or not money went through. It is all about allocation of funds and expenditure reporting, whereas the essence of the work disappears. The R&D process itself vanishes. That is to say, that everything is only about money circulation procedures: allocation of money, finishing by deadline, submitting reports and that is it. You see? Meanwhile, real life is a little bit more complex than that. Creative process, process of research is complicated. For instance, I realise that I need certain device [for the research]. I submit application that I need that device. However, our reality can be difficult and such device is not available or the dollar jumped up or something else happened. I was not able to buy it, but bought another device, which happened to be even better than the device I initially planned. Do you understand what is R&D process? It is path of trial and error. That is to say, I experimented today and realised that different device is required. Nevertheless, National Agency of Technology Development says: "Your application says that you have this device, but you purchased slightly different modification". There also can be issues with law 'On state procurement'. They say: "We won't accept that. You have to return money". In essence, they don't care what the result is, but whether or not device that you bought was in the application. Paradoxically, scientific result doesn't matter, only financial reports on spending money. (Oleg Gavrilenko, interview, 7th July 2016)

The fact that for public sector managers means eventually became more important than ends is not the only stand out factor here. It comes as little surprise that over time, officials developed a tendency to pursue only those goals visible to the higher authority due to the top-down governmental hierarchy and the lack of checks and balances. More interesting is how strongly the values of scientists manifested themselves. Their unwillingness to accept the new 'rules of the game' regardless of potential access to funds demonstrates how strongly a mismatch between formal arrangements and informal constraints can affect attempts to establish a new order of things.

The next section analyses whether withdrawal of the government from the role of a sole mediator of science-industry relationships facilitated collaboration between R&D and industrial players.

4.6. Collaboration of science and industry

The authorities assumed that their ability to turn Kazakhstan into a knowledge-based economy hinged largely on the advancement of scientific research, which they expected to become more relevant to the needs of industry. The authorities imagined that the transformation of the national innovation system from the science-push to the market-pull model of technological development would be conducted in such a way that it would nudge R&D and industrial players towards collaboration, thereby creating favourable conditions for technological breakthroughs. In his Address to the nation the President announced: "During the second [2015-2019] and subsequent five-year plans, we should establish the industries of mobile and multimedia technology, nanotechnology and space technology, robotics, genetic engineering, and future energy exploration… In the next 10-15 years, it is necessary to develop a knowledge-intensive basis for the economy. Without this basis we cannot join the group of developed countries. And it must be founded on advanced science" (Nazarbayev 2014). While the authorities acknowledged the fact that advancement of science plays an important part in building up the national economy, it was expected that the priorities and boundaries of scientific research would be defined by the needs of industrial players. What was not taken into account, however, is the fact that the Soviet era science-push model of technological development prioritised scientific research over the needs and limitations of other stakeholders. Not only did it create 'ivory tower' attitudes in the scientific community, but it also established a system of values, in which research goals were placed on a higher hierarchical level.

The National Chamber of Entrepreneurs "Atameken" is Kazakhstan's largest and most influential non-governmental organisation, headed by the Kazakhstan President's son in law. The Chamber protects the rights and interests of the business by representing it in negotiation with the government and public authorities. Its Deputy Chairman, Nurzhan Altaev describes the science-industry relationships as follows:

> As a representative of the National Chamber of Entrepreneurs, as a businessman I argue that our science should primarily work for the benefit of our business, for our industry. Not in the way it happens now. Unfortunately, I have to state that we have no connection between science and business. Science works on its own, inventing some spaceships, so to say, that business does not need in its work. There is no application for it in industry. It turns out that large state funds are allocated to science, mostly fundamental and scientists come up with ideas that have no application. (Nurzhan Altaev, interview, 29th July 2016)

This quotation captures the key reason why the authorities are unable to identify what inhibits collaboration between business and science. Businessmen and public sector managers assume that in the open market relationships, scientists should first and foremost focus on solving the problems of industry. However, they do not consider the fact that researchers have a completely different point of view about the goals of science because they are heavily influenced by the values that were formed during the Soviet era. Research in the Soviet Union was directed towards solving strategic goals of the socialist society and completely disregarded interests of

industrial entities or end-users (section 3.2.). Mindsets of people are impervious to influence governmental policies and change only in path-dependent ways (North 1990). Accordingly, what the authorities and businessmen overlook is that the attitudes of researchers towards the goals of science would not change simply because Kazakhstan undergoes transition towards open market relationships.

Whereas the harmonisation of scientific and industrial objectives is inherent to the market-pull model (if not always achieved in practice), the transformation of organisational and institutional set-ups of Kazakhstan's innovation system did not automatically encourage collaboration between R&D and industrial players. In the market economy collaboration between R&D and industrial players enables them to respond quickly to changes in markets and technology, accelerates the diffusion of technology, and facilitates the transfer of tacit knowledge. Accordingly, Kazakhstan's government implemented a series of reforms aimed to adapt organisational and institutional set-ups inherent to a market-pull model of technological development. The authorities imagined that transformation of formal arrangements would create the same environment as in 'benchmark' open market economies, encouraging R&D and industrial players to cooperate. However, despite formal arrangements aimed to increase the role of market forces have been introduced, the rift between scientific and industrial objectives remains significant. UNECE (2012, p. 22) notes: "There is a wide gap between the worlds of business and science in most countries. In Kazakhstan, the problem has been particularly acute given the legacy of the planned economy, where there was a rather strict separation between the research sector and companies". Even when major efforts are made to put institutional and organisational structures in place, it does not necessarily change the nature of relationships among actors because informal constraints remain unaffected. In reality, it is the interplay of formal and informal institutions rather than mere transformation of organisational or institutional set-ups that defines whether scientific and industrial objectives can be harmonised.

Implementation of reforms aimed at increasing the role of market forces have neither changed values and attitudes of participants of innovation processes nor influenced science-industry relationships. Duman Tastanbekov, Director of technology park "Altay" recounts:

> We hosted the Scientific and Technical Council under the akimat [office of the governor] and invited Mutanov, the rector of Al-Farabi Kazakh National University. He brought team of scientists. They arrived and said that they have some technologies for our region, in particular for Titanium and Magnesium Plant. Although funds were allocated on it, they invented something that no one in fact needed. It was waste. At the end of the meeting President of Titanium and Magnesium Plant got up and said: "Why did you bring all this? We don't need that". She said: "We have technologies in this field, we have foreign experts and we consult with them. We have other problems. We need to solve recycling of a waste problems, and so on…". It turned out that they were exploring something that no one needed. (Duman Tastanbekov, interview, 20th July 2016)

Although the government expected that transformation of formal arrangements would incentivise domestic actors to network, Kazakhstan is ranked only 88th among 144 economies in university-industry collaboration in R&D (World Economic Forum 2014). Evidently, mindsets of participants of innovation processes, their practices, routines, values, and codes of

conduct are too sticky and path-dependent to be influenced solely by change of organisational and institutional set-ups.

While the withdrawal of governmental control encourages collaboration of R&D and industrial players in the context of countries with established market relationships, it produced the opposite effect in the country that only undergoes the process of transition. The reduction of governmental intervention is perceived as a way of bridging the rift between R&D and industrial players in countries where the market relationships are well-established. For instance, Intarakumnerd (2006) mentions that financial autonomy, granted to universities by the Thai government have encouraged them to conduct industry-relevant research and forge links with enterprises through training activities. As a result, not only did Thai universities become more relevant to the needs of industry, but they also reduced their dependence on funding from the national budget. However, in the countries of the former Soviet Union the mindsets of participants of innovation processes are locked-in on the paradigm in which the government supplies inputs, allocates outputs to end-users and essentially controls every aspect of innovation processes. Accordingly, OECD (2017, p. 26) notes that in Kazakhstan: "Most universities are not well-acquainted with the task of collaborating with industry on innovation. In return, many business firms – partly because of their limited absorptive capacity – do not see universities as sources of useful research results or as trustworthy and promising partners for contract or collaborative R&D". The withdrawal of the government from the role of a sole mediator of science-industry relationships only increased the gap between science and industry in Kazakhstan.

Mikhail Bortnik, Senator, Member of the Committee on Economic Policy, Innovative Development and Entrepreneurship describes the vision of the authorities:

> There are certain industries that constitute the backbone of our economy. This relates to the oil production, mining, and metallurgy. Bunch of innovations can be introduced there in order to reduce prime cost or achieve better quality of metals. There should be the main field for innovations, for our scientists. First of all, this is direct application of innovations because if you invented something, companies probably will be interested in you. Second of all, those companies can support you at the initial stage and support you financially. You don't necessarily need government grants. (Mikhail Bortnik, interview, 22nd May 2017)

Similarly, Deputy Chairman of the Board of the National Chamber of Entrepreneurs "Atameken", Nurzhan Altaev notes:

> Representatives of our science are not interested in solving problems of business because it is easier to win some state grant, take a lot of money and spend them somehow, since no one will bring you to account for them, rather than work with business and execute particular tasks that it needs. (Nurzhan Altaev, interview, 29th July 2016)

These statements reflect the general misconception of the authorities stemming from the exposure to the ideas of market fundamentalism that the reduction of state funding might encourage scientists to engage in industry-relevant research. The problem is that such viewpoints do not account for the specificities of the science-push model of technological development, which make state support and mediation absolutely crucial during the process of transition. In the Soviet Union, science production associations were deeply engaged in frugal

engineering of consumer products, which substituted near-market research. After science production associations were shut down and their personnel dismissed, the well-established mechanism of integrating R&D outputs into industry was destroyed. As a result, the scientific community in transition economies is largely represented by former employees of the Academy of science, who in the past were mainly engaged in fundamental research and therefore have no experience of collaborating with industries. Consequently, state funding should be high enough to let domestic scientists to broaden their expertise to the level when their research outputs become relevant to the needs of industrial players but not high enough to let them ignore opportunities offered by collaboration with industries.

The adoption of the 'economy first, then politics' approach enabled officials to focus on implementing their own interpretations of what should be done in order to build up a knowledge-based economy. Collaboration between R&D and industrial players in many ways depends on the ability of two leading ministries in the domain of research, development, technology and innovation – Ministry of Education and Science and Ministry of Investment and Development to combine their efforts in addressing the expectations of stakeholders. However, nudging R&D and industrial players into collaboration was not a priority for Ministry of Education and Science. In Kazakhstan, the absence of checks and balances in terms of public accountability of officials motivates them to pursue only those targets that are closely monitored by higher authority. Nudging R&D and industrial players into collaboration is a complex endeavour which would require a lot of effort by the Ministry of Education and Science and therefore may prevent public sector managers from meeting their most important performance indicator – that is, the utilisation of funds. On the other hand, allocation of funds on conduct of purely academic research is the easiest way for the Ministry of Education and Science to utilise their budget as it can be conducted by scientists on their own. Although allocation of funds on pursuit of pure science is not going to turn Kazakhstan into a knowledge-based economy, it allows officials to meet plan targets by using their budget in the most convenient way.

The National Agency for Technological Development is directly subordinate to Ministry of Investment and Development. Sanzhar Izteleuov, Chairman of the Board recounts attempts of his Agency to coordinate its work with Ministry of Education and Science:

> Last year we visited 300 companies and have identified 75 problems that enterprises strive to solve. We said to Ministry of Education and Science: "You provide grant funding. Here are 75 problems that you can focus scientists on. Whether there will be results or not it is still better than science for sake of science". But they refused because it creates difficulties for them. They want to solve some tasks of their own. They regularly provide funding. Some scientists live at the expense of it. They get used to do it in Soviet way [separate science from industry]. But I say, even if they work in a Soviet way, let's give them these tasks. They [Ministry of Education and Science] could have prioritised these tasks and pass them down the chain [for the scientists to solve]. When you receive grant, solve these tasks since you are scientist. But it never moved from the dead-point. (Sanzhar Izteleuov, interview, 26th July 2016)

The conclusion that can be derived from the Chairman's recollection is of high importance. It shows that the tendency of governmental agencies to pursue their own goals to the detriment of the interests of the entire country is one of the key factors hindering any progress in solving

the problem of a lack of collaboration between science and industry. The unwillingness of the Ministry of Education and Science to join forces stems from the adoption of the 'economy first, then politics' approach, the primary aim of which was to accelerate the pace of market-oriented reforms. The adoption of the 'economy first, then politics' approach consolidated the power around the President, encouraging public sector managers to focus on achieving goals that would be most visible to the higher authorities. The lack of checks and balances in terms of public accountability by officials caused by the suppression of the civil society and the mass media strongly aggravated this tendency.

4.7. Conclusion

Whilst many market-oriented researchers tend to view transition as merely the transformation of formal organisational and institutional set-ups, which can be accomplished overnight, the reality is that transition represents a paradigm-shifting undertaking that needs to be addressed properly in order to avoid serious systemic problems. There is a common misconception among market-oriented researchers to consider a centrally-planned economy as a non-system, designed to replace market forces with central planning procedures. Centrally-planned development was a fully-fledged paradigm, which needs to be distinguished from the generally accepted norm of market relationships as it was established in order to pursue the goals of socialism, such as eradication of inequality, speculation, unemployment, and exploitation. The goals of socialist society shaped the system of values of Soviet people and defined a model of technological development, adopted by the communist regime. Being developed in order to fit well with the goals of socialism, the science-push model had several features, that differentiated it from market-pull model of technological development. In particular, the science-push model enabled researchers to engage more in 'big science and technology' in areas such as space exploration, nuclear power and military technology because frugal engineering of consumer products enabled the budget of civil R&D to be kept relatively low. The practice of separating R&D players from industries and end-users enabled researchers to focus on getting the science right by excluding pressures exerted by consumer demand and downstream implementation concerns. Since neither central planning agencies nor ministries were in position to determine research priorities, scientists were also able to engage in the pursuit of risky research projects, the strategic value of which was expected to be high. Over the course of decades of Soviet era codes of conduct, norms, and practices of science-push model shaped values, expectations and attitudes of researchers, which became extremely resistant to change. Transition is a paradigm-shifting undertaking, the core difficulty of which lies not in transformation of formal set-ups, but in making them fit well with the informal, tacit elements of a system, such as system of values.

The lack of a tangible plan on how to transform Kazakhstan into an open market economy, encouraged the government to adopt the 'economy first, politics second' approach in order to pursue a national sociotechnical imaginary, formed by the WTO. Kazakhstan had to abandon the science-push model of technological development because it was incompatible with the implementation of WTO-plus demands to establish an open market economy. The WTO had no knowledge about the nature of transition. Nevertheless, being an active promoter of the ideas of the Washington Consensus, the WTO formed a national sociotechnical imaginary by claiming that neoliberal reforms will turn Kazakhstan into a knowledge-based economy. Being convinced that an increase in flow of inward FDI would lead to technology transfer, the authorities decided to demonstrate political stability to foreign investors and ensure

the smooth implementation of the demands of the WTO by delaying democratic reforms and concentrating power in the hands of the President. While the strategy, adopted by Kazakhstan's government has indeed triggered massive inflow of FDI, it did not facilitate the transfer of new technologies. Contrary to the expectations of the government, multinationals neither integrated domestic R&D players into their research projects nor relocated their knowledge-intensive activities into Kazakhstan. Moreover, the establishment of unilateral control over the course of Kazakhstan's socio-economic development by the government did not bring positive results because reforms were conducted in the absence of a clear vision of how the transformation of the model of technological development could be accomplished. Being unfamiliar with the way the market-pull model actually works, authorities focused on establishing its most evident attributes, by following practices adopted by mature market economies.

The ability of Kazakhstan's innovation system to produce competitive outputs by switching to a conduct of near-market research was hindered by the lack of a tangible plan and top-down approach to implementation of paradigm-shifting reforms. A mismatch between codes of conduct, norms and practices of scientists, established in the course of decades of the Soviet history and formal set-ups that the government planned to adopt was paradigmatic. However, the government implemented radical reforms in a top-down manner due to a firm belief that by following the prescriptions of the Washington Consensus, Kazakhstan will turn into a knowledge-based economy. The fact that the national sociotechnical imaginary was based solely on neoliberal rhetoric of the WTO and offered no tangible plan was overlooked due to a reformist attitude of the authorities. Having no guidelines on how transition should be handled, the government did not take into consideration the fact that the mere change of formal organisational and institutional set-ups neither automatically makes them fit well with the expectations of researchers, nor necessarily changes how things are done. No attempt was made to create an environment that would incentivise conduct of near-market research because it was assumed that researchers would automatically start performing tasks in the way it was imagined by the authorities. Moreover, being influenced by the neoliberal ideas, the authorities drastically reduced responsibility for funding R&D as they imagined that the reforms will facilitate integration of domestic R&D players into the global research projects. Furthermore, since the national sociotechnical imaginary is neither very specific, nor sufficiently goal-oriented, officials developed a tendency to interpret it in such ways as to pursue outcomes, accomplishing of which would make them noticed by the higher authority. As a result of adoption of a top-down approach to implementation of reform, aimed at establishment of an imaginary system, the government failed to create conditions which would incentivise conduct of near-market research, required for production of competitive outputs in an open market environment.

The adoption of commercialisation policies, typically used by mature market economies in order to bring technology to the marketplace, facilitated illegal lobbying of commercially unviable technologies. Implementation of WTO-plus demands to establish an open market economy led to the shutting down of science-production associations – the last link of the production chain in the science-push model of technological development. The government attempted to address the shortage of output of commercially-viable technologies by 'borrowing' commercialisation of technologies policies from the contexts of countries in which market-pull model of technological development is well-established. It was imagined that allocation of state funds through policy instruments, typically used by mature market

economies would allow to spur the development of new technologies. What was not taken into account, however, is that in reality the problem of the shortage of output of commercially-viable technologies was caused not by the lack of mechanisms of diffusing the results of R&D, but by unwillingness of scientists to engage in a conduct of near-market research due to a mismatch between their expectations and the formal set-ups, implemented in accordance with the vision of the authorities in a top-down manner. In the absence of near-market research outputs, the allocation of funds through the mechanisms provided by commercialisation of technologies policy leads to corruption because the goal for which funds are allocated cannot be achieved. Moreover, being 'borrowed' from a different context, commercialisation of technologies policy becomes a potential risk for universities as it allows them to finance start-up companies directly from their budgets. The authorities overlooked the fact that personnel of universities possessed neither the resources nor the expertise required for development of commercially-viable technologies because under the science-push model of technological development they were engaged solely in academic research. Being convinced that Kazakhstan is on its way of turning into a knowledge-based economy, the government developed a tendency to treat the symptoms while ignoring the causes of systemic problems.

Attempts to create an environment that would incentivise multinationals to relocate their knowledge-intensive activities into Kazakhstan by creating the centres of research excellence have failed because the government disregarded the need to meet the expectations of scientists. Being convinced by the neoliberal rhetoric of the WTO that the entry of multinationals will enable the national economy to catch-up technologically with frontier countries, the authorities put a lot of effort into attraction of FDI. Although in general multinationals are reluctant to move their knowledge-intensive activities to locations outside their home base, the government was confident that implementation of demands of the WTO and improvement of investment climate will have a certain signalling value. Moreover, since multinationals tend to move their knowledge-intensive activities abroad to locations which possess strategic capabilities they can exploit, the government invested heavily in creation of technology parks, which were envisioned as centres of research excellence. The government overlooked the fact that the 'borrowed' practice of conducting near-market research in technology parks did not fit well with the values, norms and practices of research scientists. Over time, the Soviet-era science-push model of technological development developed an 'ivory tower' attitude amongst researchers, as they were at the top of a hierarchical structure, looking down on the design bureaux, the factories and the end-users. Researchers did not bother to engage in a conduct of near-market research because under the centrally-planned development paradigm getting the science right was more important than bringing technology to the marketplace. A mismatch between the mechanisms offered by technology parks and the expectations of scientists was caused by the necessity to follow complex procedures of obtaining funds, the disrespectful attitude of officials responsible for allocation of funds, and a lack of familiarity with the task of conducting near-market research.

The withdrawal of the government from the role of a mediator of science-industry relationships in the process of building up a system, based on national sociotechnical imaginary increased the rift between R&D and industrial players. The government was convinced that the establishment of an open market economy in accordance with the demands of the WTO will nudge R&D and industrial players towards collaboration, creating conditions for forthcoming technological breakthrough. However, while the reduction of governmental intervention might

be a valid strategy for making scientific research more relevant to the needs of industry in the contexts of countries where the market relationships are well-established, it produced the opposite effect in the case of Kazakhstan. Firstly, neither universities nor business firms were familiar with the task of collaborating on innovation because under the centrally-planned development paradigm the government acted as a sole mediator of science-industry relationships. The lack of trust on both sides inhibited the establishment of a promising partnership. Secondly, the collaboration was hampered by inability of the government to shape an environment that would incentivise domestic scientists to switch from a practice of pursuing purely academic goals to a conduct of near-market research, required for the development of commercially-viable technologies. Finally, scientists are unable to turn their research outputs into commercially-viable technologies by forming partnership relationships with domestic firms due to their limited absorptive capacity to manage complex technology. The tendency of the authorities to form the strategy of technological development by following the sociotechnical imaginary shaped by the WTO rather than creating an actual plan for how to transform the national innovation system inhibited collaboration of science and industry.

5. GOVERNMENT AS REGULATOR

5.1. Introduction

In this chapter, I examine how requirements of the WTO to transform Kazakhstan's regulatory environment in accordance with the neoliberal principles of the Washington Consensus influenced the country's attempts to catch-up with frontier economies in terms of technological development. Here the attention is drawn to the fact that due to the lack of knowledge about the process of transition, the sociotechnical imaginary was formed in order to convince the government that Kazakhstan's regulatory environment could be improved practically overnight through transformation of its formal institutions and liberalisation of trade and investment regime. This chapter pays specific attention to the way the reformist attitude of the authorities and their belief in the sociotechnical imaginary, shaped by the WTO, influenced attempts to establish an efficient regulatory environment, needed for integration of domestic firms into supply chains of multinationals and their capability building in open market conditions. I show that the prescriptions of the Washington Consensus disregard the fact that centrally-planned development was a fully-fledged paradigm, causing a mismatch between the formal set-ups and well-established informal institutions, embedded in practices, routines, and codes of conduct of domestic actors.

This chapter is organised as follows: section 5.2. shows how in the absence of an actual plan on turning Kazakhstan into an open market economy the government was encouraged to focus primarily on the necessity of transforming the country's formal institutional and organisational arrangements. Section 5.3. examines how the mismatch between formal set-ups and informal constraints, entrenched in the mindsets of domestic actors, influenced the ability of the authorities to control the establishment of an efficient regulatory environment. Section 5.4. describes attempts by the authorities to make society more entrepreneurial in order to facilitate capability building of domestic firms. In section 5.5. I analyse how the government tried to encourage export-led growth by following the footsteps of the Asian Tigers. Section 5.6. reviews how the regulatory environment influenced government plans to turn Kazakhstan into a platform for export operations of multinationals.

5.2. Regulatory environment in closed and open economic systems

While the regulatory frameworks of the Soviet Union were well-suited for achieving the goals of socialism in a closed economic system, its complexity would become an impediment for creating a favourable environment for development of competitive domestic firms in open market conditions. The regulatory environment plays a central role in the production, adoption and diffusion of innovations. It influences the behaviour of national firms, shapes their capabilities and defines technological opportunities. The regulatory system of the Soviet Union was constructed by extensive use of performance indicators based on central plans, checks and permissions which set performance objectives for domestic actors in conformity with the planning priorities (Bunich 1980). Complex planning procedures and all-embracing norms were used in order to replace missing market forces and regulate relationships in such a way as to harmonise the endeavours of individual actors with those of others in a pursuit of common aims. With the establishment of the self-regulatory market relationship paradigm, numerous regulatory constraints, cumbersome institutional arrangements, and

excessive governmental intervention inherent to former planned economies would create significant obstacles for capability-building of national firms. Therefore, in the Address to the nation the Head of the State argued: "Sure enough, the discarded system offered more secure minimum social benefits and was a success in a number of fields. However, we must remember that this system fell apart because it proved to be non-competitive from the economic point of view… Within the Soviet command economy, the state managed to control everything and everybody. As a result, it has become an awkward structure with numerous intersecting chains. In developed countries more than 80% of similar activities which were under the Soviet control, are not included into the list of state functions" (Nazarbayev 1997). Consequently, in order to establish an open market economy, Kazakhstan's government faced the necessity to form a regulatory environment that would motivate stakeholders to engage in innovative activity.

Nurlan Musin, former chief executive officer of Ulba Metallurgical Plant, recounts his perspective on the goals of technological development in capitalist and socialist societies:

> In the past I had always asked myself: why were we capable to produce spacecrafts, that put the Soviet Union ahead of developed capitalist countries but did not produce decent tractors such as John Deere's? The cause is in the political system. In order to keep making profits when the market was saturated, John Deere had to increase the price of each tractor by introducing new functions and improving level of comfort. Those tractors have satellite broadband, air conditioning. You can speak to your wife in any time, watch TV, listen to music. Seats are leather upholstered and have massage system. Manufacturers such as John Deere made sales of such tractors possible by lobbying state subsidies to farmers. Subsidies that are allegedly intended to support farmers in reality are targeted towards manufacturers… And now compare it to Soviet era. It is hard to imagine our farmers being provided with such conditions because our people had to be modest. Our people were meant to work in normal, simple conditions. That is why the excessive technological development of means of production was not approved. Not because our people could not do it. (Nurlan Musin, interview, 18th July 2016)

The Soviet regulatory system was created with the goals of socialism in mind (section 3.2.). Its main priority was to develop technologies capable of improving the well-being of the entire population rather than to increase profitability, competitiveness, commercial attractiveness, or exclusivity of products. Moreover, the regulatory system of the Soviet Union enabled the authorities to direct the efforts of scientists and engineers towards the goals they considered important.

Kazakhstan's authorities imagined that the implementation of radical reforms in accordance with the demands of the WTO would automatically lead to the formation of a regulatory environment that would incentivise entrepreneurs to innovate, encourage multinationals to relocate their knowledge-intensive activities to Kazakhstan and facilitate integration of domestic R&D and industrial players into the global value chain. The formation of the national sociotechnical imaginary, picturing Kazakhstan's transformation into a knowledge-based economy was inspired by the neoliberal rhetoric of proponents of the ideas of the Washington Consensus. Developed countries and intergovernmental organisations strongly encouraged Kazakhstan's government to accelerate the implementation of WTO-plus demands to establish an open market economy, emphasising the benefits of the reforms (EBRD

1994). Potentially problematic matters such as the ability of uncompetitive domestic firms to withstand competition with multinationals in an open economic environment were represented as an integral part of the process of building up their competence. For example, the United Nations Economic Commission for Europe (2012, p. 140) stated: "Over the next five to ten years, WTO accession seems likely, which would have a significant impact on the economy. The increased competition could act as a further stimulus for Kazakhstan's companies to innovate, while Kazakhstan's attractiveness to foreign investors may also increase due to improved perceptions, better market access, a more transparent legal framework, and enhanced investment procedures. At the same time, WTO membership would set significant limits to state support for industries and state regulation of projects with foreign capital participation. On the other hand, reduced state protection may also boost incentives for Kazakhstan's firms to intensify their innovation efforts". While different analysts asserted that radical reforms would greatly benefit Kazakhstan's economy, the fact is that no real evidence was provided to support such claims. Not only is it difficult to predict the results of paradigm-shifting transformations in general, in addition, there was no similar precedent in the world history, examination of which could have served as a basis for drawing such conclusions.

Even though no evidence was provided that the neoliberal reforms would turn Kazakhstan into a knowledge-based economy, the authorities enthusiastically embarked on their implementation. The 'best-practice' reform package, imposed by the WTO was based on a set of 10 economic policy prescriptions, known as the Washington Consensus (section 3.5.). In accordance with it, Kazakhstan was supposed to reduce governmental intervention in economic activity, liberalise trade and investment regime, conduct privatisation and so on. The ideas of the Washington Consensus sharply contrasted with the regulatory practices adopted in the Soviet Union, which, after disappointing results of perestroika (Desai 1989) became associated with stagnation and lack of technological dynamism. Thus, the impression that by following the recommendations stipulated in the Washington Consensus and promoted through the WTO, Kazakhstan is moving towards creation of knowledge-based economy became a foundation for national sociotechnical imaginary. Speaking about accession to the WTO in his annual Address to the people, President Nursultan Nazarbayev announced: "We want to see Kazakhstan as a country developing along the global economic trends, as a country which is embracing all that is new and progressive, as a country which holds a small but its own specific niche in the world economy, and as a country which is quickly adaptable to new economic conditions… I strongly believe our country's accession to this international economic organization opens vast opportunities for strengthening Kazakhstan's competitiveness on the world markets" (Nazarbayev 2006). Although the reformist attitude of the authorities and their enthusiasm regarding the ideas of the Washington Consensus raised the nation's expectations, the ability to turn sociotechnical imaginary into reality first and foremost depended on methodical implementation of concrete plans.

While the WTO insisted upon implementation of radical reforms, prescribed by the Washington Consensus, it offered no guidelines on how Kazakhstan's government should have handled the transformation of institutional and organisational set-ups. Being unfamiliar with the ways market systems operate, Kazakhstan's authorities anticipated that the WTO would provide instructions on how to resolve the challenges, emerging in the process of implementation of the paradigm-shifting reforms. The problem, however, was that the WTO possessed neither knowledge about specificities of innovation process in the Soviet Union nor expertise on the matters of transition (section 3.5.). Nobel Laureate Joseph Stiglitz (1994, p. 3) argues: "For economic theorists the problems facing the socialist economies represent a challenge… Surely economic theory should provide considerable guidance. Regrettably,

economic science – at least until recently – has had very little to say about these fundamental matters, and even less to say about the important issue of transition. The typical advice of the visiting consultant making a hurried trip to one of the economies embarking on a transition path is to emphasize repeatedly the importance of markets…". The suggestions given by the WTO were derived from the viewpoint of an outsider and stressed the need to liberalise trade and investment regime and create a fair play environment for multinationals. As a result of the absence of a concrete plan to transform the regulatory environment, the government focused largely on adoption of institutional and organisational practices inherent to open market economies, and attraction of FDI through improvement of the investment climate. Meanwhile, many important issues, related to the development of a regulatory environment that would improve the capability building of domestic firms remained overlooked, hindering attempts of the authorities to turn the national sociotechnical imaginary into a reality.

The Vice Minister of Investments and Development, Yerlan Khairov explains which measures Kazakhstan's government considers to be important for attraction of FDI:

> What is the investment climate? The investment climate is practically everything. Namely: how you got a visa, how you entered the country, how comfortable was your flight, how you entered the airport, whether or not immigration officer smiled to you. After that, when you went out, you need to catch high-quality cab, get to a good, adequately priced hotel. Next, when you turn on TV, is there a channel in English? Afterwards, when you start a business, it is ease of opening an enterprise: whether or not you have e-government, if customs work normally, if tax system works efficiently. At some point, social security, health care and education system come into consideration. That is to say, there is a number of issues and investment climate covers them all. That is why our task is to create the best possible business climate and solve all these problems. Then you will have desire to enter and invest in our country. (Yerlan Khairov, interview, 1st August 2016)

It is vital to note that the reformist attitude of Kazakhstan's authorities and their firm belief in the sociotechnical imaginary, shaped by the WTO, became one of the main reasons why various problematic matters were overlooked during reforms. This attitude was especially noticeable during the interview with the Vice Minister, who seemed especially confident in his belief that increase in inflow of FDI is the most important factor that would lead Kazakhstan towards transformation into a knowledge-based economy.

Another factor that impeded the attempts of Kazakhstan's authorities to turn the national sociotechnical imaginary into a reality was the necessity to meet paradigm-shifting demands of the WTO at entry, without any transitional period. Rodrik (2002) argues that gradual and cautious harmonisation of national legislation with the norms of the WTO may provide the government of a developing country with an opportunity to build a high-quality regulatory environment. However, the first part of the problem with this argument in relation to the case of Kazakhstan is that for the countries of the former Soviet Union implementation of the ideas of the Washington Consensus, even over a relatively prolonged period of time cannot be qualified as a gradual change. The key challenge of transition from centrally planned to open market economy lies not in transforming formal institutional and organisational arrangements, but in addressing issues, arising as a result of a paradigmatic mismatch between the formal set-ups that had to be established and informal constraints embedded in well-established practices, routines, and codes of conduct of domestic actors. Unlike formal rules which can be changed overnight, these informal constrains are extremely resilient to policy interventions (North 1990). The second part of the problem is that similarly to other post-Soviet

countries, Kazakhstan was required to meet most of the WTO commitments at entry with no transition period. United Nations (2001, p. 37) argues that during accession of transition economies to the WTO "No time is allowed these countries to establish the required institutional and legal infrastructure to meet these commitments which are part and parcel of their overall transition to a market economy which is a long and painful process and cannot be forced overnight". The WTO rhetoric stated that implementation of the reforms, based on the rules of the Washington Consensus would enable post-Soviet Kazakhstan to create a favourable regulatory environment, required for turning the national sociotechnical imaginary into reality. However, due to the paradigm-shifting nature of the demands imposed and the necessity to meet most of the WTO commitments at entry, Kazakhstan faced a barrier that was too difficult to overcome.

Although the WTO placed a strong emphasis on the importance of transformation of Kazakhstan's formal institutional and organisational set-ups in accordance with the ideas of the Washington Consensus, no attention was paid to the role of informal constraints, embedded in well-established practices, routines and codes of conduct of domestic actors. The poor understanding of the problem of transition stems from the tendency of market-oriented theorists to regard the centrally planned regime as a deviation from the generally accepted norm of market relationships (section 3.2.). Due to the lack of knowledge about the problems of transition, it is generally assumed that the post-Soviet economies can catch-up with technologically more advanced nations simply by adopting formal organisational and institutional set-ups inherent to 'benchmark' open market economies. The short-sightedness of such a view is in dismissing the fact that apart from consciously created formal institutions, there also exist informal, tacit institutions that evolve spontaneously. Informal institutions such as political culture, social norms, routines, established practices, and values constitute implicit 'rules of the game'. Together they form an environment which plays a central role in the production, adoption and diffusion of innovations. Accordingly, Lundvall et al. (2006, p. 3) note: "There is a new tendency in international organizations that work on development issues to focus on institutions as perhaps the most important development factor. This tendency is interesting and useful but the focus remains narrow and one may wonder if the relatively narrow spectrum of institutions, which have been in focus, really can explain so much of the development process as it is claimed". Similar to other international organisations which promote the ideas of the Washington Consensus, the WTO neither paid attention to the contextual differences between the countries on which 'best-practice' reform package was imposed, nor to the fact that for the former republics of the Soviet Union the mismatch between formal set-ups they had to adopt and well-established informal constraints was critical.

Since the WTO viewed the process of transition in the very narrow sense of changing Kazakhstan's formal institutional and organisational set-ups in conformity with the prescriptions of the Washington Consensus, WTO's focus was on persuading the government to accelerate the pace of the reforms rather than on finding ways to address a mismatch between formal and informal elements of the system. Due to the lack of knowledge about the problems of transition, the WTO had no actual plan on how to transform national organisational and institutional set-ups in such a way that would lead to the establishment of an effective regulatory environment. Nevertheless, the WTO insisted upon implementation of the reforms, based on the ideas of the Washington Consensus, highlighting their potential to turn Kazakhstan into a knowledge-based economy and the importance of accelerating the process of transformation of formal organisational and institutional arrangements. As the European Bank for Reconstruction and Development (1994, p. 45) puts it: "Suppose that a full set of market institutions, including a well functioning tax and banking system, bankruptcy and social

safety nets, functioning legal institutions (laws, courts and their personnel) had been introduced literally overnight along with the liberalisation of trade and prices. While the infeasibility of such a step is universally acknowledged, there are those who give the impression that it represents an ideal towards which reformers should strive". The WTO did not provide any evidence to support the statements that the fast transformation of Kazakhstan's organisational and institutional set-ups would allow to establish a favourable regulatory environment. Most importantly, no attempts were made to consider whether the mindsets of those responsible for transformation of Kazakhstan's formal organisational and institutional arrangements were prepared to perform such an important task.

Kazakhstan's authorities were convinced that implementing reforms in accordance with recommendations of the WTO would automatically change the mindsets of public sector managers to a new paradigm. It is often argued that harmonisation of national legislations with the internationally accepted norms can improve policymaking in developing countries. For instance, Rodrik (2002, p. 7) notes that following the norms, stipulated in the WTO agreements may help governments of developing countries to "overcome traditional weaknesses in their style of governance" and "impose a certain degree of predictability, transparency, rule-bound behavior, and nondiscrimination in areas of policy often subject to discretion and rent-seeking". Pro-liberalisation rhetoric convinced Kazakhstan's authorities that the process of accession to the WTO will automatically change the mentality of the public sector managers, making their routines, practices, and codes of conduct more suitable for the task of creating an effective regulatory environment. Shortly after Kazakhstan submitted an application to join the WTO in 1996, the President in his Address to the nation said: "Long-standing habits of petty interference with all the affairs, altogether unnecessary and harmful halo of secrecy prompting concealment of information from the society and even from each other, bureaucracy and localistic tendencies, nepotism and clannishness, collective irresponsibility, dullness and inertia, inadequate multi-stage hierarchies, corruption - this is but a far from complete "bunch of virtues" of our bureaucracy brought up by the former regime and coming to the fore in the last years to acquire overt, undisguised forms" (Nazarbayev 1997). While the strategy of the WTO aimed to focus solely on introducing change into Kazakhstan's formal set-ups, the authorities imagined that the mentality of officials, still bearing features inherent to Soviet-era regime would automatically start to alter in the process of implementation of the demands of the WTO.

The next section explains how a mismatch between formal and informal set-ups, influenced the government's ability to establish an effective regulatory environment.

5.3. Top-down system does not respond to commands

The fact that mindsets of those in charge of transformation of Kazakhstan's formal set-ups were not adapted to a market relationships paradigm, resulted in a collision of former and new rationales, inhibiting creation of an effective regulatory environment. In the Soviet Union the authorities aimed to establish a system that allowed them to maintain total control over every aspect of economic activity rather than create an effective self-regulatory environment. A conceptually different paradigm of development adopted by the Soviet Union formed a path that constrained an alternative course of action for policymakers and became self-reinforcing. Campbell (2010, p. 90) notes: "As researchers began to turn their attention to the analysis of change, they recognized that institutions typically do not change rapidly—they are sticky, resistant to change, and generally only change in 'path dependent' ways". Accordingly, public sector managers looked at the task of introducing new organisational and institutional set-ups

through the prism of the previous paradigm of socio-economic relationships. Instead of attempting to form an effective self-regulatory environment, officials strived to conduct reforms in such a way that new regulations would enable them to maintain total control over the system. Particularly, this goal was achieved through deliberately complicating legislation, which enabled them to interpret laws in the way they saw fit. As early as in his annual Address to the nation in 2001 the President expressed his concerns with such a development by noticing that the number of legislative acts adopted during the years of independence was approaching one thousand, which impeded their correct application (Nazarbayev 2001). Nonetheless, such a tendency continued due to the path-dependent nature and stickiness of former rationales. As a result, over the last decade, the number of annually adopted norms and regulations has increased more than fourfold, with about six thousand legislative acts affecting business adopted in 2016 alone (Lee 2017).

Being able to interpret complicated norms and regulations in the way they saw fit; Kazakhstani officials developed a tendency to pursue their own varied vested interests to the detriment of the common good. According to the estimation of the Prime-Minister, Kazakhstani entrepreneurs are demanded to fulfil about 28 thousand requirements (Kazinform 2017). Most of these all-embracing regulations were developed during the Soviet time in order to replace missing market forces and to control the quality of produced goods and services. However, because during the Soviet time all enterprises were state-owned, these regulations were used merely as guidelines, rather than the grounds for charging fines. The abrupt transition towards market relationships changed the way in which public sector managers perform their functions and use the power entrusted to them. For instance, it was noted by the authorities that the police use road cameras solely in order to charge fines rather than to prevent crimes (Zakon 2019). In essence, many public sector managers started to use their positions in order to pursue their own varied vested interests to the detriment of the needs of the entire society. This is important, considering that the number of agencies that have control functions by far exceeds any reasonable amount. Overall, there are shocking 61 departments with controlling functions in Kazakhstan, 45 of which are central and 16 are regional (Lee 2017). These local and central agencies rigorously check any initiatives of entrepreneurs that may deviate from well-established practices of doing things. Since innovative activity implies new ways of doing things, the complexity of legislation and the ability of public sector managers to interpret them in the way they see fit places enormous obstacles in the way of innovation. In order to prevent inspections from state agencies and avoid associated problems, Kazakhstan's entrepreneurs prefer to stay away from any types of innovative activity.

In the absence of a plan which would include concrete steps on how to address the problems associated with an abrupt shift from socialist to capitalist system of values, Kazakhstan became locked-in on a trajectory of development that led to systemic corruption and opportunistic behaviour of public sector managers. The concept of path-dependence is well-established in the literature. According to Goldstone (1998, p. 834), "Path dependence is a property of a system such that the outcome over a period of time is not determined by any particular set of initial conditions. Rather, a system that exhibits path dependency is one in which outcomes are related stochastically to initial conditions, and the particular outcome that obtains in any given ''run'' of the system depends on the choices or outcomes of intermediate events between the initial conditions and the outcome". The initial condition which is causally related to upsurge of corruption in Kazakhstan was a socialist ideology, which deprived Soviet

people from an opportunity to enjoy different attributes of consumerist lifestyle, established in capitalist countries. Being forced to live in conditions of austerity for many decades and having experienced shortage of basic goods during perestroika, people of the former Soviet Union saw corruption as the fastest way to achieve wealth after the abrupt shift to the market relationships paradigm. However, the intermediate cause that ultimately led to systemic corruption and opportunistic behaviour of state officials was neglecting the need to adapt the mindsets of those responsible for transformation of Kazakhstan's formal organisational and institutional set-ups to market relationships.

Senator Mikhail Bortnik, Member of the Committee on Economic Policy, Innovative Development and Entrepreneurship explains how fast state transformation have caused corruption and opportunistic behaviour among decision-makers:

> In fact, we are the first generation who broke away from that system which was based on principles of confining, prohibiting, restraining and forcing to follow the inscribed path. Whereas they (the Western society) developed evolutionary, upwards, upwards, upwards, towards freedom of action, freedom of decision-making, freedom of thoughts, we came from the system that suppressed this freedom. Now we are moving, hopefully towards freedom as well. But we are so "hungry" for some elementary things, everyday possessions that it leads to corruption as well as ambitions among new generation of decision-makers. One has no work experience, but he is already appointed as a vice-minister. Naturally, when he is surrounded by such money, such opportunities he forgets about the goal and starts to follow other goals. (Mikhail Bortnik, interview, 22nd May 2017)

Forced and speedy transition towards market relationships has indeed become a powerful catalyst for systemic corruption and opportunistic behaviour of officials. Discussing the reasons for systemic corruption in Kazakhstan, Nezhina (2014, p. 15) argues: "Market ideology equates happiness and wealth. To achieve wealth, one needs to be rational and efficient. Moral considerations apart, I argue that corruption is a rational and efficient instrument that enhances business opportunities, reduces competition, and leads to wealth. I maintain that the promotion of predominantly economic motivations elevated money above all other values, distorted traditional value system, and led to systemic corruption". In reality, the problem lies not in the market ideology per se, but in the way it was established in transition economies. Intergovernmental entities that forced former centrally-planned economies to undergo speedy transformation neither considered the austerity of the Soviet lifestyle, nor the fact that the mindsets of people need time to adapt to paradigmatically different ways of doing things.

Due to the rise of systemic corruption and opportunistic behaviour of public sector managers, the practice of deliberate entanglement of legislation, enabling officials to interpret norms and regulations in the way they saw fit became self-reinforcing, making the system unresponsive to the commands of the higher authority. Whereas it is generally assumed that in the countries with top-down systems of governance those at the top of the pyramid have absolute control over actions of officials who occupy positions lower down the hierarchical ladder, the reality is that informal constraints embedded into their routines, practices and codes of conduct may conflict with the goals of higher authorities, impeding execution of their commands. For instance, Amann (1982, p. 150) notes: "During the course of Soviet history the economy had become accustomed to a different pattern of priorities… and despite the repeated exhortations of Khrushchev [First Secretary of the Central Committee of the Communist Party

of the Soviet Union] many influential political leaders and economic officials found it inconvenient to adjust. This, in turn, exacerbated the problems of the system in carrying out its allocated tasks; the so-called 'command economy' did not respond to commands". The absence of a plan for how to adapt the mindsets of officials to a new paradigm put Kazakhstan's authorities into a similar position. In the process of implementing the demands of the WTO, officials looked at the task of transforming the regulatory environment through the prism of the previous paradigm and complicated legislation in order to maintain control over the system. However, the establishment of predominantly economic motivations within the society, caused by the abrupt shift from socialist to capitalist system of values, provoking officials into interpreting complicated legislation in such a way that allowed them to pursue their own varied vested interests. Attempts by Kazakhstan's authorities to reduce the regulatory burden in order to facilitate innovative activity conflicted with rationales of public sector managers, encouraging them to resist direct orders. Accordingly, the President Nursultan Nazarbayev observed that although during the first phase of implementation of his directives to reduce administrative barriers for business, the number of permits required was supposed to be reduced by 30 percent from 1015 to 700, an inventory showed that the number of permits in fact increased to 1137 (Zakon 2012).

The inability of the authorities to overcome the tendency of public sector managers to create ambiguous legislative norms can be illustrated by the example of tax regulations. According to the Prosecutor General, the reason why national legislation is filled with vague and confusing laws is because the same state agencies that are directly responsible for enforcement of the laws are not only placed in charge of drafting bills of these laws but also are in a position to initiate their subsequent amendment (Newtimes 2017). However, while that might be a proximate cause of such a tendency, the higher-level cause is the fact that due to the absence of a tangible plan on transition, the need to adapt mindsets of those in charge of transformation of formal organisational and institutional set-ups to the market relationships was overlooked. Being locked-in on a previous paradigm of socio-economic relationships, the main feature of which was the ability of the government to maintain total control over the operation of the system, officials strived to create legislation which would enable them to preserve the same level of control by interpreting norms and regulations in the way they wanted. Kazakhstan's authorities quickly came to realise that complicated legislation inhibits development of new technologies. Accordingly, the President in his annual Address announced: "The state, for its part, must clear all legal, administrative and bureaucratic barriers from the path of business initiatives and provide direct support to promising new business start-ups in the private sector" (Nazarbayev 2006). The problem, however, was that the top-down system no longer responded to the commands of the higher authority. More than a decade later, the President noted that in order to pay a value-added tax an entrepreneur needs to know 82 articles of Tax Code, directing taxpayer to another 286 articles, 206 of which have further references (Capital 2017). Although it was envisioned that Kazakhstan could quickly adjust to a new paradigm of economic relationships by altering its formal institutional and organisational set-ups, the reality is that informal constraints became an insurmountable barrier to system transformation.

The disappointment of policymakers about their inability to change tendency of public sector managers to complicate national legislation on purpose is noticeable in my interview

with Mikhail Bortnik, Senator, Member of the Committee on Economic Policy, Innovative Development and Entrepreneurship:

> It is challenging for a beginning entrepreneur and even more challenging for an entrepreneur with big turnovers because sometimes the same value-added tax is calculated differently for each type of operation, is returned differently, etc. Therefore, the simpler the legislation, the more direct effect articles, rather than articles that refer to second, third subordinate article it will be based on, the easier it will be to develop [innovations] and collect taxes. Because we know that the same value-added tax turned into a fertile field for corruption. Try to understand whom to return, whom not to return, try to untangle 82 articles referencing to 286 articles and other things. (Mikhail Bortnik, interview, 22nd May 2017)

The inability to overcome the tendency of officials to introduce ambiguous regulations, caused by a mismatch between the formal set-ups that had to be established and informal elements of the system, placed enormous obstacles in the way of innovation. Peng (2002, p. 251) notes: "Since no firm can be immune from the institutional frameworks in which it is embedded, there is hardly any dispute that institutions matter". Attempts by the authorities to create an effective regulatory environment were an exercise in futility because the strategy of implementation of radical institutional and organisational reforms, insisted upon by the WTO, was based on the national sociotechnical imaginary, rather than an actual plan.

Although the authorities imagined that in the course of reforms, new rationales would replace former rationales, leading to a formation of professional government apparatus, public sector managers continue to pursue their own plan targets to the detriment of the country's economic and technological development. From the very early stage of implementation of market-oriented reforms, Kazakhstan's authorities noticed that the collision of former and new rationales inhibited the system's functioning. Accordingly, the President in his annual Address noted: "No one in Kazakhstan, including the Prime Minister, the Ministers of the Government, the heads of the Houses of the Parliament, or myself is satisfied with the performance of our Government. It is not the fault or the failure of one official or one ministry. It is not a failure of vision or will. Regardless of our best intentions, our best plans, and even our best people, we find that every day the operation of Government is still too slow, too bureaucratic, too confused and lacks responsibility" (Nazarbayev 1998). While the authorities imagined that in the process of accession to the WTO, attitudes, practices, and codes of conduct of public sector managers will become attuned with the tasks required for turning Kazakhstan into a knowledge-based economy, the reality showed that being established over the course of decades of the communist rule, the mindsets of officials became highly resistant to change. For instance, when tax services were unable to meet their plan targets on levying taxes (plan targets need to be met by the end of each calendar year), they started to use ambiguity of legislation in order to force entrepreneurs to pay taxes in advance. Such practice was heavily criticised by the Speaker of the lower chamber of the Parliament, who argued that although levying taxes on sales which have not yet occurred, tax services manage to meet their own plan targets, they harmed industries by taking away their working financial capital (Sputnik 2018). The tendency to prioritise their own plan targets over the interests of the entire society proved to be deeply embedded into the mentality of officials, hampering the creation of an environment that would incentivise innovative development.

My interview with the Deputy Chairman of the Board of the National Chamber of Entrepreneurs "Atameken", Nurzhan Altaev shows how the business community felt about the tendency of public sector managers to twist entrepreneurs' arms in order to achieve their plan targets:

> The second most common problem on what we have always received complaints is taxation. This became particularly evident during the last year. We started to experience that first in 2015 when the prices on our main export products plummeted and the tax authorities in order to replenish the budget somehow, began to twist arms of entrepreneurs. Whenever where there a manufacturing process was organised or where an entrepreneur found a way to make things work, they try to pull out everything through taxes. Although in the central apparatus of the Ministry of Finance, Tax Committee there is a full understanding, we face very serious violations from the local tax authorities. Sometimes even the following has happened – entrepreneur received letters from a Department of State Revenue stating that allegedly, back in 2011 or 2010 or 2012 taxes were levied incorrectly. Consequently, everything has to be reassessed and has to be repaid for these past years. And when it all was reassessed, it could happen that one company could be charged additional several billion of tenge. (Nurzhan Altaev, interview, 29th July 2016)

The situation described by the Deputy Chairman is like another practice that also demonstrates the tendency of officials to prioritise pursuit of their own plan targets over the common good. It is the practice of fining entrepreneurs based on false accusations. A Member of the Parliament, Gulzhan Karagusova has drawn attention of the authorities to that fact that in 2015 the amount of revenues to the republican budget in the form of fines increased from 2.6 KZT billion in 2014 to 4.8 KZT billion (Sputnik 2017). The reason why the member of the Parliament decided to criticise the tax services is because such a sharp rise in alleged breaches of legislation happened exactly when the oil prices [Kazakhstan's main revenue earner product] plummeted and consequently tax services experienced difficulty in meeting their targets of levied taxes. Evidently, the practice of replenishing the budget by fining entrepreneurs for imaginary breaches of regulations became a burden for entrepreneurs.

The firm belief of the authorities that Kazakhstan was on its way to turning into a knowledge-based economy impeded the development of checks and balances which would have put constraints on the behaviour of public sector managers. During the Soviet era the interests of the industrial players were represented by the relevant ministries, including the Ministry of the Communications Equipment Industry, the Ministry of the Electronics Industry, the Ministry of General Machine Building, the Ministry of the Machine Tool and Tool-Building Industry, the Ministry of Medium Machine Building and the Ministry of the Radio Industry. Being state-owned entities, Soviet industrial players were safely protected from any violations from other state agencies that might cause disruption or interrupt the production process. In contrast, the regulatory framework of the modern Kazakhstan does not provide the private-owned companies the same level of protection. The Ministry of Investment and Development – the state agency directly responsible for Kazakhstan's technological development – does not have the authority to interfere when the interests of industrial players are violated by other governmental agencies. Essentially, Kazakhstan's regulatory system for a very long period of time lacked a force that would be able to back the interests of privately-owned firms. The development of civil society organisations was heavily suppressed because

the authorities assumed that their interference into the course of implementation of the radical reforms, insisted upon by the WTO, might obstruct the process of turning Kazakhstan into a knowledge-based economy. Ibrayeva and Nezhina (2013, p. 64) argue: “Most NGOs still largely depend on foreign funding and adjust their missions according to their donors’ agendas. In Kazakhstan, independent and oppositional media is controlled and politically harassed… As a result, the civil society and the mass media are unable to place significant constraints on or conduct independent investigation of the behaviour of public officials or politicians”. What was not anticipated by the authorities, however, is that the top-down system will stop responding to commands. The tendency of officials to interpret legislation in such ways as to pursue their own vested interests went out of control of the higher authority due to the absence of check and balances in the system.

Realising that the top-down system was no longer responding to commands, the authorities decided to restore some balance in the system by considering and involving the National Chamber of Entrepreneurs "Atameken" as a real partner in policy making. Deputy Chairman of the Board of the National Chamber of Entrepreneurs "Atameken", Nurzhan Altaev argues:

> Prime-Minister supported our initiative to create an appellate commission at the level of the central office of the Ministry of Finance, which would include representatives of the National Chamber of Entrepreneurs and representatives of the Ministry of Finance, so that it would be possible to respond very quickly to such violations of entrepreneurs' rights in taxation and protect their rights. Up to now you have to go to court in order to protect your rights. Imagine yourself: your rights are violated, your bank accounts are arrested, you can’t do anything, the whole business is halted. You can file a lawsuit, but the process usually lasts a year, a year and half in the court until you pass all procedures. By that time, your business will certainly die. To prevent this from happening, we proposed to the Government to create an appellate commission, which would solve such issues very quickly. (Nurzhan Altaev, interview, 29th July 2016)

The fact that the initiative of the National Chamber of Entrepreneurs to introduce an appellate commission on tax matters was approved by the Prime Minister, suggests that the authorities started to realise that the ‘economy first, then politics’ approach has its drawbacks. In the absence of public accountability of officials caused by the lack of checks and balances, false accusations in alleged breaches of legislation can be used by corrupt public sector managers to systematically extort money from entrepreneurs. In accordance with the survey conducted by the World Economic Forum (2018), Kazakhstan is ranked 65th out of 140 countries in the efficiency of legal framework in challenging government actions and/or regulations. Therefore, it may seem that an entrepreneur has a reasonable chance to defend his/her interests in a court. However, as the Deputy Chairman correctly noticed, the court procedures through which entrepreneurs can challenge decisions of public sector managers are too lengthy, meaning that businesses of those who refuse to pay extortion money would not survive.

The next section examines how the tendency of public sector managers to use complicated regulations in order to pursue their own vested interests influenced capability building of domestic firms.

5.4. Capability building of domestic firms

One of the most important factors that hindered capability building of domestic firms and defined their tendency to avoid innovative activity from the very beginning of Kazakhstan's abrupt transition toward market relationships was the fact that the mindsets of entrepreneurs were locked-in on the old ways of doing things. Private entrepreneurial activity was illegal in the Soviet Union. In accordance with the Soviet legislation, commercial mediation, and entrepreneurial activity were punishable by imprisonment for a period of up to five years with confiscation of property (Matthews 1989). Since mindsets are slow to change, most people preferred to seek or wait for public sector employment, rather than attempt to organise business of their own. In his Address to the nation, the President noted: "our mentality is shaped up by several generations of people who were brought up in the spirit of Communist principles. Some people enthusiastically took advantage of recent changes, but quite many didn't. People are influenced by subjective and objective factors; they are slow to adapting themselves to eventual changes… It would take decades until a new world outlook comes into existence with us" (Nazarbayev 1997). Although some people, as it was noted by the President, accepted the radical change of economic relationships paradigm by starting to engage in entrepreneurial activity, they did not attempt to innovate. For a generation of people who would have been prosecuted merely for engaging in private entrepreneurial activity the idea that under the new paradigm of economic relationships they were supposed to become active promoters of innovative activity was difficult to comprehend. Moreover, entrepreneurs did not see the benefits of updating manufacturing methods, establishing feedback relationships with the customers or increasing productivity because the ways of doing things were shaped throughout the decades of centrally-planned development. While the task of changing attitudes of entrepreneurs towards innovation was quintessential, it was never prioritised by the government because Kazakhstan's strategy of technological development was based on the sociotechnical imaginary, shaped by the WTO.

Sanzhar Izteleuov, Chairman of the Board of National Agency for Technological Development notes how the attitude towards innovation gradually changed in Kazakhstani society:

> Israel, Singapore, Malaysia – it took them 20-30 years to become technologically successful. As for us, it is, in fact, merely our second five-year term of being engaged in the development of innovations [refers to the adoption of five-year plans on technological development by the government]. The first business establishments to be opened were restaurants, saunas and billiard parlours. Each time someone made money on something like sales, including that of natural resources, he immediately opened for himself or for his wife a restaurant or a beauty salon. Because it is fast money. Being descendants of the Soviet era, we all lived under constraints. The horizons of financial opportunities were opened to us very suddenly, which defined the ways of formation and accumulation of capital. Nevertheless, it is starting to change now. This generation, children, students, they think differently. Even 10 years ago everyone wanted to work for KazMunayGas [the largest state-owned oil and gas company]. But now they want to create their own company in the IT sector or something similar. We meet with many of them, organise competitions for schoolchildren, students. They are no longer locked-in on finding a job in the government, the quasi-public sector, the customs or the traffic police – the

> occupations that became a byword [for corruption]. They think differently nowadays. Graduates come to us, apply for internship. – Why do you need this? – I want to create a start-up, but I am not ready, I want to understand how others work, you have a lot of projects, that people work on. This is the way they think now. Previously people come to us because "You have stability, fixed salary, the budget feeds you". This is what they used to come for. Now it is a complete turnaround from that. (Sanzhar Izteleuov, interview, 26th July 2016)

This attitude towards entrepreneurship is one of the key factors that affect the dynamics of innovation in any society. Governments of many developing countries seem to have realised that this attitude does not change automatically and needs to be addressed through policy action. For instance, Intarakumnerd (2006) mentions that there is a push by the Thaksin government to steer Thai society into entrepreneurship, motivating people to turn from employment by the government and big corporations to becoming entrepreneurs. However, the task of changing attitudes in the case of market economies is more realistically achievable compared to a country where entrepreneurship was an illegal activity for many decades.

Due to the lack of knowledge on how to make society more entrepreneurial, the authorities put their hopes on a new generation of young people, without taking into consideration how their attitude could be affected by the regulatory environment. It was assumed that the tendency of Kazakhstani business to abstain from innovation efforts will automatically be overcome in a new generation of young entrepreneurs because their mindsets were never affected by the old ways of doing things. In his annual Address to the nation the President argued: "We must be patient in our transforming mass consciousness. In this we must seek support in the younger generation which is more flexible in adapting to the new system of values and has a fresh vision of the future" (Nazarbayev 1997). The new generation of young entrepreneurs who never lived under the constraints of the Soviet era indeed had a potential to develop a different attitude towards innovation. However, their initial enthusiasm vanished once they encountered obstacles created by the public sector managers. For example, Tengri news (2016) reported a case of a young businessman, who invested significant funds into a, new for Kazakhstan, concept of a food-truck by purchasing a bus with a kitchen equipment and painting it with airbrush artwork for attracting customers. The police decided that this innovative idea was breaching the law because in accordance with the regulations, people are not allowed to cover more than 30% of a vehicle's side surface with airbrushing. The bus was towed back to the garage by the police the day before opening and since the airbrush artwork constituted the key part of the strategy for attracting customers, the owner decided to freeze the project. While in the course of almost three decades since the dissolution of the Soviet Union a new generation of entrepreneurs has been raised, Kazakhstan is still ranked 103rd out of 140 countries for growth of innovative companies (WEF 2018). The absence of a positive dynamics in the development of innovative firms, despite new generation of young entrepreneurs, clearly shows that the development of innovations depends not only of the attitude of entrepreneurs, but also of that of other domestic actors.

My interview with Nurzhan Altaev, the Deputy Chairman of the Board of the National Chamber of Entrepreneurs "Atameken" shows that launching even the most basic and well-established types of business require lengthy and complicated procedures that may completely undermine the attitude of entrepreneurs towards innovation:

> Nowadays, if you for instance want to build some small store or workshop you need a bunch of permissions, lots of technical conditions for connection to electricity, water and so on. Plus all the architectural procedures. Then, after you built everything, a bunch of permissions is required again in order to get the Act of Commissioning of the completed project. That is to say, sometimes we see that due to construction procedures entrepreneur may spend around one and a half to two years only to obtain those permits. The same thing happens again after he finished construction and wants to get the Act of Commissioning of the completed project. This is a very serious problem. (Nurzhan Altaev, interview, 29th July 2016)

Initially, the authorities assumed that the only reason for an unwillingness to engage in innovative activity was the lack of entrepreneurial spirit among the population. What the authorities needed to take into consideration, however, was that the implementation of innovative ideas often requires unorthodox approaches. Therefore, the attitude of entrepreneurs towards innovation centres on their ability to overcome the reluctance of public sector managers to issue permits which allow them to engage in activities that deviate from the well-established ways of doing things. The tendency of officials to create impediments for business was condemned by the President, who stated: "There are private dental clinics with their own patients. But why aren't there other developments in different directions such as traumatology, gynaecology? (Because) it is impossible to open a private clinic. Why? It's in our hands. Who is doing this? Where is the 'fifth column' [a group of people who undermine a country's effort from within in favour of an enemy] sitting? Inside the government?" (Lee 2017). Entrepreneurial spirit is indeed the key factor that defines prospects of technological growth in former centrally-planned economies. However, the attitude of public sector managers towards entrepreneurship significantly hindered its development.

Considering the fact that Kazakhstani business emerged from an environment where entrepreneurial activity used to be illegal, it was extremely important to focus the efforts of the government on finding ways to change the attitude of all domestic actors, including that of public sector managers, researchers, businessmen and consumers towards entrepreneurship and innovations. In the Soviet time a person who was involved into entrepreneurial activity, as a term of abuse was pejoratively called *baryga*, which originally came from the word *barysh*, meaning profit. Since the mindsets of domestic actors were unable to keep up with the pace of the radical transformation of a paradigm of socio-economic relationships, the biggest problem faced by Kazakhstani businessmen was that the society continued to view them as *barygas*. Long-established attitude towards entrepreneurship encouraged many public sector managers to use the complexity of national legislation in order to extort money from businessmen as if they were kickbacks for allowing them to engage in illegal activities. Attempts to extort money from businessmen have happened not only when officials issued them permissions or conducted inspections, but even when entrepreneurs committed insignificant violations of administrative regulations. For instance, the Head of the State informed the nation that in 2016 and 2017 alone, state revenue officials initiated the investigation of 17,000 cases, classifying them as criminal matters (Sputnik 2017[1]). However, 9,000 of these cases have been discontinued due to the lack of corpus delicti (the facts and circumstances constituting a crime). The President characterised this phenomenon as a concealed racket because the main motivation of state revenue officials was to intimidate entrepreneurs in order make them act in accordance with the vested interests of public sector managers. It needs to be pointed out that while the extortion of money from entrepreneurs is still commonplace, the situation was far

worse two-and-a-half decades earlier, when entrepreneurship only started to form in Kazakhstan. In recent years, the authorities experienced significant difficulties when trying to change society's attitude towards entrepreneurship and innovation due to the absence of a tangible plan on transition that recognised the need to influence mindsets of domestic actors alongside the change of formal set-ups.

Being familiar with the regulations and practices of public sector managers that affect business most, the National Chamber helped the authorities to formulate the law 'On permits and notifications', which significantly decreased the regulatory burden. Deputy Chairman of the Board of the National Chamber of Entrepreneurs "Atameken", Nurzhan Altaev argues:

> The majority of complaints relate to permissions. We certainly made a very serious progress in this matter because as you know one year ago the law 'On permits and notifications' was passed. We managed to reduce very significantly number of permissions there. We formulated clearly that only those permits which are specified in this law are legitimate in our country. That is to say, no state agency is allowed to invent anything to their advantage if it is not specified in this law. It means that they cannot demand to obtain any additional approvals or permissions if the law does not stipulate it. Besides, the state agencies used to intentionally protract various permissions, which are mandatory for starting a business. Now, in the framework of this law these permissions have notifying nature. Essentially, you simply have to inform state body that you started some activity. That's it, you don't have to obtain permission. As soon as state agency receives your letter, you can start your activity. (Nurzhan Altaev, interview, 29th July 2016)

Initially the authorities decided to implement the national sociotechnical imaginary in a top-down manner because it was assumed that other domestic actors would act solely in their own interests, thereby inhibiting Kazakhstan's transformation into a knowledge-based economy. Eventually, the authorities started to realise that the attitude of officials towards entrepreneurship became the biggest impediment for innovative development. Accordingly, the Head of the State repeatedly tried to convince public sector managers to change their attitude towards business. For instance, in his Address to the nation the President said: "Entrepreneurs should know that we are creating for them a conducive environment and effective incentives, that business in our country is safe and rewarding" (Nazarbayev 2005). However, since the exhortations of the authorities did not work, it was decided to restore the balance in the system by including the National Chamber of Entrepreneurs "Atameken" into the decision-making process.

Being unable to change the attitude of public sector managers towards entrepreneurship overnight, the authorities decided to limit their influence by reducing the number of inspections that can be made, as well as the number of permissions, required for running a business. The President noted: "Various inspections, contemplated by more than 50 laws, have turned into a true calamity for businessmen. Certain agencies use various pretexts to "inspect" a business several times in violation of the law. This seriously distracts enterprises from their business. Furthermore, it runs counter to the policy that I have been pursuing. The number of inspections carried out by law-enforcement authorities and other inspectors should be significantly reduced, and such inspections should be streamlined" (Nazarbayev 2008). Accordingly, in 2011 the government introduced the law 'On state control and supervision in the Republic of Kazakhstan'. The law established common guidelines for implementation of the control functions by state agencies. Later, the Head of State signed a 'Decree on drastic measures to improve the conditions for development of entrepreneurship in the Republic of

Kazakhstan'. The Decree introduced a moratorium on inspections of small and medium-sized businesses from April 2014 until January 2015. In January 2015, the practice of scheduled inspections was cancelled and the government elaborated a new unbiased system of determining inspections. The measures undertaken by the authorities led to a significant reduction of the regulatory burden. In 2008 Kazakhstan was ranked 79th out of 130 countries by 'burden of government regulation' (WEF 2008). A decade later Kazakhstan was ranked 48th out of 140 countries in the same category (WEF 2018). The authorities were confident that reducing the regulatory burden would spur entrepreneurship and encourage businessmen to engage in innovative activities. Instead, a reduction in the number of inspections immediately led to significant deterioration in the quality of goods and services. For instance, when the government put a moratorium on checks of small and medium-sized enterprises, the number of mass poisonings in restaurants significantly increased (Medelbek 2014). Essentially, the authorities found themselves in a stalemate situation, which clearly showed that the attitude of domestic actors, rather than number of inspections and permissions per se, plays the key role in the innovative activity.

Deterioration in the quality of goods and services, caused by attempts to lift the regulatory burden solely through prohibition of inspections, proved that the top-down approach might not be a solution to every problem. An alternative course of actions was offered by the National Chamber of Entrepreneurs "Atameken". Nurzhan Altaev, the Deputy Chairman of the Board elaborates:

> Certain measures were undertaken in the framework of the law 'On permissions and notifications'. In compliance with it, timeframe and number of required documents were seriously reduced. But this measure is scarcely sufficient. We cannot yet say that we have achieved any significant accomplishments. A lot needs to be done and one of the suggestions we made is to convey all the permissions associated with the architecture and construction to 'Government for Citizens' [the state-owned corporation, providing services to the population]. Besides, it should be done through electronic document management systems in order to shield an entrepreneur from contacts with officials. He could receive all that through the internet as well as submit documents. (Nurzhan Altaev, interview, 29th July 2016)

The problem of the lack of entrepreneurial spirit among the population will persist as long as the attitudes of officials towards entrepreneurship remain the same. Considering the fact that the number of small and medium enterprises in Kazakhstan decreased by 7 percent due to regulatory burden, it is safe to say that the negative attitude of public sector managers towards entrepreneurship remains a serious problem (Lee 2017). While the measure offered by the National Chamber of Entrepreneurs – to minimise direct contacts between public sector managers and entrepreneurs will not be enough to change the attitudes of officials towards entrepreneurship, it will at least reduce likelihood of extortions.

The next section investigates attempts of the authorities to incentivise export-led growth of national economy by emulating the policies of Asian Tigers.

5.5. Kazakhstan as a Snow Leopard – following the footsteps of Asian Tigers

The authorities believed that Kazakhstan's strategy of technological development should have been based on the use of its beneficial geo-economic position in order to facilitate integration of domestic firms into the supply chains of multinationals. In his Address to the

nation, the President noted: "Kazakhstan can and must actively participate in multilateral economic projects which promote our integration into the global economy and are based, among other factors, on our beneficial economic and geographical location and available resources (Nazarbayev 2006). In theory, the geographic remoteness of Kazakhstan from the headquarters of its major investors should have facilitated the establishment of backward linkages between domestic firms and multinationals. Javorcik and Spatareanu (2011) using firm-level panel data from Romania demonstrated that greater distance between the home and the host countries increases the probability of integration of domestic firms into supply chain of multinationals. The authors' argument rests on the assumption that bilateral remoteness between the headquarters and the production facilities in the recipient country encourage investors to purchase locally produced intermediate inputs required for manufacturing of the final product. Comparisons conducted by them confirmed that foreign investments from the United States of America (USA) or Canada were associated with a higher degree of vertical spillovers than FDI from the European Union. During its independence period, Kazakhstan attracted $330 billion of FDI, more than 50 percent of which came from European Union and 15 percent from the United States (Kazinform 2019). Therefore, its geographic location can be considered favourable for integration of domestic firms into the supply chains of multinationals. The question that remained to be answered, however, was whether domestic firms were able to capably exploit this potential.

The task of becoming suppliers of intermediate inputs for affiliates of foreign companies is extremely challenging for firms in transition economies. Domestic firms would have to catch up with multinationals in terms of scale efficiency, capacity to innovate, quality and variety of produced outputs (Rugraff 2013). The government assumed that the improvements, required for establishing backward linkages with multinationals could be achieved through export orientation of the economy. In accordance with the plans of the authorities, the goal of turning Kazakhstan into a major export-oriented economy was supposed to be achieved through accession to the WTO. The main reasons for the high expectations of Kazakhstan's authorities about the consequences of accession was the neoliberal rhetoric, attributing success of newly industrialised countries to the adoption of a liberal trade and investment regime. For instance, Gilpin (2001, p. 320) claims that one of the most important factors that defined the success of newly industrialised countries was that they "were able to pursue an export-led growth strategy because of the global free-trade environment". The authorities were inspired by the technological and economic success of newly industrialised countries and saw them as benchmark models, whose experience should have been used for creating Kazakhstan's own strategy of technological development. Accordingly, sharing his vision of the country's economic development, the Head of State in the Address to the nation claimed that by the year 2030 Kazakhstan will become known as a Snow Leopard, whose goal of building a technologically advanced economy will be achieved by following the footsteps of Asian Tigers (Nazarbayev 1997). The President's announcement was made one year after Kazakhstan's application for membership in the WTO was submitted and reflected the expectations of the authorities about the potential benefits of the accession.

The authorities had very high expectations for the prospects of an outward orientation of the national economy, formed by the neoliberal rhetoric of the WTO. The firm belief of the government in the sociotechnical imaginary and their reformist attitudes are evident in my interview with Vice Minister of Investments and Development, Yerlan Khairov, who argues

that despite the fact that Kazakhstan as a landlocked country cannot use low-cost sea transport, it still has a huge export potential:

> Clearly, our accession to the Eurasian Economic Union opens for us a large market of 170 million people. That is to say, access to certain markets has already been granted to us. Sharing borders with two big neighbours – Russia and China also opens up huge markets. The question is – what markets do you want to target at? Yes, of course, exporting to anywhere in Europe using cheap methods of transportation would be problematic. But if you are targeting the huge growing market of China, or Russia, then it is different case. (Yerlan Khairov, interview, 1st August 2016)

The Vice Minister's claim proves that neither the expectations nor the priorities of the authorities have changed over the time. At the very early stage of accession to the WTO, the President also noted that the markets of the neighbourhood countries, including that of Russia, China, Central Asia, the Near and Middle East with their population of about 2 billion people can absorb as much product as Kazakhstan can produce, which dictates the necessity to develop the export potential of domestic firms (Nazarbayev 1997). However, while high absorptive potential of neighbourhood markets was a favourable factor for an outward orientation of the national economy, the main impediment was the low technological capability of domestic firms.

Whereas neoliberal rhetoric convinced the authorities that Kazakhstan's accession to the WTO was the best way to ensure outward orientation of the national economy, the fact is that the rules of the organisation hamper export-led growth by prohibiting the provision of subsidies to domestic firms. Due to a lack of knowledge on how to turn Kazakhstan into an export-oriented economy, the authorities based their strategy of national technological development on the sociotechnical imaginary, shaped by the proponents of neoliberal ideas of the Washington Consensus. The reason why the government enthusiastically pursued the imaginary is because neoliberalists used the example of newly industrialised economies as poster children of successful outward orientation, achieved allegedly through liberalisation of trade regime (Gilpin 1987). In reality, export-led growth of the national industries of newly industrialised countries was achieved not through liberalisation of trade, but through export subsidisation, which is prohibited under existing WTO rules (Rodrik 2002). In particular, the WTO's Agreement on Subsidies and Countervailing Measures severely restricts incumbent members from direct subsidisation of export-oriented enterprises. The agreement defines two categories of subsidies: prohibited and actionable. Subsidies are defined as prohibited if the government requires recipients to use only domestic goods or achieve certain export targets. Subsidies are regarded as actionable if a country can prove that the subsidy has an adverse effect on its interests. In this case the countervailing duty can be charged. The prohibition on provision of subsidies had serious implications on Kazakhstan's potential to turn into an export-oriented economy as it is the state subsidisation of uncompetitive domestic firms that defined their ability to upgrade the technological capabilities needed for production of internationally competitive products. Lin and Chang (2009, p. 501) argue: "In the real world, firms with uncertain prospects need to be created, protected, subsidised, and nurtured, possibly for decades, if industrial upgrading is to be achieved". The necessity to comply with the prohibition of export subsidisation, imposed by the WTO increased the dependence of domestic export-oriented firms on the quality of the regulatory environment.

In order to achieve industrial upgrading, the government faced the necessity to find ways to incentivise domestic enterprises to export without contradicting the rules of the WTO. However, such measures were much less efficient then direct subsidisation. In my interview with Aydin Kulseitov, the Chairman of the Board of Kazakhstan Industry Development Institute, his characterisation of the domestic market as "half-dead" not only shows the state of relationships between entrepreneurs and domestic consumers, but also the attitude of the authorities about the dynamics of innovation processes on the internal market:

> To be frank with you, in our Actualisation of Industrialisation Programme [Decree amending the 'State Program of Industrial-Innovative Development of Kazakhstan for 2015-2019'] we expresses our vision that supporting a manufacturer that targets exclusively the domestic market is such an ungrateful undertaking that does not lead to any progress. Therefore, we strictly stipulated that support will be provided only to those enterprises, that produce for export. If you export, we will provide any possible support which is allowed in the frameworks of the WTO rules. But if you want to compete over share of domestic market – go to the bank or pay from your own pocket. This is not something the state should be concerned about. There is no reason to tear each other's throats over our little, half-dead internal market. So, if you want to compete domestically – then by all means, compete. But if you are going to export, we will help you. (Aydin Kulseitov, interview, 17th March 2016)

Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" comments:

> Support will be provided, but according to the rules of the WTO it cannot be granted exclusively to exporters. Therefore, we will support everybody, allegedly. Both importers and exporters will be recipients. For instance, we may cover their transport expenses. But we hope that it will mainly be used by exporters. (Borisbiy Zhangurazov, interview, 26th July 2016)

Subsidisation of export-oriented firms was especially important in the case of Kazakhstan because the mindsets of industrial players were locked-in on the old ways of doing things. In Kazakhstan feedback relationships between manufacturers and customers are practically non-existent because in the conditions of the Soviet Union they were isolated from each other (Siemaszko 1982). Due to path-dependency, those manufacturers that target only the domestic market continue to ignore their customers and therefore lack the incentive to upgrade.

The prohibition of subsidies by the WTO limited a number of instruments the government could use in order to encourage domestic firms to invest in development of internationally competitive products. In the closed conditions of the Soviet planned economy the government controlled the quality of commodities through a set of technical standards, known as GOST. Soviet manufacturers had no incentive to increase the quality of their outputs any further if they met the GOST standards. Since the mindsets of the first generation of Kazakhstani businessmen were locked-in on the previous paradigm of economic relationships, they did not see the benefits of updating their production methods and improving the quality of products above the required standards. Accordingly, it was assumed that by changing standards the government can encourage entrepreneurs to invest in production of internationally competitive goods. For instance, the United Nations Economic Commission for

Europe (2012, p. 32) in its review of innovative performance of Kazakhstan argues: "A major challenge faced by government innovation policies is how to encourage the demand for innovation, so that opportunities are created that can be seized by entrepreneurs. Standards can play an important role, provided they allow a degree of freedom over technological solutions and their implementation, unlike the previous GOST standards prevalent in Soviet times". In reality, however, adoption of different standards would not solve the problem of the unwillingness of entrepreneurs to invest in the development of internationally competitive products, but would seriously aggravate it. The problem was not in the lack of proper standards but in the way the standards were used by public sector managers. While in the Soviet time the standards were used merely as guidelines, today they are mostly used by public sector managers in order to pursue their own vested interests to the detriment of the common good. For instance, investigation of prosecutors revealed that public health inspectors methodically fined domestic firms on the grounds of breaching Soviet guideline requirements to store rye and wheat bread on different shelves or to install the lowest shelf for bread storage at least 35 centimetres above floor level (Zakon 2017). Similarly, Tengri news (2017) reports that the public health inspectors systematically fined entrepreneurs using the guideline standard of making omelettes with toppings thinner than 3 centimetres. Considering the attitude towards entrepreneurship among public sector managers, an attempt to introduce a new system of standards would only increase ambiguity and complexity of the regulatory environment, further inhibiting development of internationally competitive products.

The need to change the attitude of domestic actors towards entrepreneurship was overlooked by the authorities because the sociotechnical imaginary, shaped by the WTO encouraged them to focus solely on implementation of formal institutional reforms. What was not taken into account, however, is that formal institutions do not function properly if they are placed in the wrong context. As Putnam et al. (1993, p. 8) put it: "Just as the same individual may define and pursue his or her interests differently in different institutional contexts, so the same formal institution may operate differently in different contexts". Due to long-established attitudes of public sector managers towards entrepreneurship even the Soviet standards which were meant to serve merely as guidelines became used by officials in order to fine entrepreneurs. As a result of the absence of incentives to upgrade production methods and technological capabilities, entire sectors of Kazakhstani industries are seriously underdeveloped. The National Agency on Development of Local Content is a governmental agency, directly subordinate to Ministry on Investment and Development. Kairat Bekturgenev, Chairman of the Board comments:

> There was an agreement between the governments of Belarus and Kazakhstan on the construction of plant for the production of refrigerators in Kazakhstan. We went there, studied the entire cycle of production process of 'Atlant' [refrigerator brand]. After that we returned to Kazakhstan and started to work on localisation. And here I can say that unfortunately we were unable to localise production here in Kazakhstan. The only appropriate thing that we had was metal from ArcelorMittal. We lacked even packaging because cardboard was not produced in sufficient scale in Kazakhstan… This is very serious obstacle and it hampers development of many projects. (Kairat Bekturgenev, interview, 15th June 2016)

Even the fact that entire sectors of Kazakhstani industries were in their infant stage would not be an obstacle for export-led growth if the attitude of public sector managers towards

entrepreneurships was different. Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" provides the following example of how production of refrigerators 'Atlant' could have been organised through just-in-time delivery processes:

> In principle, the lack of some components would not matter that much if we improved trading across borders. For example, if there are no screws, they can be brought from Russia. There is no cardboard – it can be brought from Belarus or from somewhere else. But our problem, I am telling again, is trading across borders. The big problem is that it takes a lot of time to bring components. The world switched to system like just-in-time inventory 25-30 years ago. That is to say, they do not have those screws in their warehouses. They bring them directly to the plant in order not to keep a large amount of inventory on their balance sheet. This just-in-time inventory system will not work here by definition because those screws can be stuck at customs for 30 days, and that's it. That is why any production we have will be uncompetitive in comparison with China, where its customs clearance is handled within an hour. (Borisbiy Zhangurazov, interview, 26th July 2016)

The long-established attitude towards entrepreneurship as an illegal undertaking encourages public sector managers to use the complexity of regulations in order to extort money from businessmen, as if they were kickbacks for allowing them to continue engaging in their activities. In other words, the real reason why customs procedures are so lengthy and complicated is because such order of things provides opportunities to receive bribes for accelerating the process of custom clearance. The International Bank for Reconstruction and Development (2015) ranked Kazakhstan 185th out of the 189 economies in 'trading across borders' category. Not only did the attitudes of public sector managers reflect poorly on the ability of domestic enterprises to engage in development of internationally competitive products, but also directly influenced the complexity of import/export procedures.

Although the authorities introduced various initiatives, aimed at spurring the development of internationally competitive products, their efforts did not bring results because they did not change the attitude of domestic actors towards entrepreneurship. Over many years the government attempted to overcome the lock-in of the innovation system. In order to encourage the new generation of young entrepreneurs to engage in development of internationally-competitive products and reorient the national economy towards export-led growth, the government introduced various mechanisms that were supposed to help domestic firms to update their production methods and apply new technologies. As early as in 1997, one year after Kazakhstan submitted the application for membership in the WTO, the government established the Entrepreneurship Development Fund 'DAMU', which provides subsidies to domestic enterprises on favourable terms through partner banks. In order to achieve diversification and improve the competitiveness of the economy the 'State program for accelerated industrial and innovative development of the Republic of Kazakhstan for 2010-2014' was launched. It was later replaced by the 'State program of industrial-innovative development of Kazakhstan for 2015-2019'. The 'Law on State Support of Industrial Innovative Activity' was adopted in early 2012. Additionally, the government developed the 'Conception of innovative development of Kazakhstan till 2020'. However, while the authorities put a growing emphasis on the promotion of innovation, they overlooked the need

to change the attitude of domestic actors towards entrepreneurship. As a result, the initiatives introduced did not increase the international competitiveness of domestic firms. Commenting on the export potential of domestic firms OECD (2016, p. 120) notes: "Kazakhstan is still almost exclusively internationally competitive in products based on natural resources. Between 2010 and 2014, the country had on average a revealed comparative advantage (RCA) in exporting goods in 55 (out of approximately 1,000) products. Around 30% were raw material or agricultural products and two-thirds corresponded to processed natural resources including a few chemical products. Fever than 5% of the RCA products were products not based on resources, including, for example, rail locomotives, tugs and vessels". The key reason why the need to change the attitude towards entrepreneurships in the society was overlooked was because the strategy of the authorities was based on top-down implementation of the national sociotechnical imaginary.

The authorities implemented reforms in a top-down manner because they believed that public pressure may impede the process of turning Kazakhstan into a major export-based economy. In order to achieve outward orientation of economy and turn Kazakhstan into a Snow Leopard, the government started to follow the footsteps of Asian Tigers by limiting participation of domestic actors in the process of decision-making. Gilpin (2001, p. 319) argues: "The theory of the developmental state maintains that the East Asian state was able to play a guiding role in economic development because of a number of unique domestic and international factors. In all these societies, the state has been relatively autonomous and therefore able to pursue policies free from public pressure. Yet, this state autonomy was deeply embedded in a society where the state worked very closely with business interests to promote rapid industrialization". However, the problem with emulating the policies of newly industrialised countries was the difference in historical contexts. The negative attitude of officials towards entrepreneurship was shaped by decades of the Soviet history. The problem of the wrong attitude was aggravated due to adoption of the 'economy first, then politics' approach whereby public sector managers received unilateral control over the process of decision-making. Evidently, by giving carte blanche to public sector managers, the authorities created a system that lacked checks and balances. The complete dependence of entrepreneurs on the decisions of officials became the main factor that defined the nature of their relationships. The authorities believed that since Kazakhstan has a top-down governmental hierarchy, they would be able to control the behaviour of public sector managers. However, the reality is that due to lock-in of mindsets of officials the top-down system no longer responded to commands.

Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" provides the following example of how burdensome rules hamper the export-led growth of Kazakhstan's economy:

> One of our enterprises assembles Wi-Fi routers and wanted to export them. It turned out that according to old Soviet norms Wi-Fi routers are qualified as dual-use products and their export is subject to authorisation by the National Security Committee. In order to obtain permission on Wi-Fi routers you have to wait for 30 days. That is to say, that this small enterprise which with great difficulty found a buyer on its products have to wait for 30 days for permission from the National Security Committee. Naturally, the buyer will not bother to wait our routers for 30

> days. He will buy them somewhere in Thailand, China, Turkey, where there are no such rules. (Borisbiy Zhangurazov, interview, 26th July 2016)

The example provided by the Chairman illustrates the fact that the system no longer responded to commands. Earlier, the President in his Address to the nation gave a direct order to officials to reduce regulatory burden by stating the following: "A well-developed entrepreneurial sector is the basis of any economy. In this regard, I am instructing the Government, in the administrative reform's context, to radically reduce the administrative burden on businesses, and to further simplify the approval system, mostly in terms of licensing, certification, and accreditation. Let me offer an example. According to the latest World Bank report "Doing Business", it takes 89 days to perform all export-related procedures in Kazakhstan, whereas it only takes five days to do the same in Estonia" (Nazarbayev 2008). However, even many years later the situation did not change. Evidently, neither the exhortations nor the direct orders of the authorities changed the attitudes of public sector managers towards entrepreneurship.

The next section describes how regulatory environment influenced decisions of multinationals to use Kazakhstan as a platform for their export operations.

5.6. Creation of an export base for multinationals

The authorities planned to achieve outward orientation of the national economy not only by encouraging domestic firms to export, but also by turning Kazakhstan into a platform for export operations of multinationals. The authorities believed that the inflow of FDI will become a major source of the capital needed for capability building of domestic export-oriented firms. Omarova (1999, p. 350) argues: "Building an internationally competitive, export-oriented industrial sector is a long-term project requiring massive injections of capital. In the absence of domestic sources of capital, the Kazakhstani leadership's developmental ambitions critically depended on its ability to attract massive foreign investment". Moreover, it was assumed that if multinationals start using Kazakhstan as a base for their export operations, it may also increase export capacity of indigenous firms. In theory, close geographic proximity to multinationals can reduce the costs associated with the process of breaking into foreign markets for domestic firms by familiarising them with the tastes of customers in foreign markets. Affiliates have foreign parent firms which implies that they are a better source of information about foreign markets than domestic exporters. This hypothesis was tested by Aitken et al. (1997), who examined statistical data of 2113 Mexican manufacturing plants over the period 1986-1990 in order to estimate spillover effects associated with costs of foreign market access for domestic firms located near exporting multinationals. The authors concluded that multinationals act as catalysts for local firms and significantly enhance their export prospects. In the case of Kazakhstan, it was especially important to familiarise domestic firms with the tastes of foreign customers because the Soviet Union was a closed economic system. Despite the fact that theoretical research suggests the possibility of spillover effects from the presence of multinationals, Kazakhstan's strategy of achieving outward orientation of the national economy through attraction of FDI was based on an imaginary, rather than a tangible plan because they had no knowledge about the nature of export-led growth.

The Vice Minister of Investments and Development, Yerlan Khairov explains how the government imagined the role of multinationals in Kazakhstan's strategy of building export-based economy:

> Our goal is to make you choose Kazakhstan as a place for investments. We strive to crate the best investment climate. So that you could safely produce your commodities here and sell them abroad. (Yerlan Khairov, interview, 1st August 2016)

Apparently, the government imagined that the country's favourable geographic position would encourage multinationals to produce goods in Kazakhstan and export final products to China and countries of the Eurasian Economic Union.

Pursuing the national sociotechnical imaginary, the government has undertaken a series of major reforms which were meant to encourage multinationals to turn Kazakhstan into a base for their export operations. Kazakhstan's accession to the WTO was the first step in the government's plan, aimed at achieving export-led growth. It was expected that accession to the WTO would increase the flow of inward FDI because the rules of the organisation heavily protect the interests of foreign investors. Buthe and Milner (2008) argue that nowadays extreme government actions that may directly harm the interests of investors, such as the expropriation of foreign assets, rarely take place. Instead, governments of developing countries are likely to use a more subtle approach in order to obtain a larger share of the benefits from investments. The authors note that commitments by host governments to international standards in frameworks of the WTO are more credible due to the ability of home governments and multinationals to respond with costly economic pressure through dispute settlement mechanisms. Therefore, the government anticipated that accession will convince multinationals that Kazakhstan is a safe place for their investments. Besides, the authorities made some extra steps in order to encourage the flow of inward FDI. For instance, investors working in special economic zones and those who signed investment contracts with the state, were provided with full exemption from import duty payments. The dependence of multinationals on the quality of local suppliers was minimised through reduction of the average level of import tariff from 9.5 percent in 1996 to 2.6 percent in 2004 (OECD 2017). Moreover, in order to encourage multinationals to choose Kazakhstan as a base for their export operations, the government adopted policies aimed at reducing the regulatory burden, created by the complexity of administrative procedures required for obtaining visas, quotas, permissions, undergoing checks, customs procedures, etc. For instance, the Prime-Minister demanded central and local authorities to monitor the quality of services provided to investors including ease of enrolling children into kindergartens and quality of service in restaurants (Gani 2018). Although the authorities did not know whether upon entry multinationals would decide to use Kazakhstan as a basis for their export operations, they made many concessions in order to attract them.

An interview with Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" shows that the main priority of the government was attraction of FDI:

> In 2014 we attracted the largest amount of FDI among the landlocked transition economies. Among all transitions economies, regardless whether they have access to sea or not, we are second after Russia. Therefore, we play very well in our league. But the question is how we will enter the next league and how we will look there, against such countries as the Baltic States, Eastern Europe, China. (Borisbiy Zhangurazov, interview, 26th July 2016)

Similarly, the Vice Minister of Investments and Development, Yerlan Khairov argues:

> We constantly monitor existing investors, meet, talk, find out what are their problems. We have an investment ombudsman institution – it is Minister for Investment and Development, on the basis of which the current problems of a particular investor are being addressed. If the problems are of a systemic nature, then we have a Council for improving the investment climate under the Prime-minister. Issues related to improvement of tax and custom legislation are being considered there. For strategic purposes we have a Council of foreign investors under the President. (Yerlan Khairov, interview, 1st August 2016)

The measures the government undertook with the purpose of improving Kazakhstan's investment climate and regulatory environment led to a significant increase in the flow of inward FDI. As it was anticipated by Kazakhstan's government, the adoption of a non-discriminating investment regime and attempts to improve the regulatory environment resulted in an upsurge of inflow of FDI not only in oil and gas industries but also in non-extracting sectors of the economy. The flow of inward FDI in the processing sector increased more than tenfold, from $ 346 million in 2005 to $ 3, 748 million in 2014 (figure 5.1.). A similar trend was experienced by the construction sector with a rise from $ 134 million to $ 799 million in less than decade. The inflow of FDI in wholesale and retail trade along with vehicles and motorcycles repair went up from $ 387 million in 2005 to $ 2,731 million in 2014. While attracting extracting multinationals became a major source of capital, it is the work of non-extracting multinationals that was supposed to teach domestic firms the tastes of foreign customers and demonstrate to them the benefits of export orientation. Due to positive dynamics in attracting non-extracting multinationals the government imagined that the entry of multinationals will inevitably lead to export-led growth. Therefore, the authorities focused their efforts mainly on attracting FDI rather than on the need to the adapt mindsets of domestic actors, including that of public sector managers to a new paradigm of economic relationships.

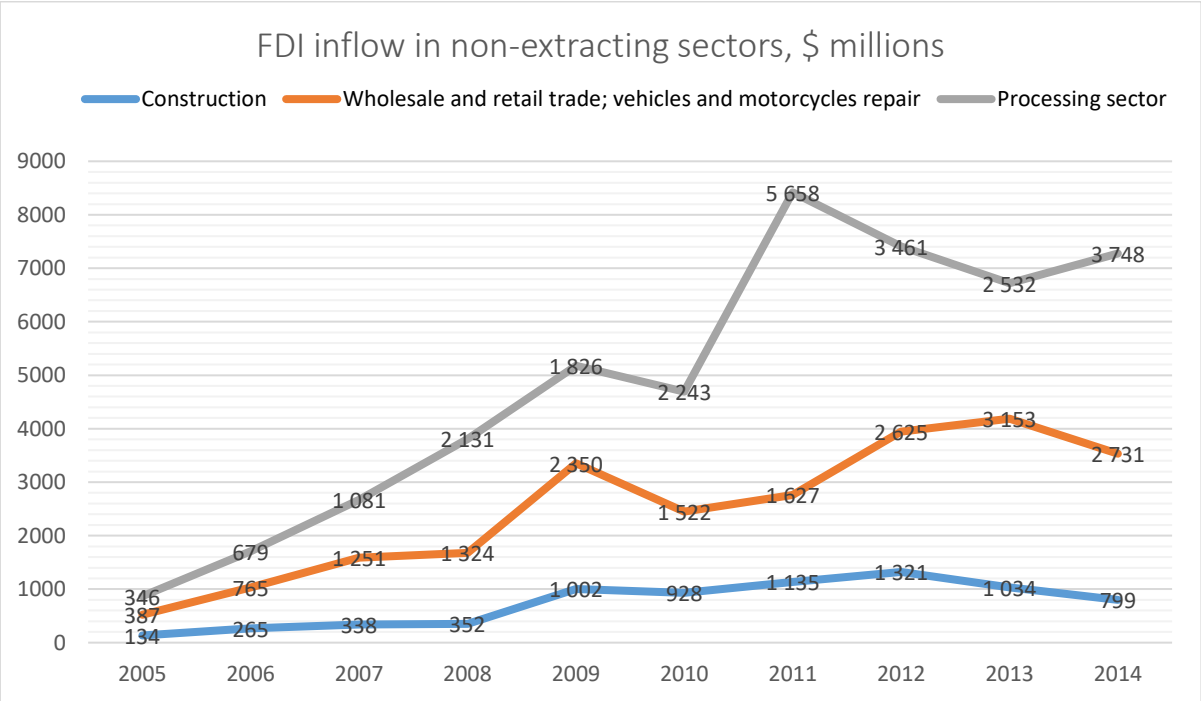

Figure 5.1. *FDI inflow in non-extracting sectors, $ millions.*
Source. *National Bank of the Republic of Kazakhstan.*

Although the authorities made a lot of concessions in order to encourage multinationals to choose Kazakhstan as a base for their export operation, they failed to create a favourable environment for export-led growth. The vision of the authorities, defining the Kazakhstan's strategy of technological development was largely shaped by recommendations of the WTO. The WTO itself had little awareness about what needs to be done in order to facilitate export-led growth in the economy in transition and therefore focused attention of the authorities exclusively on the necessity to transform Kazakhstan's formal institutions in accordance with the main principles of the organisation. Another reason why the WTO insisted solely upon change of formal institutions without weighing the consequences of their potential mismatch with the well-established informal institutions is because in reality the organisation is "concerned with setting the rules of the trade policy game, not with the results of the game" (Hoekman 2002, p. 42). Thus, the need to change the attitudes of the officials, shaped by the austerity of the Soviet regime and the, *perestroika* period, as well as vast opportunities, offered by market relationships was overlooked. Objectively, Kazakhstan has a lot of characteristics that should have convinced multinationals to turn it into a base for their export-based operation, including a safe investment climate, cheap labour force, favourable geographic location and low tariff barriers. However, due to predatory attitudes of public sector managers, the costs associated with even the most basic activities, such as launching production processes, arranging transportation, and undergoing customs procedures became too high.

Borisbiy Zhangurazov, Chairman of the Board of the National Export and Investment Agency "Kaznex Invest" assumes that the legacy of the Soviet era is the main factor that inhibits the plans of multinational companies to use Kazakhstan as a platform for export operations:

> We still work by Soviet building codes. One of investor complained to us – investor works, he wants to produce transformers. Power transformers for transport. He began to build factory, but then he was told that it is imperative to build a bomb shelter as well. That is to say, that according to our building codes which are still valid in Kazakhstan if you build a factory you have to build bomb shelter. This is the legacy of the Soviet era. (Borisbiy Zhangurazov, interview, 26th July 2016)

While the Chairman blames the regulations inherited from the Soviet era, the reality is that it is the attitude of public sector managers that hampers export-led growth of national economy. The obvious reason why the officials referred to the norm of the Soviet GOST, with the requirement to build a bomb shelter, and demanded its implementation from the investor was to extort a bribe from the multinational company so that this requirement would be overlooked. The fact that public sector managers were not obliged to demand implementation of the outdated norms of the Soviet GOST is confirmed by Askhat Kuzekov, Senator, Member of the Committee on Economic Policy, Innovative Development and Entrepreneurship, who was sceptical about the very possibility that such situation could take place:

> I doubt that anyone would nitpick specifically to building bomb shelters nowadays because it is costly and it is a waste of money. Old norms contain such requirement, but they are not taken into account and of course no one builds those. (Askhat Kuzekov, interview, 1st August 2016)

In reality, similar situations to this regularly arise. Being unable to change the attitudes of public sector managers, the authorities had to intervene in such situation on the highest level.

Being asked to comment on the situation about the bomb shelter requirements, the Vice Minister of Investments and Development, Yerlan Khairov responds:

> As you probably have heard, there are specific instructions, articulated in the Address of the Head of the State to introduce international [standards] and it is gradually implemented… Such questions are being raised, including by the investors themselves. (Yerlan Khairov, interview, 1st August 2016)

Following the instructions of the WTO, the authorities have focused solely on the transformation of formal institutions. Accordingly, the attitudes of public sector managers towards entrepreneurship were defined solely by the path of Kazakhstan's socio-economic development and did not fit well with the 'rules of the game' of a new paradigm. The major problem was that a paradigmatic shift from a socialist to a market ideology was implemented in a short period of time, leading to opportunistic behaviour by public sector managers, and systemic corruption.

The reformist attitude of the authorities and their ambition to turn Kazakhstan into a Snow Leopard were used by the WTO in order to encourage acceleration of the pace of the reforms, which led to the creation of a system that lacks checks and balances. The country's strategy on achieving outward orientation of the national economy was based on the sociotechnical imaginary that Kazakhstan can repeat the success of Asian Tigers simply by following their footsteps. Being an outsider, Kazakhstan's government had no knowledge about the processes that led to industrialisation and export-led growth of Asian Tigers. While the actual reason behind the success of newly-industrialised countries was subsidisation of domestic firms (Rodrik 2002), the neoliberal rhetoric posits that it was achieved through liberalisation of trade regime and attraction of FDI (Gilpin 1987, Gilpin 2001). Reality is being distorted because the rules of the WTO prohibit subsidisation of domestic firms. Being inspired by the success of Asian Tigers, the government was eager to implement reforms in accordance with recommendations of the WTO. However, since the WTO was concerned solely with establishing the 'rules of the game' and not with its results, it convinced the government that fast implementations of the reforms will be beneficial. In fact, such a step had no upsides for Kazakhstan's development. The European Bank for Reconstruction and Development (1994, p. 45) argues: "While the distorted economies inherited from decades of central planning may have appeared to offer ample scope for reforms making virtually every one of their inhabitants better off, nothing in economic theory suggests that… a one-step movement to a market economy would have that effect". In order to accelerate the pace of radical reforms in accordance with the advice of the WTO, the authorities emulated the strategy used by the Asian Tigers by providing carte blanche to public sector managers. However, the problem with adopting such an approach was that the attitude towards entrepreneurship in Kazakhstan was completely different to that in the newly industrialised countries due to historical differences among the countries. The possession of power aggravated the attitude of officials towards entrepreneurship and enabled them to pursue their varied vested interests to the detriment of the common good.

Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" recounts:

> The allocation of land with infrastructure is a big problem. That is to say, the system of allocating land plots is complex and incomprehensible. There is no land registry. Nowhere. We only try to make one, but we meet very strong resistance. Since there

> is no land registry database, no one seem to know where there are land plots. When you come to akimat [office of the governor], they either don't show anything or show something incomprehensible. Otherwise, they show land plots that are unsuitable. There is huge lack of transparency. (Borisbiy Zhangurazov, interview, 26th July 2016)

The Vice Minister of Investments and Development, Yerlan Khairov responds:

> This situation is being solved now in cooperation with akimats. The Head of the State tasked the Ministry of Agriculture to put this information into the open domain. The question is, what kind of investment projects you are referring to. That is to say, now there is a competition between regions for attracting any investor and there is no such thing as not to give him land. On the contrary, as I have told you we now have special deputy *akim* [on investments] in every region, they call us every day and ask to direct investors to them. When they receive information that someone came in centre, they offer the best lands, the best conditions because everyone is interested. Perhaps what you described has been happening when oil was higher than 100 dollars, but now there is a big demand. Every region is aimed not only to give land, but to help investor to implement his project. Everyone understands that it means tax revenues, jobs. We don't face such problems now. (Yerlan Khairov, interview, 1st August 2016)

Askhat Kuzekov, Senator, Member of the Committee on Economic Policy, Innovative Development and Entrepreneurship explains:

> Why akimat does not provide land? Because land is a commodity. It is one of few commodities that still remains in the hands of officials. They practically have nothing else left. Land is still in their hands and therefore they use it in their own venal interests. To be frank, there is, of course, a corruption component. (Askhat Kuzekov, interview, 1st August 2016)

The Department of Land Affairs is considered one of the most corrupt among the local authorities in accordance with rankings of the National Chamber of Entrepreneurs "Atameken" (Tengri news 2018). Centrally located land plots, especially those with infrastructure are extremely valuable commodities. Since the allocation of land plots by the local authorities is not monitored by civil society, it creates a high risk of corruption. Kazakhstan lacks civil society organisations that could intervene and introduce transparency in areas where the personal interests of officials might be involved.

The concessions made in order to convince multinationals to use Kazakhstan as a platform for export-based operations had no noticeable effect because due to the lack of checks and balances the authorities were unable to put constraints on behaviour of public sector managers. Initially, due to the fact that Kazakhstan has a top-down governmental hierarchy, the authorities were confident that they will be able to keep a firm grip on the process of the country's radical transformation. In his Address to the nation the President noted: "Strong executive power has become a basis of stability in the society and one of key factors of success of economic reforms where Kazakhstan is the leader among CIS countries. International experts also acknowledge it" (Nazarbayev 2001). The reason why international experts acknowledged that the 'economy first, then politics' approach benefited the country's development was because the consolidation of power accelerated the pace of liberalisation of Kazakhstan's trade and investment regime, something which was in the interests of the developed countries and multinationals. In reality, the top-down system did not respond to the

commands of the authorities such as a demand to ease the regulatory burden. For instance, the Head of the State noted that it takes about 10 days for a car carrier trailer to travel 1,000 kilometres between the cities of Ust-Kamenogorsk and Almaty (Kazinform 2011). The President clarified that the reason for this is not the quality of roads, but the fact that on its way a car carrier trailer will be subjected to numerous inspections where officials will nit-pick to every detail, such as insignificant difference between declared and actual weight of the cargo. The President pointed out that no foreign investor would be willing to undergo such sort of treatment.

The opportunistic behaviour of public sector managers and disrespectful attitude towards entrepreneurship became one the main reasons why multinationals do not choose Kazakhstan as a platform for their export operations. Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" comments:

> The custom clearance process takes weeks in Kazakhstan, whereas in normal countries it takes hours. That is to say, in Singapore the custom clearance procedure takes 40 minutes. In our country it can take month. For instance, customs can close for holidays. In the world's rankings estimating effectiveness of customs procedures we occupy one of the worst places. Firstly, it is due to the fact that we have very low-skilled personnel working at customs. Secondly, customs is extremely poorly equipped, we have low level of computer technologies penetration, electronic declaration was introduced only recently and so on. (Borisbiy Zhangurazov, interview, 26th July 2016)

The Chairman assumes that one of the key reasons why it takes weeks to undergo customs procedures is the custom's poor equipment. However, the truth is that the process of custom clearance was deliberately made lengthy and complicated. The logic dictates that even in the case of complete absence of computer technologies the process should not take weeks. Custom clearance could take a matter of hours if the extortion fee was paid as expected.

The situations where obstacles are created by officials on purpose are ubiquitous. For instance, one of the reasons why multinationals do not choose Kazakhstan as a platform for their export-based operations is the lack of highly-qualified workforce. President Nursultan Nazarbayev on 26th Plenary Session of Foreign Investors Council said: "Many of the investors present here have already faced the problems associated with the lack of required specialists. We need to cover the needs in engineering and technical specialists possessing appropriate competencies of international level" (Nazarbayev 2013). Even though the authorities try to solve the problem of the lack of a highly-qualified specialist by simplifying visa requirements, officials find different ways to complicate the process. Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" comments:

> We don't have a system of obtaining a visa at the airport for the majority of countries. Only for some of OECD [Organization for Economic Cooperation and Development] countries. But as I said, employees of multinationals are not necessarily citizens of OECD countries. There are a lot of Hindus, Romanians, Poles, Vietnamese and others. Besides, there is an issue with migration registration. Majority of people don't know that they need to register. When they try to leave the country, they might be either get arrested or fined. This is a very big problem. (Borisbiy Zhangurazov, interview, 26th July 2016)

It is obvious that the complexity of the registration procedures is used by officials in order to pursue their varied vested interests. More than 100,000 foreigners are fined annually on the grounds of breaking migration legislation simply because they do not know about the requirement to register upon arrival (Sputnik 2019).

5.7. Conclusion

Since market-oriented researchers viewed the centrally-planned regime as nothing more than a non-system, it was assumed that Kazakhstan's regulatory environment could be improved almost overnight through the transformation of its formal institutions. As an active promoter of the ideas of the Washington Consensus, the WTO ensured that Kazakhstan's regulatory environment was transformed in accordance with its principles by forming a national sociotechnical imaginary. The WTO provided no evidence that radical neoliberal reforms will be beneficial for Kazakhstan's technological development but demanded that the country meet these at entry, without any transitional period. In reality, there was no tangible plan on how to transform Kazakhstan into an open market economy because being an outsider, the WTO had no knowledge on potential problems of transition. Nevertheless, the neoliberal rhetoric was successful in convincing Kazakhstan's government that the implementation of paradigm-shifting reforms, aimed at the establishment of a regulatory framework inherent to open market economies and attraction of FDI, would automatically lead to formation of a favourable environment that would incentivise domestic actors to engage in innovative activity and facilitate international technology transfer. In the course of the transformation of Kazakhstan's regulatory environment many important issues such as the necessity to take into consideration the mindsets of domestic actors were overlooked because the strategy of technological development was based on an imaginary rather than a tangible plan.

The mismatch between the formal set-ups that had to be established in accordance with the requirements of the WTO and well-established informal institutions created a top-down system that did not respond to the commands of the authorities. The neoliberal prescriptions, stipulated in the Washington Consensus and imposed through WTO requirements, disregard the contextual differences between developing countries. However, while centrally-planned development was viewed by market-oriented researchers as a non-system, the reality is that it was a fully-fledged system with a well-established set of informal institutions that fitted well with the goals of a socialist society. Because the WTO had no knowledge about the pitfalls of transition and because its main concerns lie in setting up the 'rules of the game', rather than its results, the need to adapt the mindsets of domestic actors, including that of public sector managers, was overlooked. Unlike market relationships, centrally-planned development was aimed at maintaining total control over every aspect of socio-economic relationships. Since the mindsets of public sector managers were locked-in on the previous paradigm of development, through reforms they strived to recreate the regulatory environment that would allow them to preserve control over the system through deliberate complication of national legislation. The ability to interpret complicated regulations in the way they saw fit, and radical changes in the system of values caused by abrupt transition from socialist to market relationships triggered systemic corruption and the opportunistic behaviour of public sector managers, inhibited the development of innovations. Attempts of Kazakhstan's authorities to reduce the regulatory burden did not bring any results because the tendency to complicate legislation on purpose and use it to the detriment of common good became self-reinforcing.

The attempts of the government to incentivise capability building of indigenous firms failed due to the absence of a tangible plan on how to change a highly negative attitude of domestic actors towards entrepreneurship. The necessity to change the attitude of the society towards entrepreneurship was never prioritised by the government because Kazakhstan's strategy of technological development was based on the sociotechnical imaginary shaped by the WTO. The authorities realised that the attitude of the first generation of businessmen towards entrepreneurship would be difficult to change because it was influenced by the previous paradigm of socio-economic relationships. The authorities imagined that the lock-in on the old ways of doing things would be automatically overcome by the next generation of young entrepreneurs. Therefore, the government focused all its efforts solely on implementation of formal institutional reforms, insisted upon by the WTO. What was overlooked, however, was the necessity to change the attitude of public sector managers, who viewed entrepreneurs as *barygas*, obliged to pay kickbacks in order to be permitted to continue their activities. A burdensome regulatory environment, enforcing businessmen to pay bribes in order to overcome the barriers preventing engagement in even the most basic types of entrepreneurial activity, disincentivised the new generation of young businessmen from attempts to develop innovations. Neither exhortations nor direct commands of the authorities to reduce regulatory burden worked. In order to improve the capabilities of domestic firms the government attempted to limit the number of inspections in a top-down manner. However, the reduction in the number of inspections immediately resulted in a significant deterioration of the quality of products, both goods and services, demonstrating that the need to change attitudes, rather than intervene in a top-down manner was important.

The authorities imagined that Kazakhstan's favourable geographic location, adoption of a regime to protect investments and the autonomy of government decision-making would turn the country into a Snow Leopard – a major export-oriented economy. Kazakhstan's authorities were inspired by the example of newly industrialised economies – the poster children of successful export-led growth. They planned to follow in the footsteps of the Asian Tigers not only by encouraging domestic firms to export, but also by turning Kazakhstan into a platform for export operations by multinationals. The neoliberal rhetoric convinced the government that accession to the WTO is the best way to ensure outward orientation of the national economy. It was assumed that increase in the flow of inward FDI, triggered by accession to the WTO would facilitate integration of domestic firms into the supply chain of multinationals, providing that they are able to catch-up with affiliates of foreign companies in terms of scale efficiency and capacity to innovate. Furthermore, the government anticipated that the absorptive potential of the markets of the neighbourhood countries would encourage multinationals to choose Kazakhstan as a platform for their export-based operations. In reality, however, the prohibition of export subsidies, imposed by the WTO, limited the instruments available to the government in order to encourage domestic firms to engage in development of internationally competitive products, and increased their dependency on the quality of regulatory environment. Besides, the reformist attitude of the authorities and their firm belief that the implementation of the requirements of the WTO will turn Kazakhstan into a Snow Leopard, encouraged the authorities to adopt the 'economy first, then politics' approach as a means of providing autonomy to government decision-making and to accelerate the pace of reforms. However, attempts to base Kazakhstan's strategy of technological development on emulation of policies of newly industrialising economies in terms of giving carte blanche to public sector managers backfired because the need to change their attitude towards

entrepreneurships was overlooked. As a result of the inability of the authorities to overcome the negative attitude of officials towards entrepreneurship, the regulatory environment became too costly, thereby creating an insurmountable barrier to export-led growth.

6. GOVERNMENT AS COORDINATOR

6.1. Introduction

This chapter analyses attempts by the government to spur the process of Kazakhstan's transformation into a knowledge-based, export-oriented economy by replacing weak and sluggish market forces with targeted state intervention. I show that the reformist attitude of the authorities and their ambition to turn Kazakhstan into a Snow Leopard by following the footsteps of Asian Tiger economies encouraged them to base the country's strategy of technological development on a sociotechnical imaginary, rather than a tangible plan. Attention here is drawn to the fact that the task of replacing a centrally-planned coordination regime with one inherent to open market relationships was a paradigm-shifting undertaking, as domestic actors were locked-in on the old ways of doing things. I analyse how over-reliance of domestic firms on state intervention, stemming from attempts of the authorities to replicate interventionist style of governance of Asian Tigers influenced their motivation to invest in long-term capability building, development of entrepreneurial spirit and the attitude towards emerging categories of end-users. This chapter explores how the authorities aimed to turn the country into a new benchmark of successful economic development – the Snow Leopard – despite making no real attempts to study the experience of newly industrialised countries and examine contextual differences between Kazakhstan and Asian Tigers.

The arguments in this chapter are organised as follows: section 6.2. analyses whether interventionist style of governance facilitated the adaptation of the mindsets of domestic actors to the new paradigm of socio-economic relationships. Section 6.3. reviews how the establishment of backward linkages between multinationals and domestic suppliers in the oil and gas sector through the imposition of local content requirements influenced their decision to develop technological capabilities. In section 6.4. I describe attempts by the authorities to overcome the dependence of Kazakhstan's technological development on foreign capital by incentivising local firms to take part in industrialisation programmes. Section 6.5. examines the consequences of the decision of the authorities to replace domestic rivalry with extensive state procurement. Finally, section 6.6. shows how the tendency of the authorities to focus on satisfying the needs of national champions influenced the occurrence of spillover effects in other sectors of the economy through backward linkages.

6.2. From central planning to interventionist state

While the necessity to shift from the coordination approach intrinsic to centrally-planned economies, to the one inherent in market relationships, has been viewed by market-oriented researchers as merely an organisational undertaking, the reality is that such an endeavour had a paradigm-shifting nature as it involved the task of changing the mindsets of domestic players. Coordination processes under a centrally-planned regime had many specificities that did not make much sense from the point of view of market-oriented researchers. For instance, Soviet industrial players did not attempt to increase labour productivity because, due to the principles of socialist ideology, their primary task was to employ as many people as possible (Morton 1984). Accordingly, different market-oriented researchers assumed that the command regime was simply a failed experiment of the Soviet authorities, aimed at replacing market forces with planning procedures. Market-oriented researchers based their arguments about the alleged inferiority of the Soviet system of

coordination on its economic drawbacks, such as the complexity of input-output relationships, lack of flexibility, delays in allocation and distribution, high transportation costs, miscalculations in planning and so on. Since centrally-planned development was viewed by market-oriented researchers as a non-system, no real attempts were made to understand the problems of transition (section 3.2.). In reality, the centrally-planned regime was designed not to be the most economically efficient, but to serve socialist ideology, satisfy the military ambitions of Soviet leaders and solve strategic problems caused by the country's vast size, underdevelopment of peripheral territories and scarceness of resources. Most importantly, the decades of central planning not only defined the nature of relationships between domestic actors, but also became embedded in their mindsets. Therefore, the main difficulty of transition lies not in changing organisational and institutional arrangements but in adjusting mindsets of people to the new order of things because informal constraints are extremely resistant to change.

Kazakhstan's authorities neither had knowledge about how domestic actors in a market system were supposed to be coordinated, nor had a plan on how to transform the national economy. Accordingly, the need to adapt mindsets of domestic actors to a new paradigm of socio-economic relationships by changing the ways of doing things was overlooked. Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" explains:

> At today's exchange rate our minimal wage is approximately 30-40 dollars per month. Meanwhile, in countries of Western Europe, in the United States minimal wage is 3-4 dollars per hour. Consequently, many corporations there innovate, strive to get rid of extra staff, adopt different types of automatization, different types of robots and so forth. For us it is easier to hire 300 people, get huge gratitude from the ministry [of Healthcare and Social Development], get many appreciations from akimat [governor's office] and keep hundreds of people on not quite resource-efficient production. That is to say, until this situation will not be changed dramatically by the government, we will not have demand for innovations. Well, take banal situation, when you drive around the city in spring time you can see people whitewashing trees. How many people is such city as Astana are whitewashing trees? Probably several hundred of them. Am I right? That is to say that they walk around and like 300 – 400 years ago whitewashing trees. At the same time, if there were certain requirements in terms of minimal wage for that people, then public utility companies would have probably placed order to some innovators who could make some machine which makes it automatically. (Borisbiy Zhangurazov, interview, 26th July 2016)

The Chairman provided an incredibly good illustration of how the need to adapt the mindsets of domestic players to new socio-economic order is overlooked by the authorities. Low labour productivity was inherent to centrally-planned development because a policy of full employment was a cornerstone of socialist ideology. In market relationships, however, the motivation to improve labour productivity is one of the most important factors pushing forward technological progress. Since the authorities had no knowledge of the nature of market relationships, no attempts were made to change attitudes of domestic actors towards labour productivity. As a result, in Kazakhstan, the average labour productivity is at least three times lower than in developed market economies (OECD 2016). Moreover, it is evident from the interview that the actions of public sector managers hamper the attempts of entrepreneurs to

increase labour productivity, which points to the fact that Kazakhstan's government lacked a tangible plan on how to handle the transition.

Being unfamiliar with the way the national innovation system should have been coordinated in the open market conditions, the authorities relied mostly on the expertise of the WTO when formulating the strategy of technological development. In his Address to the nation, the Head of the State expressed his concerns with the fact that the government has been demonstrating an excessive administrative zeal in the matters in which it should have not interfered, and acting in a very passive and inert manner where it should have been active (Nazarbayev 1997). The reason for such behaviour of public sector managers was obviously the fact that they had no knowledge of how to coordinate the work of the innovation system under the new paradigm of socio-economic relationships. Nevertheless, the authorities were convinced that Kazakhstan could resolve many problems associated with transition, including those caused by withdrawal of the government from the role of a sole mediator of relationships among domestic actors by following the sociotechnical imaginary, shaped by the WTO. For instance, it was imagined that liberalisation of the investment regime and protection of FDI in accordance with the recommendation of the WTO will automatically facilitate integration of domestic firms into supply chains of multinationals, thereby, solving the problem of lack of downstream capabilities. The problem, however, was that the main concern of the WTO was not to help the country to adapt to an open market relationships paradigm, but to establish formal 'rules of the game' that provide access to multinationals to Kazakhstan's domestic market.

Since the main concern of the WTO was to establish a regime that favours FDI, no actual efforts were made to make the process of accession easier for transition economies. The United Nations (2001, p. 204) notes: "Apparently, WTO Member Countries are only prepared to accept accession of Kazakhstan to WTO on their terms and have little regard to the real problems and difficulties of the country. For instance, despite the fact that, according to economic indicators, Kazakhstan should be classified as a developing country, the demands for commitments would classify it as a developed country". It needs to be noted that similarly to other former centrally-planned economies, Kazakhstan experienced significant difficulties in adjusting to market relationships. Kairat Urazbayev, Director of East Kazakhstan's Department on Natural Monopolies Regulation and Competition Protection argues:

> Collapse of the Soviet Union broke multiple production networks. For instance, while we had first part of production cycle, its second part was typically located somewhere in Russia, Ukraine or Caucasus. Accordingly, the parade of sovereignties halted bulk of manufacturing processes, because we lost channels of distribution of products. Nowadays, we have the problem of finding markets. This problem is especially acute in Kazakhstan because of vast territory and small size of population. We can produce various commodities but huge distances, transport and other expenses affect cost of product. Given that we have a powerful neighbour China which can produce anything much cheaper, it is very difficult to stay competitive. (Kairat Urazbayev, interview, 15th July 2016)

What the authorities should have realised is that the WTO seeks to follow its own agenda and has little awareness of the real problems of economies in transition. Meanwhile, adapting to open market conditions proved to be an extremely difficult task for participants of economic

processes in former centrally-planned economies. Firstly, economic actors had to start performing functions, which were formerly carried out exclusively by the government. For instance, since distribution was previously handled by the state, industrial players needed to develop downstream capabilities such as marketing, finance and operations management (Radosevic 1997). Secondly, under a centrally-planned regime many industrial enterprises relied on a single supplier of inputs. After the dissolution of the Soviet Union and subsequent shift towards market relationships such a specificity of input-output relationships led to decentralised bargaining between suppliers and buyers, causing a decline in the output of goods with complex production processes (Blanchard and Kremer 1997).

Being based on the sociotechnical imaginary shaped by the WTO, rather than a tangible plan, Kazakhstan's strategy of technological development aimed to replicate the path of Asian Tigers by adopting an interventionist style of governance. Although the regime brought by the WTO in no way contributed to the success of newly industrialised countries, the neoliberal rhetoric often uses the example of Asian Tigers in order to make a showcase of the benefits of globalisation. Kazakhstan's authorities were inspired by the way the governments of Asian Tigers overcame economic stagnation and achieved industrialisation. However, due to the lack of knowledge about the processes that led to industrialisation and the outward orientation of economies of Asian Tigers, the authorities assumed that accession to the WTO and adoption of interventionist style of governance were the most important factors, related to success of newly industrialised countries. Since the authorities based their plans on the sociotechnical imaginary, rather than careful examination of experience of newly industrialised countries, neither the real causes that enabled their governments to achieve such results, nor contextual differences between the former centrally-planned economy and Asian Tigers were taken into consideration. Accordingly, in his Address to the nation the Head of the State argued: "Forty years ago when Singapore gained its independence, it was one of the poorest countries in the world with an annual per capita income less than $200. Today the per capita income of Singaporeans exceeds $20,000. Malaysia, a country similar to ours with respect to the population, ethnic composition and many other parameters, gained a 10-fold rise in living standards of its citizens within less than twenty years. Such staggering achievements made these countries world famous assigning them the name of Asian Tigers. Are there any obstacles which might prevent Kazakhstan availing of fine opportunities from scoring the same success? None whatsoever" (Nazarbayev 1997). The reformist attitude of Kazakhstan's government and their lack of knowledge about the processes that led to industrialisation of Asian Tigers were used by developed countries and intergovernmental organisations in order to convince them to follow the prescriptions of the Washington Consensus.

While the authorities aimed to replicate the interventionist style of Asian Tigers, they made no real attempts to study the experience of newly industrialised countries. Dolowitz and Marsh (2000, p. 5) define policy transfer as the "process by which knowledge about policies, administrative arrangements, institutions and ideas in one political system (past or present) is used in the development of policies, administrative arrangements, institutions and ideas in another political system". Despite obvious differences in the contexts of Kazakhstan and Asian Tigers, policy transfer in terms of lesson-drawing would not only be possible, but also practical. After liberalising the investment regime in the frameworks of accession to the WTO, Kazakhstani firms faced numerous problems caused by the lack of a qualified workforce. Upon entry, multinationals started to bid away skilled workers from domestic firms because they were able to offer significantly higher wages. Hay Group, a global management consulting firm, have analysed Kazakhstan's employment market and estimated that companies with

foreign capital payed wages on average 41% higher than local companies (Trubacheva 2013). Due to the rules of the WTO, the government could not regulate the salaries paid by multinationals. In this situation, lesson-drawing would be extremely helpful. It is well-known fact that Asian Tigers also faced the problem of lack of qualified workforce after shifting to high value-added manufacturing. However, unlike Kazakhstan, newly industrialised countries did not create barriers for hiring highly-skilled foreign personnel as it would have hindered the development of technological capabilities of domestic firms. For instance, Seah (1981) reports that as a result of the government's emphasis on new technology the percentage of expatriates recruited in Singapore rose from 15 per cent in 1980 to between 35 and 50 per cent in 1981. Actual examination of policies of Asian Tigers and lesson-drawing would enable the authorities to avoid some obvious mistakes, caused by the lack of knowledge about how open market relationships work.

Absolute confidence in the course of action, pursued by the government is evident in my interview with the Vice Minister of Investments and Development, Yerlan Khairov:

> First of all, we made visa-free entry for citizens of 19 countries, as you know. I think that if you will speak with foreigners, they will tell you straight: "Well done guys, this is first thing that you have done. Excellent. That was exactly what was needed right now. From next year, taking into account Expo, the OECD countries will become visa-free. Great. That means that you open your country to entire world. This is a huge message". (Yerlan Khairov, interview, 1st August 2016)

The inability to hire foreign highly-skilled personnel most of all affected small domestic firms, whose competitive advantage was innovation. Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" comments:

> There are a lot of barriers that do not allow us to develop technologies and high-tech industries. Again, if you want to register and develop some innovative enterprise, it will be very difficult to hire for instance chief technical officer. If let us say he is a citizen of the United States or the United Kingdom, then he may enter for 15 days. But to get permission to employ foreign labour force is extremely difficult because there are quotas. Quotas are usually given to major projects, distributed by akimats [municipal authorities] and nobody knows how transparent it is. There certainly is corruption component in these issues. In other words, for some entrepreneur who promotes certain idea, who counts every dollar, it will be extremely difficult to hire a foreign experts. In such type of business this is key factor because in any case, no country in the world can boast that its citizens are strong in all sectors and in every capacity. That is to say, even if we take a look at countless foreign investors that come in here, even in the biggest American or Korean companies key personnel, executives are neither citizens of USA, nor Korea. They are citizens of India, Romania and many other countries. (Borisbiy Zhangurazov, interview, 26th July 2016)

Strangely enough, an option to use foreign workforce was open to investors that implemented large-scale projects, giving them a competitive advantage over domestic firms. Vice Minister of Investments and Development, Yerlan Khairov argues:

> If you implement a priority investment project in one of six priority sectors, then you can bring out-of-quota for the construction period plus one year. (Yerlan Khairov, interview, 1st August 2016)

The adoption of an interventionist style of governance requires a deep understanding of ongoing socio-economic processes. The government put considerable efforts in attracting foreign investment in Kazakhstan. Even small details, such as visa-free entry for potential investors were put in place. However, the need to protect domestic firms from the tendency of multinationals to bid qualified workforce away by facilitating skilled migration was overlooked.

Although the authorities adopted an interventionist style of governance, enabling public sector managers to maintain total control over the system's functioning, they did not develop a tangible plan which would recognise the need to adapt the mindsets of domestic actors to the new paradigm of socio-economic relationships. Initially, the attitude of society towards entrepreneurship in Kazakhstan was extremely hostile because in the Soviet Union it was an illegal activity. Since the mindsets of domestic actors were locked-in on the paradigm of socio-economic relationships, shaped by the decades of Soviet history, market relationships did not start working automatically after they were legalised in Kazakhstan. The authorities imagined that attraction of FDI and adoption of interventionist style of governance would spur economic growth like the one experienced by newly industrialised countries. Accordingly, the Head of the State in his Address to the nations announced: "Our strategy of healthy economic growth rests on a strong market economy, an active part played by the state and attraction of significant foreign investments… However the fact that the state will play a limited role on developed markets [implies sectors of economy where market relationships function well] in no way implies that it will be deprived of will and power, thus turning into a passive observer. Quite the contrary: it must be very strong for the laws to be honoured, it must be competent and knowledgeable... It must minutely plan its activities so as not to be lax and disorganised, it must identify interests of various groups of the population and development priorities, it must closely co-operate with the private sector thus consolidating and cementing the society" (Nazarbayev 1997). Since the strategy of technological development was based on an imaginary, rather than a tangible plan, the need to change the attitude of society towards entrepreneurship was neglected. Instead of creating an environment that would make society more entrepreneurial, the authorities kept coordinating economic processes through interventions and direct control. Eventually, such a tendency became self-reinforcing as it provided public sector managers with the power they wanted.

My interview with Igor Shatskiy, Director of East-Kazakhstan's Chamber of Entrepreneurs "Atameken" illustrates how adoption of interventionist style of governance influenced the development of business initiatives:

> Our state allegedly issues permissive documents quickly and free of charge. But in order to obtain it you have to go to some private organisation and pay a bunch of money in order to get a free of charge document. Everyone is compelled to go to that organisation and bring easy money to lucky nephew [reference to nepotism] who sits there. We have this everywhere. In the ecology, technical regulation, fire safety, sanitary control, it is all the same. In any sphere, everywhere sits lucky nephew. (Igor Shatskiy interview, 20th July 2016)

The main reason why emulation of interventionist style of governance of Asian Tigers did not work well in the case of Kazakhstan was because the system of values of public sector managers was shaped by a radical shift from socialism to capitalism. The tendency of officials to coordinate economic processes became self-reinforcing as it enabled them to use their

positions in pursuit of their own varied vested interests. Eventually, public sector managers started to seek ways to spread their control even further by creating affiliated organisations.

The fact that the need to change mindsets within society should have been taken into consideration decades ago became evident when the authorities attempted to delegate some of state functions to quasi-public and private sectors. For many years the government emulated the interventionist policies of Asian Tigers by trying to spur technological development through direct state coordination of economic activity. The main drawback of such a strategy was that it neglected the contextual differences between Kazakhstan and newly industrialised economies, including the lack of entrepreneurial spirit and high level of corruption. When the authorities realised that interventionist style of governance and unilateral domination of public sector in the process of decision-making did not make society more entrepreneurial, they decided to create incentives for innovation activity by engaging in dialogue with other domestic actors. In theory, dialogue between state and society should have provided a valuable input for making well-informed decisions and should have helped to build trust among all stakeholders (Burri 2015). The problem, however, was that over the years domestic actors got used to the routines, practices and codes of conduct that formed in Kazakhstan due to adoption of an interventionist style of governance and unilateral domination of public sector, including the need to pay bribes and extortion fees to public sector managers. The well-established ways of doing things shaped the behaviour of domestic firms, making them reluctant to invest in their own capability building, passive in terms of business initiatives and reliant on administrative connections and the decisions of the authorities. While attempting to delegate power to domestic actors, the authorities found themselves in a stalemate situation because the path that emerged over the years of active state intervention and top-down coordination of economic activity shaped the mindsets of domestic actors in such a way that makes productive partnership extremely difficult.

The ways of doing things became so well-established in Kazakhstani society that when the authorities delegated some of the state functions to private sector, these firms themselves adopted a practice of extorting money from entrepreneurs. This phenomenon is best illustrated by attempts by Kazakhstan's authorities to entrust the provision of expertise in origin of goods and the function of issuing registration certificates to private expert organisations. Aydin Kulseitov, Chairman of the Board of Kazakhstan Industry Development Institute, comments on this matter:

> I will tell frankly: when authority to issue certificates CT-KZ was delegated to private sector, situation became worse. Previously, Committee on technical regulations executed this function, a civil service. There was a lot of criticism, business complained about extortions, et cetera. When authority was delegated to private sector i.e. accredited companies, size of minimal unofficial payment increased twofold. Besides, the country now is flooded with companies that allegedly produce locally and sell domestic goods. Whereas in reality they only have stamp and accountant. Sometimes they don't even have an accountant. They import goods, put stamp "Made in Kazakhstan" and sell. On the basis of certificate CT-KZ they participate in tenders, get discounts and so on. (Aydin Kulseitov, interview, 17th March 2016)

Domestic firms strive to receive certificate CT-KZ, confirming that the product has enough share of local content to receive preferential treatment from the state. After the authority was delegated to private expert organisations, certificates CT-KZ were issued to any firm which

was willing to pay a bribe without the need to undergo confirmation procedures. As a result, the National Chamber of Entrepreneurs had to initiate recall of such certificates after confirming 30 cases of issuing certificates CT-KZ with violation of established procedures in just eight months (Zakon 2014).

The next section shows how well-established ways of doing things influenced development of oil and gas sector in Kazakhstan.

6.3. Development of oil and gas sector

In the past, Kazakhstan was largely dependent on other republics of the Soviet Union in terms of processing industries. During the command era important scientific facilities and final assembly plants were strategically dispersed across the entire territory of the Soviet Union. Even production units that supplied major subsystems, such as engines, were allocated in separate locations, regardless of transportation costs (Creacey 1993). Accordingly, due to strategic and military considerations, a number of high-technology facilities were located in Kazakh SSR, such as the world's first breeder nuclear reactor which provided energy for a desalination facility, the Baykonur space centre, an extensive network of research laboratories in fields of microbiology and so on (National Research Council 2007). Moreover, due to the abundance of natural resources, an advanced system of mining complexes and metallurgical plants was built in several regions of Kazakh SSR. However, downstream industries that processed raw and semi-finished materials and supplied commodities to end users were primarily located in Russia. Therefore, Kazakhstan's infrastructure, including roads, railways and pipelines were developed in such a way as to deliver extracted materials for processing to the other republics of the Soviet Union. Omarova (1999, pp. 83-84) argues: "The structure of Kazakhstan's industrial sector inherited from the Soviet era rendered it particularly vulnerable to the break-up of inter-republican trade after the collapse of the USSR. Kazakhstan's large and inefficient oil and gas enterprises, mining operations, and metallurgical combines lost their traditional customers and desperately needed to find new markets". In order to overcome the economy's dependence on neighbouring countries the government planned to integrate domestic industries into the global value chains by attracting FDI.

Aydin Kulseitov, Chairman of the Board of Kazakhstan Industry Development Institute recounts:

> Before 1991 [year of gaining independence] we allegedly were industrial country. In fact, we were an agrarian-industrial country. 30 percent of economy was represented by services and 30 percent by agriculture. The overall industrial output was about 16 billion dollars [per year], including oil and gas. Notably, 20 percent was generated by oil production and 80 percent by light industry. Nowadays it is completely different. Agriculture is approximately 4 percent; industry is about 20 percent. But that is not the question here. We did not have the industry as such. We were in the glavk system [Central Board of Industrial Management of the Soviet Union], where semi-finished goods were extracted here and sent to other republics. (Aydin Kulseitov, interview, 17th March 2016)

After dissolution of the Soviet Union, Kazakhstan's authorities faced the need to upgrade the national economy towards the higher end of the value chain, because domestic industries mainly consisted of upstream entities, engaged solely in extraction of natural resources.

Since post-Soviet Kazakhstan lacked the capacity to build the entire value chain from extraction of raw materials to production and retailing on its own, the authorities planned to attract capital, needed for development of domestic industries through exploitation of natural resources. During the first years of independence Kazakhstan's economy desperately needed to find a source of capital in order to rescue the economy from stagnation. Omarova (1999, p. 338) argues: "As other former Soviet republics, the Kazakhstani state was facing a wide array of social and economic problems of the transitional period: most of the country's industrial enterprises operated at a loss, the agricultural sector was on the verge of total bankruptcy, wages and pensions were not paid for months, the system of health care and education desperately needed subsidies to provide for the most basic needs of Kazakhstani citizens. Under these circumstances, future oil windfalls were seen as the only source of revenues needed to resolve Kazakhstan's problems". The problem was, however, that Kazakhstan's oil and gas deposits were scarcely explored during the Soviet period because the bulk of the country's petroleum operations took place in Western Siberia and Volga-Urals region. Accordingly, during the Soviet period small production associations, operating in Kazakhstan's oil and gas industry were supplied with a fraction of the trained petroleum engineers and managerial personnel required. As a result, post-Soviet Kazakhstan lacked human resources, technological capabilities, finances, and infrastructure, all of which were needed for the establishment of viable private oil companies. Being unable to fully exploit the potential of the abundant natural resources, Kazakhstan's government had no other choice, but to attract multinationals into the country's extraction industries. From 1993 to 1999 Kazakhstan's government managed to attract $9.29 billion of FDI, more than half of which went to the oil and gas industry (Olcott 2010). The inflow of FDI into extraction industries became the main source of capital, needed for the country's industrialisation, with oil and gas sector alone contributing half of real GDP growth between 2000 and 2005 (OECD 2016).

Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" argues:

> Our country is ninth biggest in the world, but it lacks access to sea. Therefore, many types of production cannot be developed here by definition. It mainly refers to technologically advanced, multi-tonnage industries such as oil refinery, petrochemistry and chemistry. All types of manufacturing that comprise of importing large amount of raw materials, cheaply, in tankers and subsequent shipment of final product in tankers as well, has no perspective of development here. That is why various experts are sceptical about prospects of development of industries like oil refinery or petrochemistry in Kazakhstan on a large scale, that is, for export. (Borisbiy Zhangurazov, interview, 26th July 2016)

Initially, the decision-making by the authorities was confined to limited options because the prospects of becoming a major oil exporter without the help of foreign capital were hindered by the fact that landlocked Kazakhstan could neither ship oil by tankers, nor had pipeline access to international oil markets. The number of available options was further reduced by the fact that the authorities considered that it was unprofitable for Kazakhstan to develop multi-tonnage industries.

Whilst during the early years of independence Kazakhstan was incapable of developing a petroleum industry on its own due to the lack of human resources, technological capabilities, finances and infrastructure, the massive inflow of foreign capital into its oil and gas sector and imposition of local content requirements facilitated the establishment of backward linkages

between domestic firms and multinationals. This should have led to technological upgrade of local suppliers and subcontractors. Despite being considered a mature industry, the oil and gas sector has enormous innovative potential. For instance, Maleki (2013) shows that even the upstream (exploration and production) petroleum industry, traditionally considered exhausted of technological opportunities, in fact has experienced technological upsurge after the mid-1990s, triggered by demand for innovation in complex projects in harsh and less accessible environments. The problem, however, was that the mindsets of Kazakhstani businessmen were shaped by decades of unilateral domination of the public sector, making them reluctant to invest in long-term capability building, passive towards business opportunities, and over-reliant on governmental intervention. Therefore, domestic firms relied solely on local content requirements, which forced multinationals to use a certain amount of domestically produced inputs in producing their final outputs. Local suppliers did not use linkages with multinationals in order to shorten the learning process, improve quality of products or upgrade their production methods. For instance, Ospanova (2010) reports that in Kazakhstan investors referred to numerous difficulties in adhering with local content requirements, including: lack of qualified human resources; insufficient interaction between domestic producers, investors and the government, shortage of indigenous suppliers of specialised products, the insufficient technological capacity of local suppliers, etc. What domestic firms failed to take into consideration is that the imposition of local content requirements on foreign investors violates the Article III of the General Agreement on Tariffs and Trade, the WTO Agreement on Trade-Related Investment Measures as well as Kazakhstan's specific commitments (WTO 2015). In the oil and gas sector specifically, local content requirements will be eliminated by 1 January 2021 (WTO 2015[1]). Considering the fact that domestic firms rely solely on the imposition of local content requirements and do not use linkages with multinationals in order to improve, it is safe to say that their strategy is short-sighted and doomed to eventual failure.

The inflow of FDI into oil and gas sector provided Kazakhstan with an opportunity to establish an internationally competitive downstream petroleum industry and avoid negative consequences, caused by the dominance of extracting over processing industries. Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" comments:

> Our refineries do not process all the oil we produce because we produce about 75 million tons of oil and process only 15 million tons. We have three refineries, each is capable to process about 5 million tons. Bulk of oil is exported raw. It goes to refineries located abroad. (Borisbiy Zhangurazov, interview, 26th July 2016)

The downstream petroleum industry reaches consumers through products such as gasoline, kerosene, fuel oils, lubricants, waxes, asphalt, and various petrochemicals. The development of a downstream petroleum industry would diversify the national economy and prevent disproportion in the development of the extracting and processing sectors. Porter (1990, p. 73) argues: "The basic unit of analysis for understanding national advantage is the industry. Nations succeed not in isolated industries, however, but in clusters of industries connected through vertical and horizontal relationships. A nation's economy contains a mix of clusters, whose makeup and sources of competitive advantage (or disadvantage) reflect the state of economy's development". However, unilateral domination by the public sector placed enormous obstacles in the way of innovation by making domestic firms blind to the potential offered by the development of the petroleum industry.

Disproportion in the development of the extracting and processing sectors have led to so-called 'Dutch disease' of Kazakhstan's economy. The term Dutch disease originates from a crisis of the Netherland's economy in the 1960s, following the discovery of North Sea natural gas deposits. The higher real income, generated by the resource boom, led to an upsurge in spending in the non-tradable sectors (sectors whose output is not traded internationally, such as construction, services, etc.). Higher demand on outputs of non-tradable sectors increased prices and wages in those sectors, squeezing profits from the tradable lagging sectors (manufacturing, agriculture, etc.), where prices are fixed at international levels. With increased inflation in non-tradable prices, there is appreciation of the real exchange rate, resulting in a fall in the output share of tradable goods in lagging sectors relative to non-tradable goods. The symptoms of Dutch disease were especially acute in Kazakhstan due to the significant disproportion in the development of the extracting and processing sectors. OECD (2011, p. 18) notes: "Diversification efforts can be challenging for an economy like Kazakhstan's for several reasons, among them the so-called "Dutch disease". Abundant natural resources may indeed lead to appreciation of the country's real exchange rate, thereby making manufactured goods less competitive than those of other nations, and so increasing imports and decreasing exports (a process of de-industrialization would then ensue)". In Kazakhstan, dominance of extracting over processing industries became too evident with about two-thirds of exports and almost a third of budget revenues generated by the oil and gas sector (OECD 2016). Accordingly, the government had to devalue the domestic currency in order to boost competitiveness of the lagging tradable sectors. Whereas devaluation of the national currency protects the interests of some firms operating in lagging sectors, it also damages domestic producers that use imported goods as inputs. Moreover, devaluation of the national currency decreases the purchasing power of consumers with fixed incomes, thereby hampering development of domestic producers, profits of which depend on the domestic market.

Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" explains:

> Before devaluation it was very difficult for us to produce any processed goods, because our goods were more expensive than Russian goods, Belarusian goods, Chinese goods. Therefore, the government and the National Bank should maintain a very low exchange rate of tenge, because there is a massive inflow of petrodollars. Large influxes of dollars increase demand on local currency, causing its overvaluation… Before the devaluation the impact was especially significant. We had a very high average salary, even higher than in China. The standard of living was higher than in China, per capita GDP was higher than in China. Before the devaluation. Therefore, from the point of view of labour cost it was unprofitable to locate production here in comparison with China. (Borisbiy Zhangurazov, interview, 26th July 2016)

Rapidly rising wages in the extracting sector led Kazakhstan's economy into a middle income trap, the situation where a country can neither compete with lower income economies that produce cheaper outputs due to lower wages, nor with developed countries that produce more technologically advanced outputs.

The next section examines how over-reliance of domestic firms on governmental intervention influenced their ability to assume the leading role in industrialisation of national economy.

6.4. Racing to the bottom: the industrialisation programme

The authorities realised that the ability to achieve the ambitious goal of turning Kazakhstan into a knowledge-based, export-oriented economy first and foremost hinged on their ability to industrialise the country. During the Soviet era, Kazakhstan served merely as a source of raw materials due to the abundance of its fossil fuel and mineral deposits. Under the central planning regime strategic and military consideration prevailed over economic ones. Therefore, plants that processed resources extracted in Kazakhstan were located mostly in Russia despite the high transportation costs. The Head of the State noted: "During the Soviet time we were being developed as a raw-material appendage, so that we could only supply raw materials. Neither machine-engineering nor processing industries were developed here" (Nazarbayev 2013). After the dissolution of the Soviet Union, domestic industrial players, specialising mostly in extraction and lower-end manufacturing lost their customers and struggled to find new markets. Besides, they had to develop new capabilities, which they did not need under the central planning, such as networking and negotiation skills (Radosevic 1997). Apart from that, industrial players faced the necessity to perform their own R&D, something that had previously been conducted by sectoral institutions and science production associations, which were abolished in the course of market-oriented reforms (Graham 1993). Due to the multiplicity of problems faced by domestic industries in the process of Kazakhstan's transition towards open market relationships, it was hardly expected that they would soon become the locomotives of technological development. Yet, for achieving ambitious goals of the authorities, the national economy needed to shift from the extraction of resources and lower-end processing towards value-added stages of production.

Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" comments:

> Obviously, it is problematic to send certain goods by railways such as ferrous and non-ferrous metallurgy. That is to say, in isolated conditions of Soviet Union, development of those industries was expedient because of internal consumption. Quality and price did not matter because everything that was produced was consumed domestically. Now, when we play on the open market, joined the WTO, joined the Eurasian Economic Union we compete with exactly the same industries that are located, for example, on the coasts of some countries. For example, South Korea is one of the largest producers in metallurgical industry, particularly in ferrous metallurgy. Raw materials for their metallurgy, particularly coal they may transport from Indonesia or Australia. Their metal will be cheaper than the one produced inside the continent. (Borisbiy Zhangurazov, interview, 26th July 2016)

Kazakhstan's industrial players were hardly competitive on the international scale. Omarova (1999, p. 346) argues: "Most of the republic's industrial enterprises were monstrous, inefficient Soviet-style metallurgical combines and mines, located in heavily Russian-populated regions and providing support for the cities surrounding them. After the collapse of the USSR, the Kazakhstani state had to continue subsidising these enterprises, which had lost the traditional market for their outdated and uncompetitive products". Obviously, the specificities of central planning, such as a policy of full employment, fragmentation of innovation process, etc. had a strong impact on the competitiveness of domestic industries in open market conditions.

The ambition to industrialise Kazakhstan through attraction of FDI into processing sectors encouraged Kazakhstan's government to accelerate accession to the WTO. According to recommendations produced for Kazakhstan by international organisations, accession to the WTO was imperative for attracting investments into processing industries and diversification of the economy. For instance, OECD (2012, p. 17) claimed: "As an open economy seeking to attract investment outside of the primary sectors [oil and gas], Kazakhstan needs a predictable and transparent trade policy and efficient and reliable cross-border trade procedures. Kazakhstan's long awaited and still pending accession to the WTO will be an important step in this direction ...". Apart from harmonising national legislation with the requirements of the WTO, the government signed several dozen bilateral agreements 'On the Encouragement and Mutual Protection of Investments', which create a favourable legal environment for the promotion and protection of foreign investments on the territory of Kazakhstan. The liberalisation of trade and investment regime has boosted overall inflow of FDI, but mainly into extraction industries and related activities, such as geological prospecting and exploration (Figure 6.1.). Apart from extraction of fossil fuel and minerals some multinationals organised lower-end processing, which was barely enough to satisfy the ambition of Kazakhstan's authorities of upgrading the economy towards value-added stages of production. The reformist attitude of the government and their ambition to turn Kazakhstan into the Snow Leopard were used by the WTO in order to create an imaginary that encouraged authorities to accelerate the pace of reforms.

My interview with Aydin Kulseitov, Chairman of the Board of Kazakhstan Industry Development Institute, demonstrates the reformist attitude of Kazakhstan's government and their ambition to industrialise the economy:

> Some people say: "We now have a powerful industry, we have Mittal Steel [multinational corporation], et cetera". In fact, we still lack basic products that we require. In chemical industry Kazphosphate, Kazazot produce yellow phosphorus which is the bottom level of processing in chemistry. We need to produce fertilisers. Currently we produce approximately 40 tons of fertilisers. It's nothing. Only now we started to build plants that will produce about million tons of phosphorus fertilisers, calcium fertilisers and perhaps we will produce complex fertilisers. We operate at the very bottom of the chain but lack production in the highest segments of chemical sector. We still cannot launch petrochemistry, although we sit on gas. We need to start production of structural and stainless steel. Perhaps even steel sheets for an automotive sector although scales don't let us yet. We currently are on the bottom level. Mittal Steel somehow survives there but does not see point to develop further. We started to produce metallic aluminium only 5 years ago. Previously we had only bauxites [an aluminium ore]. And so, our standpoint is: if we want industrial innovative development, we need to finalise formation of basic industries first. (Aydin Kulseitov, interview, 17th March 2016)

Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" explains how aluminium production is being developed in Kazakhstan:

> In Soviet times, aluminium was not produced here at all. Only bauxites [an aluminium ore] were produced. And only in the 2000s [2007] Eurasian Resources Group [multinational corporation] attracted money and built the first electrolysis plant. Out of one and a half million tons of alumina [aluminium oxide] they began to process 300-400 thousand tons here. The rest they send to Russia as they used to do. But now

the company is planning to expand. The second stage of the electrolysis plant is thoroughly discussed. Therefore, if all this happens, we will start to produce primary aluminium. Different companies such as Turkish investor Galaxy can use primary aluminium to make aluminium profile for the construction and various other things. This requires very large investments. For instance, this project costs about 2 billion dollars, the construction of the second stage of an electrolysis plant. Why such a large amount, because in addition to this plant, it is needed to build a power plant in order to have cheap electricity. We have a total power installed capacity for Kazakhstan of 18 gigawatts. In order to process another million of tons of alumina, we need to put 2 more gigawatts into operation. (Borisbiy Zhangurazov, interview, 26th July 2016)

The government clearly envisaged industrialisation as the only way of upgrading the economy towards the higher end of the value chain and the means of mitigating the symptoms of Dutch disease. Moreover, the government expected that industrialisation would spur economic activity by reducing the dependency of domestic firms on the necessity to use imported inputs in their production cycle, thereby cutting down transport expenses, eliminating currency risks and saving time. Therefore, attracting multinationals into the processing sectors of economy through accession to the WTO was seen by the authorities as the only viable option.

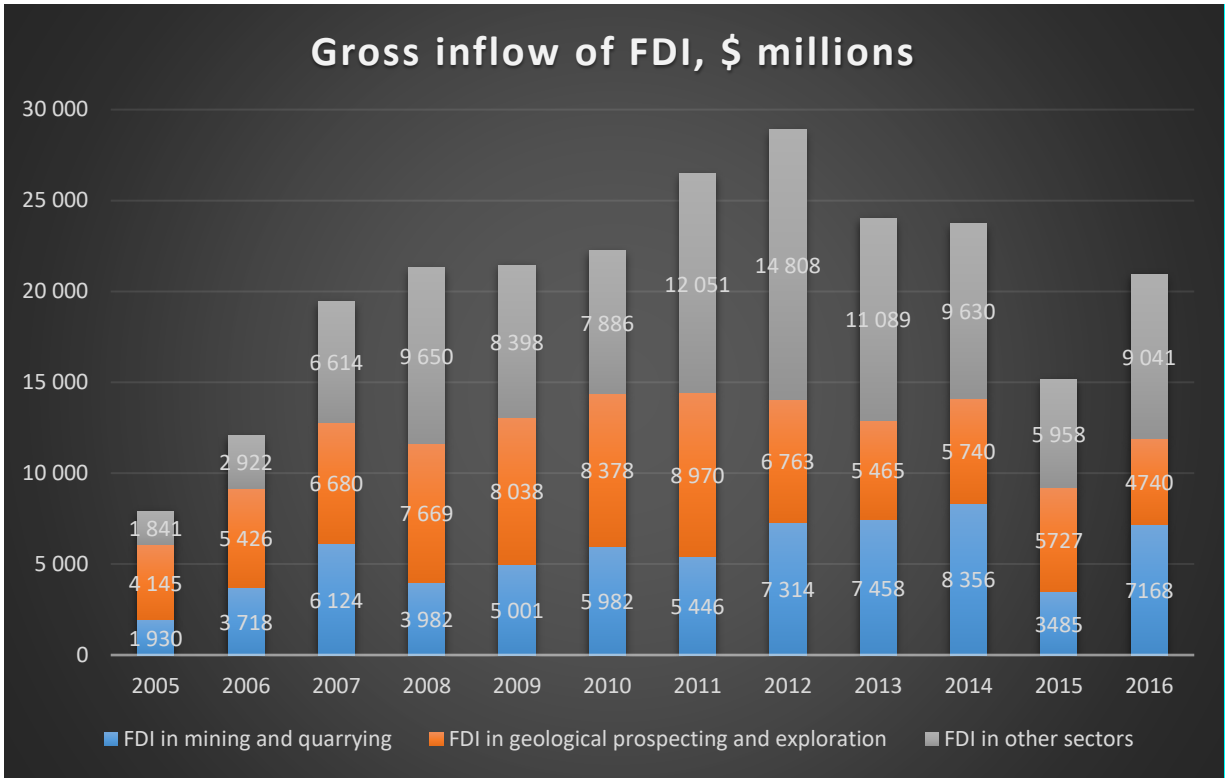

Figure 6.1. *Gross inflow of FDI, $ millions*
Source. *National Bank of the Republic of Kazakhstan 2018*

While accession to the WTO increased the overall flow of inward FDI, the plans of the authorities to industrialise the country were hindered by the reluctance of extracting multinationals to process natural resources locally. The government could not use administrative pressure to enforce multinationals to shift their operation towards value-added processing because WTO rules heavily protect the interests of multinationals. Nevertheless,

attracting FDI provided Kazakhstan's government with financial resources needed for launching an industrialisation campaign. In the Innovation Performance Review of Kazakhstan, UNECE (2012, p. 81) notes: "the revenues extracted from resources make possible the undertaking of ambitious policy measures. The main challenge remains the precise targeting of such measures and the efficient channelling of the resources used". Accordingly, the government launched the 'State Program of Forced Industrial and Innovative Development 2010-2014', followed by 'State Program of Industrial and Innovative Development 2015-2019'. Incentive packages, provided by these Programmes included exemption from paying taxes, removal of restrictions on using foreign workforce, provision of land plots, and compensation of capital expenses. Shortly after the first state industrialisation programme was launched, FDI inflow into processing industries increased two and a half times from $2 244 million to $5 658 million, illustrating that the decision of multinationals to invest into processing industries was triggered by the opportunities provided by the industrialisation programme (Figure 6.2.). The empirical evidence suggest that increase in flow of inward FDI into processing industries is causally linked to the launch of an industrialisation program, rather than to accession to the WTO.

The extraction of natural resources by multinationals enabled Kazakhstan to overcome the major economic difficulties during the first years of independence. Omarova (1999, p. 338) argues: "Throughout the post-independence period, exports of petroleum, raw minerals, and semi-processed metals remained the main source of the country's hard currency revenues". Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" recounts:

> Investments in our processing sector grow quite rapidly due to the industrialisation program. Nowadays Kazakhstan attracts on average 10 billion dollars of FDI. Around half goes into oil and gas. In 2014 about 10 percent was invested into processing industries. It is twice as much as in 2013. That is to say, in 2013 we only attracted about half billion dollars in processing sector overall. In 2014 we attracted billion dollars. (Borisbiy Zhangurazov, interview, 26th July 2016)

The problem was that no attempt was made to focus on specific industries resulting in a broad-range of industrial sectors being supported, as exemplified by this quote from Sanzhar Izteleuov, Chairman of the Board of National Agency for Technological Development:

> We cannot even establish a consensus of priorities. The State Program of Industrial-Innovative Development supports various industries. But do we need them all at this stage? No, we don't. We could have focused on three and develop at least them. They could act as centres of gravity, creating small companies around them. (Sanzhar Izteleuov, interview, 26th July 2016)

Apparently, the reformist attitude of the authorities encouraged them to imagine that Kazakhstan will succeed in different sectors of the economy. OECD (2014, p. 257) notes: "Kazakhstan's system of planning does indeed have an all-encompassing nature which can dilute the notion of priorities, discourage managers from making choices and arbitrating between conflicting objectives, and lead to a mechanical application of the planned tasks. For example, the "State programme of forced industrial and innovative development" has generated no less than thirteen sub-sectoral programmes covering all major industries and, in

addition, policy objectives such as attracting foreign investments, supporting innovation and promoting local content". Since Kazakhstan's strategy of technological development was based on the sociotechnical imaginary, rather than a real plan, the industrialisation programme had no well-defined priorities.

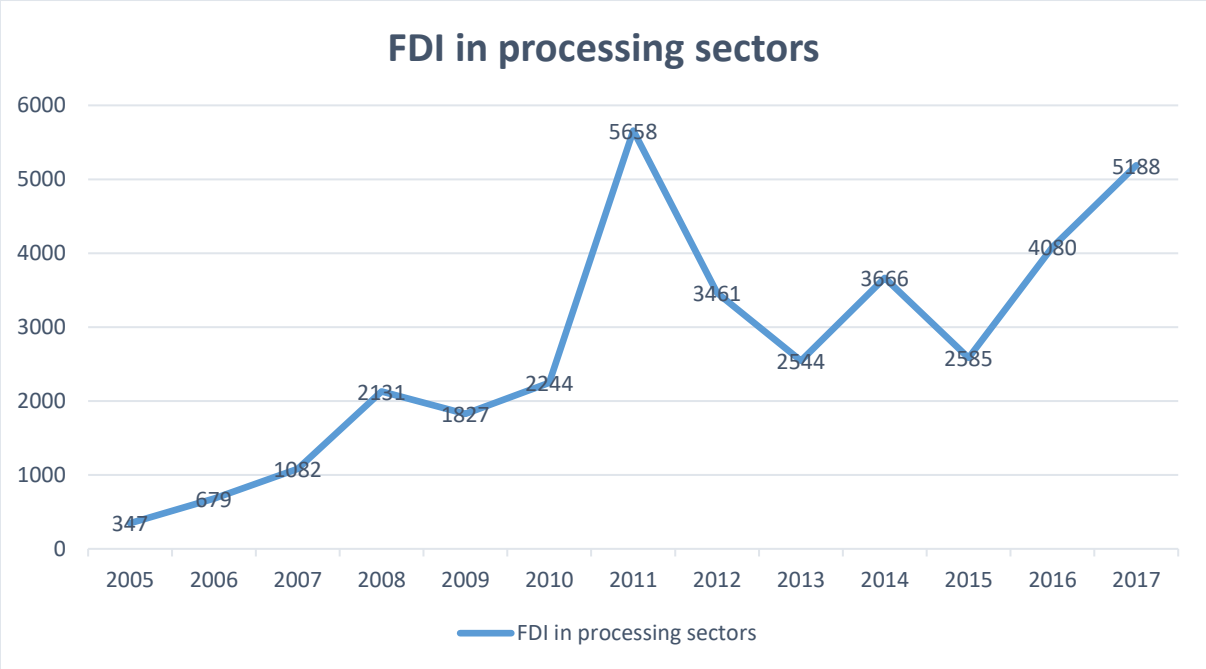

Figure 6.2. *FDI in processing sectors (millions of dollars)*
Source. *National Bank of the Republic of Kazakhstan 2018*

The country's fast economic growth and the launch of the industrialisation programme were the catalysts that facilitated relocation of production processes into Kazakhstan, but mainly for those multinationals that sought for an opportunity to reduce transportation costs. It is frequently assumed that the protection of the rights of investors by the WTO is the main factor that encourages multinationals to establish production facilities in the host country, but the reality is that the decisions of multinationals are based mostly on the prospects of profit maximisation. Chang (1998, p. 109) argues: "those who criticize 'restrictive' policies toward TNCs [transnational corporations] assume that FDI decisions are mainly affected by the amount of business freedom granted to them... However, FDI decisions are much more strongly affected by the overall performance of the economy, especially the prospect for growth". Mostly due to an increase in the flow of inward FDI, Kazakhstan's economic growth accelerated sharply after 2000, reaching an average of 9.4% during 2000-08 (OECD 2018). Moreover, the industrialisation programme provided various benefits to investors, thereby incentivising them to establish production facilities in Kazakhstan. Although in general the country's rapid economic growth and launch of the industrialisation programme were important, the main factor that influenced the decision of multinationals to relocate were high transportation costs. Kazakhstan is the largest landlocked country in the world, encompassing an area equivalent in size to Western Europe. Since the country is landlocked, the cost of shipping intermediate inputs into Kazakhstan is higher in comparison with countries that have access to sea. Besides this, Kazakhstan has a poorly developed transport infrastructure as well as extremely lengthy and inefficient customs procedures (section 5.5.). Accordingly, relocation

of production facilities into Kazakhstan enabled multinationals to reduce high transportation costs. The prospects of establishing production facilities in Kazakhstan mostly motivated a limited circle of multinationals, specificities of outputs of which required them to produce locally.

Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" comments:

> Since we are landlocked, we need to make an extra effort in order to attract multinationals here. First and foremost, we attract multinationals that produce goods which cannot travel very far. There are a number of commodities that can be transported within a distance of maximum 500 km. This includes different kinds of insulating materials, glass, cement, etc. When they are shipped for longer distances, there are big transportation costs involved. Glass breaks. Cement solidifies. Transporting insulating wool is expensive simply because it is a very lightweight material. That is to say, that some manufacturing can be localised here. And in principle, this is exactly how it happens [refers to multinationals that participate in state industrialisation programme]. Pipes, for example, are also very unprofitable to transport. You can load a maximum of five large diameter pipes in a railway carriage. Since pipes are hollow, you are essentially transporting air. Therefore, in principle, there are certain types of production, that are getting launched in our country anyways. This year Tenaris was launched in our country, it is a factory for threading large-diameter pipes for the oil and gas industry. (Borisbiy Zhangurazov, interview, 26th July 2016)

The increase in flow of inward FDI into Kazakhstani processing industries should have made the government aware that domestic firms lag far behind foreign competitors and needed to be supported. Porter (1990, p. 671) argues: "… widespread foreign investment may carry an important message. Except when it is largely passive, widespread foreign investment usually indicates that the process of competitive upgrading in an economy is not entirely healthy because domestic firms in many industries lack the capabilities to defend their market positions against foreign firms". Nevertheless, for a very long period of time the authorities neglected such a worrisome tendency and continued to rely solely on attraction of FDI.

Due to the top-down nature of decision-making, attempts by the government to reduce the dependence of Kazakhstan's technological development from multinationals by encouraging domestic firms to participate in the industrialisation programme led to a race to the bottom. In general, the tendency of policymakers to focus solely on attracting multinationals might be a short-sighted strategy. Porter (1990, p. 679) argues: "A development strategy based solely on foreign multinationals may doom a nation to remaining a factor-driven economy. If reliance on foreign multinationals is too complete, the nation will not be the home base for any industry. At the same time, multinationals can relocate when factor costs shift or if wages get too high". In the case of Kazakhstan, the major drawback of a development strategy based on multinationals was that the production facilities were relocated mostly by those whose outputs needed to be produced and sold locally. Accordingly, these multinationals would neither export their outputs nor likely increase the volume of production. Eventually, the government came to the realisation that Kazakhstan's technological development had become overly dependent on multinationals and that domestic firms, rather than multinationals

should be the backbone of technological development. Consequently, the government demanded that local authorities focused on incentivising domestic firms to participate in the industrialisation programme. The problem was that unilateral domination of public sector in the process of decision-making encouraged policy-makers to develop a tendency to pursue less valuable but more visible outputs. In order to demonstrate the results of their work to the President and the central government, the local authorities tried to include into a map of industrialisation as many local firms as possible without taking into consideration the absence of technological competences, the lack of downstream capabilities and inability to find potential markets for their products.

The way implementation of the industrialisation programmed turned into a race to the bottom is described by the Deputy Chairman of the Board of the National Chamber of Entrepreneurs "Atameken", Nurzhan Altaev:

> You touched upon a very big problem, which we constantly talk about. Why do we need a business development map? Why do we need niche projects? First five-year plan of the state Program on Industrial-Innovative Development was expected to examine each region in order to find niches and form industries that would pull small and medium business. In other words, analyse what raw materials, how much of it and establish its processing so that producers would be able to organise supply. Every region should have determined such niches and niche projects. But that did not happen. What do first five-year plan and map of industrialisation really represent? Akimat [office of the governor] was responsible for regional map. If I came to them and asked to include me in the map because I wanted to build cement plant, the main question they would always ask was if I had money for this. If bank agrees to make a loan and financial question is resolved, then cement plant will be built. There is no analysis, whether or not cement factory is required there, no marketing. It is considered that entrepreneurs know everything and those projects got included in the map. The akimats are motivated to include as many projects as possible into the map of industrialisation without any analysis. *They even have some sort of competition among themselves.* That is why we constantly have such projects as 'Solar' [failed solar panel manufacturing plant]. We have problems because we built pile of cement plants in all regions and now they can't sell their products. We have built a lot of ill-considered projects that were built but now they all experience troubles with retail. Specifically, if you will analyse projects of first five-year plan, I can safely say that 70-80 percent of them have problems with sales because they were thoughtless from the beginning. I believe that the map of industrialisation should be based on marketing of each region. We must understand what is lacking there, calculate sales opportunities for that product and build plants only after that. (Nurzhan Altaev, interview, 29th July 2016)

Over the years, the behaviour of domestic firms was shaped by the unilateral domination of the public sector, making them overly reliant on the initiatives and directives of the state. The problem was that the local authorities were more motivated by an opportunity to demonstrate their enthusiasm to the President rather than the need to achieve actual results. As a result, attempts by the government to shift the country's production processes towards the higher end of the value chain by including domestic firms in the industrialisation programme have clearly failed. According to the World Economic Forum (2016), Kazakhstan is ranked 114th in value chain breadth. Furthermore, the economy of Kazakhstan depends on extraction of natural resources more than ever. OECD (2016, p. 124) notes: "Kazakhstan is exporting considerably

fewer non raw-material goods than an average country of similar economic weight would; and even fewer than a decade ago". The reformist attitude of the authorities, and their zeal to implement top-down commands, stemming from the firm belief in the sociotechnical imaginary made them deny the obvious failures of the industrialisation programme. This attitude is evident in my interview with the Vice Minister of Investments and Development, Yerlan Khairov, who makes the following statement concerning the course of implementation of the industrialisation programme:

> At this point it is important to ask about what can be done in order to develop the processing here, inside the country. The answer is the Program of Industrialisation. As you know, implementation of the second five-year plan is already underway. It has distinct mechanisms, well-articulated priorities and clear-cut levels of interaction and project implementation. That is to say, and the Head of the State always emphasises this, *industrialisation goes on, it progresses, no matter who says what.* By this time over 900 projects have already been implemented. That is relatively large ones, which were included in the map of industrialisation. (Yerlan Khairov, interview, 1st August 2016)

Whereas the Vice Minister argues that overall 900 projects were implemented, in the East Kazakhstan region alone more than 100 solemnly opened industrial objects, which were included in the map of industrialisation do not function (Zhakupova 2017). Considering that East Kazakhstan is just one out of Kazakhstan's 14 regions, the share of non-functioning objects is extremely high. Askhat Kuzekov, Senator, Member of the Committee on Economic Policy, Innovative Development and Entrepreneurship recounts:

> You probably remember, about 6-7 years ago during a big meeting the President made very clearly statement to all akims [governors] and ministers. He said: "What is going on? I open ceremonies, cut the ribbons. Everything is solemn, collective is standing, we are making speeches. After a while we see that that enterprises are being closed". And he made a strict warning. First of all, he said that he is not going to open new enterprises any longer. Second of all, even if he agrees to attend, he would recheck very thoroughly, supervise the work of this enterprise and hold governors of regions and ministers responsible for it. Nowadays, number of such enterprises reduced sharply. I remember how each region had dozens of such enterprises opened per year. There should have been production, but it was not there. (Askhat Kuzekov, interview, 1st August 2016)

It is important to note that the role of the state is undertheorized in technology studies literature. Accordingly, the literature is usually based on the assumption that actions of government are geared towards maximising the public benefit (Dunning 1993). However, in reality, governmental agencies devote no resources to the production of outputs that are invisible to the public authorities (Lindsay 1976). This section demonstrates that in Kazakhstan the industrialisation programme was used in order to show the results of work of officials during lifetime of their careers. As Porter (1990, pp. 622-623) puts it: "Competitive advantage in a nation's industries is created over a decade or more, not over three- or four-year business cycles. … Yet a decade is an eternity in politics". This draws attention to the fact that strategy of technological development should be based on a tangible plan, rather than a sociotechnical imaginary.

The next section reviews in what way extensive use of state procurement influenced the attitudes of domestic actors towards entrepreneurship and examines whether it spurred Kazakhstan's technological development.

6.5. State procurement versus domestic rivalry

Since Kazakhstan's strategy of technological development was based on the sociotechnical imaginary, shaped by the proponents of the Washington Consensus, the necessity to develop local initiatives and facilitate capability building of domestic firms was overshadowed by the intention of the authorities to attract multinationals. Developed countries and international organisations made different claims about why FDI plays the central role in the process of catching-up and how attracting this would benefit the transition. For instance, adopting the typical line of reasoning used by the other proponents of neoliberal ideas, EBRD (1994, p. 99) notes: "Liberal trade and FDI are carriers of economic benefits that are supportive of growth and may be of particular relevance for the dynamics of transition. They contribute to both macroeconomic demand and supply. As microeconomic phenomena, they can constitute "packages" that transfer goods and knowledge and cause, potentially, a host of behavioural and institutional adjustments". Due to the lack of knowledge on how to establish an open market economy, Kazakhstan's authorities followed the advice of developed countries and international organisations by focusing on liberalisation of trade barriers and attraction of FDI. In theory, the entry of multinationals may indeed generate positive externalities to domestic firms. However, the capability of indigenous firms to learn from multinationals, integrate into their supply chain and react positively on rivalry depends on their competitiveness (Chen et al. 2011). While focusing mainly on finding ways to attract multinationals, the government overlooked the need to create an environment that would incentivise domestic firms to update their production methods.

Vice Minister of Investments and Development, Yerlan Khairov mentions:

> Law provides investment privileges, including following two packages. First package includes 283 types of activity apart from trade, production of excise goods and subsoil use. Accordingly, it allows you to receive land plot from state as grant-in-kind after implementation of your project. However, it refers first and foremost to industrial projects. We do not provide land for agricultural purposes, only industrial projects. Second package allows you to get exemption from paying custom duties on imported equipment. According to state programme of industrialisation second package embraces six priority sectors if you invest equivalent of 200 million minimum calculation indexes. Considering fluctuation of exchange rate today it constitutes about $12-14 million dollars. If you invest in these six priority sectors which incorporate 98 types of activity you get the opportunity not to pay taxes. That is corporate tax – 10 years, property tax – 8 years, land tax – 10 years. Apart from that, the state will allow you to bring foreign workforce regardless of the quota for the period of construction works, plus one year after completion of construction. Moreover, if you are going to manufacture product that will be unique for Kazakhstan, you may get compensation of expenses from state up to 30 percent of the volume of your investments. (Yerlan Khairov, interview, 1st August 2016)

One of the reasons why Kazakhstan's authorities believed in the sociotechnical imaginary that attraction of FDI would lead to establishment of knowledge-based, export-oriented economy is because they had no knowledge about the nature of international technology transfer. Hanson (1982, p. 429) remarks: "The Soviet system excludes direct foreign investment in the USSR and restricts contacts between Soviet citizens and foreign nations. It thus shuts out the technology transfer associated with flow of risk capital and labour, notably the operations of multinational companies and the extensive movement of managers and technologists that characterize intra-Western relations". Various privileges provided by the authorities to foreign investors illustrate how strongly they believed in imaginary, shaped by the WTO that attraction of multinationals would spur Kazakhstan's technological development.

An unwillingness to upgrade their production methods and invest in the development of technological capabilities, stemming from a lack of entrepreneurial spirit became the key reasons behind the failure of domestic firms to integrate into the supply chains of multinationals. Multinationals are not necessarily dependent on local suppliers as their arrival may be accompanied by increase in imports of intermediates (Hoekman and Javorcik 2006) or by the entry of international follow-source suppliers – the limited circle of suppliers following the multinational to new locations (Ivarsson and Alvstam 2005). Nevertheless, after establishing their production facilities in Kazakhstan, multinationals started to seek opportunities to purchase intermediate inputs locally, as it would allow them to reduce transportation costs, avoid currency risks and eliminate uncertainty about timely delivery. Usually, local firms must meet certain quality standards in order to become a part of a supply chain of a multinational (Javorcik 2006). However, in the case of Kazakhstan the problem was that domestic firms neither wanted to update their production methods nor strived to improve the quality of products. Reviewing innovation performance of Kazakhstan, the United Nations Economic Commission for Europe (2012, p. 32) notes: "Entrepreneurial spirit is still in an embryonic state, with economic development largely dependent on state-owned conglomerates and foreign investors as sources of wealth, employment opportunities and technology generation and demand. This results in scarce opportunities for new business creation and spillovers". The attitudes of entrepreneurs towards innovation and potential business opportunities inhibited attempts by multinationals to find reliable suppliers of intermediate inputs among local firms.

The attitudes of domestic firms, inhibiting the establishment of backward linkages with multinationals became a source of major disappointment for policymakers. Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" remarks:

> Danone built a large factory here to make yoghurts. They add jam to their yoghurts. They buy it in Moscow region, although we have potential to make the same jam. We have fruits and berries and in principle we can make this jam. But no one produces it here. Why no one produces? Because it needs to be high-quality product. It certainly would be more profitable for them to buy jam here, from us. Firstly, it will be in tenge, so no currency risks. Secondly, it would be safer from a supply point of view. It is four thousand kilometres between Moscow region and Almaty. They buy a large amount of this product there, but here we do not have such suppliers. That is to say, we need to improve ease of doing business to facilitate creation of such intermediate

> producers. They want to cooperate but we, in Kazakhstan cannot provide them with the appropriate quality and low price. (Borisbiy Zhangurazov, interview, 26th July 2016)

Despite the lack of a tangible plan on how to transform Kazakhstan into an open market economy, the model of coordination was based on the adoption of an interventionist style of governance and unilateral domination of public sector in the process of decision-making. The reformist attitude of the authorities is evident in my interview with the Chairman of the Board of Kazakhstan Industry Development Institute, Aydin Kulseitov who comments on the prospects of technology transfer through backward linkages between multinationals and domestic firms:

> Transnational corporations, they do not transfer technologies. When they come here as business entities, they do not transfer. But if you have real companies here, indigenous Kazakhstani companies and they have grown to a level where multinationals are ready to cooperate with them, only then technologies will come into such business. As long as you don't have such a serious business, tech-savvy, with advanced engineering competencies, not a single multinational will be interested in you and no one will speak with you seriously. That is why we say: for the next 10 years we need to work in this direction so that such industrialised small and medium enterprises can emerge. (Aydin Kulseitov, interview, 17th March 2016)

The necessity to make society more entrepreneurial by adapting the mindsets of domestic actors to a new paradigm of socio-economic relationships was overlooked because the authorities based the strategy of technological development on the sociotechnical imaginary which posited that the attraction of multinationals and adoption of an interventionist style of governance were the key components for turning Kazakhstan into a knowledge-based, export-oriented economy. As a result, the World Economic Forum (2014) ranked Kazakhstan 108th out of 144 countries in the 'local supplier quality' category.

The interventionist style of governance, adopted in an attempt to emulate the policies of Asian Tigers, suppressed the domestic rivalry needed for the development of an entrepreneurial spirit. The tendency of domestic firms to invest in the development of technological, human, and organisational competences required for establishing backward linkages with multinationals, does not depend solely on the strategic choices of entrepreneurs. Bergek et al. (2010, p. 115) argue: "The systems approach stems from a key insight of innovation studies, which is that innovation by firms cannot be understood purely in terms of independent decision-making at the level of the firm. Firms' strategies are central to innovation, but strategic options are shaped and constrained by environmental factors such as collaborative patterns, regulatory systems and customary practices which persist in systemic ways and which influence how innovation may occur". In the case of Kazakhstan, the problem was that despite the lack of knowledge about the way market relationships work, the authorities established unilateral control over socio-economic processes. It was assumed that governmental intervention would be the most efficient way to introduce changes because domestic actors were locked-in on the old ways of doing things, shaped by decades of the central planning regime. In reality, however, the government had no tangible plan for how to create a competitive environment that would make society more entrepreneurial. For instance, instead of incentivising domestic rivalry by creating a fair play environment, competition policy in Kazakhstan was subordinated to other policy aims, such as ensuring crisis recovery, fighting

consumer price increases caused by inflation and satisfying popular demands (OECD 2016[1]). Accordingly, the Global Competitiveness Report 2017-2018 ranked Kazakhstan 114th out of 144 economies surveyed for intensity of local competition (World Economic Forum 2017). Overregulation and the absence of domestic rivalry made entrepreneurs passive towards business opportunities, reluctant to invest in capability building and overly reliant on the leading role of the government.

The mindsets of participants of innovation processes are locked-in on the old ways of doing things because informal constraints are sticky and path-dependent. Nevertheless, the government would eventually be able to adapt the mindsets of industrial players to the new paradigm of socio-economic relationships by encouraging domestic rivalry. Borisbiy Zhangurazov, Chairman of the Board of National Export and Investment Agency "Kaznex Invest" comments:

> In order to integrate our entrepreneurs into the value chain of multinationals, there needs to be a competition. We need several companies that would give good proposals in price and quality. In fact, multinationals are interested in buying from local producers. But as a rule, local companies can't provide a low price and high quality. (Borisbiy Zhangurazov, interview, 26th July 2016)

Although changing the attitudes of participants of innovation processes towards entrepreneurship by creating an environment that facilitates domestic rivalry would be a very lengthy endeavour, in the long-run it would also deliver the best result. Porter (1990, p. 119) mentions: "Domestic rivalry not only creates pressures to innovate but to innovate in ways that upgrade the competitive advantages of a nation's firms". However, the problem was that the outcomes of policies promoting the long-term measures would not be immediately visible to the higher authority and would not allow public sector managers to demonstrate their zeal. Therefore, public sector managers found this option inadmissible.

Extensive use of state procurement as a main instrument of public intervention inhibited the country's shift toward the new paradigm of socio-economic relationships by suppressing domestic rivalry and causing systemic corruption. Since public intervention plays a key role in the process of technological development, it should be based on an adequate understanding of the implications for domestic actors. Chaminade and Edquist (2010, p. 102) note: "Innovation policy – or other kinds of public intervention – should be a complement to the market, not replace or duplicate it. If there is no 'additionality', the public actions are a substitute for the actions of firms, and other private organizations. The two are overlapping or competing. It is of great importance that there actually is 'additionality' associated with the public intervention". In the case of Kazakhstan, targeted state intervention was extremely important because due to the elimination of trade and investment barriers in the process of accession to the WTO, domestic firms needed to catch-up with their external competitors. The obvious problem was that in post-Soviet Kazakhstan market forces were extremely weak and sluggish as the ways of doing things were shaped by decades of the central planning regime. Therefore, the need to create a domestic environment that would stimulate domestic firms to upgrade their production methods, increase networking, and improve downstream capabilities was quintessential. The authorities neither had a tangible plan for how to stimulate entrepreneurial activity nor knowledge about the measures that needed to be undertaken in order to intensify

market forces. Nevertheless, imagining themselves in the role of ideological successors of the governments of newly industrialised countries, Kazakhstan's authorities assumed that they could successfully intensify activity in the domestic market by using state procurement. Eventually, state procurement became a key instrument of public intervention as well as a main means of state budget utilisation. However, since state procurement constituted the bulk of public expenditure, domestic firms became concerned more about establishing and maintaining connections with the authorities, rather than the need to develop technological and downstream capabilities.

The way state procurement shapes the attitudes of the society towards entrepreneurship is exemplified by the following comments from Nurlan Musin, the former chief executive officer of Ulba Metallurgical Plant:

> We don't have economic activity of the population. The most active its part is occupied with the distribution of the 'budget cake'. That is to say, no one wants to engage in creative work. Rules of our society create environment in which no one wants to create, to develop new projects. No one needs this. Level of corruption is very high. It is not profitable, not interesting for people to do this, while it is possible to arrange everything quickly and discreetly. Most importantly, the whole society is afflicted. One asks, another gives. Both are sick. Do you see? Because both do not see anything wrong with this. Both believe that this is normal. (Nurlan Musin, interview, 18th July 2016)

The Deputy Chairman of the Board of the National Chamber of Entrepreneurs "Atameken", Nurzhan Altaev comments:

> The third issue, on which our entrepreneurs complain most of all is procurement of public sector, of the quasi-public sector and procurement of subsoil users [subsoil users need to purchase a certain amount of domestically produced inputs due to local content requirements]. Violations of both the legislation and the rights of entrepreneurs happen all the time during procurement. Technical conditions are frequently specified in such a way as to target a specific product from a specific supplier, often from the one who simply imports goods from abroad. (Nurzhan Altaev, interview, 29th July 2016)

OECD (2016, p. 35) notes that in Kazakhstan "public procurement commands 43% of government expenditure and is viewed as particularly corrupt". Since the government substituted market forces with state procurement, it became the key reason for systemic corruption in Kazakhstan.

The key problem with the idea of the extensive use of state procurement for spurring market forces was that it did not change the attitudes of domestic firms towards emerging categories of end-users, inhibiting their adaptation to competitive environment. In open market conditions various actors, including multinationals, industrial, and individual consumers rather than the government should become the main end-users of outputs produced by domestic firms. State procurement, on the contrary, implies that the government specifies product characteristics. Therefore, domestic firms did not put any efforts into developing distribution networks and the downstream capabilities required for bringing technology to the marketplace.

Besides, extensive state procurement means that domestic firms no longer need to improve their production methods in order to meet the international standards required for establishing backward linkages with multinationals. As a result of the replacement of market forces with state procurement, the quality of outputs of domestic firms deteriorated significantly. The extremely poor quality of even the most basic commodities, such as school desks purchased through state procurement made them impossible to use (Tengri news 2019). Not only did state procurement suppress domestic rivalry, disincentivise domestic firms to upgrade their production methods and develop downstream capabilities but it also impeded the adaptation of the mindsets of domestic actors to a new paradigm of socio-economic relationships.

My interview with the Deputy Chairman of the Board of the National Chamber of Entrepreneurs "Atameken", Nurzhan Altaev shows how attitudes towards the need to develop downstream capabilities, implement international standards, and understand the tastes of customers is influenced by extensive state procurement:

> I think our ubiquitous problem is that a very large number of entrepreneurs are focused on state procurement and procurement of the quasi-public sector, but not on the common market. Obviously, they know that year after year there will be state orders, procurement. There is no need to work on innovativeness, no need to improve your product. Clearly, one way or another it will be all purchased and used. For instance, many enterprises in light industry are not market-oriented. If you examine range of goods that they produce you will find that it is only what is used by rescue services, defence or law enforcement. I often go to exhibitions and see products of our light industry. It turns out that it is either a school uniform or uniform that is used by state bodies or organisations of the quasi-public sector, but those are not goods that are used in the market such as ordinary civilian shoes, suits etc. Although recently it began to appear, for a long time before that focus was exclusively on state procurement. Of course, it depraves entrepreneurs. That is to say, he doesn't need to improve this product, its competitiveness. He knows that it will be purchased anyway. (Nurzhan Altaev, interview, 29th July 2016)

It is important to emphasise that state procurement as an instrument of intensifying domestic rivalry lost all its meaning. In 2018, non-competitive (sole source) procurement constituted 75 percent of overall volume of state procurement, or 3.3 KZT trillion (≈ $ 8.5 USD billion) out of 4.4 KZT trillion (≈ $ 11 USD billion) (Sputnik 2019[1]).

The next section analyses how an interventionist style of governance influenced the role of national champions in Kazakhstan's technological development and whether it led to integration of local firms into their supply chains.

6.6. Automotive industry: promoting national champions

The reformist attitude of the authorities and their ambition to turn Kazakhstan into the Snow Leopard encouraged them to invest heavily in the development of the automotive industry. The automotive sector is traditionally considered to be one of the most prestigious industries. In addition to its own size, the automotive industry can generate far-reaching spillover effects in other sectors of the economy through backward linkages. Therefore, governments of both emerging economies and technologically advanced, industrialised countries placed attracting FDI into automotive industries high on their agenda. For instance,

Head (1998) reports that in order to convince Mercedes Benz to locate a plant in Alabama, the United States government effectively invested approximately $150,000 per job created. Being driven by the ambition to turn Kazakhstan into a knowledge-based, export-oriented economy, the authorities imagined that they would be able to develop high value-added manufacturing in other sectors of economy by attracting multinationals into the automotive sector. It was anticipated that entry of multinationals, facilitated by the removal of investment barriers in the frameworks of accession to the WTO, would enable domestic firms to integrate into the supply chains of multinationals. As a result of favourable state policies, the automotive industry quickly became a flagship of Kazakhstan's industrialisation. During a 5-year period the combined volume of production of all goods and services in Kazakhstan grew only twofold: from 9,121 KZT billion in 2009 to 18,531 KZT billion in 2014. Meanwhile, the volume of production in the automotive sector increased 29.6 times, from 6.3 KZT billion to 187.9 KZT billion for the same time period (Agency of statistics 2016). However, since Kazakhstan's strategy of technological development was based on an extremely ambitious sociotechnical imaginary, rather than a tangible plan, the authorities did not consider whether domestic industrial players are prepared to be suppliers of intermediate inputs for multinationals in such an advanced industry.

My interview with Aydin Kulseitov, Chairman of the Board of Kazakhstan Industry Development Institute demonstrates the government's enthusiasm for developing the automotive industries in Kazakhstan:

> When we went to China to learn about the programme 'China Manufacturing 2025' we met with the ideologists, the people who initiated their further industrialisation, Chinese Academy of Engineering. We asked their opinion about our programme. They examined it and wrote recommendation: "We see special potential in your automotive sector". (Aydin Kulseitov, interview, 17th March 2016)

Erzhan Mandiyev, President of Azia Avto comments:

> We've managed to achieve good results in Kazakhstan because our model of development allows us to control significant market share. Our own network, our model of development has shown its efficiency. In this sense AvtoVAZ is very interested in preserving this market share. This is the first cause why AvtoVAZ is interested. Another reason: we are located here in Kazakhstan and we understand that prospects of our development largely depend on ability to build long-term relationships with our partners. And this production is one of the ways to ensure such longevity. But there is, of course issue of economic expediency of these projects. And in this sense we are in trend here because of an industrial-innovative development policy, state support, et cetera. All these reasons combined together allow us to launch such a manufacturing project here, in Kazakhstan. For AvtoVAZ, why they do it? This is in order to ensure control of this production and guarantee preservation of their market share in long-term perspective. Because close distance between manufacture and markets improves manageability of these markets, increases stability of brand, and allows to preserve significant market positions in the area. (Erzhan Mandiyev, interview, 19th April 2016)

Through years of generous support for the automotive industry, the government raised a national champion – Azia Avto, producing 87% of all passenger cars in Kazakhstan through a

semi knocked-down assembly (box 6.3.). Together with the subsidiary of Renault-Nissan alliance, Russian automotive manufacturer AvtoVAZ, they organised a joint venture project that aimed to produce 120 thousand cars per year.

AZIA AVTO

- Established in 1992
- Main activities: car manufacturing and repairing
- Located in Ust-Kamenogorsk, East Kazakhstan
- Manufactured 87% of all passenger cars produced in Kazakhstan
- During 2012-2015 sold 265 791 cars (51% of total market share)
- 32 sales offices in 26 cities of Kazakhstan (population 17,45 million people)
- 24 sales offices in Ural and Siberian Federal Districts of Russian Federation (population 31,6 million people)
- Offices will be opened in Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan and Mongolia (overall population 53,4 million people)
- 5 751 employees (as of 01.01.2016)
- Logistics: 87 car transporters, 320 auto racks
- Payments in Kazakhstan's budget: approximately $500,000 USD every working day or 14% of budget of East Kazakhstan

Box 6.3. Azia Avto
Source: Azia Avto

The authorities were adamant that top-down hierarchy and unilateral domination by the public sector in the process of decision-making were essential for the successful transformation of post-Soviet Kazakhstan into a knowledge-based, export-oriented economy. Despite the absence of a tangible plan on how to overcome the problems of transition, the authorities imagined that by replicating an interventionist style of governance of Asian Tigers, they would be able to turn Kazakhstan into a new benchmark of successful economic development – the Snow Leopard. The Head of the State asserted: "It is my belief that all this progress, underpinned by a strong presidential power, has made it possible to overcome the legacy of the by-gone era and to grow at a higher pace than most members of the Commonwealth" (Nazarbayev 2005). The problem was, however, that in the absence of public accountability of public sector managers they focused on the less valuable but most visible targets while ignoring the necessity to pursue goals which were 'below the radar' of the higher authority. The main indicator of success that the government used was the share of local content in the outputs of the joint venture as it was supposed to indicate whether enough amounts of intermediate inputs were produced locally. In reality, the demands of the authorities to increase localisation share were meaningless because it did not show the level of integration of the joint venture with the local firms. For example, a 50% localisation share did not mean that half of all intermediate inputs were produced in Kazakhstan. In fact, it might have implied that the outputs were assembled exclusively from imported parts. The calculation of the share of localisation is based on subtracting the price of imported components from the retail price of the final product. Therefore, it includes wages, taxes, logistics costs, assembly operations, testing, advertising,

and many other things. Nevertheless, since the dynamics of the development of the joint venture project were constantly monitored by the authorities, public sector managers aimed to show positive results at all costs, by making massive concessions. Meanwhile, the necessity to build the capabilities of local firms by intensifying domestic rivalry, reducing regulatory burden, and facilitating networking was overlooked.

In order to demonstrate the results of their work to the higher authority, public sector managers even tried to convince the national champion to switch to the production of components, which would significantly increase the share of local content in the outputs of the joint venture. Erzhan Mandiyev, President of Azia Avto Kazakhstan explains why the pursuit of the imaginary goals of officials through production of random components was impossible:

> Market's potential and our ability to use this potential are crucial for development of domestic production. The main thesis which leads any entrepreneur is: if domestic production is more profitable than imports, the production will be organised. Otherwise no mottos will facilitate its development. This thesis is main here and it should be followed in any circumstances: if domestic production is more profitable, then there will be investment and money will inflow. From time to time we hear: "Why do we produce cars? Let's begin with production of engines first or launch production of some metal component for cars". Well, those people have some sort of perverse idea about the evolution of development. They assume that it is possible to start like that and then move forward. I mean that this metal component have to be sold somewhere. Who is going to need this metal part? Our company started to develop through sales. We have been selling and servicing cars. This was our key function and it still is. Our network is the largest in Kazakhstan. We are now developing in Russia. We have 15 service centres there. Currently we build relationships with Central Asia, start first supplies, open sales centres. This is our key function. Accordingly, after we learned how to sell product we came to a point where this product can be produced. Now, after we have established mass production we can speculate on issue of localisation. As soon as you have amassed volumes of production of local components, you can advance manufacturing process by making next step which implies performing R&D in order to increase efficiency. If market potential allows, of course. (Erzhan Mandiyev, interview, 19th April 2016)

My interview with Aydin Kulseitov, Chairman of the Board of Kazakhstan Industry Development Institute shows what the key priority of public sector managers was during negotiations:

> We told them: "If you want help, you need to localise." They replied: "Ok. How much?" We told: "well 50%." They replied: "Guys, in order to achieve 50% localisation we need to produce at least 120 thousand cars per year. The whole Kazakhstan in the best year produced 40 thousand. In order to produce 120 thousand we need market." We told: "Well then, decide for yourself." And they together with Renault-Nissan reached an agreement that parent firm gives them market from Ural to Far East [territory of Russian Federation] plus Central Asia on their AvtoVAZ models. In average this is exactly 120 thousand. (Aydin Kulseitov, interview, 17th March 2016)

While negotiating, public sector managers insisted upon the need to increase localisation share as it would demonstrate to the higher authorities that their vision of turning Kazakhstan into a

Snow Leopard is being implemented. As a result of concessions made by the Kazakhstani government, AvtoVAZ allowed Azia Avto to open 24 sales offices in Ural and Siberian Federal Districts of the Russian Federation with a population 31.6 million people. Moreover, due to agreement reached with AvtoVAZ, Azia Avto was planning to open sales offices in Turkmenistan, Uzbekistan, Tajikistan, Kyrgyzstan and Mongolia with an overall population of 53.4 million people.

Since the automotive industry is characterised by use of a vast variety of intermediate inputs in the production processes, the government imagined that local firms would be automatically integrated into the supply chain of the joint venture. Two main factors supported such an assumption. Firstly, the subsidiary of Renault-Nissan alliance, Russian automotive manufacturer AvtoVAZ owns 30 percent of the joint venture project, while 70 percent belongs to Kazakhstani national champion Azia Avto. Generally, joint ventures with the majority ownership share by domestic companies increase the likelihood of establishing backward linkages with local firms (Hoekman and Javorcik 2006). Secondly, being convinced by the rhetoric of the WTO that international technology transfer was the key to Kazakhstan's transformation into the Snow Leopard, the authorities provided the joint venture with an enormous level of state support. For example, in April 2015, Kazakhstan's government initiated the programme of concessional lending to finance the purchase of cars of domestic assembly. From April 2015 until May 2019, the state allocated 50 KZT billion (≈ $ 128 USD million) to car loans and leasing, enabling Kazakhstani citizens to purchase 6,000 cars (Strategy 2050 2019). Considering the fact that 87 percent of all passenger cars were produced by the national champion, it can be argued that Azia Avto became the major recipient of state support. Since the prospects of developing the joint venture hinged largely on support of the state, the government anticipated that there would be no impediments to establishing backward linkages with local firms. However, while the national champion had no objection against the idea of integrating domestic firms into its supply chain, the problem was that local industries were incapable of supplying intermediate inputs of satisfactory quality. The attitude of domestic firms towards the need to develop technological capabilities was shaped by interventionist policies of the government, which suppressed domestic rivalry and the development of an entrepreneurial spirit. As a result, local firms relied mostly on state procurement and had no incentives to invest in upgrading their technological capabilities.

Erzhan Mandiyev, President of Azia Avto argues that they were interested in buying intermediate inputs locally:

> We are located quite far from the main supply centres, it is Southeast Asia or central part of Europe. Therefore, ability to purchase intermediate inputs locally would enable us to avoid additional logistics costs associated not only with the transportation, but also with certain number of defects because of the damages that occur during the transportation. (Erzhan Mandiyev, interview, 19th April 2016)

In general, the likelihood of establishing backward linkages depends positively on transport costs (Rodrıguez-Clare 1996). The nearest place from which inputs could be exported is the Russian city Tolyatti, which is located 3500 kilometres away from the plant. Certain car components such as bumpers or wind shields are bulky, fragile and require expensive packaging. Therefore, transportation of such parts can be very costly, creating a strong incentive to purchase them locally.

The consequences of the tendency of domestic firms to rely solely on state intervention can be illustrated by the attempts of the government to negotiate the supply of car batteries

between Azia Avto and Kainar AKB. In general, local content policies are a viable instrument for nudging multinationals towards establishing backward linkages with potential domestic suppliers. However, the usefulness of local content policies can be completely undermined if their implementation is not based on a tangible plan. For example, the inability to utilise the potential of local content policies led to the failure of an initially highly successful car manufacturing programme in Philippines (Ofreneo 2008). The Philippines' government intended to upgrade their car industry from the assembly of completely-knocked-down or semi-knocked-down parts, to creating locally-made cars. Essentially, a programme was based on progressive rises in the local content of assembled cars. However, due to inconsistent implementation of the programme, the complete localisation of car manufacturing processes were never achieved. Later, local content requirements were fully withdrawn in compliance with the Agreement on Trade-Related Investment Measures under the WTO. In the case of Kazakhstan, however, the key problem was that the need to adapt the mindsets of domestic actors to a new paradigm of socio-economic relationships was overlooked. The authorities tried to accelerate the pace of reforms by adopting interventionist style of governance and replacing domestic rivalry with state procurement. Due to adoption of such an approach, domestic firms lacked entrepreneurial spirit and relied heavily on state intervention. In an attempt to establish backward linkage between the national champion and local firms, the government negotiated the possibility of supplying car batteries made by Kainar AKB – another national champion, which produces 1.3 million car batteries per year (box 6.4.).

During negotiations, representatives of Kainar AKB refused to undergo the necessary certification procedures for integration into the supply chains of multinationals. Moreover, representatives of Kainar AKB repeatedly appealed to obligations of Azia Avto to increase the share of local content. My interview with Aydin Kulseitov, Chairman of the Board of Kazakhstan Industry Development Institute demonstrates the tendency of domestic firms to rely solely on administrative measures:

> Local manufacturers could not even organise supply of car batteries. Well, our manufacturer [Kainar AKB] says: "We produce a million car batteries, why not to put some in this 30,000 cars? Azia Avto responds: "You have to go through a certain procedure. For instance, we assemble Kia [among other car brands]. You must approach Kia, prove that your car batteries are compatible with Kia, that they won't damage anything, won't affect quality, warranty, et cetera". In fact this is certification of particular type of product. They say: "Do it for us". Azia Avto replies: "Why should we do it? This is your product. You must be interested". They say: "No, Kazakhstani content, Kazakhstani content". I spoke with Erzhan Mandiyev [President of Azia Avto]. He says: "Strange people. They say that they want to sell their product but they don't want to certify and promote it. Well, we don't need that either". (Aydin Kulseitov, interview, 17th March 2016)

According to Erzhan Mandiyev, President of Azia Avto Kazakhstan, the key condition for cooperation was appropriate quality of intermediate inputs from local suppliers:

> There are so many nuances associated with the organisation of mass production of goods, trademarks of which do not belong to you. Lada trademark belongs to Renault-Nissan alliance. Therefore, it is manufactured in compliance with standards and requirements of Renault-Nissan alliance. Accordingly, we have to follow these

> standards. I mean that our aspirations to optimise our expenses should not have a negative effect on the final product. This condition should be taken into account. It means that we must follow the standards and must carry them out. Issues such as safety, certification, et cetera have to be considered. This is very complex procedure but it should be followed. (Erzhan Mandiyev, interview, 19th April 2016)

Nurlan Musin, former chief executive officer of Ulba Metallurgical Plant comments:

> Perhaps if we lived in the times of Henry Ford, it would be possible to integrate into supply chain without certification. Now it's just not possible. (Nurlan Musin, interview, 18th July 2016)

KAINAR AKB

- Established in 1975
- Main activities: battery manufacturing for cars, trucks, agricultural and military vehicles
- Headquarters located in Taldykorgan, Kazakhstan
- Form of ownership: a private limited-liability company
- Uses equipment of leading world manufacturers: Sovema (Italy), MAC (USA), Digatron and Kustan (Germany), BM (Austria)
- Full cycle of production, including lead–acid batteries recycling
- Manufactures 1.3 million car batteries per year
- Company's sales cover 40% of total domestic market share
- Exports constitute 55% of company's profits
- Main destinations of exports: Russia, Uzbekistan, Kyrgyzstan, Azerbaijan, Tajikistan, Belarus, Armenia, Ukraine, Afghanistan and China
- 700 employees

Box 6.4. Kainar AKB
Source: Vlast (2019).

Some public sector managers argue that after forming the joint venture with AvtoVAZ, the behaviour of the national champion Azia Avto started to closely resemble that of multinationals. For instance, Kairat Bekturgenev, Chairman of the Board of National Agency on Development of Local Content comments:

> Here is my personal frank opinion. Azia Avto should not stay aside. It is clear that our Kainar does not have contacts and cannot approach a parent company. Azia Avto can easily organise this. If they will help, the company will be certified. If they will just sit like that and argue "go, do it yourself", how they are supposed to approach them? Clearly there are hundreds of global producers of car batteries and when Kainar from Kazakhstan will come to parent company and say "let me be your supplier" will it suffice? I think they should act as partners. Azia Avto and Kainar should prove that here in Kazakhstan we produce, that we have required scope, we will develop further, we need localisation, on issue of localisation there is such product. In this case, a dialogue can take place. Azia Avto receives a lot of support from the state. So, there

> should be something in return from them. However, they see their contribution only in jobs creation. (Kairat Bekturgenev, interview, 15th June 2016)

Despite all attempts of the authorities to facilitate the establishment of backward linkages, negotiations between Kainar AKB and Azia Avto Kazakhstan brought rather frustrating results. Porter (1990, p. 625) argues: "… firms (and unions) will not change if they believe that government "assistance" will allow them to avoid the need to do so. Direct government "assistance" in one firm or industry also has a strong tendency to create forces that cause it to spread and multiply". Mikhail Bortnik, Senator, Member of the Committee on Economic Policy, Innovative Development and Entrepreneurship argues:

> I think that this is not normal for market relations. Perhaps it is a remnant of the past or maybe related to their dominant market share. Those are successful companies, having great achievements. But, I say that it is important to understand that we have to support those companies whether we want it or not. At some point they also begin to lose directions and use administrative measures instead of market mechanisms. Sometimes they say: "Provide us guarantees that you will buy cars that we produce for ambulance service, for the police". The car assembly plant, they already consider themselves in a position where they can demand. And we support. The same story with the battery factory. They know that there are state programmes that prioritise support of local manufacturers. So, why don't you buy my car batteries? Tomorrow you will report to akim [governor] and he will force you to buy. (Mikhail Bortnik, interview, 22nd May 2017)

Low technological capabilities of domestic firms, stemming from the absence of entrepreneurial spirit and their tendency to rely on state interventions, became the main obstacles for establishing backward linkages with the joint venture. Initially, the authorities expected that Azia Avto would potentially establish backward linkages with 15 firms located in the same region, such as a local producer of windshields U-Ka triplex, or Semey KozhMeh, specialising in leather products. However, negotiations between Kainar AKB and Azia Avto clearly demonstrated that attitudes of domestic firms, shaped by the interventionist policies of Kazakhstan's government, became the biggest impediment for establishing backward linkages.

6.7. Conclusion

The task of shifting from the coordination approach intrinsic to centrally-planned regime to the one inherent to the open market relationships was an extremely challenging undertaking because the mindsets of domestic actors were a product of the previous paradigm of socio-economic relationships. The authorities were truly inspired by the way the governments of newly industrialised economies overcame stagnation, achieved outward orientation of their economies and coordinated the industrialisation processes. Neoliberal rhetoric convinced the government that attracting FDI and implementing the reforms, insisted upon by the WTO would turn Kazakhstan into a new benchmark of successful economic development – the Snow Leopard. Therefore, the authorities attempted to accelerate the pace of radical reforms by replicating the interventionist style of governance of Asian Tigers. Although the authorities imagined themselves in the role of ideological successors to the governments of newly industrialised countries, no real attempts were made to examine contextual differences between post-Soviet Kazakhstan and Asian Tigers. Accordingly, the strategy of Kazakhstan's technological development was based on a sociotechnical imaginary, rather than a tangible plan that would recognise the necessity to adapt the mindsets of domestic actors to the new paradigm of socio-economic relationships. The interventionist style of

governance and dominance of the public sector aggravated the negative attitudes of domestic actors towards entrepreneurship, shaped by decades of central planning, making them reluctant to invest in capability building, blind to business opportunities and over-reliant on governmental intervention.

After the collapse of the Soviet Union, Kazakhstan's authorities faced the necessity to upgrade the national economy from the extraction of natural resources and lower-end processing towards the higher end of the value chain. During the command era an advanced system of mining complexes and metallurgical plants was built on the territory of Kazakhstan in order to utilise its rich fossil fuel and mineral deposits. However, downstream industries that processed raw and semi-finished materials were located in other republics of the Soviet Union. Post-Soviet Kazakhstan lacked the human resources, technological capabilities, and financial means, needed for building an entire value chain from the extraction of raw materials to production and retailing. Accordingly, attracting FDI into the processing industries through accession to the WTO seemed to be the only way of industrialising the national economy. Initially, the reforms have boosted the flow in inward FDI, but mainly into extracting industries. However, after the government launched an industrialisation programme, those multinationals that sought for an opportunity to reduce transportation costs started to relocate their production processes into Kazakhstan. The government realised that reliance on multinationals was a short-sighted strategy and aimed to reduce dependence of Kazakhstan's technological development on foreign capital by encouraging domestic firms to participate in the industrialisation programme. The problem was, however, that the authorities imagined themselves in the role of ideological successors of the governments of Asian Tigers and established unilateral control over the decision-making process. In the absence of checks and balances that would put constraints on the behaviour of public sector managers, they developed a tendency to focus solely on producing outputs that were monitored by the higher authority. The lack of entrepreneurial vision amongst domestic firms and their over-reliance on governmental intervention led to a race to the bottom because in an attempt to demonstrate the results of their work to the higher authority, the local authorities tried to include into a map of the industrialisation as many domestic firms as possible, without taking into consideration the absence of necessary infrastructure, lack of access to potential target markets, and weak downstream capabilities.

Since the ways of doing things were shaped by decades of a central planning regime, the authorities attempted to spur the process of transition by replacing weak and sluggish market forces with state procurement. After relocating their production facilities into Kazakhstan, multinationals started to seek opportunities to integrate domestic firms into their supply chains as it would enable them to avoid currency risks, lower transportation costs and eliminate uncertainty about timely delivery. While multinationals were interested in purchasing intermediate inputs locally, they found that domestic firms neither wished to update their production methods nor strived to improve quality of produced outputs. The main reason for that was that the government based the country's strategy of technological development on a sociotechnical imaginary, rather than on a tangible plan. Instead of intensifying domestic rivalry by creating a fair play environment, the government tried to incentivise domestic firms to invest in the development of technological, human, and organisational competences through state procurement. However, since non-competitive (sole source) procurement constituted the bulk of state procurement, domestic firms became more concerned about establishing connections with public sector managers, rather than with the need to upgrade technologically.

As a result, governmental intervention suppressed domestic rivalry and caused systemic corruption. Moreover, since extensive state procurement replaced market mechanisms, domestic firms no longer needed to adapt themselves to the needs of emerging categories of end-users, improve their production methods, develop the distribution networks and downstream capabilities required for bringing technology to the marketplace.

7. CONCLUSION

7.1. Introduction

The principle goals of this research project were laid out in detail in introduction chapter. Thus, they require only brief recapitulation here. My first goal was to gain an understanding about why transition economies experience difficulties whilst trying to catch-up with mature market economies in terms of technological development. I embarked on this research journey after witnessing over many years the futile attempts of Kazakhstan's government to turn this former centrally-planned economy into a knowledge-based, outward-oriented market economy. The turning point was the realisation that despite the eagerness of policymakers to learn from their own mistakes, the situation could not be dramatically improved. This was because some inevitable miscalculations in governmental policies were only a proximate cause of the systemic problems experienced by economies in transition. Therefore, this research aimed to identify the higher-level causes of the inability of transition economies to catch-up in terms of technological development. Since there was no theory or guidelines on transition, such a research project seemed highly worthwhile. My second research goal stemmed from the need to identify an appropriate course of action for Kazakhstan's government as I was bothered by the tendency of policy-makers to act on visions of desirable futures rather than tangible plans. The fact was serious in view of the magnitude of change, the reformist attitudes of the authorities, and the lack of theoretical guidelines upon which policymakers could base their decisions. My third goal was to examine whether accession to the WTO really was a free ride towards technological catching-up as had been imagined by the governments of transition economies. I aimed to examine if the ability to increase the flow of inward FDI outweighed negative effects caused by the imposition of the principles of the Washington Consensus on former closed centrally-planned economies. Considering the fact that there is no verified, well-articulated analytical framework linking changes in the inflow of FDI to differences in technological performance, my intention to contribute to international technology transfer literature by showing the importance of engaging in a contextual examination of the factors that inhibit the occurrence of spillover effects seemed as a step in the right direction.

In this chapter I outline the practical and theoretical implications of this thesis, and discuss issues which arouse during its progress. Section 7.2. summarises the main findings by answering the research questions and presenting the theoretical and empirical contributions developed in the process of conducting this research. Section 7.3. explains how the findings of this thesis should be interpreted by policymakers and in what ways they can be applied in the 'real world of policymaking'. Section 7.4. discusses the limitations of this research project and provides suggestions for future studies.

7.2. Empirical results

Whilst my main objective was to learn things I did not know rather than to prove something I already did, this thesis enabled me to demonstrate that the largely neglected field of innovation policy is arguably the most important dimension in the innovation systems approach. There were various things I learnt in the process of conducting this research project. For instance, I discovered that Kazakhstan's accession to the WTO was significantly more than simply a case of a country that failed to catch-up with mature market economies due to the poor decision-making of the national government. Rather, it represents a metaphor of the realities of global policymaking by demonstrating how alleged 'fair-play' rules imposed by developed countries through intergovernmental organisations affect powerless countries. I also found that the most dangerous instrument in the arsenal of intergovernmental entities is not the

blunt force of economic and political pressure, but soft power of creating imaginaries that play on the ambitions of those who lag behind. This realisation was important, as promises of desirable futures can may set a country on a wrong path of technological, social, and economic development, and can be far more devastating than political and economic restraints. Overall, everything I learnt in the process of conducting this research project confirmed what I believed all along – that innovation policy answers the most important questions as it deals with the complex interplay of knowledge, its application, and power. As Russel (2004, p. 4) puts it: "The fundamental concept in the social sciences is Power, in the same sense in which Energy is the fundamental concept in physics". Accordingly, while presenting my findings I aim to draw attention to the fact that innovation policy is far from being a trivial field of study because the prospects of technological development hinge as much on the knowledge of those at the top of the pyramid, as they do on those who work in labs, clinics, technology parks and other professionally bounded spaces.

In this section, I restate the research questions and sum up the main findings.

1. In what ways does the interplay between the formal arrangements the governments of transition economies had to set up in the process of reforms, and the long-established informal elements, embedded in the mindsets of domestic actors affect the transformation of former centrally-planned economies into open market economies?

This thesis demonstrates that the tendency to depict transition merely as a process of harmonising the formal institutional and organisational set-ups of former centrally-planned economies with the generally accepted norms of open market relationships is deeply misleading. In recent times, policymakers were able to express their concerns about the fairness of WTO policies because different studies convincingly demonstrated that some demands of the organisation negatively affected economic and technological development of catching-up economies. For instance, Cimoli and Dosi (2017, p. 49) argue: "There is another big novelty in the current organization of international economic relations, namely, the regulatory regime stemming from the World Trade Organization… This historically unprecedented regime indeed implies a significant reduction in the degrees of freedom developing countries can enjoy in their trade policies, while notably all catch-up countries in the preceding waves of industrialization could exploit a large menu of quotas, tariffs, and other forms of nontariff barriers". Nevertheless, due to a commonly held misconception that a centrally-planned regime was a non-system, the WTO was in position to demand that the governments of former Soviet republics establish open market relationships before gaining an upgrade to full membership status by arguing that such demands would unequivocally benefit transition economies. In reality, however, centrally-planned regime was a fully-fledged paradigm, the aim of which was not simply to replace market forces with planning procedures, but to eradicate inequality, speculation, unemployment and exploitation. The ideology of socialism shaped the values of domestic actors, defining their norms, routines, and codes of conduct. Over the course of decades of socialist rule these informal elements entrenched deeply in the mindsets of people. Radical reforms could not be implemented overnight because these informal elements are sticky, path-dependent, and highly resistance to change. Accordingly, the empirical findings of this thesis suggest that WTO-plus demands hindered the development of former centrally-planned economies because the main challenge of transition was not in changing formal structures but in making them fit with well-established informal constraints.

This research project demonstrates that the attention of policymakers should be shifted away from the rules stipulated in formal WTO agreements and towards the effects produced by WTO-plus demands. A mismatch between the formal structures that the government set up

in the process of implementation of WTO-plus demands and well-established informal elements manifested itself in various ways. The first thing to mention is a lack of near-market research required for producing competitive outputs in open market conditions. The tendency of researchers to overlook the commercial viability of research outputs has proved extremely difficult to overcome, because the mindsets of researchers became locked-in on certain ways of doing things shaped by the structure of incentives and the organisational framework of the science-push model of technological development. The second issue relates to the lack of entrepreneurial spirit in society and the tendency of businessmen to rely heavily on governmental intervention, something which is incompatible with the open market relationships. Entrepreneurs simply did not see the benefits of adapting themselves to the needs of emerging categories of end-users, updating their manufacturing methods, or developing the distribution networks and downstream capabilities required for bringing technology to the marketplace because throughout the decades of communist rule several generations of people lived in a completely different paradigm of socio-economic relationships. The third way in which mismatch manifested itself relates to the negative attitude of public sector managers towards entrepreneurship, stemming from the fact that during the Soviet time entrepreneurial activity was an illegal activity. This long-established attitude towards entrepreneurship encouraged public sector managers to create obstacles to engaging in business activities and became the primary reason for systemic corruption, with officials exploiting the complexity of national legislation in order to extort kickbacks from businessmen. The findings of this thesis suggest that the mismatch between formal arrangements that the government set up and long-established informal constraints had a significant impact on the economic and technological development of transition economies. Nevertheless, research literature neglects these issue, focusing exclusively on examining the effects of the rules stipulated in formal WTO agreements, and does not take into consideration the impact of WTO-plus demands on establishing open market relationships.

2. *How did the governments of transition economies envision technological development and was their strategy efficient in terms of turning former centrally-planned economies into open market economies?*

This research draws attention to the fact that in the absence of knowledge on how to transform a former closed, centrally-planned economy into an open market economy, policy-makers based Kazakhstan's strategy of technological development on a sociotechnical imaginary shaped by the neoliberal rhetoric of the WTO, rather than on tangible plans. At the outset of the transition no attempts were made to develop a theory on how to implement this transformation. In the absence of a clear vision of what needed to be done in order to catch-up with mature market economies, policymakers had to act in accordance with their personal instincts, abstract theories, and anecdotal evidence. However, the course of action was shaped by the process of accession to the WTO. Being an active promoter of the ideas of the Washington Consensus, the WTO required the governments of transition economies to deregulate FDI and establish open market relationships. In order to accelerate the pace of reforms, the WTO formed a sociotechnical imaginary by convincing the government that these requirements were necessary to turn Kazakhstan into a knowledge-based, outward-oriented economy. The WTO had no knowledge of what course of action should be taken in order to transform transition economies into fully-fledged competitive economic systems. The reforms that the WTO insisted upon were simply a part of broader WTO agenda to establish the neoliberal principles of the Washington Consensus on a global level. Moreover, the rules of the Washington Consensus were designed with market economic systems rather than centrally-planned economies in mind and contained some obvious misconceptions, pointed out in

innovation policy literature, such as a tendency to borrow 'best-practice' policies and a strong bias towards market fundamentalism. Nevertheless, the authorities enthusiastically embarked on their implementation due to the firm belief that reforms would unequivocally benefit Kazakhstan's development, and adopted the 'economy first, then politics' approach in order to prevent any delays. Therefore, this thesis points out that reforms were designed with a lack of understanding of what needed to be done and were guided by the contextually-irrelevant prescriptions of the Washington Consensus, and implemented in a top-down manner.

The empirical findings of this thesis suggest that the decision to base the strategy of technological development on visions of a desirable future, shaped by the WTO did not make good social, political, and economic sense. First, envisioning themselves in the role of ideological successors to the governments of Asian Tigers, the authorities developed reformist attitudes and adopted an interventionist style of governance. The adoption of the 'economy first, then politics' approach hampered the development of checks and balances which would have put constraints on the behaviour of officials, something which caused systemic corruption and facilitated the establishment of a practice of pursuing only those targets, the accomplishment of which would have brough public sector managers to the attention of their higher authority. Second, the belief that Kazakhstan was about to turn into a new benchmark of successful economic development – the Snow Leopard – inspired the government to spur weak and sluggish market forces with governmental intervention whilst overlooking the need to adapt the mindsets of domestic actors to the new paradigm of socio-economic relationships. However, since the attitudes towards entrepreneurship in Kazakhstani society were shaped by decades of central planning, excessive governmental intervention made entrepreneurs unresponsive to emerging business opportunities, reluctant to invest in capability building, and over-reliant on state support. Third, imaginary of what implementing the reforms would entail encouraged the government to pursue goals that were set in accordance with neoliberal ideology, such as opening up, finding ways to attract FDI and creating a 'fair play' environment for multinationals. Meanwhile, the need to encourage entrepreneurs to update their production methods, improve the competitiveness of their commodities, develop distribution networks and downstream capabilities was overlooked. This research project demonstrates how dangerously misleading sociotechnical imaginaries can be and explains why national policies should be based upon well-grounded theory and supported by empirical investigation. It also draws the attention of innovation policy researchers to the fact that the tendency to engage in purely theoretical elaborations about the factors that may lead to system failure have limited practical value as a checklist of potential systemic problems, does not provide guidelines on what needs to be done, and may be completely irrelevant to context of a country.

3. *To what extent did joining the WTO enable transition economies to benefit from FDI spillover effects and what are the system-level factors that may inhibit integration of domestic research and development and industrial players into global value chains?*

This research represents an attempt to move forward from aggregate-level evaluations of factors determining the occurrence of spillover effects, to an empirical examination of the systemic problems that obscure technology transfer. Although the occurrence of FDI spillovers is a relatively unexplored subject, organisations engaged in developmental efforts insist that accession to the WTO and the creation of a fair-play environment for multinationals will have strong positive effects on economies in transition. Accordingly, despite the binding nature of WTO commitments, transition economies strived to gain membership of the organisation in order to catch-up with industrialised economies in terms of technological capabilities. Yet, claims about the positive externalities generated by the presence of multinationals are based on different interpretations of aggregate data or cross-sectional surveys without the supporting

evidence for causation. Various extravagant claims about the occurrence of horizontal spillovers have been refuted by more recent studies. For instance, Javorcik (2006, p. 208) argues: "It is possible, though, that researchers have been looking for FDI spillovers in the wrong place. Since multinationals have an incentive to prevent information leakage that would enhance the performance of their local competitors but at the same time may benefit from transferring knowledge to their local suppliers, spillovers from FDI are more likely to be vertical than horizontal in nature". However, the empirical findings of this thesis suggest that the expectations of the authorities that multinationals would integrate domestic firms into their supply chains (vertical spillover) were also not met. Domestic firms were incapable of supplying high-quality intermediate inputs to multinationals as they lag behind in terms of scale efficiency, the capacity to innovate, and the quality and variety of produced outputs. The key reason for this was the tendency of the authorities to focus on attracting multinationals whilst overlooking the need to develop local capabilities. Entrepreneurs on their own did not see the benefits of investing in capability building because their mindsets were locked-in on the previous paradigm of socio-economic relationships. Moreover, this thesis shows that since multinationals are interested in exploiting local capabilities rather than expanding their own competences abroad, in Kazakhstan their activity is mostly limited to last-stage assembly and extracting natural resources. Attempts by the authorities to incentivise the relocation of knowledge-intensive stages of production through the creation of centres of research excellence have failed because researchers have been reluctant to engage in near-market research. Overall, this thesis found no evidence that accession to the WTO and a consequent increase in the flow of inward FDI benefited Kazakhstan's R&D and industrial players.

7.3. Implications for policy

This research draws the attention of governments of transition economies to the realities of global policymaking by showing that the decision of the WTO to overlook the specificities of the contexts of former centrally-planned economies and to force them to follow the ideas of the Washington Consensus was fundamentally wrong. In the absence of bargaining power, transition economies had no other option but to follow WTO-plus demands to implement the prescription of the Washington Consensus to deregulate FDI and establish open market relationships with minimal governmental intervention. The United Nations (2001, p. 37) notes: "… because of their relative insignificance to the world trading system as a whole, countries with economies in transition have encountered tougher demands from WTO members than they would be able to implement without causing injury to their national economy". The WTO disregarded the fact that the rules of the Washington Consensus were designed with market economic systems in mind and did not take into consideration the difficulties experienced by transition economies. Due to a widely held view that a centrally-planned regime was a non-system; the WTO was in position to argue that the imposition of the rules of the Washington Consensus would unequivocally benefit economies in transition. However, the crucial-case research design used in this thesis allows us to generalise the findings of the case of Kazakhstan to all transition economies by showing that the main obstacle to the successful transformation of former centrally-planned economies into open market economies lay not so much in the task of changing their formal structures, as in making them fit with well-established informal elements, embedded in the mindsets of domestic actors. The reforms in Kazakhstan were implemented more gradually then in all other transition economies – its accession taking 19 years – which makes it the longest in the history of the WTO. Accordingly, among all transition economies Kazakhstan had the biggest potential to avoid systemic problems, caused by a mismatch between formal structures that the government set up in the process of implementing WTO-plus demands, and well-established informal elements. Moreover, WTO officials

portrayed Kazakhstan's experience as the most successful amongst transition economies, linking its alleged successes to the benefits of accession (WTO 2018[1]). Nevertheless, the findings of this thesis suggest that Kazakhstan was unable to overcome such systemic problems because the mindsets of domestic actors are sticky, path-dependent, and extremely resilient even to the most skilful and targeted governmental intervention. Therefore, the findings of these thesis can be used by the governments of transition economies in order to defend their interests. As Flyvbjerg (1998, p. 229) puts it: "In a democratic society, rational argument is one of the few forms of power the powerless still possess". Being latecomers and having no real bargaining power, transition economies, nevertheless, can raise their awareness and appeal to reason.

The governments of transition economies need to understand that their actions should be based on comprehensive analysis and well-elaborated plans rather than visions of desirable futures. As a means of making transition economies follow the agenda of the WTO, sociotechnical imaginaries proved to be extremely potent as they do not set limitations on what can be said by holding those forming them accountable for what they promise, or requiring them to provide evidence that it is truth. The following quotation demonstrates how convincing can be rhetoric based on imaginaries. WTO's Deputy Director-General Alan Wolff claims: "There is no better place to demonstrate the dividends of a long and hard WTO accession process than in Kazakhstan. It was a long journey of nearly 20 years for Kazakhstan to join the Organization in 2015. But, it has helped transform Kazakhstan from a poor country with GDP per capita at USD 1,350 in 1996 to a modern economy, with sophisticated management based on knowledge and skills, with GDP per capita peaking at nearly USD 14,000 in 2013" (WTO 2018[1]). What the governments of former centrally-planned economies need to remember is that although imaginaries can be very attractive, they have nothing to do with what really needs to be done. In order to mitigate the impact of radical transformation from central planning to market relationships, the authorities need to adopt measures which will reduce mismatch between formal set-ups and informal elements. These measures include the need to reduce complexity of national legislations, increase transparency of governmental decision-making, raise entrepreneurial spirit, change attitudes of public sector managers towards entrepreneurship, and introduce checks and balances by providing freedoms to civil society and mass media. Implementation of these measures is a long-term endeavour that requires careful, balanced, step-by-step approach in order to avoid the danger of turning them into another means of achieving ulterior goals through populist statements or actions.

Neoliberal ideas seem very attractive to the governments of transition economies as they suggest that open market relationships offer a fast, free ride towards the successful transformation of former closed, centrally-planned economies into knowledge-based, outward-oriented economies. Proponents of neoliberal ideas insist that an intensified formation of border-crossing networks of finance, production and trade turns the world economy into a unified global market (Wriston 1992). According to their argument, globalisation rapidly transforms the contemporary world, leading to the 'denationalisation' of sovereign states. Neoliberalists claim that a rise in the power of multinationals and intergovernmental entities has blurred borders between nation states, turning contexts of individual nations into obsolete and even irrelevant units in today's boundless world. For instance, Kindleberger (1969, p. 207) states: "the nation state is just about through as an economic unit". Similarly, Kenichi Ohmae (1995, p. 11) argues that the "nation-states have already lost their role as meaningful units of participation in the global economy of today's borderless world". Accordingly, the governments of transition economies tend to focus on attracting FDI rather than creating an environment that would facilitate the capability building of domestic firms. In reality, the national dimension becomes even more important after a country opens up to outside

competition. Porter (1990, p. 19) argues: "The role of the home nation seems to be as strong or stronger than ever. While globalization of competition might appear to make the nation less important, instead it seems to make it more so. With fewer impediments to trade to shelter uncompetitive domestic firms and industries, the home nation takes on growing significance because it is the source of the skills and technology that underpin competitive advantage". Therefore, the important implication of this thesis is that the governments of transition economies should first and foremost pursue policies that lead to an upgrade of national R&D and industrial players, rather than following neoliberal ideas that promise quick results. The problem with pursuing such policies is that building the competitive advantage of national R&D and industrial players is a very slow process that may take decades of hard work because the mindsets of domestic actors are locked-in on the old ways of doing things. For policymakers it might be a hard call to make because it means that they will not be able to demonstrate results of their work within the lifetime of their carriers.

7.4. Limitations and suggestions for further research

Whereas this research explains the causes of systemic problems in transition economies and puts emphasis on what needs to be done, it does not clarify how it should be done. My research interests lay in a deep contextual examination of the experiences of transition economies rather than in making universal generalisations. As Ragin (1987, p. 6) puts it: "the goals of comparative social scientists typically extend beyond an interest in simply cataloguing and explaining cross-societal similarities and differences. Most comparativists, especially those who are qualitatively oriented, also seek to interpret specific experiences and trajectories of specific countries (or categories of countries). That is, they are interested in the cases themselves, their historical experiences in particular, not simply in relations between variables characterizing broad categories of cases". Attention to specificities of the context of transition economies helped me to understand the main cause of systemic problems in transition economies. Accordingly, in this research I have drawn attention of the reader to the fact that the imposition of the prescriptions of the Washington Consensus by the WTO was fundamentally wrong because the mindsets of domestic actors were not adapted to the ways things are done in the open market relationships. I argued that a mismatch between formal structures that the government set up in the course of reforms and well-established informal elements caused various systemic problems. I then emphasised that the government should reduce the complexity of regulations, focus on making society more entrepreneurial, abstain from attempts to replace weak and sluggish market forces with extensive state intervention. I also demonstrated that 'borrowed' policy instruments that bring positive results in the contexts of mature market economies do not fit well with the routines, norms, practices and codes of conduct inherent to transition economies. However, I did not suggest any alternative policy instruments that could be successfully used specifically in the contexts of transition economies. One of the reasons for this is my firm belief that by 'borrowing' policies we overlook the 'bigger picture' of creating 'learning organisations'. Another reason is potential mismatch to the 'real world of policymaking'. Nevertheless, I acknowledge that the main limitation of my thesis is an absence of analysis on which policy instruments can be used in the context of transition economies, something which simultaneously offers great potential for future research.

Examining the experience of a country that undergoes the process of transition provides an opportunity to advance our understanding of the causal links between institutions and technological change. In this thesis I demonstrated that there is a lack of understanding about the role of institutions amongst policy-makers, by showing how the tendency of the WTO to disregard the importance of interplay between formal institutional arrangements that the

government were required to set up in the process of reforms and informal institutions affected Kazakhstan's technological development. I have also shown that the research literature does not provide any insights on this matter, because the discussion of the role of institutions in the scarce field of innovation policy is rarely based on empirical evidence with attention being paid mostly to developed countries (Chaminade et al. 2012). Convergence of the institutional arrangements under examination creates an impediment to understanding the effects they have produced on the process of technological catch-up. Scott (1995, p. 146) argues: "It is difficult if not impossible to discern the effects of institutions… if all our cases are embedded in the same or very similar contexts". Given that most existing research takes place in developed, market-driven economies, examining a country that has distinctively different institutional arrangements would allow for variation in institutional contexts. Moreover, I believe that such a study would offer great opportunities for the field of innovation policy as the role of institutions is highly salient in the transition economies because scope and pace of institutional change is unprecedented. For instance, Lundvall et al. (2006, p. 1) define transition as "a process where one constellation of institutions is turning into a different constellation of institutions". Radical institutional transformation implemented in a very limited time frame brings out issues associated with path-dependence and stickiness of institutions, revealing how institutional change shapes the behaviour and performance of economic actors.

When I started this research project, the thing that surprised me the most was that even though innovation systems scholars typically seek explanations in institutional, organisational or other systemic characteristics, they have tendency to cluster countries by their aggregate economic characteristics. Clustering countries together is a frequently used strategy, allowing to reduce complexity and establish a cross-national analytic framework. Clustering allows us to highlight the most salient patterns within the data and produce a parsimonious explanation of observable phenomena. However, the problem is that the process of clustering in innovation studies is often taken as given and not explicitly discussed. There are two types of clustering in social science: empirical clustering and typologies. Empirical clustering is based on patterns within statistical data. It talks about 'similar cases' at an aggregate level (e.g. large high-income countries, small lower-income countries, etc.). Meanwhile, typologies include references to theory, generate statements of interconnectedness, consistency and organic unity about 'structural wholes'. One of the most notable examples of country clustering based on the use of typologies is the book of Francis G. Castles (1998) 'Families of nations. Patterns of public policy in western democracies'. Castles distinguishes four 'families of nations' among 21 highly industrialised and democratic OECD countries. The clusters of countries within the 'families of nations' typology are based on long-standing common institutional, cultural, and historical experiences. Accordingly, the English speaking 'family of nations' consists of Australia, Canada, Ireland, New Zealand, the United Kingdom and the USA. A Continental 'family of nations' includes Austria, Belgium, France, Germany, Italy, and the Netherlands. A Scandinavian 'family of nations' consists of Denmark, Finland, Norway, and Sweden. A Southern 'family of nations' comprises Greece, Portugal, and Spain. Only Japan and Switzerland did not fit into any of these four families. Castles demonstrates that nations within each family manifest very similar public policy outcomes whereas 'families on nations' differ from each other significantly in respect of policymaking. I believe that seven decades of common history, during which transition economies were parts of the Soviet Union not only led to establishment of similar institutional and organisational arrangements, but also formed common values, attitudes and views of the world, defining the ways things are done in these countries. Therefore, I argue that transition economies represent another 'family of nations', the examination of which can be very beneficial to the field of innovation policy due to homogeneity and representativeness of its cases.

Groups of countries differ from each other significantly in terms of ideologies, traditions, social, and economic experiences. Inability to take this simple fact into consideration may cause some serious repercussions. A central reason why this research project was undertaken was to draw attention to the problems experienced by former centrally planned economies when being forced to set-up formal institutional and organisational arrangements inherent to open market economies during their accession to the WTO. This thesis illustrates that the tendency by intergovernmental organisations to impose reforms without taking into consideration informal constraints, entrenched in the mindsets of domestic actors is highly irresponsible. Thinking holistically about cases under observation helps to avoid such mistakes and offers vast research opportunities for extending the most important, albeit overlooked dimension of innovation systems approach – the field of innovation policy.

8. APPENDIX
Self-Audit Checklist

University of Edinburgh,
School of Health in Social Science
RESEARCH ETHICS COMMITTEE
Self-Audit Checklist for Level 1 Ethical Review
The audit is to be conducted by
 For funded research: *The Principal Investigator ,*
 Postdoctoral research fellowships *– the applicant in collaboration with the proposed mentor.*
 Postgraduate research *(PhD and Masters by Research) – the students in collaboration with supervisor.*
 Taught Masters dissertation *work and* ***Undergraduate dissertation/project work:*** *the applicant in collaboration with dissertation/project supervisor*

Note: all members of staff and students should conduct ethical self-audit of their proposed research as part of the proposal process.

1. IRAS or LOCAL AUTHORITY/SOCIAL WORK ethical review
Does the project require IRAS review or review by bodies aborad? NO
2. Protection of research subject confidentiality
Are there any issues of CONFIDENTIALITY which are not ADEQUATELY HANDLED by normal tenets of academic confidentiality? NO
These include well-established sets of undertakings that may be agreed more or less explicitly with collaborating individuals/organisations, for example, regarding:
(a) Non-attribution of individual responses;
(b) Individuals and organisations anonymised in publications and presentation;
(c) Specific agreement with respondents regarding feedback to collaborators and publication.
3. Data protection and consent
Are there any issues of DATA HANDLING and CONSENT which are not ADEQUATELY DEALT WITH and compliant with established procedures? NO
These include well-established sets of undertakings, for example regarding:
(a) Compliance with the University of Edinburgh's Data Protection procedures (see www.recordsmanagement.ed.ac.uk);
(b) Respondents giving consent regarding the collection of personal data;
(c) No special issues arising about confidentiality/informed consent.
4. Moral issues and Researcher/Institutional Conflicts of Interest *Are there any SPECIAL MORAL ISSUES/CONFLICTS OF INTEREST?* NO
(a) An example of conflict of interest would be a financial or non-financial benefit for him/herself or for a relative of friend.
(b) Particular moral issues or concerns could arise, for example where the purposes of research are concealed, where respondents are unable to provide informed consent, or where research findings would impinge negatively/differentially upon the interests of participants.
5. Potential physical or psychological harm, discomfort or stress
(a) Is there a SIGNIFICANT FORSEEABLE POTENTIAL FOR PSYCHOLOGICAL HARM OR STRESS for participants? NO
(b) Is there a SIGNIFICANT FORSEEABLE POTENTIAL FOR PHYSICAL HARM OR DISCOMFORT? NO
(c) Is there a SIGNIFICANT FORSEEABLE RISK TO THE RESEARCHER? NO

6. Bringing the University into disrepute

Is there any aspect of the proposed research which might bring the University into disrepute? NO

7. Vulnerable participants

Are any of the participants or interviewees in the research vulnerable, e.g. children and young people, people who are in custody or care, such as students at school, self help groups, residents of nursing home? NO

8. Duty to disseminate research findings

Are there issues which will prevent all participants and relevant stakeholders having access to a clear, understandable and accurate summary of the research findings? NO

Overall assessment

If all the answers are NO, the self audit has been conducted and confirms the ABSENCE OF REASONABLY FORESEEABLE ETHICAL RISKS. The following text should be emailed to the relevant person, as set out below:

Text: "I confirm that I have carried out the School Ethics self-audit in relation to [*my / name of researcher*] proposed research project *[name of project and funding body]* and that no reasonably foreseeable ethical risks have been identified."

 Research grants– the Principal Investigator should send this email to the SHSS Research Ethics Administrator (L.Sheal@ed.ac.uk) it will be kept on file with the application.

 Postdoctoral research fellowships – the Mentor should ensure that the Fellow email the SHSS Research Ethics Administrator Office (L.Sheal@ed.ac.uk) where it will be kept on file with the application.

 Postgraduate research (PhD and Masters by Research) – there is no need to send the Level 1 email. The ethical statement should be included in the student's Review reports.

 Taught Masters dissertation work and **Undergraduate dissertation/project** work – there is no need to send the level 1 email. The dissertation/project supervisor should retain the ethical statement with the student's dissertation/project papers.

If one or more answers are YES, risks have been identified and level 2 audit is required. See the School Research Ethics Policy and Procedures webpage …. for full details.

Consent Form

ИНФОРМИРОВАННОЕ СОГЛАСИЕ НА УЧАСТИЕ В НАУЧНОМ ИССЛЕДОВАНИИ

Описание научного проекта

Целью проведения данного интервью является выявление факторов определяющих производительность национальной системы инноваций Казахстана после вхождения во Всемирную Торговую Организацию (ВТО). Интервью являются частью исследовательского проекта направленного на изучение влияния вступления в ВТО на национальные системы инноваций стран с переходной экономикой.

Интервью будут проведены во взаимно согласованное время и в заранее оговоренном месте. Интервью будут записываться на цифровые устройства. Интервью будут проанализированы для целей этого исследовательского проекта и информация содержащаяся в них может быть использована в соответсвующей научной публикации.

Я был проинформирован о целях исследовательского проекта и задачах данного интервью. Я понимаю:

 Смысл моего участия в данном интервью.

 Я даю согласие на ведение записей во время интервью.

 Мое участие в интервью является добровольным.

Я даю свое согласие на использование информации полученной в данном интервью для целей вышеупомянутого научного проекта.

Я даю свое согласие на цитирование элементов данного интервью с указанием моих личных данных.

Респондент..... Дата.....

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